2022

Quality improvement initiatives in county hospitals: a multiple case study of four hospitals in Uasin Gishu County

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Quality Improvement Initiatives in County Hospitals: A Multiple Case Study of Four Hospitals in Uasin Gishu County

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Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Business Administration in Healthcare Management at Strathmore University

Strathmore University

Nairobi, Kenya

December 2021

Declaration

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Approval

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Abstract

There is growing evidence showing that expanded access to healthcare services is in itself insufficient, and that quality and patient safety are vital components for achievement of good outcomes. Like other counties, Uasin Gishu County has made effort to encourage healthcare facilities to take up continuous quality improvement (QI) initiatives. While hospitals report implementing QI, no assessments have been done to inform the county policymakers. This study sought to fill that gap. Using four facilities as cases (Huruma, Turbo, Pioneer, and Uasin Gishu), the study employed a mixed-methods approach, including a questionnaire survey covering 180 participants (various roles and levels) and qualitative in depth interviews with facility in charges, heads of department or QI focal persons (champions). The study found that the Plan-Do-Study-Act (PDSA) model was the primary approach used across the County, building mainly from the vertical HIV care program. Most QI initiatives were externally driven under vertical programs such as reproductive health, tuberculosis and infection prevention programs. Barriers to QI implementation included staff and organizational-level challenges. Staff-related factors such as laxity, high turnover and low morale were elicited. Organization barriers included hierarchical culture, poor communication practices and inadequate QI leadership support from the County. Factors that facilitated QI implementation included relevance of the initiatives to the staffs, training in QI, monitoring of projects and rewarding staffs. While a narrow range of clinical outcomes were monitored objectively, most outcomes were estimated subjectively, making it difficult to gauge the effectiveness of the QI activities. The initiatives were also not sustained beyond the initial scope. The study recommends improving the QI approach by focusing strongly on internal gaps, improving the integration with existing structures, instituting on job training and addressing human resource challenges.

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List of Abbreviations

AMPATH	Academic Model Providing Access to Healthcare
CCC	Comprehensive Care Clinic
CQI	Continuous Quality Improvement
DHIS	District Health Information System
EMTCT	Elimination of Mother to Child Transmission of HIV
GoK	Government of Kenya
HIV/AIDS	Human Immunodeficiency virus/Acquires Immunodeficiency Syndrome
ISO	International Organization for Standardization
KHQIF	Kenya HIV Quality Improvement Framework
KQM	Kenya Quality Model
KQMH	Kenya Quality Model for Health
LMIC	Low and Middle Income Country
MoH	Ministry of Health
MTRH	Moi Teaching and Referral Hospital
NHIF	National Hospital Insurance Fund
PDSA	Plan Do Study Act

PLWHA	People Living With HIV/AIDS
QI	Quality Improvement
QIT	Quality Improvement Team
SCH	Sub –County Hospital
UGC	Uasin Gishu County
UHC	Universal Health Coverage
USAID	United States Agency for International Development
WHO	World Health Organization
WIT	Work Improvement Team

Chapter 1: Introduction

1.1 Introduction

This section introduces the study. It covers the concept of quality and quality improvement, the background of the study, problem statement, objectives, research questions, significance and scope of the study.

1.2 Background of the study

1.2.1 Understanding the Concepts of Quality and Quality Improvement

There is increasing recognition that service coverage and financial risk protection are not enough, and that meaningful impact can only be achieved if the service offered is of good quality. Quality sits at the core of key global initiatives, among them the Alma Ata Declaration on Healthcare, the Sustainable Development Goals and more recently, the World Health Organizations' Universal Health Coverage (UHC) rallying call to member states. In these policy frameworks, quality is presented as a key driver for improving outcomes and efficiency(Leatherman et al., 2010) .The triad of a health systems' aim described by Berwick include access, quality and cost. The WHO has quality as one of the four mediators between health systems building blocks and outputs.

Quality is broadly defined as the extent to which health services provided to individuals and populations achieve desired outcomes. It is often measured against professional standards, guidelines and client expectations, and assessed on the basis of safety, timeliness, efficiency, effectiveness, equity and patient centeredness (WHO, 2010).

In Kenya, healthcare quality is enshrined in the Constitution's Bill of Rights that grants all Kenyans the right to the highest attainable standard of health, including the right to emergency healthcare services and reproductive healthcare. In addition, the social pillar of Vision 2030, Kenya's development blueprint, emphasizes the importance of a healthy population in the achievement of economic prosperity. It is envisioned that the counties will provide efficient integrated and high-quality affordable health care to all citizens. To achieve this, the country is rolling out UHC, with a goal of providing quality services to all without financial barriers. Achievement of UHC is pegged on

provision of quality essential services, increasing health financing and strengthening health systems (Meessen & Malanda, 2014).

Quality improvement (QI) is a systematic management approach for continuously assessing and changing processes and services using data for better patient and program outcomes. Tenets of quality improvement include focus on patients, emphasis on systems and processes, collection and use of data, and team work (Varkey et al., 2007).

Quality improvement initiatives are coordinated activities designed to achieve measurable improvements in processes and outcomes, targeting health providers, clients and communities. These initiatives could target clinical processes and outcomes such as improving nutrition and foot care education among diabetic patients (Muhoma et al., 2020)and laboratory processes (Ayuo, 2016) among others. Application of quality improvement initiatives on managerial or administrative aspects has not been extensively published. This study will address some of these gaps.

Preceding studies on quality improvement in Kenya have investigated the process of introducing quality improvement in a private mission hospital in Nairobi (E. W. Mwangi, 2018a) , use of quality improvement tools to increase utilization of antenatal services in Kwale district (Mwaniki et al., 2014), and use of data in modelling quality improvement projects (Herrler et al., 2015a).A study by Muchomba and Karanja (2015) focussed on the influence of devolved governance and performance of the health sector in Kenya. Findings included significant investment were made in visible input areas such as physical access to health care. On the contrary, there was minimal investment in quality of care. The study recommended streamlining procurement processes, development of organization leadership, development of policy and regulatory framework with a focus on quality of healthcare (Muchomba & Karanja, 2015).In addition, a policy brief report by Chen et al. (2014) that assessed quality of primary health services in Kenya quoted that communities had a constitutional empowerment to demand for quality services(Chen et al., n.d.) . In the recommendations, the MOH was tasked with training healthcare providers, availing supplies, monitoring and supervision and incentivising quality service delivery. However, little research has gone into describing the nature of QI initiatives implemented locally and examining the barriers and sustainability bottlenecks.

This study explored the roles of leadership, staffs, hospital culture, in the initiation, implementation and sustainability of quality improvement.

Leadership encompasses hospital level and county level management, with roles spanning operations such as overseeing daily running of facilities, staff training and deployment, procurement, implementing the budget, monitoring and evaluation of QI among others. Leadership roles also entail developing quality improvement strategy, Human resources policies, financial planning and other supportive plans. Success of QI initiatives demands support from key leadership in initiation and sustaining the initiatives (Herrler et al., 2015b).

Hospital culture relates to the values, beliefs and norms in an organization. Quinn and Kimberley 1984 identified four culture typologies namely group culture, development culture, hierarchical culture and rational culture. Group and development culture in hospital settings drive QI implementation. These are characterised by affiliation, teamwork, participation, risk taking, innovation and change. One of the CQI/TQM principles includes employee empowerment to identify problems and opportunities for improved care and take necessary action.

Sustainability entails holding on to the changes made and spreading them to other areas in the organization. This ensured by engaging others in planning, implementing and sustaining change. Strategic communication is imperative in sustaining QI initiatives beyond their initial cycles. In addition, successful changes ought to be formalized and standardized by integrating them into the organization strategy and culture (*Sustaining Improvement | IHI - Institute for Healthcare Improvement*, n.d.) .

Uasin Gishu is one of 47 Kenyan Counties. It houses the Moi Teaching and Referral Hospital, (MTRH) the second largest public hospital in Kenya and AMPATH Plus, a major program implementing partner for USAID. The study site consists of four public health facilities implementing QI in Uasin Gishu County.

1.3 Problem statement

Quality Improvement initiatives can be part of the broader quality management strategy for hospitals. The need for quality improvement is backed by regulatory mechanisms; public reports on performance, accreditation standards and pay for performance arrangements. The tools for QI include Plan-Do –Check -Act (PDCA), lean and six-sigma strategies among others. The exact nature of the strategy employed will usually depend on the project.

There is increasing interest in understanding factors that contribute to improved healthcare services at healthcare facilities. Some of the success factors identified through past research include on boarding all staff on QI intentions, supportive leadership and integration of initiatives with service delivery (Brandrud et al., 2011; Kash et al., 2014) .

Regardless of the strategies employed, successful deployment of QI requires accurate and rigorous measurement of the processes and outcomes of interventions. A study by Hulscher et al outlined the framework and need for process evaluation on quality improvement interventions. It shed light on mechanisms and processes attributable to the results observed. This can inform subsequent interventions (Hulscher, 2003).

Walshe et al. (2002) observed that QI interventions are context specific, meaning that organizations must tailor approaches taken. This underscores the value of understanding how and why QI initiatives work (determinants of effectiveness) rather than merely measuring if they work. Process evaluation must be incorporated into QI programs to generate sufficient information for improvement (Walshe, 2002).

In addition the issues of quality in healthcare gained prominence in 2018, when three global initiatives released reports showing the sorry state of patient safety and quality at healthcare facilities globally, more so, across low- and middle-income countries (LMICs) like Kenya (Berwick et al., 2018). The reports indicated that six million deaths occurred each year globally due to poor quality in health systems. In addition, up to 15% of deaths in LMIC were attributed to poor quality care (WHO, OECD, 2018).

Uasin Gishu County started implementing QI initiatives in 2014, primarily to improve HIV clinical management. However, the programs have since expanded to other departments with the aim of achieving holistic improvement. However, since the introduction of QI in Uasin Gishu, little effort has gone towards evaluating the processes and their effects, and generating lessons for service delivery. This may, somewhat, explain variations in performance across programs. During annual County wide health performance data review of 2014 through 2018, it was noted that, while key performance indicators for HIV and AIDS have exceeded targets, indicators for immunization coverage and skilled birth attendances continue to lag (DHIS 2018).

Studies have evaluated whether quality initiatives work using key service delivery indicators (Prytherch et al., 2017). Performance indicators in clinical areas were defined and measured at baseline level then after implementation of quality improvement projects. Improvement of these parameters pointed to success of the initiatives (Marx et al., 2018) . Mwaniki (2014) showcased applicability of quality improvement projects in resource constrained rural health facilities in Kwale District. In this study, performance gaps were identified followed by interventions to bridge the gaps and measurement of the improvements at specified time intervals. Attendance of the antenatal clinic increased from 40% at baseline to 80% at three months and 100% at six months. This study did not look into barriers or success factors. In addition the authors did not investigate sustainability of these initiatives in the long term.

It is against this background that this study seeks to examine the QI initiatives implemented across four Uasin Gishu hospitals. This study will look into the nature of quality improvement projects including the tools utilized in county hospitals and evolution of such initiatives over time. The study will also examine the barriers, drivers and sustainability of these initiatives. Findings will inform healthcare stakeholders on how best to leverage QI to improve processes and outcomes.

1.4 Study objectives

Overall objective

To examine the nature and characteristics of the quality improvement initiatives implemented at four public hospitals in Uasin Gishu County.

Specific Objectives

i. To characterize the quality improvement initiatives implemented across four Uasin Gishu County hospitals between2014 and 2020.
ii. To explore in-depth the facilitators and barriers to implementation of quality improvement initiatives across the four hospitals.
iii. To assess the outcomes of quality improvement initiatives across the four hospitals.
iv. To explore sustainability of the quality improvement projects implemented across four Uasin Gishu County hospitals.

1.5 Research questions

The study sought to answer the following questions: -

i. What is the nature and characteristic of Quality improvement initiatives in Uasin Gishu County Hospitals?
ii. What are the drivers and barriers of Quality Improvement initiatives in Uasin Gishu County Hospitals?
iii. What are the outcomes of Quality Improvement initiatives?
iv. What measures are in place to ensure sustainability of Quality Improvement initiatives in Uasin Gishu County Hospitals?

1.6 Scope of the study

The study will focus on QI initiatives at four county public hospitals in Uasin Gishu County, namely, Turbo Sub County Hospital, Huruma Sub County Hospital, Pioneer Health Centre and Uasin Gishu County Hospital. The facilities have been implementing QI. It will entail desk review of quality improvement documents, questionnaire administered to 180 respondents and in depth interviews with quality and work improvement team members at the hospitals.

1.7 Significance of the study

The study aims to provide insight into the nature, characteristics and outcomes of QI initiatives in Uasin Gishu County Hospitals. The findings will draw best practices and challenges which will inform the county management on how to leverage quality improvement. This is important in view of the plans to scale up UHC countrywide under the Big Four Agenda. It is anticipated that the lessons on improvement of service processes and outcomes will be applicable to other health facilities embracing quality improvement.

This is also applicable in the dynamic healthcare space that is currently undergoing rapid changes including use of technology, globalization, medico-legal challenges, patient safety concerns,

emergence of chronic illnesses in addition to old disease burdens, decreased financing and insurance of health risk.

The myriad of stakeholders in health care will appreciate quality improvement in depth; support and advocate for its implementation in line with their objectives.

Chapter 2: Literature Review

2.1 Introduction

This chapter gives a brief history and theoretical basis of quality improvement, and then synthesizes findings from publications on quality improvement. The reviews were done to guide the study's objectives of describing QI projects, comparing QI models and exploring facilitators and barriers to successful deployment and factors determining sustainability. This section also discusses the role of quality improvement in healthcare, contextual factors important in quality improvement initiatives, and drivers and barriers to successful implementation of QI projects.

2.2 Theoretical review

2.2.1 Evolution of quality improvement

Quality improvement in healthcare has its foundations in the industrial quality evolution dating back to the 1920s when Hawthorne experiments showed how worker productivity could be impacted by participation. In 1930s, Walter Shewhart introduced statistical analysis and quality control. Deming and Juran later introduced quality philosophies in the 1950s to industries in Japan, which went on to outperform companies in the US and other developed nations for decades. Japan became the world leader in quality management systems in the 1960s. Ishikawa introduced "bottom –up" approach to quality management. To date organizations embrace total quality management (ASQ, 2015).

Quality management as a concept evolved from quality control (QC, 1950s) and quality assurance (QA, 1970s). The period saw a paradigm shift, from inspecting errors after occurrence (QC) to preventing errors from occurring under QA. The concept of total quality management (TQM) emerged later, with a strong focus on customer centeredness and continuous improvement, and ensuring that quality management is anchored in all plans and activities within organizations (Spath, 2009a).

Up to 1970s healthcare quality management was based on industrial principles where the healthcare workers were trained, deployed and given tools with which to work. The American College of Surgeons (ACS) was founded in 1913 with a mandate to address quality of medical education. It then developed hospital standards to address the working conditions of physicians. Certification, licensure of personnel, inspection of hospitals and equipment by ACS was later handed over to the Joint

Commission. In 1980, The Joint Commission developed Quality Assurance standards against which peer review organizations evaluated hospital performances. This was driven by increase in Medicare and public funding of healthcare expenditures. Hospital performance was assessed for organization wide practice of identifying patient care problems, solving the problems, monitoring such efforts and documenting the effectiveness of the programs in regard to patient care and clinical practice. Despite a slower pace compared to other industries, healthcare is gradually embracing best practices in quality management (Spath, 2009a).

2.2.2 QI Approaches

Quality improvement approaches have different nomenclature; nonetheless, they all entail measuring processes or outcomes, assessing them against a standard and developing and/or implementing improvement initiatives.

2.2.2.1 Shewhart cycle

The Shewhart cycle (Plan-Do-Check-Act, PDCA) involves planning for improvement, implementing the changes on small scale, checking whether the intended purpose was attained and then scaling up the findings. Each stage has elaborate requirements. Under the PDCA, the team identifies the areas of improvement, prioritises them, undertakes a baseline performance assessment, deliberates with team members desired goals, and allocates necessary financial and technical support towards implementation in the next step. Planning also outlines the activities to be undertaken, how they will be measured and the necessary timelines (Spath, 2009a).

2.2.2.2 Juran theory

The quality trilogy consists of quality planning, quality improvement and quality control; all the three components must be incorporated for a quality improvement initiative to be successful. Juran outlines ten looping steps as creating awareness of the opportunities and needs for improvement and setting improvement goals. This is followed by training of teams, initiating the projects and monitoring progress. The results are reported, recognised and tracked for further improvement (Spath, 2009b).

Juran trilogy is the basis for building high performance management systems which are prerequisite for sustaining and spreading quality improvement initiatives (*Sustaining Improvement | IHI - Institute for Healthcare Improvement*, n.d.)

2.2.2.3 Ishikawa theory

This theory highlights the tools used in the quality improvement process. Pareto analysis is used to identify the significant few problems; these are often targeted for maximal impact. Cause and effect diagrams identify root causes to be addressed. Stratification of information helps collate available information. Check sheets determine frequency of problems and are used before and after the improvement initiative. Scatter charts demonstrate relationship between a variety factors. Histograms monitor variation while process control charts determine which variations to focus upon. Common cause variations are expected while special cause variations are investigated and remedied (Spath, 2009b).

2.3 Empirical literature review

This section looks at the evidence base on quality improvement across healthcare organizations.

According to Joanna Briggs Institute, best evidence based practices relating to continuous quality improvement include clinical governance combined with multifaceted strategies on quality improvement. The most Effective strategies were use of clinical audit, performance against indicators, and targeted, peer-led feedback on the clinician performance. There is less evidence to support interventions such as reporting against national performance indicators, or top-down models of quality improvement, such as external accreditation or financial incentives. It is also viewed negatively when staffs are directed to collect data for reporting purposes, rather than the focus being on data translation to improve service delivery. Expert opinion indicates that facilitators to the uptake of CQI include leadership, team communication, champions of CQI who are willing to engage, and a culture of commitment to CQI. Stability of the workforce is also identified by expert opinion as important. It facilitates ongoing use of tools and data collection systems, conducting clinical audits, interpreting and acting on the results of CQI. Expert opinion has identified barriers to the uptake of CQI such as high staff turnover rates, and lack of clear understanding from staff regarding the purpose and benefits of CQI. Moreover, it also highlights low levels of engagement as a problem in some circumstances,

which can be partly due to the process being driven by external facilitators. Data use, opportunities for staff training and support in CQI activities is viewed as important in improving levels of engagement, and professional development. Leadership that has a focus on improving patient outcomes and performance measurement as motivation for all staff is highlighted as important (McArthur, 2020).

Walshe et al. (2007) observed that effects of quality improvement interventions are highly context specific and dependent on how they are implemented. They observed that QI research lend itself more to theory driven analysis than experimental methods given high heterogeneity in content, context, application and outcomes. They therefore argued that pertinent questions should be how, when and why certain QI interventions work, rather than restricting inquiry to whether or not they work(Walshe, 2002, 2007). This implies that organizations must tailor their quality improvement approaches to their contexts.

Future research into QI interventions should therefore focus more towards understanding how and why they work (determinants of effectiveness) rather than measuring if they work. Process evaluation must be incorporated into every quality improvement program for monitoring effectiveness. The information can then be used to improve systems (Walshe, 2002) . This is also reported by Hulscher et al (2003), who outlines a framework and utility of process evaluation on quality improvement interventions. It sheds light on mechanisms and processes attributable to the results observed to inform subsequent interventions (Hulscher, 2003).

Another study by Mwangi (2018)delved into introduction of quality improvement initiatives in a Mission hospital in Nairobi, Kenya. The findings included an informal approach to QI without a specific model of implementation, measurable objectives, staff training or organisational QI policy. The efforts dabbed QI were only motivated by ISO certification and staff willingness to improve healthcare delivery. It was recommended that the hospital adopts a QI model anchored on an organisation policy. The policy should commit budgetary allocation towards QI and cultivate a culture of continuous quality improvement such as through establishing a research centre. In addition training on quality improvement be prioritised followed by formation of work improvement teams (E. W. Mwangi, 2018a) .

2.3.1 Barriers and facilitators

Field et al explored drivers of performance of quality improvement projects. They identified project goal setting and quality training as having positive association with process quality. In addition, the association was stronger for clinical care than administrative projects. This is indicative of cognitive and motivational aspects of goal setting involving clinical staff (Field et al., 2014) .

Best practices of TQM in healthcare include top management commitment, team work and participation, process management , customer focus and satisfaction, resource management, organization behaviour and culture, continuous improvement, training and education (Talib et al., 2011) . Other critical success factors include involvement of the CEO in training, participation in quality improvement teams, application of QI in his daily work. The organization ought to have customer focus with clear link of quality improvement with overall strategy. Linkage of QI with financial performance and reward system (Stephen M. Shortell, Damiel Z. Levin, 1995) (Shortell et al., 1998).

Barriers to successful implementation of QI can be categorised into cultural, strategic, technical and structural. Understanding these barriers enables managers to develop more effective strategies (Mosadeghrad, 2013) .Cultural obstacles include hierarchical organizations, inward looking strategies that focus more on professionals than customers, lack of senior management support, lack of physician involvement, command and control leadership style. Prevalent technical challenges entail lack of training that is team based, problem focussed and lack of data for QI. Strategic challenges include disassociation of QI objectives with overall organization goals and fragmented departmental visions or goals. Structurally, the organization requires a steering team to coordinate organization wide QI, align rewards and financial motivation to performance and increase visibility of QI activities. Management must align budgeting and planning to support QI and share QI data with the board. Research by Shortell et al. (1994) suggests that challenges tend to be associated with maturity of QI implementation in the organization such that technical and structural problems dominate initial stages which cultural and strategic challenges emerge as QI initiatives expand.

Mercuris' publication on the problems of QI includes lack of consensus in defining quality, and subsequently, the inability to identify and measure it. In addition, presence of multiple stakeholders with varied inclinations founded on their disciplines hinders achievement of a common definition. He

discusses the ongoing debate on utility of evidence-based medicine in quality improvement, fronting two schools of thought. One arm argues that QI problems exist even in contexts with good evidence and decision making mechanisms while the other suggests that evidence based medicine is the basis for QI. Both however agree that contexts differ and no size fits all (Mercuri, 2019) .

2.3.2 Outcomes of Quality Improvement Initiatives

The quadruple aim of quality improvement includes: improving the individual experience of care; improving the health of populations; reducing the per capita cost of healthcare and improving the experience of providing care (Sikka et al., 2015). It was an improvement on the triple aim which did not factor in the providers experience while providing care.

Studies exploring impact of quality improvement initiatives have focussed on perceptions of the service providers, patient perspectives and improving population health. Studies on cost effectiveness, benefit analyses and other economic impact of quality improvement in Kenya are not widely published .Waiganjo (2015) assessed the perception of paediatric health care workers on audit and performance feedback in Kenyan County Hospitals. The staffs were appreciative and took the feedback positively. Improvements were noted in reporting and utilization of information for patient care ,staffs also appreciated feedback on performance areas they were unaware of (Waiganjo, 2015).

Patient perceptions of quality differed with those of staff in a study at a hospital in Kiambu. While patients did not expect much from the physical amenities, staffs perceived that these facilities contributed a great deal to quality of services (S. Mwangi, 2016).

This study will include questions addressing outcomes in cost, provider experience, patient health and customer focus in the quality improvement initiatives undertaken.

2.3.3 Sustainability

It is estimated that fewer than 40% of quality improvement initiatives transition from adoption to sustained implementation or spread to other areas of the organization (Health Quality Ontario, 2013). Sustainability entails holding on to the changes made and spreading them to other areas in the organization. To ensure sustainability, it is imperative to engage others in planning, implementing and sustaining change. Communication from the QI team must be planned including the audience,

objective, message and channel. Successful changes ought to be formalized and standardized by integrating them into the organization strategy and culture. Continual training of staff, monitoring the implementation of changes and formal sustainability plans all ensure changes are sustained.

According to the Institute of Health Improvement, organizations applying tool based, narrow approaches to quality improvement must first ensure they develop robust management systems before attaining sustainability of improvement in outcomes. The Juran trilogy of quality planning , control and improvement informs sustenance (*Sustaining Improvement | IHI - Institute for Healthcare Improvement*, n.d.). Effort geared in sustaining improvements must be normalized and escalated throughout the organization up to the top level management. This is further reinforced by Mate and Rakover (2016) who studied top performing organizations that sustained changes. They concluded that to sustain change, there is need for strategy of engaging and standardizing the work of frontline managers (Mate & Rakover, 2016). The process may be summarised into four steps namely: piloting standardization in a unit, the ideal unit is one with good management practices, low staff turnover and a quality champion .Secondly engaging the front line manager who is responsible for day to day operations at the unit. This enables incorporation of changes in the daily schedule. Thirdly, celebrate early wins as these build momentum. Lastly, motivate the frontline managers by tackling challenges that interest them, these appeal to their intrinsic motivation.

Long term impact are driven by both the front line managers who ensure incremental change at the service delivery point and top management who avail infrastructural and system integration support (Federico, n.d.)

2.3.4 The Informing Quality Improvement Research (InQuIRe) framework.

Measuring contextual factors poses challenges to researchers given the fluidity of the contexts, interplay between individual, team, organization factors and difficulty in attributing outcomes to specific intervention. In addition determining factors to measure, suitable metrics in a variable pool of complex literature deepens need for a standardised framework. The Informing Quality Improvement Research (InQuIRe) framework offers guidance on factors to include in evaluations and measurement of these factors (Brennan et al., 2012, 2013) . The framework amalgamates other

theories that interplay with quality improvement such as change management, teams, and knowledge management. In this framework, an organization intending to pursue quality improvement or evaluating success of previous initiatives must consider the organization's context in terms of technical capability, climate and culture, leadership and mandate for quality improvement. At the organization level, readiness for change is determined by the leadership commitment to quality improvement, motivation of staff, allocation of financial support and use of data to drive improvement. The second level involves teamwork, including organization climate for teamwork, team composition, attitude and commitment to teamwork and perceived team effectiveness. QI projects may span across departments or require cross functional teams, as such there is need for the team context to be positively inclined.

Individual level factors are considered third including knowledge, skills, and efficacy for QI, beliefs about outcomes and value of QI, motivation, goals and readiness for change. Mapping the individuals enables the organization to strategize for buy in, incentivize for quality performance and bridge gaps in training.

The CQI process makes the second pillar of this framework. It entails the methodologies used in identifying areas for improvement, setting measurable aims, structured problem solving, data collection and analysis. The teamwork behaviours related to successful QI include collaboration, problem solving, communication, work sharing, motivation, cooperation and participation of all members.

Outcomes are divided into proximal outcomes at the organization, team and individual levels which result in structural changes in the organization process and provider adherence to the new processes. This ultimately results in distal outcomes concerning safe and effective patient centred care, quality care, Job satisfaction and organization commitment by employees and strengthened management systems. The framework is appended.

Concepts from the above framework will be applied in this study, for instance in assessing the organization context, questions relating to direct support for QI, inclusion of QI in the overall strategy, finances will be explored. Training of individuals in the QI teams and wider organization will be sought including statistical and quantitative methods used in quality improvement. Use of data and ease of accessing the same for QI will be evaluated as well.

2.3.5 Organization culture

Organization culture plays a critical role in determining the extent of success in Quality improvement. Culture relates to the values, beliefs and norms in an organization. Quinn and Kimberley 1984 identified four culture typologies namely group culture, development culture, hierarchical culture and rational culture. Group and development culture in hospital settings drive QI implementation. These are characterised by affiliation, teamwork, participation, risk taking, innovation and change. One of the CQI/TQM principles includes employee empowerment to identify problems and opportunities for improved care and take necessary action. The hierarchical culture is stifling owing to bureaucracy while rational culture advocates for efficiency and achievement (Shortell et al., 1995). A section of the questionnaire will be dedicated to assessing the dominant culture in these organizations

Chassin et al define high reliability as consistent performance of high standards of safety over prolonged time periods. This is witnessed in nuclear plants and aviation but has been elusive in healthcare. They argue that achieving high reliability requires leadership, safety culture and robust process improvements. All employees must practice collective mindfulness and actively seek any potential for failure in their processes. Once such risks are identified, they are corrected in time before posing severe safety breaches. The authors propose a model detailing of how healthcare organizations can leverage on leadership commitment, safety culture and robust systems towards quality improvement. Quality improvement must be etched in the organization strategy with support from management. Safety culture includes creating trust, reporting mechanism and improvement (Chassin & Loeb, 2011).

Navon et al argued that healthcare workers are not pilots, that the contexts of patient to healthcare worker interactions are diverse and unpredictable unlike aviation conditions(Katz-Navon et al., 2007). In addition, the healthcare worker practices autonomy in patient management. The authors also argue that in industrial theory, first movers are the real change agents. Health care is a second mover in quality improvement initiatives, a move done due to external pressure such as insurers and patient groups. As such quality is not core to healthcare strategies.

2.3.6 The quality management policy framework journey for Kenya

2.3.6.1 Background

Improving the quality f healthcare is a key priority in Kenya as reflected in policy documents including the constitution which envisions citizens attaining the highest standard of health care, Vision 2030, Kenya's economic blueprint which aims at equitable and affordable healthcare system of the highest possible quality by the year 2030.The ministry of health overarching goal is attaining the highest possible health standards in a manner responsive to population needs. The KQM provided a framework for integrated approach to improve healthcare in Kenya(Ministry of Health, 2011).

2.3.6.2 The KQM evolution

In 2001, the Kenyan Ministry of Health introduced the Kenya Quality Model (KQM) as a framework to guide continuous quality improvement (CQI) across healthcare facilities. This was the first effort towards institutionalizing quality management at policy level. The framework defined quality as a process for improving adherence to standards and guidelines using quality management principles and tools, singling out evidence-based medicine, total quality management and patient partnership as the key pillars to drive positive change(Ministry of Health, 2011).

The KQM's uptake was limited for various reasons, including inadequate dissemination, the absence of a regulatory framework, low clarity on standards included therein, and inadequate stakeholder engagement. However, the National Hospital Insurance Fund (NHIF) adopted the framework as a guiding tool for identifying facilities for empanelment and encouraging them to continue improving. This provided valuable experience that would later feed into the revision of KQM.

The KQM was subsequently revised in 2011, giving the Kenya Quality Model for Health (KQMH). Launched in 2012, the KQMH sought to address inadequacies with KQM, introducing key changes, including adding new dimensions such as clinical care of patients, management support and leadership. The KQMH development actively engaged the health stakeholders and developed quality standards as per the level of healthcare(Ministry of Health, 2011).

As this was happening, there were other concurrent QI activities. One notable example was the Kenya HIV Quality Improvement Framework (KHQIF), which was commissioned in 2014 to promote

quality in the care for HIV and AIDS and improve the quality of life of people living with HIV/AIDS (PLWHA)(Ministry of Health, 2007). The Framework was anchored in the KQM. In the private sector, QI efforts included adoption of the Joint Commission International Standards, the SafeCare Standards, and the ISO Standards for strengthening management and documentation aspects.

Muragumi (2014) studied the challenges of implementing the Kenya Quality Model for Health in Kiambu County. Inadequate financing, lack of leadership, training, inadequate stakeholder engagement delayed adoption of the strategy. Management also lacked in technical and financial capability to implement the strategy (Murugami, 2014)

2.4 Gaps in literature reviewed

Gaps identified in the empirical literature review relevant to this' study objectives are summarised in the Table 2.1 below.

Table 2.1: Research Gaps

AUTHOR (YEAR)	TITLE	FINDINGS	GAPS
Barake (2015)	Influence of Total Quality Management principles on quality health care provisions in private facilities: a case of Avenue hospital, Kisumu County, Kenya (Barake, 2015)	Customer focus, leadership involvement and employee involvement influence quality implementation	This study was conducted in a private facility, there is need for similar study in public health facilities
Ayuo (2016)	Influence of Total Quality Management on Provision of Medical Laboratory Services at Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu County, Kenya.	Customer focus, leadership involvement, continuous quality improvement and employee involvement influence quality to a great extent	Sustainability was not addressed. Outcome measures did not address provider perspectives.
Gill and Bailey (2010)	Bottom up and top down: a comprehensive approach to improve care and strengthen	Strong leadership at the district	Sustainability was not addressed.

	the health system(Gill & Bailey, 2010)	Hospital promoted numerous quality improvement strategies that involved local. Institutional and community problem solving. QI outcomes included: increased accountability, quality of Care and a stronger health system.	
Muhoma et al. (2020)	A quality improvement project to improve diabetes self-management and patient. satisfaction in a low-resourced central Kenyan hospital	supporting providers with culturally congruent tools and resources about diabetes care Guidelines can improve knowledge of self-care practices in patients with diabetes. Measures to ensure sustainability of the interventions include educative material, pamphlets and posters	Impact of leadership on the project was not outlined
Mwangi 2018	Introducing continuous quality improvement initiatives: a case study of St Francis community Hospital in Nairobi Kenya	Staff had knowledge gap on Quality improvement despite participation in the activities for accreditation purposes. Buy in from the top leadership was key to success and support.	The study only focussed on introducing quality improvement initiatives, barriers and facilitators. The set up was of a mission hospital and not generalized to public hospital
Muthui (2018)	Factors Influencing the Provision of Quality Services in Health Care Facilities: A	Training of personnel. Management commitment, monitoring quality and	Organization culture and the leadership style were not outlined.

	case of Kitui County Referral Hospital	resource availability are key in determining quality of services offered	
Murugami (2014)	Challenges of Implementing Kenya Quality Model for Health Strategy in Kiambu County, Kenya	inadequate funding, communication within the facility, limited qualified personnel to implement KQMH and responsibility level of employees at the facility. Strategies to mitigate challenges include resource allocation and collaboration	The study findings cannot be generalized to this case study as aspects of the KMQH have been implemented in these facilities
Marx et al (2018)	If you can't measure it- you can't change it - a longitudinal study on improving quality of care in hospitals and health centres in rural Kenya	A longitudinal study to assess indicators on structure, process and outcomes at baseline and after 1.5 years. Improvement of some indicators was noted. Success was attributed to multidisciplinary teamwork	Factors leading to continued improvement were not studied. Longitudinal study design does not lend to the current study

2.5 Conceptual framework

This study was guided by the conceptual framework, which drew on the theoretical perspectives on quality and the empirical review findings. All three theories discussed emphasized the importance of leadership, staff involvement in QI, and collection and use of data (measurement and assessment, to guide QI effort). These relationships are summed up in the conceptual framework in Figure 2.1. Beyond the three sets of factors (leadership, staff/employees and data), QI efforts can only work if the right environment has been created within the healthcare facility. The study posited that strong leadership, adequately motivated staff and data availability can only result in sustained QI if the hospital has created a culture that rewards effort and does not punish error (learns from error).

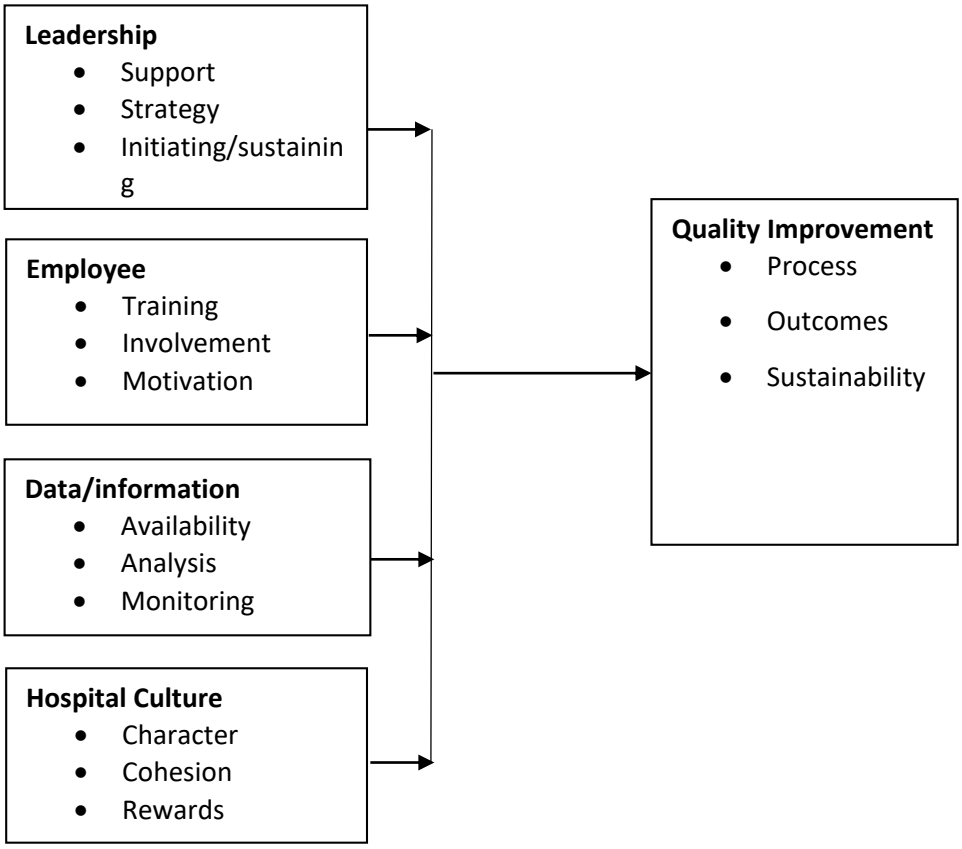

Figure2.1: Conceptual Framework of Drivers and Facilitators of Quality Improvement

2.6 Operationalization of Variables

The Table 2.2 below shows how the variables on leadership, employee engagement, use of data and hospital culture were operationalized and measured.

Table 2.2: Operationalization of Variables

Variable	Indicator	Measure	Source
Leadership	Support mechanisms Strategy/ policy	1-strongly disagree, 2-disagreee,3- somewhat	Michigan's Quality Improvement and

	Initiating /sustaining	disagree, 4-somewhat agree,5-agree, 6-strongly agree Opinion of Key informants	Performance Management Survey
Employee	Training Involvement Motivation	1-strongly disagree, 2-disagreee,3- somewhat disagree, 4-somewhat agree,5-agree, 6-strongly agree Opinion of Key informants	Michigan's Quality Improvement and Performance Management Survey
Data	Availability Analysis Monitoring	1-strongly disagree, 2-disagreee,3- somewhat disagree, 4-somewhat agree,5-agree, 6-strongly agree Opinion of Key informants	Michigan's Quality Improvement and Performance Management Survey
Culture	Character Cohesion rewards	Score 0-100 20 questions in sets of 4 Opinion of Key informants	Quality Improvement Implementation survey ,Hospital Culture

Chapter 3: Research Methodology

3.1 Introduction

This chapter represents the methodology used in conducting the study. It discusses the how, when, and where details relating to the study. Subsections include study design, population and sampling, data collection and analysis, ethical consideration and strategies to ensure data validity.

3.2 Research design

Quality is multi-dimensional and often viewed through different lenses by stakeholders such as providers, patients, payers, public and politicians. In addition, questions relating to quality may not be amenable to quantitative methods. Qualitative research involves systematic collection, organization and analysis of textual material from observation or talk. The perspectives of the participants are taken into consideration when interpreting the phenomena.

A case study is an in-depth investigation of an individual, institution or phenomena(Kothari, 2004). In a case study, the researcher takes an explorative approach to data collection, analysis and interpretation. The reiterative nature of a case study enables in depth understanding and triangulation of findings. This increases validity and reliability of the research.(Pope et al., 2002)

Multiple case studies were employed in this research. This study aimed to examine the nature and characteristics of the quality improvement initiatives implemented at four public hospitals in Uasin Gishu County.

Participant responses to the research questions were obtained through a survey. Findings from the survey informed the depth interviews which examined the findings in depth and enabled a deeper understanding of underlying observations.

3.3 Population and sampling

According to Yin (2014) a population is a group of elements, individuals or objects selected based on inclusion and exclusion criteria related with the variables being investigated(Yin, n.d.). The target

population and unit of study is four county public hospitals namely: Turbo sub county hospital, Huruma sub county hospital, Pioneer health centre and Uasin Gishu county hospital. Only these four facilities met the inclusion criteria of practising Quality Improvement.

3.3.1 Study location

Geographically, Uasin Gishu County is in the north rift valley region , covers 2955km^2 and has a estimated population of 894,179 .

The County has ten high volumes, level four facilities and over one hundred and fifty primary healthcare facilities.

Quality improvement projects have been implemented across several hospitals in Uasin Gishu County over the past five years, most with technical and financial support from the USAID – AMPATH program. Earlier projects were mainly aimed at improving HIV/AIDS management, including accelerating efforts towards eliminating mother to child transmission of the HIV virus (eMTCT).

The QI initiatives have covered high volume facilities that have Comprehensive Care Clinics (CCC) supported by AMPATH Plus. These include the Uasin Gishu County Hospital, Turbo Sub-County Hospital (SCH) and Huruma Sub-County Hospital and Pioneer Health Centre. Over time the scope of the projects has expanded to include maternal and child health, pharmacy and laboratory services among others. This is in line with horizontal approach to health system strengthening.

The county public facilities are within a radius of 40 kilometres from Eldoret central business district. Uasin Gishu County hospital is in Moiben Sub County, Pioneer health centre is in Kapseret Sub County, while Huruma and Turbo sub county hospitals are on opposite borders of Turbo Sub County.

3.3.2 Sampling

Sampling is the process where a small subset of the study population is selected to be used in data collection. The data from the sample is then used to estimate population characteristics and making statistical inference.

Respondents from the target population were randomly sampled for an initial survey. Inclusion criteria include deployment to the facility under study, willingness and availability during study duration. Students and interns were excluded. Key informant interviews engaged the quality improvement champions, facility in charge or heads of department. Completed QI projects were studied.

3.3.3 Sample size

The sample size for this study is one hundred and eighty respondents from the four facilities as shown in Table 3.1. The sample size was calculated using Yamane's formula as follows:

$n= N / [1+N (e)^2]$

Where.

n = sample size,

N = population size

e = error term (0.05)

Hence,

$n = 330/ [1 + 330(.05)^2] =$

n = 330/1.825

n = 180

Table 3.1: Sampling Frame

Facility	Target population	Sample size
Huruma SCH	85	47
Pioneer Health centre	50	27
Uasin Gishu County Hospital	120	65
Turbo SCH	75	41
Total	330	180

3.4 Data Collection Methods

The main tool for data collection in this study was a questionnaire. This tool was considered owing to ease of administration to many people, adaptability to the conceptual framework, reliability of responses when administered to comparable set ups. The questionnaire had five sections namely: demographic information of the respondents, quality improvement, drivers and barriers, outcomes and sustainability. The questions were adapted from validated tools. Prerequisite permissions were sought for use of the tools. Questions were framed to describe the nature and characteristics of the QI interventions, the scale and scope of the initiatives, level of staff involvement, leadership and culture, outcomes, facilitators, challenges and extent of spread. Questions sought to understand the experiences implementing QI initiatives, including the level of staff involvement in QI, staff buy-in (including exploring reasons buy-in or lack of buy-in/resistance), staff opinions and views on successes and achievements, and staff proposals on what could have been done differently to achieve better results. Respondents were given two weeks to complete the questionnaires.

In depth interviews were used to obtain in depth understanding of the results from the survey. These entailed clarifying, enriching and describing the observations made. In addition it availed an opportunity to discover the interviewee experiences, real stories and disclosure of more information.

One research assistant was engaged in the field work. The assistant was introduced to the facility in charge and respondents. Once the researcher introduced the purpose of the study and sought general consent, the assistant will identified study participants as per the sampling strategy. He assisted in administering the survey questionnaire and collection of the same after two weeks. The assistant also books appointments and prepare venue for in depth interviews. Given varied work schedules, COVID 19 restrictions and need to minimize interruption of service delivery, scheduled meetings allowed participant flexibility. In person Interviews were conducted within half with further engagement done online.

3.5 Data analysis

Data from the questionnaires was checked for completeness, cleaned up and entered into Microsoft Excel and SPSS statistical software package. Likert scale questions were analysed using descriptive statistics including measures of central tendency and their measures of dispersion for ordinal data sets. Summary statistics were presented on tables and graphs.

Qualitative data from interviews was recorded, transcribed and coded in themes and sub themes relating to the study objectives. The researcher listened to the tape recordings more than once and read the interview transcripts several times to derive actual and implied responses. This enabled classification, summarizing, comparing and interrogating the responses.Two levels of content analysis were used, a descriptive account of the interview data followed by interpretive analysis. The data was presented in narrative synthesis form under topics congruent with the study objectives.

3.6 Research Quality

Content validity of the questionnaire was ensured through literature review and adoption of validated instruments.

Pilot study was conducted prior to the main study to check for clarity of instructions, appropriateness of the format, clarity of questions, removal of ambiguity and reduction of typographic errors.

Validity of qualitative data was ensured using Creswell's strategies including prolonged engagement with the recordings, transcripts, enriching descriptions of phenomena, triangulation of data from different sources, recording of discrepant information and acknowledging researcher bias (Creswell & Miller, 2000). In addition, data collection instruments were tested for appropriateness using a pilot study. This ensured the survey questions and interview guides were accurate and collected the intended data.

The researcher ensured the research assistant was oriented to His roles and is versed with research. Validation was further achieved by presenting preliminary results to key informants for checking.

3.7 Ethical Issues

Approval to conduct the study was sought from the Strathmore University Ethics review body (SU-IERC) and the National Commission on Science, Technology and Innovation (NACOSTI). Permission to conduct the study was sought from the County Director of Health Services and Hospital Managers of sampled hospitals. Consent was also sought from individual participants including specific consent to record in depth interview proceedings. The study did not accrue direct personal benefits or harm to the participants.

Chapter 4: Research Findings

4.1 Introduction

This section presents findings from data collected and its analysis. Broad themes include quality improvement activities, barriers and facilitators to implementing quality improvement initiatives, outcomes of quality improvement projects and sustainability of quality improvement initiatives.

Responses were elicited from a survey administered to 180 participants. Respondents' opinions were collected using a 6-point Likert scale. The scale was ranked as follows: 1-strongly disagree, 2-disagreee, 3- somewhat disagree, 4-somewhat agree, 5-agree, 6-strongly agree. The results were interpreted using the mean and standard deviation of the responses. A mean of 1-1.83 implied strongly disagree, 1.84-2.66-disagreee, 2.67-3.49 - somewhat disagree, 3.5- 4.32 -somewhat agree, 4.33-5.15-agree, 5.16-6.0-strongly agree. Standard deviation value of less than two is desirable as it suggests that responses were in agreement.

In depth understanding of the responses from the survey was elicited through four key informant interviews. The respondents were drawn from Pioneer Health Centre, Uasin Gishu County Hospital, Huruma and Turbo Sub-county Hospitals, The Key informants included facility in charges, heads of department or quality improvement champions.

Focus group discussions were not feasible owing to ongoing COVID related restriction imposed on meetings and respondent's inability to attend an electronic meeting at a singular specified time.

Validity of the instrument was tested during the pilot study. Questions were clarified to the respondents to remove ambiguity and shorten the questionnaire. Key informant interviews were recorded, played thrice, transcribed, coded in relation to the objectives and analysed appropriately.

4.2 Response rate

The sample size was 180 respondents, of these 166 filled and returned the questionnaires. This constituted a response rate of 92% as shown in Table 4.1 below. This response rate was considered adequate.

Table 4.1: Response Rate

Facility	Sample Size	Response	Percent
Huruma	47	44	93.6
Turbo	41	38	92.7
Pioneer	27	24	88.9
UGCH	65	60	92.3
Total	**180**	**166**	**92.2**

4.3 Demographic information

Data was collected on the respondents' age and gender, facility, cadre, length of service and level of education.

4.3.1 Age and gender of respondents

The graph in figure 4.1 below shows the age and gender of the respondents.

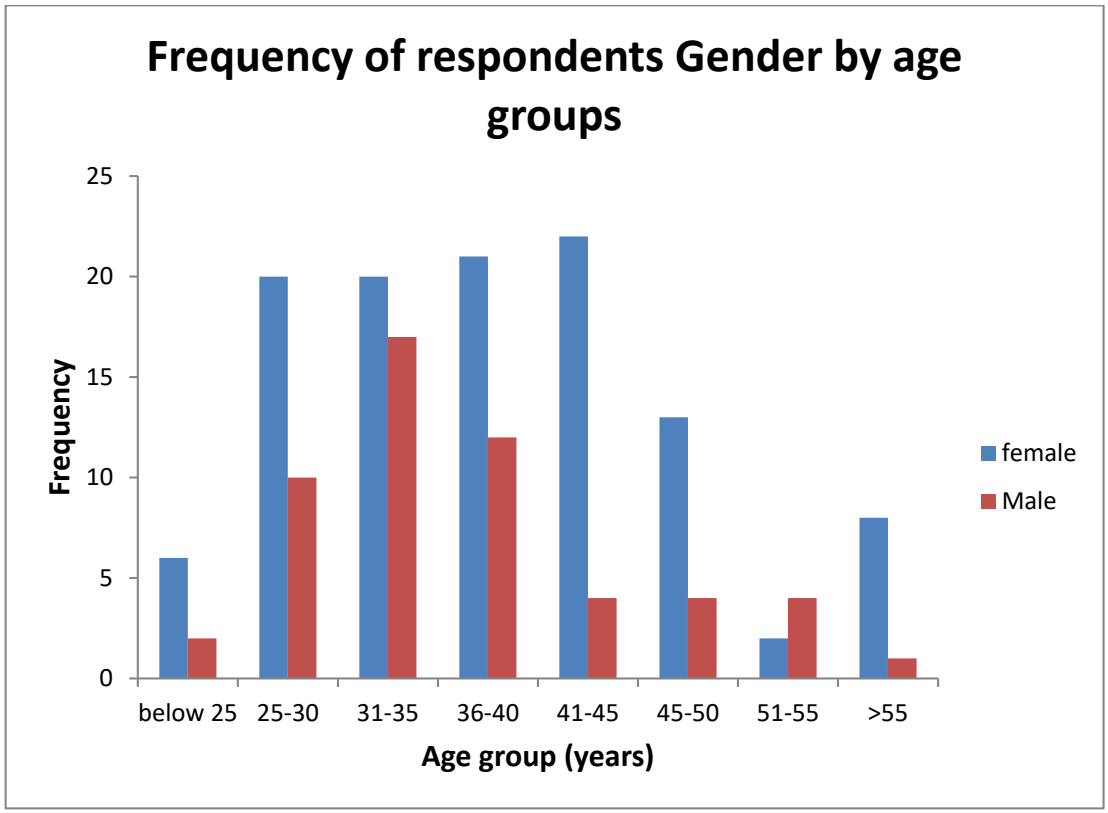

Figure 4.2: Respondents gender by age groups

The findings indicate that 67.5% of respondents were female. Most respondents were aged between 31-35 years while the median age was 36-40years.

4.3.2 Respondents' length of service

The Respondents length of service in the facility under study is as in the table 4.2 below.

Table 4.2: Respondents' length of service

Length Of Service (Years)	Frequency	Proportion (%)
0-2	52	31
3-5	75	45
6-8	20	12
9-11	10	6
12-14	5	3
>15	4	2
Total	**166**	**100**

This implies that the respondents had stayed in the facility within the period of interest to the study; they could respond to the questionnaires.

4.3.3 Respondents Highest Level of Education

Respondents' highest level of education is presented in figure 4.3 below. Majority had a diploma (57.8%) while 28.9% held a first degree. Others include post graduate diploma and competence-based trainings.

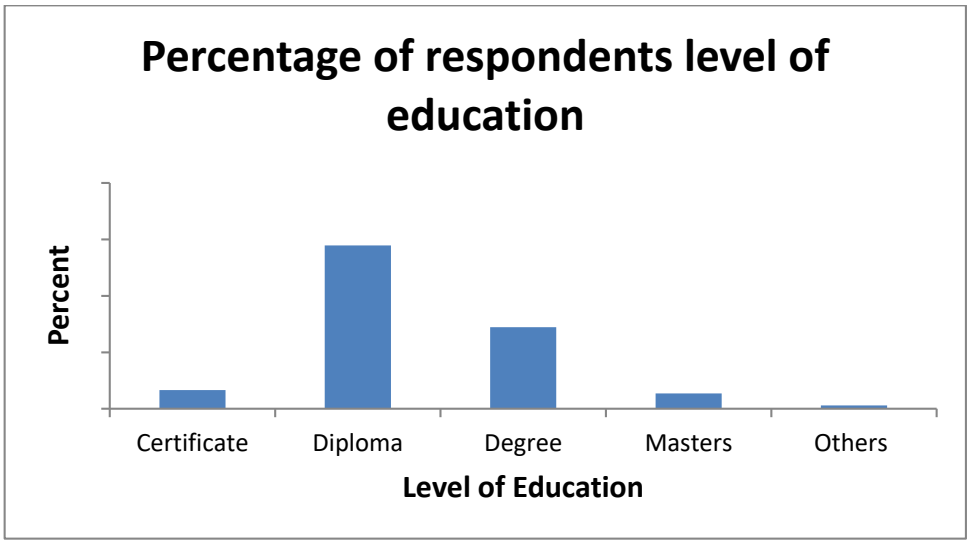

Figure 4.3: Respondents level of education

4.3.4 Respondents' cadre

Findings show that 45.2% of respondents were Nurses, 19.9% Clinical officers, Hospital administrators (5.4%) while medical doctors, pharmacists and dental officer were 4.2%, 2.4% and 1.2% respectively. This implies that different cadres participated in the study. Out of 166 respondents, 24 were in management including facility in charges, Heads of department and Quality improvement champions. This is reflected in figure 4.4 below.

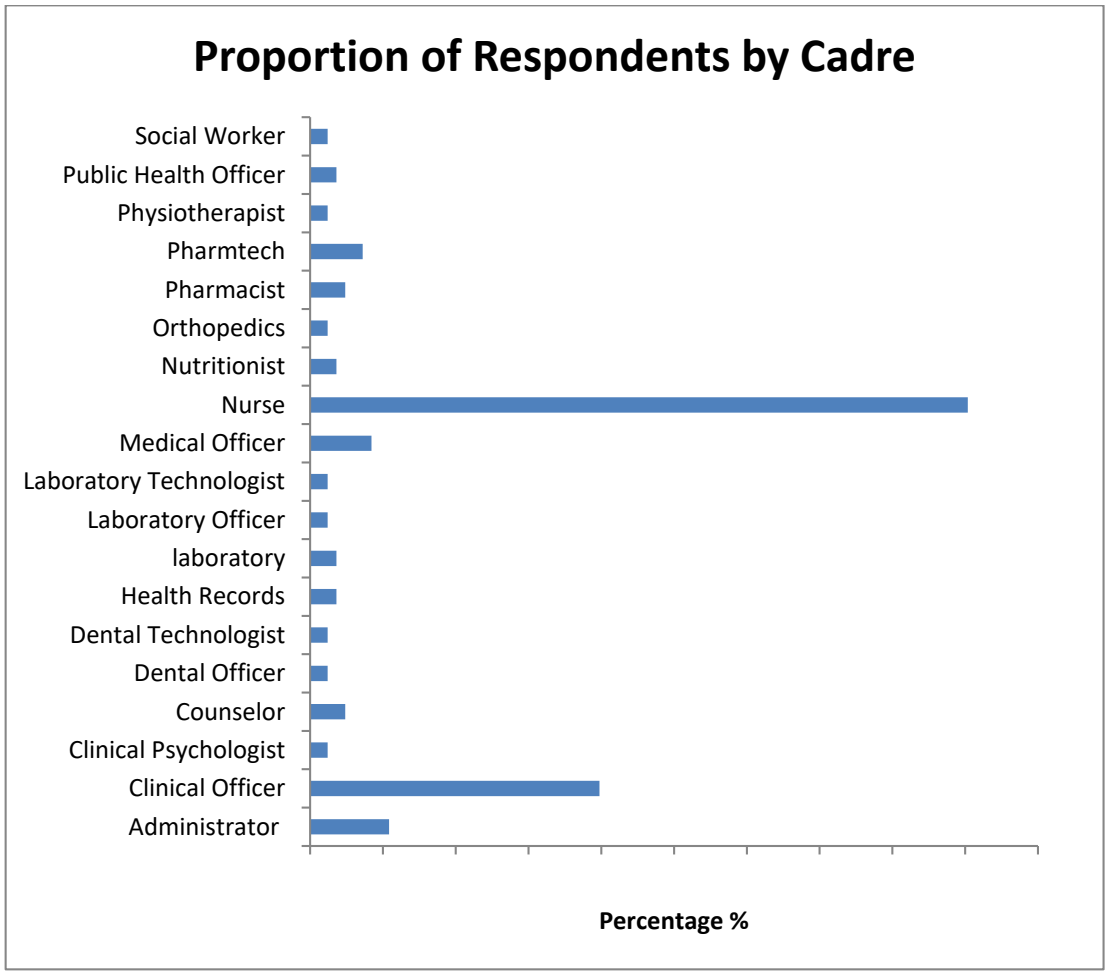

Figure4.4: Proportion of Respondents by Cadre

For set ups with similar distribution of staffs by cadre, age, length of service and level of education, results below could be generalized while acknowledging contextual and cultural variables.

4.4 What is the nature and characteristic of Quality improvement initiatives in Uasin Gishu County Hospitals?

The average mean for questions on the typology of quality improvement initiatives was 3.75(SD 0.90). This implies that respondents somewhat agreed on the statements and the opinions were not varied. Specific opinions include respondents somewhat agreed to have participated in quality improvement, ability to describe quality improvement, its benefits, describe a PDSA cycle. Respondents strongly disagreed that quality improvement involves managers only, does not involve data or information from clients. Respondents agreed that there is need to identify whether the change constituted an improvement and strongly agreed that quality improvement is worth the time and effort.

The most frequently used QI tools were Brainstorming (48.2%), check sheet (36.7%), control chart (31.3%), fish bone (27.7%), among others. These findings are shown in table 4.3 below.

Interviews with key informants from the four facilities sought to understand in depth, the characteristics of quality improvement in their facilities.

One facility in charge acknowledged the importance of quality improvement in ensuring the quality of services given to clients. They however expressed frustration at the current dormant state in their facility. They went ahead to recount the journey over the years.

"*It started off well in 2014 but when the first cycle ended there were no deliberate efforts to continue. I would say it died a natural death. The only trace of quality improvement is Maternal Perinatal Death surveillance response (MPDSR).* "

Table 4.3: Respondent Opinions on Quality Improvement

Question	Min	Max	Mean	Std. Deviation
I have participated in QI activities	1	6	3.78	1.70
I can define quality improvement	1	6	4.62	1.14
I can differentiate QI from QA	1	6	4.53	1.20
I can describe benefits of QI in health	1	6	4.67	1.26
I can describe the stages in PDSA cycle	1	6	3.54	1.54
QI involves changing processes	1	6	4.38	1.44
QI does not involve data	1	6	2.02	1.15
QI involves managers only	1	6	1.78	1.02

QI does not consider information from clients	1	6	1.83	1.19
In QI need to identify if a change is an improvement	1	6	4.83	1.36
I can list four basic QI principles	1	6	3.90	1.47
QI is worth spending on time and resources	1	6	5.01	1.38

Similar sentiments were expressed by another interviewee II. Quality improvement initiatives are not as optimised as should be. They explained that staffs equate quality improvement to infection prevention measures or Tuberculosis program audits. They also added that new staffs may not define QI or understand its importance.

One facility had an active quality improvement project; the respondent IV described how the project was initiated as captioned below.

"In my facility, Quality improvement was triggered by an external party. The implementing partners in reproductive health services trained the staffs on quality improvement. Subsequently we identified gaps in reproductive health service delivery, strategized on how best to bridge these gaps. We have realized remarkable improvements over the past six months."

The respondent pointed to the process of initiating a project as follows*:*

"Firstly, the sponsor met with the management and agreed on the scope of the project. Next, staffs were trained and expected to identify areas for improvement. They used of data to calculate the baseline performance. They then set a target against a clinical standard. The team then planned activities/interventions towards attaining the target. This included setting meetings, implementing suggested changes, monitoring progress and communicating the progress. The tools used included

root cause analysis,5 whys and brainstorming of solutions. Run Charts were used to display progress. During meetings, power point presentations were used."

Interview with Key Informant 4.

A former quality improvement champion (respondent 10) recounted how they led previous projects. They reported that quality improvement was first introduced to the County health facilities by AMPATH Plus. The initial goal was to empower service providers to sprint toward the 90-90-90 target. This project sought to identify HIV positive clients from the community through testing, linking 90% of them to care and ensuring 90% viral load suppression. Once this project was concluded, individual centres took on HIV related projects. Elimination of Mother to child transmission of HIV was notable as it engaged more facilities. The aim was to ensure less than two percent of HIV exposed infants contract the virus. This project saw resources injected towards training staffs and pregnant mothers, availing transport reimbursements to encourage antenatal clinic attendance, follow up of children in cohorts and a graduation ceremony at two years of age.

"*We also undertook a project on judicial use of anti-malaria medicines. This was informed by frequent stock outs and notorious treatment of clinical malaria against existing MOH guidelines. We had to avail the guidelines, train clinicians, enforce linkage of laboratory, clinical and pharmacy data to ensure compliance. The results were impressive, at baseline adherence was only 35%, this improved to 90% over three months, 80% over six months. We didn't continue monitoring afterward."*

Interview with QI champion X.

The study also reviewed quality improvement files from two facilities. The files contained the list of quality improvement teams, work improvement teams and a training log of staffs sensitized on quality improvement. The teams also filed minutes of quality improvement meetings documenting stages of the PDSA cycles. Print out of run charts displayed progress of previous projects. Copies of the Kenya Quality Model for health were available in the four facilities. There was no Quality improvement policy or strategy document at the County level.

The study observed aspects of 5S in the filing of patients' records, office stationery, notice boards, treatment and emergency trays and pharmacy department. Files were colour coded by age of patients,

sorted according to follow up/ discharge from care status. Notice boards had current notices posted. The pharmacy staff had pre-packaged and arranged commonly dispensed medicines in trays. The refrigerator was also clearly labelled to avoid confusion between look-alike vials of medicine. Treatment trays and emergency trolleys had tags indicating contents of the drawers for ease of access. Office desks had in tray and out trays, departments had steel cabinets with labelled box files.

Audit and support supervision reports were reviewed. Quality improvement projects were not externally supervised by the county teams. AMPATH conducted Site Improvement and Monitoring systems (SIMS) which had a quality improvement component. These audited previous and ongoing projects at the clinics and facility in totality. Tuberculosis program also conducted supervision and audited clinical indicators. Recommendations could entail implementing changes to bridge a gap or a multisite quality improvement project.

These findings show that quality improvement initiatives in the four facilities include PDSA cycles and 5S. Staffs have information concerning quality improvement including need for leadership, training, employee engagement, use of data and monitoring.

Quality improvement initiatives were not as vibrant as during the initial years. In addition, most projects were triggered by donors, upon completion of the initial cycles, the facilities did not continue with the projects.

4.5 What are the drivers and barriers of Quality Improvement initiatives in Uasin Gishu County Hospitals?

The average response to questions relating to drivers and barriers was 4.09(SD 1.05). Respondents agreed with the statements. The standard deviation shows that the responses were not varied.

Specific responses to leadership, participatory approach, use of data and information, technical knowhow, monitoring and evaluation are shown in table 4.4 below.

Respondents agreed that the hospital level leadership was receptive to ideas and offered support for quality improvement. They also agreed that staffs could contribute to problem solving and decision making but were neutral about having authority to influence practice or policy or set the priority areas for improvement.

Table 4.4: Responses on facilitators and barriers

Question	Min	Max	Mean	Std Deviation
Leadership				
Leaders are receptive to ideas for improvement	1	6	4.49	1.09
management team work together for common goal	1	6	4.49	1.20
Staff Participation				
staff consult to solve problems	1	6	4.72	1.22
staff contribute to decisions	1	6	4.17	1.30
Staff have authority to change practice or influence policy	1	6	3.98	1.46
Prioroty setting process is in place	1	6	3.84	1.35
Data and information				
Customer satisfaction information is used	1	6	3.92	1.29
Accurate and timely data available for quality evaluation	1	6	4.21	1.28
Technical know how				
HoDs have skill to assess quality	1	6	4.10	1.44

My department has objective measures for quality	1	6	3.99	1.29
staffs use routine methods to understand root causes of problems	1	6	3.80	1.48
Staff use best practices to improve quality	1	6	3.98	1.33
Monitoring and evaluation				
Continuous evaluation of programs and services in place	1	6	3.70	1.58
quality of programs is monitored	1	6	3.87	1.44

4.5.1 Training

Findings showed that 39% (n=65) of respondents had formal training in quality improvement. Of these, 69% (n=45) put the training into practice by engaging in QI activities. Respondents in managerial positions (n=24) including heads of department and facility in charges had all received formal training. Respondents indicated that they were trained on the PDSA cycle, 5S, Kaizen and Lean. Of those trained and implementing QI activities, 20% used PDSA cycles and 5s, while 80% used PDSA only.

4.5.2 Culture

The type of culture was computed using the average of a set of five questions. Each respondent's score was then computed for each culture type. The mean depicted in figure 4.5 below shows that group culture scored mean 34.9, Developmental culture mean 13.6, Hierarchical culture mean 34.9, rational culture 19.4. This implies that most respondents identified their facility as having a hierarchical culture closely followed by group culture.

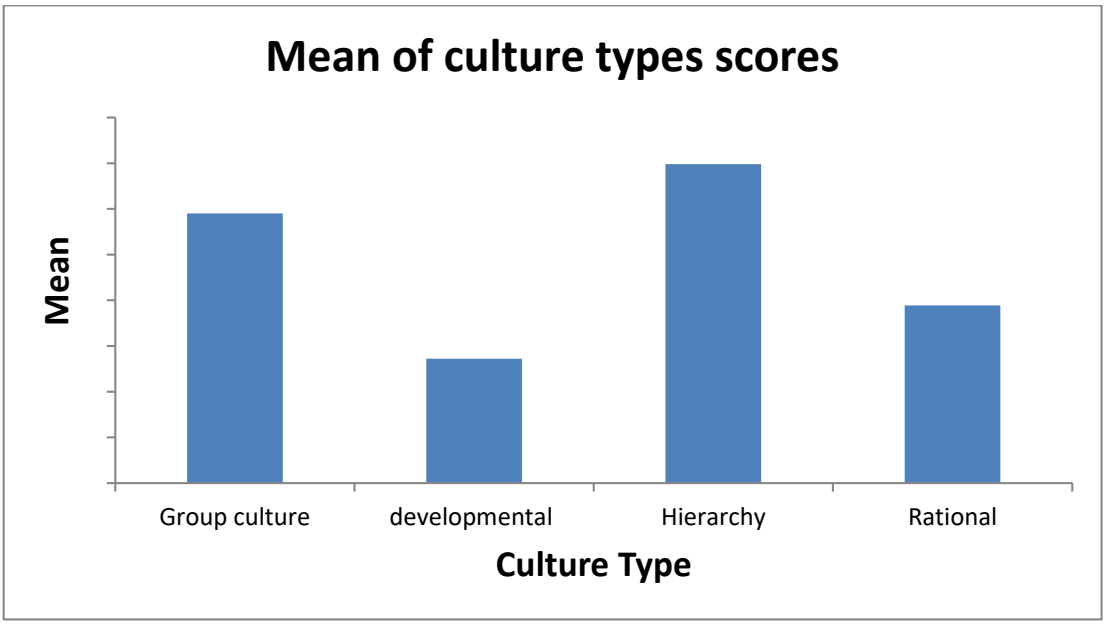

Figure 4.5 Mean culture scores

The findings in table 4.5 indicated that Huruma SCH was predominantly Hierarchical (35.8%) and least developmental, Pioneer Health Centre had a mix of Hierarchical (34.1%) and group culture (32%). Uasin Gishu County Hospital was also hierarchical (36.1%) while Turbo was higher in group culture (34.2%) followed by hierarchical (32.6 %)

Table 4.5: Average Culture Type Scores by Facility

Facility	Group	Developmental	Hierarchy	Rational
Huruma	27.3	14.2	35.8	21.4
Pioneer	32.0	13.7	34.1	19.0
Uasin Gishu	27.2	14.3	36.1	19.2
Turbo	34.2	11.8	32.6	17.9

In depth interviews sought to clarify the above findings. The respondents expressed the barriers as lack of support from the county level, reluctance to engage implementing partners, demoralized staffs,

frequent staff turnover and lack of deliberate effort to sustain quality improvement. Some respondent expounded on the staff barriers

"Lack of initiative is the major problem. Staffs have very low morale; rarely do we go beyond call of duty. We have stagnated without promotions, are daily overwhelmed with high workload. This hinders personalising patient care."

Key informant interview 3

"The county often transfers staffs out. It is impossible to build a pool of quality improvement champions. In addition, there is no effort to train new staffs. Over time, demands of the job overshadow those of quality improvement activities which are seen as additional."

Key informant interview 2

Success in previous projects was attributed to monitoring and evaluation, support from donors, training of staffs, favourable departmental culture, recognition of performers and internal satisfaction.

"The Tuberculosis, Malaria, and Reproductive Health programs have been able to maintain quality improvement through regular audits, follow ups and training. These are mostly overseen at national level. The program managers are always keeping us on toes to deliver the targets. Active monitoring of performance indicators, monthly feedback and quarterly support supervision are well established. The other quality improvement initiatives are not as robust in structure. It is interesting to know that the AMPATH Plus Clinics still run quality improvement projects. These are rewarded through performance based financing that assigns 80% of the cash reward to the staffs and 20% to the facility thus inculcating team work and motivating improvement ."

Interview with QI champion VII

"It was easier to undertake projects within the department where you can all see the challenges improve on them and reap the benefits. Low hanging fruits encouraged staffs to undertake bigger projects."

Key informant interview VI

"*My team won the trophy for being the best county wide in quality improvement. The trophy reminded us for a while that we are excellent and motivated the team to keep the efforts for some time. This feel-good effect is more meaningful than cash rewards. The drive for quality improvement has to stem from within.*

Key informant interview VIII

"A good practice in my department is use of data. Before we submit it to the records, we check it for errors and interpret what it really means."

Key informant interview IV

"Training is important but more important is to support the staff to put to use what they have learnt. In class there were so many tools that could be employed, but we rarely use more than two. Less transfers out will also give the staff ample time to carry out a project and spread the practices to other departments."

Key informant interview III

The drivers for quality improvement include training of staffs, availing resources for quality improvement, support from leadership, rewarding success, high staff morale and staff participation in quality improvement. Barriers include laxity from staffs, high workload, transfers of staff, non-supportive organization culture.

4.6 What is the outcome of Quality Improvement Initiatives?

Four outcome areas were assessed namely cost saving, improved customer satisfaction, improvement in quality of services and improvement of employees' quality of work. Respondents were not sure of the impact of quality improvement on cost savings (59%), improvement of quality of services (42.8%) and improvement of quality of employee work life (44%). Respondents agreed that quality improvement led to cost saving (25.3%), improving customer satisfaction (53%), service improvement (44%) and quality of work life (34.9%). There were no quantified responses in amounts saved or data comparing baseline scores against post intervention scores of the outcomes. This is summarised in figure 4.6 below.

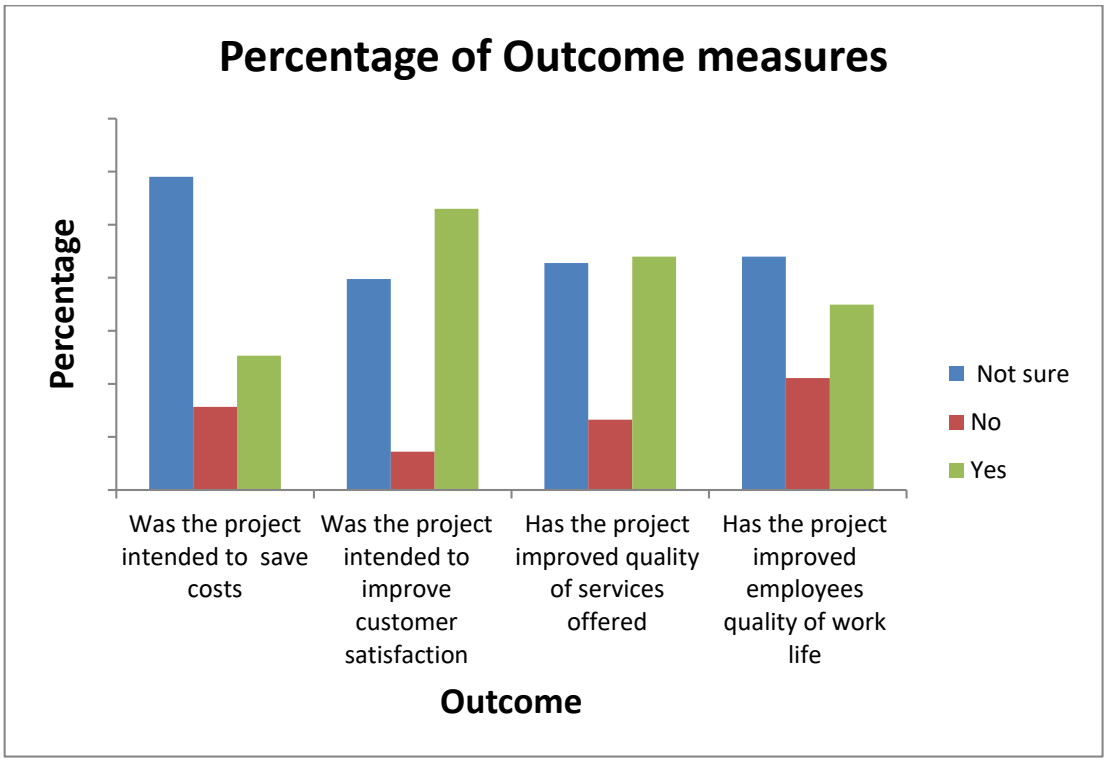

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Figure 4.6: Percentage of Reported Outcome Measures

Outcome findings were further explored. The respondents reported that outcomes were limited to clinical outcomes and rarely included objective measures of client satisfaction, cost saving or improvement of employee's quality of life. They were however aware of the potential of quality improvement initiatives in addressing all the aforementioned outcomes.

"Only the clinical outcomes were objectively measured in completed quality improvement projects. The customer satisfaction and improvement in work life quality was mostly subjective. The county did a general client satisfaction survey in 2019 but it was not linked to any improvement initiatives, in addition it target all service areas including roads and agriculture. We can however extrapolate cost savings made through judicial use of medicines as we know the costs of the medicine and average cost of treatment to the clients."

Interview with QI champion IX

Quality improvement outcomes in the four facilities included objective measures of clinical outcomes. These were in accordance with the initiatives objectives and often defined by the implementing

partner. Other outcomes such as cost reduction, staff work life improvement and client satisfaction were subjectively measured.

4.7 What measures are in place to ensure sustainability of Quality Improvement initiatives in Uasin Gishu County Hospitals?

Communication concerning projects was reported at the beginning and end of the project among 82% respondents, throughout the project among 28%, at the end in 18% while among 38% no efforts were made.

Respondents also reported steps taken to sustain changes from projects. Most reported that no effort was made n=47, 21 respondents had been briefed on the project and encouraged to participate while among 14 respondents work norms and policies had been changed to sustain change. The figure 4.7 below summarises the responses.

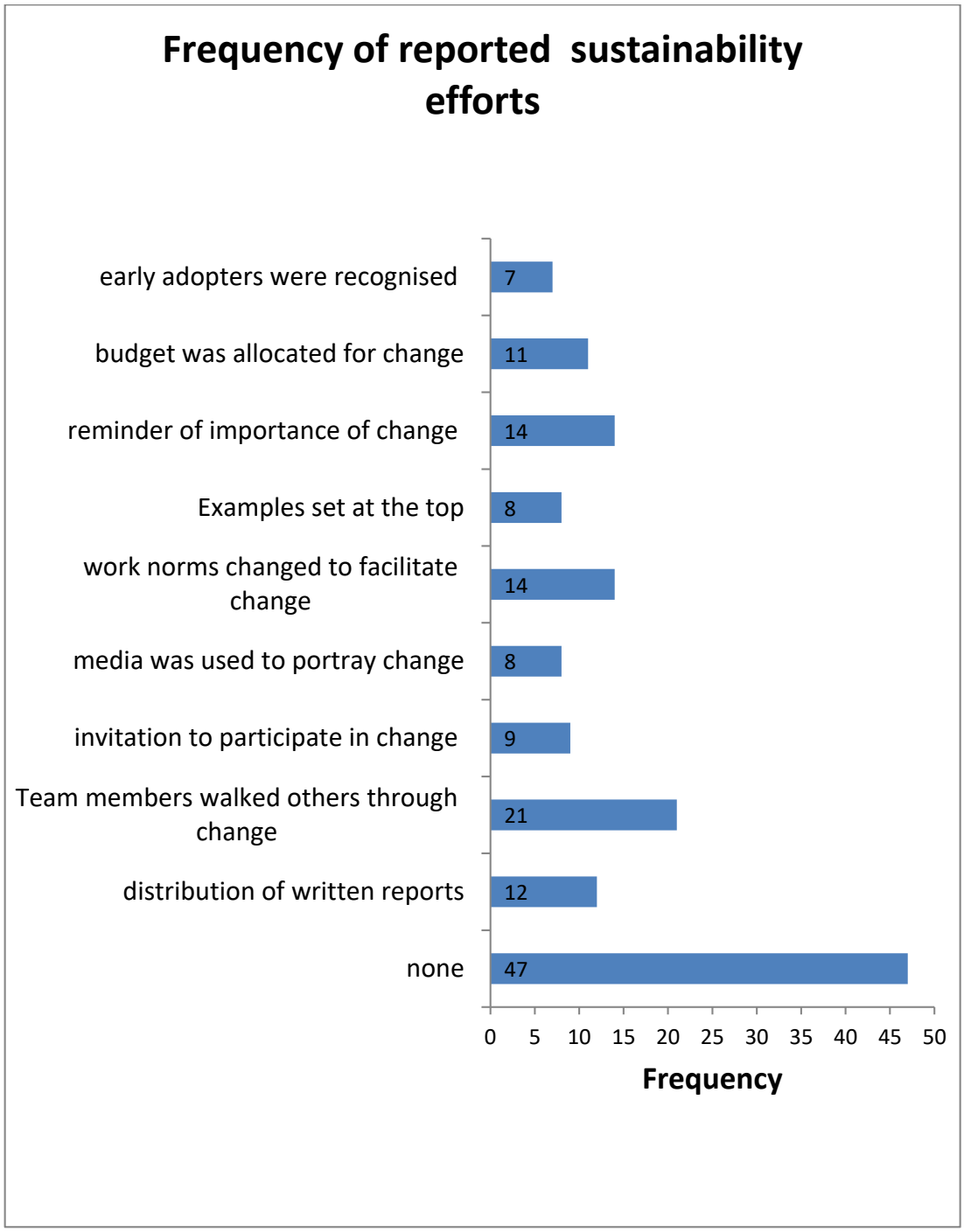

Figure 4.7: Frequency of Sustainability Efforts

Interview respondents reported that sustainability was rarely incorporated into the quality improvement initiatives at their facilities. The activities were mostly seen as departmental rather than facility wide. Sustainability is often affected by the staffs' perception of the importance of the change, relevance to other departments and potential costs of spreading the changes to other departments. The

projects that had a similitude of sustainability were often run at county or national level such as infection prevention, Tuberculosis audits and Reproductive Health Services. Such projects often have a budget allocation among other resources and have a public health importance. In addition they have a long lifespan over decades.

Interview respondents reported that sustainability could be ensured through early, deliberate, consistent communication of the project to all staff. The second key informant reported that:

Most often staffs get enjoined mid-way through the project. It's like you get on the team because the protocol demands it not because your input is valuable. Information is often treated as secretive. When this happens, the sole desire is to wrap it up and move on, there is no ownership, no attempt to buy you in. In this case the changes can never be sustained.

More findings included frequent reporting of interim results, engaging staffs actively from the onset of projects and throughout the project cycle. Interviewees added that encouraging ownership of the project, celebrating milestones and keeping an institution memory such as a quality improvement week can cultivate sustainability.

"*Be practical in QI projects, use simple approaches that are low hanging fruits. Communicate often, simplify the projects and tailor them to the users and their own objectives. Ensure projects involve all departments not just one and celebrate winners.*

Interview with Key informant I

The ninth key informant expressed that behaviour change and culture also play a role. While communication may be in place, there are habits that hinder sustainability. They recounted a scenario in maternal audit as a vicious futile cycle:

"In case of a maternal death or near miss, the caregivers assess the circumstances around the death and put strategy in place to improve services. The aim of such meetings is not to appropriate blame but improve care. Findings are disseminated to all staffs even those not directly involved in the case at hand. Despite communicating to all staff s and recommending they are to cascade to other patients, other near misses still happen and same recommendations are made over and over again. Most of the

time, the previous action points remain unimplemented. It becomes a repetitive vicious and futile cycle."

The first respondent added:

Frequent staff turnover affects both the project and the staff's morale. There is no continuity of quality initiatives when the core staffs leave. Sometimes the staff doesn't have enough time to see the project through its lifespan. They often drop such activities altogether choosing not to engage in the new facilities.

Sustainability measures are not well established among the studied facilities. Communication is a key strategy employed towards sustainability. This entails relaying the project information before, during and after the project, and publicizing the changes. Staff transfers, lack of funding for projects negatively affect sustainability.

Chapter 5: Discussion

5.1 Introduction

This chapter examines results from the findings section comparing them against existing literature. It also includes conclusions on key aspects and recommendations for further research and practice.

5.2 Discussion of findings

The discussion is guided by the study objectives namely, to describe the quality improvement initiatives implemented, to explore in-depth the facilitators and barriers to implementation, to assess the outcomes of quality improvement initiatives and to assess sustainability of the quality improvement projects implemented across four Uasin Gishu County hospitals.

The response rate was acceptable for subsequent data analysis and reporting as it met the threshold of 60%. (*The Complete Guide to Acceptable Survey Response Rates*, 2019)

5.3 Description of quality improvement initiatives implemented.

The first objective sought to describe the quality improvement projects in the four facilities in Uasin Gishu County. In Uasin Gishu, quality improvement was first introduced in clinical care to improve outcomes of HIV patients in viral load suppression and elimination of mother to child transmission. A donor triggered the quality improvement process, offered training, set targets to achieve in patient care and monitored the progress of the projects. These findings are in agreement with the quality improvement journey in Kenya. The Kenya HIV Quality Improvement Framework (KHQIF) was commissioned in 2014 to promote quality in the care for HIV and AIDS, with a view of improving the quality of life of people living with HIV/AIDS (PLWHA) in Kenya (Ministry of Health, 2007). This shows that HIV care pioneered Quality improvement initiatives at country and county level.

The facilities had implemented at least one PDSA cycle and 5S Kaizen. Respondents were aware of other methods but had no opportunity to put these into practice. While a study by K Walshe (2002) advised on working with one approach at a time, this finding was not of consistency to QI approaches but stagnation (Walshe, 2002). None of the facilities in the study had completed more than three

quality improvement cycles. This is owing to reliance on the external stakeholder for directive on projects to undertake. Clinical audits are conducted in specific programs where arising recommendations often required some form of quality improvement. The Tuberculosis program is coordinated at the national level while reproductive health services were coordinated centrally at the county level. The techniques obtained from the audits could be transferred to other clinical areas such as auditing patient responses to treatment, adherence to treatment protocols among others. This shows that other factors such as organization culture, leadership account for these findings rather than lack of resources. Tools in use include Root cause analysis to identify the cause of the gaps observed, brainstorming to identify solutions and run charts to display progress. These tools are adequate and could be enriched by augmenting them with process maps, story boards, pareto charts, among others.

The ideal design process for a quality improvement project includes identifying the problem targeted for improvement. This is followed by problem analysis including quantifying the problem, identifying the cause, possible remedies and identifying barriers and facilitators'. The next step involves designing the intervention complete with plans of the activities, resources, timelines, and strategies to overcome barriers and monitoring of progress. The plan is then tested on small scale to elicit feasibility or challenges. The intervention is then adopted at a larger scale, spread and sustained. Evaluation is incorporated at all stage; resulting feedback is used to refines the processes (Kok et al., 2003). The first project adhered to most aspects of the design process except spreading and sustainability. Initiatives done intuitively such as the maternal mortality audits in one facility do not achieve intended outcomes owing to faults at the design stage.

These findings show that quality improvement is not optimised in these facilities. Quality improvement could be incorporated into the organizations daily activities and owned up rather than being driven entirely by external stakeholders such as donors or National programs. There are opportunities to implement small incremental changes at department and spread the same to the facility level.

These findings agree with E Mwangi (2018) whose study on introducing continuous quality improvement initiatives found out that the Mission hospital had PDSA cycles and 5S Kaizen as the main methodologies (E. W. Mwangi, 2018b) . In contrast, this facility had more activities including clinical and non-clinical projects such as purchase of medical equipment, reducing wastage of resources and monitoring customer satisfaction. This could be explained by the difference in

ownership of the institutions; nonetheless, clinical outcomes including reducing errors in laboratory and pharmacy processes could be adopted.

In both facilities a trigger drove the adoption of quality improvement, for the mission hospital, ISO certification while for Uasin Gishu facilities a stakeholder improving HIV care.

5.4 Facilitators and barriers to implementation of quality improvement initiatives

The second study objective sought to describe the barriers and facilitators to implementation of quality improvement initiatives.

The findings showed that while hospital leadership was receptive to ideas and staffs were consulted, the staffs did not have the authority to influence practice or change policies. Data was available and it was used to inform change. Evidence on best practices for quality improvement show that staffs viewed directives to collect data for reporting negatively while they appreciated data translation to improve service delivery(Talib et al., 2011). The gap in the study was that the staffs could float ideas, use data to suggest improvements but the execution was not supported, over time this discouraged efforts towards quality improvement.

Quality improvement was known to majority of the staffs through attending QI training or dissemination of information by colleagues post training. There is a potential for developing job roles for the quality improvement teams including training and refreshing knowledge on quality improvement.

County and National levels programs were actively monitored and evaluated. This was integrated into the implementation of these programs through report writing, supervision and feedback. Facilities could use the existing mechanisms as a model or anchor for monitoring and evaluating quality improvement projects. There is potential to integrate projects such as infection prevention across all departments rather than only in chest clinics.

Expert opinion indicates that facilitators to the uptake of CQI include leadership, team communication, champions of CQI who are willing to engage, and a culture of commitment to CQI (Sikka et al., 2015), availability of data, staffs trained in quality improvement, and participation from staff are favourable to initiation of quality improvement initiatives. The facilities were in a good position to launch rapid cycles of improvement addressing clinical and non-clinical gaps(McArthur, 2020).

Majority of the facilities had a combination of hierarchical and group culture. While hierarchical culture is not conducive to quality improvement, group culture promotes quality improvement. The overall outcomes rely on a balance of leadership commitment and support. This finding on culture agrees with other findings on outcomes and sustainability of quality improvement initiatives in these facilities. These were found to be underutilised while quality improvement was dormant is some facilities. According to Quinn and Kimberley (1984), culture typologies promoting quality improvement include group culture and developmental culture which are marked with participation and growth.

The successful programs run at the county and national levels are marked with funding, training, regular audits, monitoring and evaluation and a wider regional involvement. This shows that structural organization of a quality improvement program determine its success. In addition, these projects were compulsory and had ability to impute consequences on staffs not implementing the requirements.

Staffs were reported to have low morale, laxity and priority for competing activities over quality improvement. On further investigation, quality improvement was deemed as an additional job and not part of the staff's core roles. In addition, donor led initiatives were seen to serve the donors objectives predominantly. National audits were inevitable. The study identified that there is need to obtain staff buy in and ownership by highlighting the importance of quality improvement and its relevance to them individually. The staffs have to know the importance and want to make a change rather than being motivated by cash tokens to engage in quality improvement.

This agrees with Varkey et al (2007) who highlighted the perception of importance of quality improvement as a determinant of participation among healthcare workers as motivation for quality improvement is majorly intrinsic (Varkey et al., 2007) .

Staffs also reported frequent transfers between duty stations, high workload and staff shortages as barriers to engaging in quality improvement. These issues work against the successful planning, implementation and continuity of quality improvement projects. Human resource challenges were beyond the facility level but allude to support from the county leadership.

Stability of the workforce is also identified by expert opinion as important as it facilitates ongoing use of tools and data collection systems, conducting clinical audits and interpreting and acting on the results of CQI. Expert opinion has identified barriers to the uptake of CQI as including high staff turnover rates, and lack of clear understanding from staff regarding the purpose and benefits of CQI.

Moreover, it also highlights low levels of engagement a problem in some circumstances, which can be partly due to the process being driven by external facilitators. Data use, opportunities for staff training and support in CQI activities is viewed as important in improving levels of engagement, and professional development(McArthur, 2020).

5.5 Outcomes of quality improvement initiatives

The third object sought to describe the outcomes of quality improvement projects. According to the quadruple aim, outcomes of quality improvement include improving quality of services offered, cost savings ,customer satisfaction and improvement of employees quality of work life(Sikka et al., 2015).

In Uasin Gishu, the focus is majorly on quality of services offered. This was measured using clinical indicators. The HIV care projects measured the viral load suppression among clients linked to care. The target of 90% suppression was achieved among the participating sites within a year. Current target was up scaled to 95%. The targets were specific, measurable, achievable, realistic and time bound. Elimination of mother to child transmission of HIV targeted at less than two percent was also achieved and continues to be targeted. The data was available, monitoring in place and the performance could be assessed and tracked over time.

The other outcomes were not monitored objectively. Tools assessing customer satisfaction and employee quality of work life are available. These are not the core competence of heath care workers, as such may not be utilized thus leaving such outcomes to subjective assessment. Economic studies may also be deemed complex. In addition, direct and indirect costs were not known to staffs or management.

5.6 Sustainability of the quality improvement initiatives

Communication of project at the beginning and end of the project was commonest practice. This is not ideal; there is need for continuous communication throughout the project cycle for sustainability. Communication should not just target conveying information but include seeking staff's ideas, challenges, giving feedback and maintaining a common ground.

Sustainability of quality improvement projects was not incorporated in the plans of the projects studied. As such, the projects were not spread to the entire organization. In addition, gains made regress over time and quality improvement became historical.

Chapter 6: Conclusion and Recommendations

6.1 Conclusion

Quality improvement in Uasin Gishu was pioneered by PDSA cycles in HIV care. Current active projects are externally coordinated including Reproductive health, Tuberculosis and infection prevention programs.

Important barriers to implementation included staff related factors such as laxity, frequent turnover and low morale. Organization factors barring quality improvement include hierarchical culture, poor communication practices, lack of leadership support at county level. Facilitators for department level

quality improvement include relevance of the initiatives to the staffs. Clinical outcomes were monitored objectively while other outcomes were subjectively estimated. Quality improvement initiatives were not sustained beyond the initial scope.

6.2 Limitations of the study

Data collection was limited to surveys and key informant interviews owing to COVID regulations on gatherings. FDGs were not feasible online as participants could not all attend a meeting on the same day and time. Use of face masks hampered interpretation of facial expression during one-on-one key informant interviews.

Likert scale questionnaires are prone to central tendency bias .This was circumvented by using 6 point Likert scale to force respondents to choose responses rather than tend to extremes or one neutral point (Thompson, n.d.). The researcher acknowledges potential social desirability bias where respondents would want to portray their organization in good light.

Case study design limits the generalization of these findings to other contexts.

These limitations, however, do not invalidate the findings afore discussed.

6.3 Recommendation

The study found that quality improvement was not optimised; as such it recommends the following for practice. Firstly, facilities in Uasin Gishu County revive quality improvement initiatives. This entails internal identification of service delivery gaps, strategizing to address them, implementation of the plans and monitoring progress. The facilities could also integrate initiatives to complement existing activities in infection prevention, reproductive health, and Tuberculosis programs.

The study also found hierarchical culture predominantly, as this stifles quality improvement, the study recommends culture shift through encouraging group culture and support from organization leadership, leadership commitment and change management at county level. The staffs should be empowered to improve work environment.

The study elicited lack of objective measures of outcomes and thus recommends integration of measures relating to cost cutting, client satisfaction and employee quality of life in quality improvement projects.

The study also found paucity of sustainability measures in the previous projects. It thus recommends incorporation of spread and sustaining measures in planning stages of projects.

Recommendation for policy includes formulation of a county QI strategy with cascade to all facilities. The study identified barriers relating to staff morale, laxity, high turnover, and workload and thus recommends realignment of human resource policies to address grievances, create a pool of quality improvement champions, train staffs and motivate them.

This study was conducted in Uasin Gishu County; the study thus recommends conduction of similar studies in other counties and in private facilities. In addition, there is need to quantify and correlate the barriers and facilitators in context to ascertain their effect on quality improvement initiatives.

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APPENDICES

Appendix 1: Letter of Introduction

I am a student currently undertaking an MBA degree in Healthcare Management at Strathmore University Business School. I am conducting a study titled "Quality Improvement Initiatives in County Hospitals; A Multiple Case Study Of Four Hospitals In Uasin Gishu County". The aim of this study is to understand in-depth the nature, characteristics and outcomes of QI projects undertaken since 2014 to date in public facilities within the county, and propose ways in which this can be improved in future.

As part of data collection, I will be administering a questionnaire and in depth interviews with various stakeholders and staff who have been involved in providing and/or improving services at the hospital. Participation in this research is voluntary. However, your input is helpful if I am to understand the experiences enough to propose ways in which you can be better supported in future to carry out your mandate and help improve services. Please note that any information you share will be confidential. All information collected will be reported in aggregate, without using individual persons' names or identifiers.

I look forward to your input.

Thanking you in advance

Researcher

Jedidah Kiprop

Appendix 2: Information sheet for participants

Title: "Quality Improvement Initiatives in County Hospitals: A Multiple Case Study of Four Hospitals in Uasin Gishu County".

Section1: Information Sheet

Investigator: Jedidah Kiprop

Institutional affiliation: Strathmore University

Section2: Study Information

2.1: Why is this study being carried out?

Quality improvement initiatives have been practiced in hospitals across hospitals in Uasin Gishu since 2014. At inception, the initiatives targeted improving HIV clinical management. Over time the initiatives were integrated across departments so as to achieve holistic improvements.

Since the introduction of QI at Uasin Gishu hospitals, little effort has gone towards evaluating their effect and generating lessons for service delivery. This may, somewhat, explain huge variations in performance across programs. For instance, while key performance indicators for HIV and AIDS have exceeded set targets, indicators for immunization coverage and skilled birth attendances continue to lag.

This underscores the value of doing research to examine the quality improvement initiatives implemented across different hospitals in the County. Findings will inform the county management on how best to leverage QI to improve service processes and outcomes.

2.2: Do I have to take part?

No. Participating in this study is optional. However your input is valued as it will enable understanding of the subject matter. Prior to the actual discussion, an information session will be organised and questions relating to the study will be addressed. You are free to withdraw your participation at any given time.

2.3: Who is eligible to take part in this study?

Previous and current members of the quality improvement team, work improvement team, administrators and records offices can take part in the study. It is estimated that a minimum of ten respondents will respond in each facility.

2.4: Who is not eligible to take part in this study?

Staffs that have not been part of quality improvement efforts are excluded from this study.

2.5: What will taking part in this study involve for me?

The researcher will request you to take part in the study, avail background information and obtain formal consent for participating in focus group discussion and recording of responses. The total time per encounter will not exceed two hours. In order to ensure continuity in service delivery, the research will allow flexibility and convenient scheduling of interviews and focus group discussions.

2.6: Are there any risks or dangers in taking part in this study?

There are no risks involved. All information you provide will be treated with confidentiality and not used in any way without your permission.

2.7: Are there any benefits of taking part in this study?

The information you contribute will be vital in understanding Quality Improvement in this facility and how to improve the initiatives. Lessons drawn will also be fed back to the county health management as the health department gears for Universal Health Coverage. There are no monetary benefits for participating in this research.

2.8: What will happen to me if I refuse to take part in this study?

Your participation is voluntary. Withdrawal from the study has no adverse consequences to you.

2.9: Who will have access to my information during this research?

Records will only be accessible to people closely working on the study. They will be securely stored in locked cabinets and where in digital format, password protected.

2.10: Who can I contact in case I have further questions?

You can contact me, Jedidah Kiprop, by e-mail at jedidahn87@gmail.com, or by phone 0782102866 / 0723102865.

You can also contact my supervisor, Dr Francis Wafula at Strathmore University Business School Nairobi, by email at fwafula@strathmore.edu or by phone at 0722679467.

If you want to ask someone independent anything about this research please contact:

The Secretary–Strathmore University Institutional Ethics Review Board,

P.O. BOX 59857-00200 Nairobi

Email: ethicsreview@strathmore.edu

Tel number: +254703 034 375

I have had the study explained to me, understood the information and asked questions. I understand that my participation is voluntary.

Please tick the box that applies to you;

Participation in the research study

☐ I AGREE to take part in this research

☐ I DON'TAGREE to take part in this research

Participants name & signature	
Date	

I have explained the study information to the study participant, given opportunity for questions and clarifications. The participant has understood the information provided and consents to take part in this study.

Investigators name & signature	
Date	

Appendix 3: Informed Consent Form

I..... As a participant in this research confirm that

- I have read and understood the information required of me in this research from the cover letter and interview guide provided.
- I have had an opportunity to ask questions and clarifications concerning my participation and this research project.
- I voluntarily agree to participate in this research
- I understand that I can withdraw from the research at any point without questioning or penalization of my action.
- Measures to ensure confidentiality have been explained to me.

- The use of the data in research, publication, sharing, archiving has been explained to me.

I, together with the Researcher, agree to sign and date this informed consent form

Participant (optional): Name/Initials .....sign .....date.....

Researcher: Name/Initials .....sign .....date.....

Appendix 4: Questionnaire

SECTION 1: Demographic

a) Facility Name …… ……

b) How long have you worked for this health institution? (Please tick appropriate bracket)

0-2years	3-5 years	6-8 years	9-11 years	12-14 years	15 and above

c) Designation …… …….

d) Specify your professional category

Medical Officer		Laboratory	

Dentist		Health records	
Pharmacist		Nutritionist	
Clinical Officer		Administrator	
Nurse		Counsellor	
Public Health Officer		Others-specify	

e) What is your highest level of education?

Certificate	**Diploma**	**First Degree**	**Master's Degree**	**PhD**	**Other- specify ……**

f) Specify your age bracket

Below 25	**25-30**	**31-35**	**36-40**	**41-45**	**45-50**	**51-55**	**>55**

g) Specify your gender

Male		Female		Other	

SECTION 2: Quality Improvement

Please indicate your level of agreement with the following statements regarding your knowledge and opinions about **quality improvement**.

	Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly Agree
I have Participated in organized quality improvement activities in the past three years.						
I can define quality improvement.						
I can describe the difference between quality improvement and quality assurance.						
I can describe the benefits of using quality improvement in health.						
I can describe the stages of the Plan-Do- Study-Act (PDSA)cycle.						

Quality improvement involves changing processes.						
Quality improvement does not involve data.						
Quality improvement only involves managers.						
Quality improvement does not consider information from clients or						
When using quality improvement, you should be able to distinguish whether your change is an improvement						
I can list the four basic principles of quality improvement.						
Spending time and resources on quality improvement is worth the						

3. Have you, or any of your staff, participated informal training on the following quality improvement methods or frameworks?

	You	
	Yes	No
Plan Do Study Act (PDSA)		
Baldrige Performance Excellence Criteria		
Balanced Scorecard		
Lean Six Sigma		
Other(please specify)		
I have not received any training in quality improvement methods.		

4. What quality improvement methods have you, or any of your staff, previously used, if any?

	You	
	Yes	No
Plan Do Study Act (PDSA)		
Baldrige Performance Excellence Criteria		
Balanced Scorecard		
Lean		
Six Sigma		
Other(please specify)		
I have not previously used quality improvement methods in my work.		

5. Do you, or any of your staff, have experience using any of the following quality improvement tools?

	Yes	No
Affinity diagrams		
Brainstorming		
Fish Bone/Cause and Effect Diagram		
Five Whys		
Force field Analysis		
Gantt Chart		
Logic Model		
Matrix		
Process Map/Flowchart		
Story Board		
Check Sheet		
Control Chart		
Histogram		
Pareto Chart		
Run Chart		
Scatter Diagram		
Stratification		
Other(please specify)		

.6Please indicate your level of agreement with the following statements about **quality improvement** in your hospital.

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
Leaders of my hospital are receptive to new ideas for improving hospital programs, services, and outcomes.						
The director and/or the management team of my hospital work together for common goals.						
Staffs in my department/ hospital. Consult with one another to solve problems.						

Staff members are routinely asked to contribute to decisions at the department/ hospital.						
There is an established process for identifying priorities for quality improvement in my department/hospital.						
Customer satisfaction information is routinely used by many individuals in my department/ hospital.						
Accurate and timely data are available for heads of department to evaluate the quality of their services						
Staffs have the authority to change practices or influence policy to improve services within their areas.						
Heads of department have the skills needed to assess the quality of their programs.						
My department/ hospital has objective measures for determining the quality of programs and services.						
Staffs in my department routinely use systematic methods to understand the root causes of problems.						
Staffs in my department routinely use best or promising practices when selecting interventions for improving quality.						

	Strongly Disagree	Disagree	Somewhat	Somewhat	Agree	Strongly Agree
Programs and services are continuously evaluated to see if they are working as intended and are effective.						
The quality of many programs /services in my hospital is routinely monitored.						

SECTION 3: Drivers and Barriers

Hospital culture

Instructions: These questions relate to the type of hospital that your institution is most like. Each of these items contains four descriptions of hospitals. Please distribute 100 points among the four descriptions depending on how similar the description is to your hospital. None of the descriptions is any better than the others; they are just different. For each question, please use all 100points.

For example: Inquestion1,if Hospital A seems very similar to mine ,B seems somewhat similar, and C and D do not seem similar at all, I might give 70 points to A and the remaining 30 points to B.

Hospital Character (Please distribute 100points)

1. Hospital A is a very personal place. It is a lot like an extended family. People seem to share a lot among them.

2. Hospital B is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.

3. Hospital C is a very formalized and structured place. Bureaucratic procedures generally govern what people do.

4. Hospital D is very production oriented. A major concern is with getting the job done. People aren't very personally involved.

Hospital's Managers (Please distribute 100points)

5. Managers in Hospital A are warm and caring. They seek to develop employees' full potential and act as their mentors or guides.

6. Managers in Hospital B are risk-takers. They encourage employees to take risks and be innovative.

7. Managers in Hospital C are rule-enforcers. They expect employees to follow established rules, policies, and procedures.

8. Managers in Hospital D are coordinators and coaches. They help employees meet the hospital's goals and objectives.

Hospital Cohesion (Please distribute 100points)

9. The glue that holds Hospital A together is loyalty and tradition. Commitment to this hospital runs high.

10. The glue that holds Hospital B together is commitment to innovation and development. There is an emphasis on being first.

11. The glue that holds Hospital C together is formal rules and policies. Maintaining a smooth running operation is important here.

12. The glue that holds Hospital D together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.

Hospital Emphases (Please distribute 100points)

13. Hospital A emphasizes human resources. High cohesion and morale in the organization are important.

14. Hospital B emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.

15. Hospital C emphasizes permanence and stability. Efficient, smooth operations are important.

16. Hospital D emphasizes competitive actions and achievement. Measurable goals are important.

Hospital Rewards (Please distribute 100points)

17. Hospital A distributes its rewards fairly equally among its members. It's important that everyone from top to bottom be treated as equally as possible.

18. Hospital B distributes its rewards based on individual initiative. Those with innovative ideas and actions are most rewarded.

19. Hospital C distributes rewards based on rank. The higher you are, the more you get.

20. Hospital D distributes rewards based on the achievement of objectives. Individuals who provide leadership and contribute to attaining the hospital's goals are rewarded.

SECTION 4: Outcomes

In this final section we ask you to estimate the impact of the improvement project. We ask you to provide the percent- age of improvement compared to baseline values. Please complete a separate section D for each project.

1. Was the intent of the project to save costs?

❑ I am not sure
❑ No
❑ Yes

If yes, were there any savings?

❑ No data are available.
❑ It is too early to tell.
❑ Yes, potential future costs have been avoided. Give the percentage of reduction in future costs: ____%
❑Yes, real costs have been avoided, and as a consequence the budget for the unit has been modified. Give the percentage by which the unit budget was reduced: _____%

2. Was the intent of the project to improve client satisfaction?

❑ I am not sure
❑ No
❑ Yes

If yes, (select and answer all that apply)

❑ No improvements made in customer satisfaction.
❑ Too early to tell.
❑ The project improved customer satisfaction by _%.
❑There was improvement in customer satisfaction, but these improvements have not been measured.
❑ Not sure whether the project made any improvements in satisfaction of customers.

3. Has the project improved the quality of services offered by this unit?

❑ I am not sure
❑ No
❑ Yes

If yes, (select and answer all that apply)

❑ The project increased patients' access to services by __%.
❑ The project reduced mortality of patients by __%.
❑ The project reduced morbidity of patients by __%.
❑ The project increased patients' health status by %.
❑ The project improved _by ____%.

4. Has the project improved the employees' quality of work life?

❑ I am not sure
❑ No
❑ Yes

If yes, (select and answer all that apply)

❑ Employees' work is more convenient.
❑Employees have to do less because redundant activities have been streamlined.
❑ Employees' roles are better defined, communication is more enhanced, and interpersonal conflicts are reduced.

❑Employees are more aware of each other's work.
❑Employees socialize more with each other.

SECTION 5: **Sustainability**

1. When did employees in other units of the organization first hear about this project?

☐ At the start and end of project
☐ At end of project
☐ Throughout the project
☐ No organized attempt was made to inform other units

2. Did the administration or team members take any of the following steps to encourage others in the organization to adopt the recommendations of the team (mark all that apply):

☐ No specific steps were taken

☐ Written team reports were distributed widely

☐ Team member(s) walked key other employees through the report or possible change

☐ People interested in adopting the recommendations were invited to meet socially together and discuss their issues.

☐ Media (e-mail, newsletters, memos, Whatsapp, text, videotapes, etc) were used to portray a positive image for change

☐ Work norms and policies were changed to facilitate adoption of the recommendations

☐ Examples were set at top of organization

☐ Key decision makers were repeatedly reminded of potential advantage of change over several meetings

☐ Budget was allocated for change

☐ Early adopters were recognized and praised and asked to speak about their experiences

☐ Other, please specify:

Appendix 5: Topic Guide for In Depth Interview

Part 1: Demographic data/ Bio data

a) Gender

b) Age

c) Designation

d) Professional qualification

e) Length of service at current station

f) Work experience

Part 2: Quality improvement

a) What is your understanding of QI?

b) What is your role in QI? (past/present)

c) How was QI introduced to this facility? (brief history to date)

d) Which initiative(s) has this facility/ your department undertaken? (past/present, brief description)

e) What are the barriers and facilitators to implementing quality improvement?

f) What were the expected versus actual outcomes?

g) If (e) above do not match, what could be the cause?

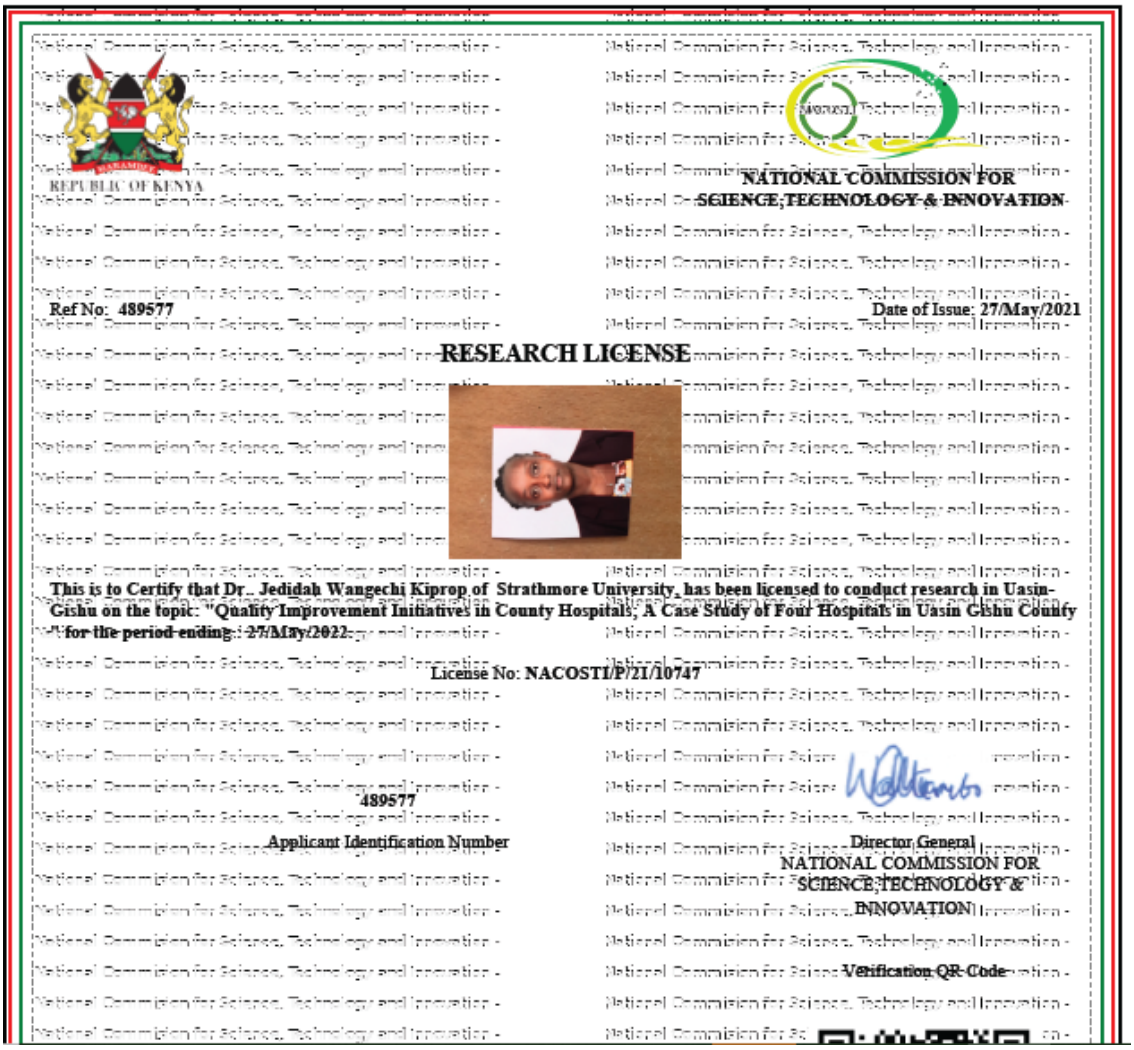
h) What were the enabling and limiting factors for (e)

Appendix 6: Data extraction template

Facility: ..... Date.....				
S/no	Document /tool	Availability YES/NO	Content	Observation/Comments
1.	KQMH /KHQIF guidelines			
2.	QI file		Training log Minutes QIT/WIT Record of QI projects other	
3.	5S board/chart			
4.	PDSA cycle charts			
5.	Fish bone diagrams			
6.	Run charts			
7.	Progress reports/ charts			

8.	Support supervision book			e.g. were Recommendations implemented
9.	SIMS audit feedback			e.g. were Recommendations implemented

Appendix 7: NACOSTI Clearance



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 489577

Date of Issue: 27/May/2021

RESEARCH LICENSE

This is to Certify that Dr.. Jedidah Wangechi Kiprop of Strathmore University, has been licensed to conduct research in Uasin-Gishu on the topic: "Quality Improvement Initiatives in County Hospitals; A Case Study of Four Hospitals in Uasin Gishu County" for the period ending: 27/May/2022.

License No: NACOSTI/P/21/10747

489577

Applicant Identification Number

Director General

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

APPENDIX 8: SU-IREC Clearance

Strathmore UNIVERSITY

13th May 2021

Dr Kiprop Jedidah,
jedidahn87@gmail.com

Dear Dr Kiprop,

RE: Quality Improvement Initiatives in County Hospitals; A Case Study of Four Hospitals in Uasin Gishu County

This is to inform you that SU-IERC has reviewed and **approved** your above master's research proposal. Your application reference number is **SU-IERC0955/20**. The approval period is **13th May 2021 to 12th May 2022**.

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and also obtain other clearances needed

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
13 May 2021
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

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