

**DETERMINANTS OF QUALITY HEALTHCARE SERVICE PROVISION AT
KENYATTA NATIONAL HOSPITAL, KENYA**

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FOR THE AWARD OF A MASTER OF SCIENCE IN HEALTH SYSTEMS
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DECLARATION AND RECOMMENDATION

DECLARATION

This thesis is my original work and has not been presented in any other university.

Signed

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RECOMMENDATION

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

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DEDICATION

To my little scientist Cherotich and the curious Chelang'at who constantly ask “Why?” and “How?” May this work satisfy your curiosity, at least a little bit.

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ABSTRACT

Quality healthcare service provision is a cornerstone for achieving Sustainable Development Goals (SDGs), a challenge particularly acute in national referral hospitals within resource-limited settings. Kenyatta National Hospital (KNH) in Kenya, as a pivotal healthcare institution, faces persistent challenges in delivering consistent, high-quality care. This study aimed to identify and analyze the key determinants influencing the provision of quality healthcare at KNH, specifically focusing on human resources, hospital infrastructure, system optimization, and health financing. A descriptive cross-sectional research design was employed for this investigation. The study targeted a population of 5,779 healthcare workers within the Surgical Services Division of KNH. A stratified random sampling technique was used to select a sample of 374 respondents, from which 330 completed questionnaires were collected, yielding a high response rate of 88.2%. Data collection was conducted using pre-tested, self-administered questionnaires. The collected data underwent rigorous analysis, utilizing descriptive statistics to summarize the data and inferential statistics, including Pearson's correlation and binary logistic regression, to examine relationships and predictive capacities between the independent variables and the dependent variable. The reliability of the research instrument was confirmed with a Cronbach's Alpha score of 0.811. Descriptive statistics revealed that all study variables had mean scores above 3.0, indicating a general consensus among respondents on their importance. Inferential analysis demonstrated significant positive correlations between hospital infrastructure ($r=0.445$, $p<0.01$), system optimization ($r=0.306$, $p<0.01$), and the provision of quality healthcare. The logistic regression model further identified hospital infrastructure ($\beta=0.593$) as the most potent predictor of quality care, followed by system optimization, human resources, and health financing. The overall model was statistically significant and explained 66.8% of the variance in quality healthcare provision (Cox & Snell $R^2 = 0.668$). The findings underscore the paramount importance of infrastructure investment and operational process efficiency as foundational to enhancing healthcare quality. The study concludes that a multi-pronged strategy is essential for sustainable quality improvement at KNH. Consequently, it is recommended that hospital management and policymakers prioritize strategic investment in infrastructure upgrades, enhance staff training and retention programs and foster a culture of data-driven decision-making to bridge existing service delivery gaps and achieve superior patient outcomes.

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ABBREVIATIONS AND ACRONYMS

KNH	Kenyatta National Hospital
SDGs	Sustainable Development Goals
WHO	World Health Organization
HR	Human Resources
SPSS	Statistical Package for Social Scientists
KEMU	Kenya Methodist University
NACOSTI	National Commission for Science, Technology and Innovation
TQM	Total Quality Management
UHC	Universal Health Coverage
SERC	Scientific Ethics Review Committee

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Ensuring quality healthcare service provision in public hospitals is essential for any health system, aligning with the broader goal of achieving Sustainable Development Goals (SDGs) (World Health Organization [WHO], 2016). Quality service delivery within the health industry involves various factors such as costly service provision; prompt service delivery, adequate access to health facilities, and ensuring that healthcare providers fulfil their service mandate (Akachi & Kruk, 2017). One of the fundamental principles guiding the achievement of quality service delivery in healthcare is the promotion of universal health coverage (UHC). Proper health system management is crucial in addressing these factors and ensuring that public hospitals are equipped to provide high-quality healthcare services, thus contributing significantly to the overall health system and the attainment of SDGs.

Quality healthcare in public hospitals is fundamental for achieving universal health care and meeting Sustainable Development Goals (SDGs). Accessible, affordable, and high-quality healthcare is essential for community well-being and societal progress (WHO, 2023). Key factors ensuring quality healthcare include a skilled workforce, proper infrastructure, access to essential medicines and technology, patient-centered care, and data-driven decision-making (Moro et al., 2019). Addressing these factors is pivotal for advancing universal health care, making healthcare inclusive, and promoting social and economic development.

The United Nations' Sustainable Development Goals (SDGs), particularly Goal 3 focusing on health and well-being, emphasize the significance of quality healthcare. Public hospitals' provision of quality healthcare significantly contributes to achieving Goal 3 by ensuring healthy lives and well-being for all ages. Furthermore, quality healthcare indirectly influences

other SDGs such as poverty reduction (Goal 1), gender equality (Goal 5), and reduced inequalities (Goal 10) (Feliciano, 2019). Healthy individuals are more likely to participate in education and employment, breaking the cycle of poverty and fostering economic growth, creating a more equitable and prosperous society (United Nations, 2015).

Quality service in the healthcare sector can be analyzed through two dimensions: technical quality and functional quality. Technical quality primarily focuses on the precision of medical diagnoses and procedures, adhering to professional standards. On the other hand, functional quality pertains to the manner in which healthcare services are delivered to patients (Li & Shang, 2020). In simpler terms, technical quality refers to what customers receive, whereas functional quality concerns how they receive it. Despite the emphasis placed on technical quality by patients, research suggests it does not fully capture patients' evaluation of medical service quality (Al-Neyadi et al., 2018). Many patients lack the necessary knowledge to effectively assess the quality of diagnostic and therapeutic processes, either because they lack expertise or because the required information is not shared with them.

When assessing healthcare service quality in Iran, Jahantigh (2019) discovered that while hospitals met patients' tangible expectations, challenges persisted in areas such as responsiveness, empathy, and security within these medical facilities.

In the United States, the healthcare sector has come to recognize the pivotal importance of delivering high-quality services to ensure patient satisfaction (Karaca & Durna, 2019). The provision of high-quality service has a direct influence on customer satisfaction, loyalty, and the financial performance of organizations operating in the service industry. In the healthcare industry, the assessment of service quality revolves on two key dimensions: technical quality, which centers on the precision of medical diagnoses and procedures, and functional quality,

which applies to the method in which healthcare services are delivered to patients (Endeshaw, 2021).

The efficiency and quality of care within healthcare organizations in European countries are greatly impacted by the performance of healthcare personnel (Tynkkynen & Vrangbaek, 2018). In Latin America, the healthcare workforce, including human resources, plays a crucial role in the functioning of healthcare systems (Kruk et al., 2018). In stark contrast, the neglect of the healthcare workforce emerges as the primary cause for the deterioration of health systems in African countries (Bryant, 2019). Developing nations face challenges stemming from insufficient human resource capacity, hindering their ability to effectively implement health interventions proposed by initiatives such as the millennium development goals (Patel et al., 2018).

Sub-Saharan Africa faces unique challenges in providing quality healthcare services within its public hospitals. Nigeria for instance, healthcare services grapple with substantial challenges, including underfunding leading to resource shortages, inadequate infrastructure, healthcare sector corruption, and a brain drain of skilled professionals (Lugard, 2022). Cultural factors and limited awareness of preventive care also contribute. To combat these issues, the government must prioritize increased funding for hospitals, enhance infrastructure, and ensure staff have access to better equipment. Addressing corruption requires transparency and strict penalties. Retaining healthcare professionals' mandates competitive salaries and growth opportunities. Public education about healthcare's importance and affordability can make significant strides (Owolabi et al., 2021). Despite the complexity, these steps are crucial for Nigeria to achieve universal access to quality healthcare for all its citizens.

The healthcare system in South Africa exhibits significant variation, including a spectrum of services that span from fundamental primary care provisions administered by the government to sophisticated specialty treatments available in both public and private healthcare facilities. Despite the government contributing 40% of healthcare expenses, public health facilities, which are meant to serve about 80% of the population, often face challenges due to uneven resource distribution (Department of Health, Republic of South Africa, 2021). This disparity leads to underfunding, mismanagement, and deteriorating infrastructure, ultimately resulting in a decline in healthcare quality (Leslie et al., 2017). The urgent need to improve healthcare quality in Africa is crucial, given the rising number of fatalities caused by negligence and subpar services in healthcare facilities. Strategic policy changes in Nigeria have shown improvements, highlighting the importance of comprehensive reforms in the health sector. Achieving lasting progress requires the active involvement and commitment of all stakeholders, not just in Nigeria and South Africa but throughout Africa.

In Kenya, the public health system operates with a carefully structured tiered approach designed to handle intricate medical cases seamlessly (Kyalo, 2018). This well-organized system comprises six hierarchical levels, beginning at Level 1 with community service facilities and progressing up to Level 6, which accommodates national referral hospitals and major private teaching hospitals (Ministry of Health [MOH], 2018). This tiered system ensures effective healthcare management, catering to diverse needs with precision. Notably, Kenya takes a leading position in East Africa by mandating referral healthcare services, a testament to its commitment to advancing medical care.

Despite these progressive steps, the public healthcare sector faces notable challenges, particularly the migration of Health Care Workers (HCW) from public to private practice

(Wambugu, 2021). Factors such as decision-making empowerment and improved compensation lure professionals away, underscoring the pivotal role of human resource departments in nurturing positive relationships between healthcare employees and employers (Otieno & Nyongesa, 2022). These relationships are essential for ensuring optimal healthcare delivery.

Additionally, operational inefficiencies and substandard service provision pose ongoing hurdles, intensified by the high standards set by private hospitals, creating a competitive environment (Asaolu et al., 2019). To surmount these challenges, public hospitals have embraced the Total Quality Management approach (TQM) as a strategic solution (Nderitu, 2016). The increasing adoption of TQM underscores its recognition as a valuable system for enhancing service quality and efficiency in healthcare facilities. Ultimately, the primary objective of every public health facility remains unwavering: to provide efficient and continually improving services to its clients (Ministry of Health, 2022). This commitment reflects Kenya's dedication to elevating healthcare standards and ensuring the well-being of its citizens, even in the face of complex challenges.

Established in 1901, Kenyatta National Hospital stands as a cornerstone of Kenya's healthcare sector, offering unmatched medical services in the African region. With a dedicated team of 6,000 professionals, the hospital's daily capacity of 2,000 to 3,000 patients is facilitated by 1,800 total beds, including 209 in the private wing (Kenyatta National Hospital [KNH], 2023). Its distinction lies not just in its size but in its unwavering commitment to excellence. Rigorous staff training, focusing on technical expertise, reduced waiting times, and efficient discharge processes, has significantly elevated patient satisfaction from 39% to an impressive 71%.

Serving as a vital referral center, the hospital handles complex cases from institutions within and outside the country, showcasing its expertise in specialized healthcare treatments. Moreover, the hospital's emphasis on compassionate, patient-centered care, advanced technologies, and adherence to international standards solidify its standing as a symbol of exceptional healthcare in Kenya (KNH, 2023). Through continuous efforts, Kenyatta National Hospital remains at the forefront, shaping the future of healthcare provision in East Africa. It is against this background that this study seeks to explore Determinants of Quality Healthcare Service Provision at Kenyatta National Hospital, Kenya.

1.2 Statement of the problem

The provision of quality healthcare services in public hospitals is essential for the well-being of Kenya's population (Muthui, 2019). Poor quality healthcare leads to preventable illnesses complications and deaths, disproportionately affecting vulnerable and marginalized communities. Kenya's public healthcare system has been grappling with numerous challenges for several years. Despite government efforts to improve healthcare infrastructure and access, the quality of healthcare services remains a major concern. Public hospitals have been characterized by overcrowding, shortages of essential medical supplies, understaffing, and inadequate infrastructure, all of which contribute to suboptimal healthcare services (Musyoka et al., 2021). Additionally, issues related to governance, management, and accountability further exacerbate the problem.

At Kenyatta National Hospital, system optimization to streamline processes and procedures, referral system effectiveness, data utilization and motivation of staff are the missing game changers in as far as quality service delivery is concerned. Bad culture and negative staff attitude have led to delays in service delivery, longer waiting times for patients, and reduced

attentiveness to patient needs. According to a study on Patient Expectation and Quality of Care offered at KNH conducted in May 2021 by Kenyatta National Hospital Healthcare Quality Division; Patient Affairs Unit, the quality-of-care expectation index was found to be higher at 93% as opposed to the perceived care at 83.3% hence an expectation perception gap of 9.7%. As a result, some patients seek alternative healthcare providers, and sharing negative feedback, which in turn thwarts potential clients and hampers the hospital's growth (Oketch, 2020). Moreover, this predicament is exacerbated by the patients' perception of operational problems, which they encounter during their treatment journey, including subpar physical facilities and unresponsive interactions with doctors, nurses, and other support staff (Musyoka et al., 2021). These inefficiencies coupled with longer patient stays and wasted resources contribute to the rising cost of operations in Kenyatta National Hospital hence the need to breach the expectation-perception gap in order to be perceived as providing quality care.

Despite these challenges few studies have been conducted to examine the factors affecting quality healthcare service provision in Kenyatta National Hospital. Available studies include, Musyoka et al. (2021) who did a study on the factors affecting provision of quality service in the public health sector but focused on Nyahururu District Hospital which has contextual gaps from Kenyatta National Hospital, a national referral hospital. Mbangua et al. (2021) also did a study on the factors influencing delivery of quality health care in Kasarani Sub County. The study also had contextual gaps as it covered hospitals in the level 3 and 2 categories which are way below the level of Kenyatta National Hospital as a National referral hospital. This study thus aimed to explore Determinants of Quality Healthcare Service Provision at Kenyatta National Hospital, Kenya.

1.3 Purpose of the Study

The main aim of the study was to improve healthcare service delivery in Kenya by spelling out Determinants of Quality Health Care Service Provision at Kenyatta National Hospital.

1.4 Specific Objectives

- i). To examine the influence of human resource on provision of quality healthcare service at Kenyatta National Hospital
- ii). To determine the influence of hospital infrastructure on quality healthcare service provision at Kenyatta National Hospital
- iii). To evaluate the influence of system optimization on quality healthcare service provision at Kenyatta National Hospital
- iv). To establish the influence of health financing on quality healthcare service provision at Kenyatta National Hospital

1.5 Research Questions

- i). What is the influence of human resource on provision of quality healthcare service at Kenyatta National Hospital?
- ii). How does hospital infrastructure influence quality healthcare service provision at Kenyatta National Hospital?
- iii). To what extent does system optimization influence quality healthcare service provision at Kenyatta National Hospital?
- iv). What is the influence of health financing on quality healthcare service provision at Kenyatta National Hospital?

1.6 Justification of the Study

This study holds immense significance for government officials and policymakers in Kenya. By focusing on Determinants of Quality Healthcare Service Provision at Kenyatta National Hospital as a case study, the research provides valuable insights that can inform healthcare policies and regulations. The findings and recommendations will guide the development of strategic plans aimed at enhancing the overall quality of healthcare services in the country. Improved healthcare quality not only contributes to the well-being of citizens but also aligns with broader national development goals related to public health and human capital.

Healthcare administrators and practitioners, both within Kenyatta National Hospital and across the broader healthcare system, stand to benefit significantly from this study. The insights provided by the research can assist administrators in optimizing resource allocation, improving staff training programs, and refining operational processes.

Improved healthcare quality translates into better patient experiences, increased satisfaction, and enhanced health outcomes. Patients can expect more reliable and consistent healthcare services, reduced waiting times, and increased access to necessary treatments. The study contributes to the broader public health landscape, promoting health equity and accessibility for all citizens.

The research adds to the body of knowledge in healthcare management and quality improvement, making it significant for researchers and academia. By examining the specific case of Kenyatta National Hospital, the study provides a valuable real-world context for future research endeavors. Researchers can build upon the findings, explore related topics, and contribute to the ongoing discourse on healthcare quality.

1.7 Limitation of the Study

Complexity of factors such as diverse influences arising from a vast array of interacting factors like infrastructure, equipment, staff competency, leadership, patient volume and resource availability. Isolating specific determinants and establishing clear cause and effect relationships can be difficult. KNH, as a large hospital, likely has significant variation in quality across different departments and wards. Analysing it as a single entity may not reveal specific departmental challenges.

Access to accurate, timely, and consistent data on all aspects of care at KNH might be limited. Quality healthcare data systems may be inadequate or fragmented. Some quality factors are inherently subjective, like patient satisfaction or perceptions of staff friendliness. These require careful measurement to avoid bias. Findings at KNH may not readily apply to other hospitals in Kenya due to differences in size, resources, and patient populations. KNH may face unique limitations due to being a public referral hospital, such as high patient volumes and potential understaffing. These can create a complex context for studying quality outside of the scope of many theoretical models.

Studying quality issues at KNH might involve vulnerable patient groups hence ensuring ethical research practices, obtaining informed consent, and maintaining patient confidentiality are paramount.

1.8 Delimitation of the Study

The study will focus specifically on Surgical Services Division of Kenyatta National Hospital. Medical Services, Diagnostic Services Divisions and other non-clinical functions were not considered in this research. The study covered a time period from April 2024 and June 2024. The study involved healthcare professionals (doctors, nurses, administrators) and management.

External stakeholders, such as policymakers, insurance providers, or pharmaceutical companies, will not be the primary focus. The study will use quantitative research methods.

1.9 Assumptions of the Study

The study made the following assumptions.

- i). That the respondents are knowledgeable on the factors affecting quality of healthcare.
- ii). That the respondents are honest and accurate in giving information regarding the study subject.
- iii). That all the results obtained from the study will be representative and generalized to all functions under clinical services directorate in Kenyatta National Hospital.

1.10 Definition of Terms

Quality healthcare service provision	The provision of medical services that meet or surpass acknowledged standards in order to ensure patient safety, efficacy, and patient-centered care. It involves a comprehensive approach that considers clinical expertise, evidence-based practices, patient satisfaction, and the efficiency of healthcare delivery (World Health Organization, 2006).
Human Resource	The individuals within an organization who contribute their skills, knowledge, and efforts toward its goals and objectives. The field of human resource management (HRM) involves the strategic management of these personnel to optimize their performance and promote organizational effectiveness.
Hospital Infrastructure	The physical and organizational elements essential for the effective functioning of a healthcare facility, encompassing buildings, medical equipment, utilities, and support services. It includes the layout and design of hospital buildings, the availability and maintenance of medical technology, and the overall logistical framework to provide healthcare services.
System optimization	Process of improving the efficiency, effectiveness, and quality of healthcare delivery within the constraints of limited resources. It involves analyzing and refining various aspects of the hospital's operations to achieve better outcomes for patients, staff, and the overall healthcare system.
Health Financing	The mechanisms and resources used to fund health care services, ensuring the availability of financial resources to maintain and improve the health system. It encompasses various methods, including government budgets, social health insurance, private funding, and external aid, to allocate funds for healthcare delivery, infrastructure, and workforce

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Specifically, literature related to human resource, hospital infrastructure, system optimization, and health financing in relation to determinants of Quality Healthcare Service provision will be reviewed. This chapter also includes the theoretical background, conceptual framework, research gap, and summary.

2.2 Quality of Healthcare in Public Hospitals

Quality healthcare service provision is a multifaceted endeavor influenced by a variety of factors, as demonstrated in recent studies. In the context of public healthcare facilities, such as Mwingi Sub- County Hospital in Kitui County, several crucial elements have been identified. Muthui (2019) emphasized the significance of employee capacity, leadership, and commitment, alongside the availability of resources, as pivotal factors shaping the quality of healthcare services in the public sector. These findings underscore the vital role played by skilled professionals, effective management, and sufficient resources in ensuring the delivery of high-quality healthcare services.

Patient-centered care, a holistic approach focusing on individual patient needs and preferences, has emerged as a key determinant of healthcare service quality. A systematic review conducted in 2022 illuminated the positive impact of patient-centered care on the overall quality of healthcare services. This approach emphasizes a tailored, empathetic approach to patient care, recognizing the unique requirements of each individual. The findings underscore the importance of personalized healthcare delivery in enhancing service quality and patient satisfaction (Gartner et al., 2022).

2.2.1 Mortality Rates

Mortality rates are a fundamental indicator of healthcare quality, reflecting the ultimate outcome of care. Krumholz et al., (2013) conducted a study in the United States to analyze the correlation between hospital care quality and mortality rates for certain conditions like heart failure and pneumonia. The study found that hospitals with higher adherence to evidence-based care processes had significantly lower 30-day mortality rates. A study in a national hospital in China by Zhu et al. (2021) highlighted the impact of surgical safety checklists on postoperative mortality, revealing a substantial reduction in death rates when checklists were rigorously applied.

Mbaruku et al. (2018) explored the impact of quality improvement interventions in Tanzania, including enhanced communication and teamwork, on maternal mortality. The study's findings indicated a significant reduction in mortality rates following the implementation of these interventions. The success of these strategies underscores the critical role of effective communication and collaboration among healthcare providers in improving maternal outcomes in low-resource settings. This study suggests that targeted interventions focusing on the healthcare team's dynamics can lead to substantial improvements in patient care and survival rates.

Hoshijima et al. (2019) assessed the link between the volume of surgical procedures performed in hospitals and the associated mortality rates in Malawi. The findings revealed that hospitals with higher volumes of specific surgical procedures tended to have lower mortality rates. This correlation suggests that concentrating resources and expertise in higher-volume centers can enhance surgical outcomes and reduce mortality. The study highlights the importance of

strategic resource allocation and the potential benefits of centralizing complex surgical care in high-volume hospitals to leverage experience and specialized skills.

Atuyambe et al. (2017) focused on neonatal mortality trends over more than a decade. The study, conducted in Uganda, pinpointed critical factors contributing to high mortality rates, such as limited access to skilled birth attendants and quality care facilities. Despite some improvements over time, the persistently high rates of neonatal mortality emphasize the need for continued efforts to enhance access to and the quality of maternal and neonatal healthcare services. This study illustrates the ongoing challenges faced by rural areas in providing adequate healthcare and the necessity of targeted interventions to address these gaps.

2.2.2 Readmission rates

Readmission rates serve as an indicator of the effectiveness and continuity of care. High readmission rates often point to gaps in care coordination or the adequacy of treatment and post-discharge support. Zhu et al. (2021) explored the relationship between hospital readmission rates and quality of care in the United States, indicating that lower readmission rates were associated with better patient outcomes and higher overall care quality, especially for conditions like heart failure and COPD. Moreover, interventions focusing on enhanced care coordination and patient education have shown promising results in reducing readmissions, emphasizing the role of comprehensive discharge planning and follow-up care.

Ozaydin et al. (2021) found that 30-day readmissions after heart failure hospitalizations were closely associated with increased mortality from a study conducted in Turkey. This association underscores the necessity of considering readmission rates as a vital quality indicator for heart failure care. The study's findings suggest an urgent need for strategies that not only improve the initial hospital care but also ensure effective post-discharge support and management.

Similarly, a systematic review and meta-analysis conducted by Njoku et al., (2020) in Australia examined hospital readmissions for COPD, revealing that readmission rates were high and correlated with worse patient outcomes. The study identified factors such as inadequate discharge planning and lack of social support as significant contributors to high readmission rates. These findings highlight the complexities of managing COPD post-discharge and the importance of comprehensive care strategies.

An extensive review by Kim et al. (2015) on the "Impact of unplanned readmissions on healthcare costs and outcomes" conducted in the United States across various conditions confirmed that readmissions significantly burden healthcare costs and are linked with poorer patient outcomes. This study emphasizes the broader implications of readmissions beyond individual conditions, suggesting systemic issues within healthcare transitions and discharge processes.

2.2.3 Timeliness of care

Timeliness of care is critical in preventing complications and worsening of health conditions. Delays in care can significantly impact outcomes, especially in acute conditions requiring immediate attention. Lauque et al. (2022) examined the effects of emergency department wait times on patient outcomes. It found that longer wait times were associated with increased in-hospital mortality, longer hospital stays, and higher costs. On the other hand, initiatives to improve access to primary care and streamline emergency department processes have been effective in reducing wait times and improving patient satisfaction and outcomes.

Habib and Sudaryo (2023) conducted a retrospective cohort study to investigate the association between emergency department (ED) length of stay (LOS) and 30-day mortality in critically ill patients. The study, published in BMC Emergency Medicine, aimed to provide insights into

the impact of ED wait times on patient outcomes. The study population consisted of critically ill patients admitted to the ED. The researchers analyzed data on LOS in the ED and subsequent 30-day mortality rates. Their findings revealed a significant association between prolonged ED LOS and increased 30-day mortality rates among critically ill patients. Specifically, patients with longer ED stays were more likely to experience adverse outcomes within 30 days of admission.

Shanafelt et al. (2013) investigated the effect of ED wait times on hospital readmissions and mortality. Published in *JAMA Internal Medicine*, this study aimed to explore the impact of prolonged ED wait times on patient outcomes beyond the initial ED visit. The researchers analyzed data on ED wait times, hospital readmissions, and mortality rates among a large cohort of patients. Their findings revealed a significant association between extended ED wait times and higher rates of hospital readmissions and mortality. Patients who experienced longer wait times in the ED were more likely to be readmitted to the hospital within 30 days and had increased mortality rates compared to those with shorter wait times. This study highlights the potential consequences of delays in accessing emergency care on subsequent healthcare utilization and patient outcomes. It emphasizes the importance of improving ED efficiency and reducing wait times to enhance patient care quality and reduce the burden on healthcare systems.

Sauerland et al. (2016) conducted a systematic review to evaluate the impact of reducing ED wait times on patient satisfaction and clinical outcomes. Published in the *Annals of Emergency Medicine*, this review aimed to assess the effectiveness of interventions aimed at improving ED efficiency. The researchers synthesized evidence from multiple studies investigating interventions to reduce ED wait times, such as process improvements, staffing changes, and

technological innovations. Their review found that interventions aimed at reducing ED wait times were associated with improvements in patient satisfaction and clinical outcomes. Specifically, shorter wait times were correlated with higher patient satisfaction scores and better clinical outcomes, including reduced mortality rates and hospital admissions.

2.3 Human Resource and Provision of Quality Healthcare Service

The delivery of high-quality healthcare services hinges on a competent and motivated workforce. This literature review explores the interplay between human resource (HR) practices and the provision of quality healthcare, drawing upon relevant research and evidence. A strong body of research demonstrates a positive link between effective HR practices and various measures of quality care. Studies have found positive correlations between HR practices and patient satisfaction, a meta-analysis by Jiang et al. (2020) found a significant positive association between high-performance work systems (HPWS) and patient satisfaction in healthcare settings. HR practices and reduced medical errors by Laschinger et al. (2009) highlight the link between a supportive work environment and reduced patient safety incidents. HR practices and increased staff satisfaction and retention observe a positive relationship between organizational commitment and employee turnover intentions in hospitals.

Specific HR practices consistently identified as crucial for enhancing quality include: Recruitment and selection; Selecting qualified staff with the necessary skills and attributes. Training and development; Providing ongoing training opportunities to ensure staff stay updated with the latest knowledge and techniques (Laschinger et al., 2009). Performance management; Establishing clear performance expectations, providing feedback, and supporting staff to achieve objectives. Compensation and benefits; Offering competitive compensation

and benefit packages to attract and retain qualified staff Yildiz et al. (2016). Work environment; Fostering a positive and supportive work environment that promotes teamwork, communication, and staff well-being (Laschinger et al., 2009).

2.3.1 Staffing levels

According to the Agency for Healthcare Research and Quality (AHRQ, 2023) provided evidence brief summarizing research on the link between nurse staffing levels and patient outcomes. These brief highlighted associations with adverse events, mortality, and patient satisfaction, suggesting that higher staffing levels correlate with better outcomes. The AHRQ brief presented valuable insights into the relationship between nurse staffing levels and patient outcomes, emphasizing the positive correlation between higher staffing and better quality of care.

Aiken et al. (2017) conducted a cross-sectional study involving over 200,000 patients across 1,688 hospitals. By analyzing patient data, the study found that higher nurse-to-patient ratios were associated with lower patient mortality, failure-to-rescue rates, and hospital-acquired infections. This study utilized extensive data collection and statistical analysis to demonstrate the critical impact of nurse staffing on patient outcomes, providing compelling evidence for the necessity of adequate nurse staffing in acute care hospitals. The study found that for each additional patient assigned to a nurse, the risk of death increased by 7%. This translates to a significant reduction in mortality rates with higher nurse-to-patient ratios. One explanation could be that nurses with fewer patients have more time to assess and respond to patients' needs, potentially preventing complications and improving survival chances. The study also showed that higher nurse-to-patient ratios were associated with a lower risk of failure-to-rescue, which refers to a patient's death after a serious medical event. This suggests that adequate staffing

levels enable nurses to identify and intervene more effectively in critical situations, potentially saving lives. This could be due to increased vigilance, faster response times, and improved coordination among healthcare team members.

Laschinger et al. (2019) systematically reviewed 62 studies and concluded that adequate staffing levels contribute positively to various patient outcomes, including safety, satisfaction, and adherence to care plans. This comprehensive review reinforced the notion that sufficient staffing is a crucial factor in ensuring high-quality patient care and highlighted the broad consensus in the literature regarding the positive impact of adequate nurse staffing on healthcare outcomes. The study showed reduced rates of adverse events, medication errors, and hospital-acquired infections with higher nurse-to-patient ratios. This suggests better surveillance, timely interventions, and improved adherence to safety protocols. Patients reported higher satisfaction with care in facilities with adequate staffing, likely due to increased time and attention from nurses, improved communication, and reduced wait times. Adequate staffing facilitates better communication and collaboration between nurses and other healthcare professionals, leading to more consistent and effective implementation of care plans, potentially improving treatment outcomes. The review also identified positive associations with reduced readmission rates, shorter length of stay, and improved patient functional outcomes.

Cho et al. (2018) reviewed 29 studies to identify the relationship between nurse staffing levels, hospital costs, and quality of care. The review found a complex relationship, where adequate staffing improved quality but also led to increased costs. This systematic review emphasized the need for cost-containment strategies to achieve sustainable improvements in care quality, suggesting that financial considerations are an integral aspect of staffing decisions. Studies

included in the review demonstrated that higher nurse-to-patient ratios were associated with better patient outcomes, including reduced mortality, fewer complications, and increased patient satisfaction. Adequate staffing allows nurses to spend more time with patients, provide more personalized care, and efficiently respond to their needs, ultimately leading to better clinical outcomes. Increased staffing reduces workload and fatigue, enabling nurses to be more vigilant and proactive in identifying and preventing potential safety hazards. This can lead to a decrease in medication errors, falls, and other adverse events. Adequate staffing alleviates burnout and stress, leading to higher job satisfaction and decreased turnover among nurses. This ensures stability in the workforce, promoting continuity of care and efficient resource management.

In a multi-country study, Aiken et al. (2017) discovered that lower nurse-to-patient ratios increased the risk of pressure ulcers, underlining the importance of sufficient staffing for preventing preventable complications. By examining data from 12 countries, this study provided international evidence supporting the critical role of nurse staffing in maintaining patient safety and preventing adverse outcomes such as pressure ulcers. The study established that with fewer nurses per patient, each nurse has less time to assess, reposition, and provide preventive care for pressure ulcers. This leads to increased pressure on skin tissues; especially for immobile or unconscious patients. Reduced staffing can hinder nurses' ability to closely monitor patients for early signs of pressure injury development, such as redness or skin breakdown. Early detection and intervention are crucial for preventing pressure ulcers from progressing. Fewer nurses may limit opportunities for patient education on pressure ulcer prevention strategies, including proper positioning, use of support surfaces, and skin care. Additionally, nurses may have less time to provide emotional support and address patient concerns about pressure ulcers.

2.3.2 Clinical Competence

Clinical competence in nursing is a vital component to ensure high-quality patient care and effective healthcare delivery. Understanding the development, perceptions, and practice gaps in clinical competence among nurses can inform strategies to enhance their professional growth and healthcare outcomes. Shezi (2014) conducted a qualitative study in South Africa to explore community service nurses' experiences regarding their clinical competence. The objective was to understand their self-perceived competence and the factors influencing it. The findings highlight a significant variation in the feelings of competence among community service nurses, with the quality of supervision being a critical determinant. Nurses reported that effective and supportive supervision was essential for their development and confidence in their clinical abilities. This study underscores the importance of structured and quality supervision in the professional development of community service nurses.

Similarly, Maboja et al. (2019) investigated professional nurses' perceptions regarding the clinical competence of community service nurses in South Africa. The study found that while most professional nurses viewed community service nurses as competent, they acknowledged the necessity for ongoing support and mentorship to enhance their skills. This suggests that the perception of competence is multifaceted, involving acknowledgment of foundational skills and recognition of the need for continuous professional development.

The adoption of evidence-based practice (EBP) among nurses is critical for improving patient outcomes and healthcare quality. Melkamu et al. (2020) examined the use of evidence-based practices among point-of-care nurses in Ethiopia, revealing significant gaps. The study identified a lack of training and skills in information searching and accessing the latest research as key barriers to the implementation of EBP. This indicates a crucial need for educational

interventions and resources to support nurses in integrating evidence-based practices into their routine care.

Further insights into the development of clinical competence come from Taylor et al. (2021), who conducted a longitudinal survey of nurse practitioner students in Norway. Although outside the African context, this study offers valuable perspectives on skill development trajectories in nursing. The findings suggest that developing clinical competence is an ongoing process, with specific areas requiring continuous learning and improvement. This reinforces the notion that competence in nursing is not static but evolves with experience, education, and reflective practice.

Elarabi and Johari (2019) investigated how human resource management affects healthcare quality. To display and assess prior literature, descriptive methods were employed. Effective HR management affects healthcare quality and hospital staff performance, according to study. The study found that human resource management has a significant impact on healthcare quality, and most literature emphasizes the importance of human resource management in achieving health organizations' goals and developing hospital staff and nurses' performance through periodic training to improve healthcare service and a strong, well-motivated, and highly trained medical profession. Modern hospitals need many HRM approaches. The report suggests measuring hospital human resource managers' performance before starting performance development and training staff performance.

2.3.3 Motivation of staff

Ebenso et al. (2020) conducted a systematic review aiming to identify motivation factors across various healthcare cadres in Sub-Saharan Africa. Their comprehensive analysis highlights the significance of both financial and non-financial factors in influencing healthcare worker

motivation. Financial incentives, such as salary, are crucial, yet non-financial factors, including working conditions, career development opportunities, and recognition; also play a vital role in motivating healthcare workers. This dual aspect of motivation underscores the need for a holistic approach in policy-making and management strategies within healthcare systems to enhance worker motivation and, consequently, improve healthcare delivery.

Lagarde et al. (2019) emphasize the importance of intrinsic motivations in the provision of high-quality care, arguing that motivation is not solely driven by financial incentives. Their review points to the significance of empathy, compassion, and a genuine desire to help others as key motivators for healthcare professionals. This perspective suggests that fostering a culture that values and supports these intrinsic motivations could enhance the quality of care provided by healthcare workers, indicating that motivational strategies should encompass both intrinsic and extrinsic factors.

Muthuri et al. (2021) explore the experiences of senior managers with health, happiness, and motivation in hospitals in Meru County, Kenya. Their findings reveal that managers' perceptions of employee well-being and motivation have a direct impact on the health system's effectiveness. This study highlights the importance of leadership awareness and the implementation of strategies that promote health and happiness among healthcare workers to improve overall system performance.

Tengah and Otieno (2019) identify various factors influencing job satisfaction and the intention to leave among nurses. Their study points to workload, recognition, and workplace environment as key elements affecting nurse motivation and retention. These findings suggest that addressing job satisfaction issues is crucial for retaining skilled nursing staff and ensuring the sustainability of healthcare services.

2.4 Hospital Infrastructure and provision of quality healthcare service

The physical environment of a hospital, encompassing its infrastructure and facilities, plays a crucial role in the quality of healthcare services provided. This review explores the relationship between hospital infrastructure and the delivery of quality care, examining relevant research and its implications. Studies have demonstrated that improved infrastructure and patient outcomes have a positive correlation between well-maintained and modern hospital infrastructure and improved patient outcomes. For instance, research by Aiken et al. (2017) highlights how modern facilities with appropriate technology are associated with lower mortality rates. The physical environment can significantly impact patient experience. Studies like that of Banerjee et al. (2020) find that factors like cleanliness, comfort, and accessibility within the hospital contribute to patient satisfaction and overall well-being. A well-designed and well-maintained hospital infrastructure can contribute to improved staff efficiency and workflow. Studies by the American Hospital Association highlight how modern facilities with proper layout and equipment can optimize staff workflows, leading to better time management and patient care.

Several key infrastructure components significantly impact the provision of quality healthcare services. Functional layouts that optimize patient flow, minimize travel distances, and ensure efficient use of space are essential. Access to cutting-edge medical equipment, efficient information systems, and well-maintained facilities are crucial for accurate diagnoses, effective treatment, and improved patient outcomes Aiken et al. (2011). Regular maintenance of buildings, equipment, and proper sanitation practices are essential to ensure a clean, safe, and hygienic environment for both patients and staff World Health Organization, (2017). Ensuring the entire facility is accessible to individuals with disabilities and adhering to safety regulations are paramount.

Hospitals are increasingly focusing on sustainable design and construction practices that minimize environmental impact and promote energy efficiency. The integration of smart technologies like building automation systems, tele-health, and data analytics is transforming hospital operations and improving efficiency in areas like resource management and patient care delivery (Habib and Sudaryo, 2023). The design of hospitals is evolving to prioritize patient-centered care, with a focus on creating comfortable, healing spaces that support patient autonomy and well-being.

2.4.1 Essential equipment and medication

Aiken et al. (2017) conducted a comprehensive cross-sectional study across multiple hospitals in sub-Saharan Africa to assess the relationship between the availability of essential intensive care unit (ICU) equipment and medications and hospital mortality rates. Utilizing a detailed survey that quantified the availability of critical ICU resources, the study applied statistical analyses to correlate these availability metrics with patient mortality data extracted from hospital records. The significant association found between limited ICU resource availability and higher mortality rates underscores the necessity of bolstering ICU resources to improve patient outcomes in the region.

Alkire et al. (2015) employed a mixed-methods approach to explore the impact of limited access to essential surgical equipment on outcomes in LMICs. The study combined quantitative data analysis of surgical success rates from hospital records with qualitative interviews from surgical staff across various countries. This methodology highlighted the direct link between resource scarcity and compromised surgical care quality, advocating for targeted interventions to enhance the availability of surgical equipment.

The World Health Organization (2020) undertook a systematic review to scrutinize the impact of essential medicine availability and affordability on healthcare quality in LMICs. This review meticulously analyzed data from numerous studies, employing a rigorous inclusion criterion that ensured the synthesis of high-quality evidence. The findings pointed to the stark impact of medicine scarcity on healthcare quality, emphasizing the need for comprehensive policy reforms.

Ozawa et al. (2019) conducted an observational study to investigate how healthcare infrastructure and resources affect the utilization of essential medicines. By collecting data on infrastructure quality, medicine supply chains, and healthcare accessibility across several LMICs, and analyzing these against medicine utilization rates, the study provided empirical evidence on the necessity of infrastructure improvements for enhancing medicine accessibility.

Frenk et al. (2021) utilized a case study approach to examine the relationship between a skilled healthcare workforce, the availability of essential medicines, and the quality of care. Through in-depth analyses of several healthcare settings with varying levels of resource availability, the study illuminated how the expertise of the healthcare workforce plays a critical role in the effective use of essential medicines, directly impacting care quality. This approach underscored the multifaceted nature of healthcare quality improvement, which requires simultaneous investment in both human and material resources.

2.4.2 Infrastructure maintenance

Adeoye et al. (2022) conducted a systematic review to synthesize evidence on the impact of health facility infrastructure on quality of care. The methodology involved a comprehensive search of databases for studies that assessed infrastructure's influence on various qualities of care aspects, including patient safety, infection control, and efficiency. By aggregating data

from numerous studies, the review highlights the substantial effect of infrastructure on care quality, emphasizing the need for improved facility design and maintenance.

Cohen et al. (2018) explored the association between hospital hygiene, sanitation infrastructure, and the incidence of healthcare-associated infections. The study employed a cross-sectional design, gathering data from various hospitals to evaluate their sanitation practices and infrastructure. Statistical analysis revealed a strong link between inadequate sanitation infrastructure and increased rates of healthcare-associated infections, highlighting the critical role of proper sanitation in ensuring patient safety.

Clasen et al. (2021) investigated the impact of water and sanitation infrastructure on maternal health outcomes in rural communities. The study's methodology involved a longitudinal analysis of maternal health records from several rural communities, comparing outcomes in areas with varying levels of water and sanitation infrastructure. The results demonstrated that poor infrastructure significantly contributes to adverse maternal health outcomes, emphasizing the need for improved water and sanitation facilities in these areas.

Galea et al. (2021) conducted a study to explore the importance of resilient infrastructure in maintaining healthcare quality during emergency situations. Utilizing a case study approach, the research examined health facilities' responses to public health emergencies, focusing on infrastructure's role in these responses. The findings suggest that resilient infrastructure is crucial for sustaining care quality during crises, providing valuable insights into emergency preparedness.

Galea et al. (2021) examined how healthcare facility design and maintenance affect patient experience and staff well-being. Through a mixed-methods approach that combined surveys, interviews, and facility audits, the study assessed perceptions of design and maintenance

among patients and staff. The results indicate a significant connection between facility design, maintenance, and both patient and staff satisfaction, underlining the broader implications of infrastructure on healthcare quality.

The World Health Organization (2022) emphasized the importance of investing in infrastructure maintenance as a strategy for sustainable healthcare quality improvement. This report adopted a policy analysis approach, reviewing existing data on maintenance practices and their outcomes in healthcare settings. It advocates for increased investment in maintenance, highlighting its potential to significantly enhance care quality across various dimensions.

2.4.3 Technology adoption

Jamal et al. (2023) conducted a systematic review analyzing numerous studies to understand the impact of digital technologies on healthcare quality. The methodology involved a comprehensive search of databases for studies that reported on digital technology interventions in healthcare settings. The review specifically looked at patient safety, efficiency, and clinical decision-making. The findings revealed a consistently positive impact of digital technologies across these areas, highlighting the potential of technology to enhance various aspects of healthcare quality.

Park et al. (2020) review current applications of artificial intelligence (AI) in healthcare and its future directions. The review method involved analyzing studies and reports on AI applications in clinical settings, including diagnosis, treatment planning, and patient monitoring. The findings suggest that AI has the potential to revolutionize healthcare by improving accuracy in diagnosis and personalizing treatment plans, thereby enhancing overall care quality.

Tanner et al. (2015) systematically reviewed the impact of electronic health records (EHRs) on patient safety. The review methodology included searching for studies that assess EHR

implementations' effects on safety outcomes. The findings indicated that while EHRs have the potential to improve patient safety by reducing medication errors and improving clinical decision-making, they also present challenges such as user interface issues and information overload.

Char et al. (2023) emphasize the role of human-centered design in developing healthcare technologies. The article methodologically reviews principles of human-centered design and their application in technology development processes. It argues that focusing on the users' needs and experiences can ensure that healthcare technologies are both ethical and effective in improving quality of care. Understanding the needs, experiences, and limitations of patients, clinicians, and other stakeholders is crucial. This goes beyond demographics to consider emotional, cultural, and accessibility factors.

2.5 System Optimization and provision of quality healthcare service

In today's complex healthcare landscape, delivering high-quality care while operating efficiently is a constant challenge. System optimization emerges as a crucial strategy for hospitals and healthcare systems to improve performance, enhance quality, and ensure sustainability. This review explores how system optimization contributes to the provision of quality healthcare services, drawing on relevant research and evidence. Studies consistently demonstrate the positive impact of system optimization on various aspects of quality healthcare: Research by Shokouh et al. (2022) highlights how implementing process optimization strategies in emergency departments can lead to reduced waiting times and improved patient satisfaction, potentially impacting clinical outcomes. Studies by Ozcan et al. (2020) demonstrate that optimizing resource allocation and scheduling through data-driven approaches can lead to cost savings and improved operational efficiency. Implementing

optimized workflows and reducing administrative burden can contribute to greater job satisfaction and reduced burnout among healthcare staff. Several key strategies have been identified in the literature as crucial for optimizing healthcare systems: Identifying and streamlining workflows, eliminating unnecessary steps, and implementing standardized procedures to ensure consistency and efficiency (Berenholtz et al., 2010). Optimizing staffing levels based on patient needs and demand, utilizing data analytics for efficient scheduling and allocation of resources like equipment and supplies. Utilizing data analysis and performance metrics to identify areas for improvement, evaluate the impact of interventions, and inform strategic decisions. Implementing technology solutions to automate tasks, improve communication and collaboration, and enhance data collection and analysis (Hsu et al., 2022). Promoting patient involvement in their care decisions and encouraging them to participate in quality improvement initiatives Institute for Healthcare Improvement.

Applying Lean principles, emphasizing continuous improvement and eliminating waste, is gaining traction in healthcare optimization initiatives. Focusing on providing high-value care by aligning resources with patient needs and measuring outcomes is becoming a central aim in healthcare systems. Integration of AI and machine learning in areas like predictive analytics, personalized care, and clinical decision support holds potential for further optimizing healthcare systems (Park et al., 2020).

2.5.1 Streamlined Processes and Procedures

Feng et al. (2022) conducted a systematic review analyzing multiple studies to identify the relationship between streamlined administrative processes and healthcare outcomes. The methodology involved a comprehensive search and analysis of literature that documented interventions aimed at reducing administrative complexity and their subsequent impact on

healthcare quality and efficiency. The review highlighted significant benefits such as reduced waste, improved safety, and enhanced staff satisfaction, pointing towards a positive correlation between streamlined processes and improved healthcare outcomes.

Shanafelt et al. (2023) investigated the impact of reducing administrative tasks on patient safety and quality of care in emergency departments. The study employed a mixed-methods approach, integrating quantitative measures of patient outcomes and safety with qualitative feedback from physicians regarding engagement and workload. The findings revealed that the implementation of automation and digital tools to reduce administrative tasks significantly improved physician engagement, which in turn, led to better patient outcomes and enhanced safety.

Berenholtz et al. (2010) demonstrated the benefits of standardizing clinical pathways through a quantitative analysis of patient survival rates and complication rates before and after the implementation of standardized care processes. This study utilized a controlled before-and-after study design, allowing for a clear assessment of the impact of reduced variation in care on healthcare quality metrics. The study revealed improved survival rates and reduced complication rates after implementing standardized care processes. This indicates that standardization can lead to better patient prognoses and fewer adverse events. Standardization likely achieved these results by minimizing unnecessary variation in care delivery. This suggests that by ensuring consistent adherence to evidence-based practices, clinical outcomes can be more predictable and potentially improved.

Shanafelt et al. (2022) explored the link between administrative burden and staff burnout through a cross-sectional study that assessed burnout levels among healthcare staff in relation to their reported administrative workload. The study findings highlight how reducing administrative tasks could alleviate staff burnout, thereby improving the overall quality of care.

The study established that there's a significant positive correlation between reported administrative workload and burnout levels among healthcare staff. As administrative tasks increase, so does burnout. Burnout manifests in emotional exhaustion, cynicism, and reduced personal accomplishment. This negatively affects staff engagement, job satisfaction, and ultimately, the quality of care they provide. Reduced burnout, through managing administrative workload, could potentially lead to improved quality of care. More engaged and satisfied staff deliver better care with fewer errors and higher patient satisfaction.

Iedema et al. (2021) discussed the necessity of balancing process standardization with clinician autonomy through a qualitative study that involved interviews with healthcare professionals. The study identified key factors that contribute to successful process improvement initiatives, emphasizing the importance of maintaining clinician flexibility and responsiveness to patient needs. The study established that Standardization can improve efficiency, consistency, and safety by reducing variation in care delivery. However, excessive standardization can lead to inflexibility and hinder clinicians' ability to respond to individual patient needs, potentially compromising quality of care.

2.5.2 Referral System Effectiveness

Birkmeyer et al. (2021) examined the effect of streamlining referral processes on access to specialized care. The study adopted a pre-post intervention design, analyzing referral wait times, patient satisfaction, and access to specialist care before and after the introduction of digital platforms and clear communication protocols. The results showed a marked improvement in timely access to specialized care, underscoring the importance of efficient referral processes in healthcare delivery.

Alkire et al. (2015) investigate the consequences of delayed referrals in LMICs, attributing inefficiencies in the referral process as a primary cause of compromised health outcomes. The study's objective was to demonstrate how these delays, often due to logistical and systemic barriers, lead to negative health outcomes. Through a comprehensive review of referral outcomes, the study highlights the critical need for timely access to higher-level care and the significant role efficient referral systems play in achieving this goal.

The World Health Organization (2022) addresses the specific challenges of implementing effective referral systems in rural areas of LMICs. The report identifies geographical barriers and limited resources as significant obstacles to accessing specialized care. By focusing on strategies to improve referral systems, such as enhancing transportation options and leveraging local healthcare workers, the report offers practical recommendations for improving access to quality care in these underserved areas.

Birkmeyer et al. (2021) explore the importance of clear communication protocols within referral systems. The study posits that effective communication is essential for reducing confusion and ensuring smooth transitions between levels of care. Through an analysis of referral communication strategies, the research findings underscore the need for standardized communication protocols to improve the efficiency and effectiveness of patient referrals.

Faruk et al. (2020) contribute to the discourse by developing and validating indicators for assessing the effectiveness of referral systems. The research aims to provide healthcare stakeholders with reliable tools for measuring referral system performance, thereby facilitating data-driven improvements. The validated indicators cover various aspects of referral system functionality, including timeliness, satisfaction, and outcome success, offering a comprehensive framework for evaluation.

2.5.3 Data utilization in decision making

Li et al. (2022) investigated the influence of real-time data analytics on clinical decision-making and patient outcomes in critical care settings. The study employed a quantitative approach, analyzing patient data and outcomes before and after the implementation of real-time data analytics tools. The findings demonstrate that the use of real-time patient data significantly enhances evidence-based decision-making, leading to improved patient outcomes. This underscores the potential of real-time data analytics in elevating the standard of care in critical settings.

Abul-Husn and Kenny et al. (2019) focused on the role of electronic health records in personalizing treatment plans and enhancing patient care. Through a mixed-methods study that analyzed EHR data and patient outcomes, the research revealed that personalized medicine approaches, informed by comprehensive EHR analysis, can significantly improve care quality for specific patient populations. This study highlights the importance of EHRs in tailoring treatments to individual patient needs and conditions.

Goyal et al. (2023) utilized big data analytics to uncover healthcare disparities and inform targeted interventions. By analyzing extensive healthcare data sets, the study identified patterns of inequity in access to care and outcomes. The findings advocate for data-driven approaches to develop and implement interventions aimed at improving equitable access to quality healthcare, demonstrating big data's pivotal role in addressing systemic healthcare disparities.

El Torab-Miandoab et al. (2023) explored the challenges associated with data interoperability and integration across healthcare systems. The study identified key obstacles, such as disparate data formats and lack of interoperability standards, which hinder the seamless use of data for

informed clinical decision-making. The research suggests that overcoming these challenges is essential for the full realization of data-driven healthcare benefits.

2.6 Health Financing and provision of quality healthcare service

The way healthcare is financed plays a crucial role in the quality of services provided. This literature review explores the relationship between health financing mechanisms and the provision of quality healthcare services, drawing upon relevant research and evidence. Studies consistently highlight the complex and multifaceted relationship between health financing and quality care. Adequate financing is crucial for ensuring access to essential healthcare services for the population. Studies by Yin et al. (2021) demonstrate how financial barriers, like user fees, can significantly hinder access to care, particularly for vulnerable populations. The way healthcare is financed affects how resources are allocated and utilized. The study suggests that performance-based financing mechanisms, where funding is linked to achieving specific quality goals, can incentivize healthcare providers to improve efficiency and quality of care. The financial incentives embedded in different financing mechanisms can influence provider behaviour and potentially impact quality.

Several health financing mechanisms are prevalent globally, each with potential implications for quality. Governments directly fund healthcare services through taxes or social insurance. This system can offer universal access but may face challenges with resource allocation and cost control (Yin et al., 2021). Individuals pay directly for healthcare services or purchase private health insurance. This system allows for choice but can lead to inequities in access and affordability. Combining elements of public and private financing can offer a balance between universal access and individual choice, but requires careful design and implementation.

2.6.1 Budget Allocation

Hsu et al. (2022) investigated the negative consequences of budget cuts on hospital staffing levels and patient safety. The study utilized data analysis to show that decreased budgets directly compromise the quality of care by leading to reduced staffing levels, which in turn, negatively affects patient safety. This study underscores the critical importance of adequate funding in maintaining essential staffing levels in hospitals.

Shanafelt et al. (2022) explored the connection between inadequate healthcare funding and physician burnout, employing survey methods and statistical analysis. The study's findings emphasize that financial constraints contribute significantly to physician stress and burnout by creating overwork and resource shortages. This situation compromises the quality of care provided to patients and highlights the need for adequate funding to support healthcare professionals.

Starfield et al. (2021) advocated for increased investment in primary care through a comprehensive literature review, demonstrating its effectiveness in preventing chronic diseases and improving overall population health. The study argues that primary care investment is a cost-effective strategy for enhancing healthcare delivery quality, thereby contributing to better health outcomes.

Yin et al. (2021) conducted a systematic review to examine the relationship between healthcare spending and various health outcomes. The review concluded that adequate healthcare funding is crucial for improving the quality of care and enhancing population health, emphasizing the positive correlation between healthcare investment and improved health metrics. While acknowledging the challenges and complexities involved, the review suggests a positive

correlation between adequate healthcare funding and improved health metrics, highlighting the importance of investing in healthcare for achieving better population health.

Aiken et al. (2017) presented evidence on how inadequate funding leads to understaffing in hospitals, employing a quantitative research design. The study's findings indicate that understaffing directly impacts patient safety and the quality of care, further supporting the argument for sufficient healthcare budgets to ensure adequate staffing levels and consequently improved health outcome.

Ahmed et al. (2023) investigated the relationship between healthcare funding and preventive care initiatives, using evidence-based research to highlight how adequate funding facilitates preventive healthcare measures. The study concludes that such investment can significantly improve population health and reduce the overall burden on healthcare systems.

2.6.2 Financial Efficiency

From a Tajikistan health sector performance-based financial effect review, Ahmed et al. (2023) examined rewarding quantity and quality of treatment. The research found that more low- and middle-income nations are testing financial incentives connected to provider performance to increase health care usage and quality. The study assessed the performance-based finance pilot's effects in Tajikistan using a difference-in-differences technique. Primary care institutions received financial incentives based on service quality and quantity. Quality metrics, particularly care content, increase significantly. The trial districts' residents were happier with their primary care facilities, but quality improvements had little effect on usage.

Beauvais et al. (2023) conducted a cross-sectional study analyzing data from 3,998 hospitals across 29 high-income countries. The objective was to examine the relationship between hospital financial efficiency and quality of care. The study found a positive association between

higher cost efficiency and better quality of care, as measured by patient safety, effectiveness, patient-centeredness, and timeliness.

Ozcan et al. (2020) investigated the impact of hospital efficiency on readmission rates using data from 6.7 million Medicare hospitalizations in the USA. Through their analysis, they discovered that hospitals with higher financial efficiency demonstrated lower 30-day readmission rates, indicating an improvement in the quality of care provided.

Jha et al. (2019) conducted a systematic review of 62 studies to explore the impact of cost-saving initiatives in hospitals on the quality of care. Their objective was to assess whether these initiatives lead to quality improvements or have adverse effects. The review concluded that while cost-saving initiatives can sometimes result in quality improvements, they can also have negative consequences if not implemented carefully.

Yin et al. (2021) examined the relationship between financial efficiency and quality of care in public hospitals in China. Their study aimed to determine how improvements in financial efficiency impact patient outcomes, measured by mortality rates and length of stay. The findings revealed a positive association between financial efficiency improvements and better patient outcomes, suggesting a link between financial management and care quality.

Jiang et al. (2017) conducted a meta-analysis of 29 studies to investigate the relationship between hospital readmission rates and financial performance. Their objective was to determine whether lower readmission rates correspond to better financial performance, indicating higher efficiency and potentially better quality of care. The meta-analysis confirmed a significant association between lower readmission rates and improved financial performance, suggesting a positive link between efficiency and care quality.

2.6.3 Equity in Access

Gabani et al. (2023) examined how health finance affects results. The analysis clustered country-year data by out-of-pocket, contributory SHI, and non-contributory government spending as a fraction of overall health expenditures. The research used fixed effects regressions to determine how various systems affected health system outcomes. From OOP-dominant to government-financed systems improved most results more than SHI systems, according to the research. Government funding boosts life expectancy, decreases under-5 mortality, and reduces catastrophic health cost percentage points. Increasing non-contributory government funding rather than SHI finance was more likely to enhance health system outcomes, making results resilient to sensitivity testing.

Myint et al. (2019) conducted a systematic review of ASEAN and PRC health-financing mechanisms and their effects on UHC goals in terms of universal financial protection, utilization/equity, and quality. The research included ASEAN and Chinese results. The research found that government-subsidized health insurance plans for the poor had increased health care use in majority of the analyzed nations. Inappropriate policies and provider payment structures affect health care quality. Government subsidization is an efficient way to prioritize and include disadvantaged people in health insurance systems to achieve Universal Health Coverage (UHC), according to the research. Financial protection increases with more government health spending. A unified health insurance system with equal benefit packages is the most effective way to provide fair healthcare access, according to the research. To offer sustainable, high-quality healthcare, it focuses administrative and health service provider capacity development.

Koros et al. (2020) examined how finance methods affect Kenyan healthcare providers' service quality. The research used an explanatory survey approach to target senior management and clientele from 535 Kenyan level 4–6 hospitals. The sample size was 242 and chosen randomly. Descriptive and inferential analysis was done on questionnaires. Multiple regression analysis showed that equity and network financing positively impact hospital service delivery, while debt financing negatively impacts it. The research shows that equity and network funding improve hospital care while debt financing impedes it. Public hospitals with significant bed capacities combine equity, network, and debt finance to improve service delivery. The research offers new hospital funding and service quality insights. The research also showed that hospital features moderate the finance strategies-service quality link, adding to new understanding.

2.7 Theoretical framework

The study was guided by Donabedian's Model of Quality of Care and The Systems Thinking Approach.

2.7.1 Donabedian's Model of Quality of Care

Avedis Donabedian, a distinguished physician and health services researcher at the University of Michigan, made significant contributions to the field of healthcare quality assessment by developing his renowned model. Donabedian (1966) proposed a model for assessing healthcare quality that includes structure, process, and outcome. Donabedian's model, widely embraced in the healthcare community, dissects the quality of care into three fundamental components: structure, process, and outcome. Structure delves into the foundational elements of the healthcare system, including personnel qualifications, availability of equipment, and the physical environment. Process assesses the delivery of healthcare, focusing on aspects like timeliness, communication, and evidence-based practices. Outcome, the ultimate measure,

gauges the results of healthcare efforts, encompassing patient satisfaction, health status, and quality of life. Donabedian emphasized the equal importance of all three components while asserting that outcomes hold the utmost significance, representing the ultimate test of healthcare effectiveness. His model remains a cornerstone in assessing and enhancing healthcare quality, shaping the standards by which healthcare excellence is measured (Ibn El Haj et al., 2013).

The model proposed by Donabedian for assessing the quality of care serves as a fundamental conceptual framework, providing a structured method for conceptualizing and evaluating the quality of healthcare. Donabedian's approach offers a thorough knowledge of the efficacy of the healthcare system by delineating the multidimensional idea of quality into three separate components: structure, process, and result. Structure comprises the fundamental components of healthcare, which encompass the credentials of the workers and the resources available inside the facilities. The process under consideration explores the intricacies of healthcare delivery, spanning several elements such as the timely provision of services, effective communication, and the implementation of evidence-based procedures. Outcome measurements are used to assess the outcomes of healthcare interventions, including several aspects such as patient satisfaction, health condition, and general quality of life (Moore et al., 2015).

Donabedian defined medical services quality as ‘the application of medical science and technology in a manner that maximizes its benefit to health without correspondingly increasing the risk’ (Donabedian, 1980). Øvretveit defines quality care as the ‘Provision of care that exceeds patient expectations and achieves the highest possible clinical outcomes with the resources available’ (Øvretveit, 2009). For Lohr, quality is “the degree to which healthcare

services for individuals and population increases the likelihood of desired healthcare outcomes and is consistent with the current professional knowledge” (Lohr, 1991).

Donabedian emphasized the paramount importance of outcome measures, considering them the ultimate gauge of healthcare effectiveness. Widely utilized in both research and practical applications, Donabedian's model has been instrumental in assessing and enhancing healthcare quality. Its versatility allows it to be applied in diverse contexts, such as hospitals, clinics, and public health agencies, where it is employed to assess, improve, and compare the quality of healthcare services. As a robust and established framework, Donabedian's model continues to be a valuable tool for understanding, evaluating, and ultimately enhancing the quality of healthcare across various settings.

In the exploration of healthcare quality at Kenyatta National Hospital, the Donabedian's Model of Quality of Care provides a methodical framework for analysis. It begins by scrutinizing human resources, delving into qualifications and numbers of healthcare workers, pivotal for quality service delivery. The evaluation extends to training programs and workload distribution, recognizing their direct impact on care quality. Shifting focus to hospital infrastructure, this assessment covers both the 'Structure' and 'Process' components. It evaluates the physical environment, equipment, and supplies, crucial elements in care provision (Alberti et al., 2005).

Furthermore, it analyzes how these resources are efficiently utilized, from equipment maintenance to their role in patient procedures, offering insights into operational efficiency and service quality. Examining the system optimization emphasizes 'Process,' focusing on data accuracy, communication effectiveness, and adherence to evidence-based practices. Timeliness and accessibility of patient information are also paramount, influencing healthcare

efficiency. Lastly, the study investigates health financing's influence, delving into budget allocation and its alignment with healthcare priorities. Understanding how financial decisions impact staffing, training, and technology provide crucial insights. In essence, Donabedian's Model offers a holistic understanding of factors affecting healthcare quality, guiding targeted improvements and strategic decisions at Kenyatta National Hospital.

2.7.2 The Systems Thinking Approach

The Systems Thinking Approach, rooted in Ludwig von Bertalanffy's General Systems Theory in the early 20th century, postulates that all systems share common properties, such as wholeness, openness, hierarchy, and feedback. Influential thinkers like Jay Forrester, Ross Ashby, and Gregory Bateson further developed and refined this approach, extending its application to diverse fields including healthcare, business, and environmental science. Professor Jay Forrester established the Systems Dynamic Group at MIT's Sloan School of Management in 1956 (Arnold & Wade, 2015).

In healthcare, notable proponents of this approach include Don Berwick, a healthcare quality expert advocating for systems thinking in healthcare improvement, and Peter Senge, a renowned author applying systems thinking to various organizational contexts, including healthcare. Margaret Wheatley, an organizational theorist, has also contributed significantly, employing the systems thinking approach to tackle complex issues in areas like healthcare and education. Through their pioneering work, these experts have paved the way for a more holistic understanding of complex systems, fostering innovations and improvements across multiple disciplines (Walker et al., 2018).

The systems thinking approach in healthcare perceives the entire system as a complex and interconnected web of various elements. This methodology emphasizes the critical significance

of comprehending the intricate relationships between different components within the healthcare system, including healthcare providers, patients, healthcare organizations, and the broader social and political context. This approach is profoundly relevant because it enables a deep exploration into the underlying causes of issues within the healthcare system. By dissecting these relationships, it becomes possible to identify the root causes of problems rather than merely addressing their symptoms (Haines, 2000).

Moreover, systems thinking aids in the development of effective solutions by understanding how changes in one part of the system can reverberate and produce unintended consequences in other parts. Adopting this holistic perspective, healthcare professionals and policymakers can gain a comprehensive understanding of the intricate dynamics at play, leading to more informed decisions and sustainable improvements in healthcare delivery (Kefalas, 2011).

The Systems Thinking Approach is invaluable in dissecting the complex interplay of factors affecting healthcare quality. Understanding the hospital's functioning as a system, we can perceive human resources as integral components. The expertise, dedication, and collaborative efforts of healthcare professionals collectively contribute to the hospital's overall performance. Analyzing the human resources as interconnected entities within the system, it's possible to identify areas for improvement, such as training programs, staff distribution, and employee satisfaction initiatives, all of which can significantly enhance the quality of healthcare services (Banson et al., 2015).

A systems perspective considers it not merely as physical structures, but as a network of interconnected resources. The buildings, medical equipment, and technological systems are interdependent elements influencing each other. Assessing the hospital's infrastructure from this angle involves evaluating how each component interacts and impacts service delivery. For

instance, the availability of advanced medical technology might improve diagnostics and treatments, but only if supported by a well-maintained physical facility and skilled technicians. Addressing infrastructure challenges requires a holistic approach, considering the entire system rather than isolated issues (Andrew & Petkov, 2003).

Furthermore, the Health Management System (HMS) acts as the informational backbone of the hospital system. The flow of data, its accuracy, and accessibility are vital. Applying the Systems Thinking Approach, it becomes crucial to analyze how the HMS integrates with other hospital components. Efficient information processing ensures timely diagnoses, appropriate treatments, and streamlined workflows. Recognizing the interconnectedness of information management with human resources and infrastructure is vital. A breakdown in any of these elements could disrupt the entire healthcare system's functionality (Clark et al., 2022).

Health financing is pivotal for sustaining the entire healthcare system. Systems thinking encourages viewing financial resources not in isolation, but as a dynamic component influencing and being influenced by human resources, infrastructure, and information management (Elias et al., 2021). Understanding how financial decisions impact staffing levels, equipment procurement, and technological advancements, the study can unravel the intricate relationships. A balanced financial approach, aligned with the hospital's overall objectives, ensures the availability of necessary resources, preventing bottlenecks in service delivery (Banerjee & Lowalekar, 2021).

In essence, employing the Systems Thinking Approach offers a comprehensive understanding of Kenyatta National Hospital's healthcare system. By recognizing the interconnectedness of human resources, infrastructure, information management, and financial aspects, the study can

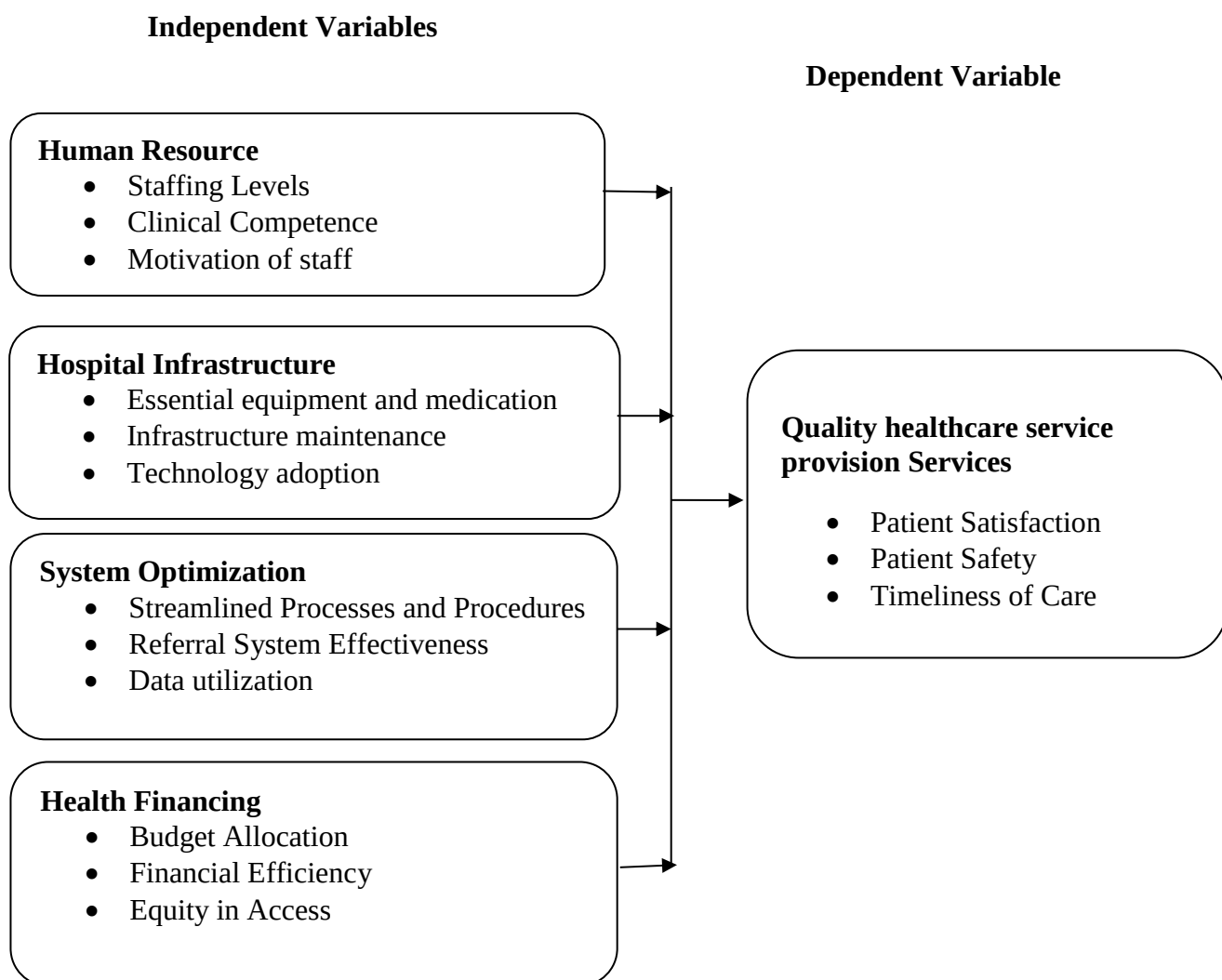
identify nuanced solutions that address the root causes of challenges, thereby enriching the establishment and implementation of a quality care model for the hospital.

2.8 Conceptual Framework

According to Mugenda & Mugenda, 2009, the relationships of study variables are demonstrated using a conceptual framework. The graphic shows that independent variables affect dependent factors. Figure 2.1 shows the independent-dependent connection in the study;

Figure 2.1:

Conceptual Framework



2.9 Research Gaps

This study addressed research gaps associated with; measuring the impact of specific HR practices on quality outcomes due to the influence of various other factors , effectiveness of HR practices in relation to context of the healthcare organization, including its size, location, and patient population, optimizing complex healthcare systems with diverse stakeholders and dynamic environments resistance to change and attributing specific improvements solely to system optimization (Hsu et al., 2022).

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides an overview of the research approach was used in conducting the research study. The study delineates and provides rationale for the chosen research design, the specific population under investigation, the determined sample size, and the adopted sampling process. Furthermore, the chapter provides a detailed explanation of the instrument used for data collection, including an analysis of its validity and reliability. Lastly, the study finishes by providing a comprehensive account of the data gathering methodology and the statistical techniques used for data analysis.

3.1 Research Design

According to Kothari (2014), research design is the strategy or technique used to achieve the goal of a study. According to Cooper and Schindler (2007), a descriptive cross-sectional survey design provides for a thorough and accurate analysis of a phenomena, situation, or feature. This strategy is appropriate for circumstances in which the researcher want to comprehend and report the current condition of things without modifying factors. Furthermore, the goals of a descriptive survey are specified, allowing for data gathering that is relevant and adequate to the research topic (Kothari, 2014).

3.2 Target Population

Cooper and Schindler (2003) define population as "the entire set of objects or events under study from which one wishes to draw conclusions." Additionally, Mugenda and Mugenda (2003) describe the target population as having some observable characteristics to which the findings of the study could be generalized. In the proposed study, the target population was

healthcare workers at Kenyatta National hospital (KNH). The study targeted a workforce of 5779 at KNH. Table 3.1 shows the population of workforce at KNH.

Table 3.1:

Target Population

Department	Target Population
Health Management Team	45
Medical Officers	971
Clinical Officers	613
Nurses	2718
Paediatricians	137
Pharmacists	173
Dentists	74
Technical staff	1048
Total	5779

3.3 Sample Size and Sampling Technique

3.3.1 Sample size

The sample size of the health workers to be interviewed was ascertained using the Yamane's 1967 formula.

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

Where: N = Population size

n = sample size

e = Margin error of the study set at ±5%

Sample size will be

$$= \frac{5779}{1+5779(0.05)^2} = 374 \text{ respondents that is 6.5\% of the target population. The sample}$$

population is as presented in Table 3.2.

Table 3.2:

Sample size

Department	Target Population (N)	Sample 6.5% of N
Health Management Team	45	3
Medical Officers	971	63
Clinical Officers	613	39
Nurses	2718	176
Paediatricians	137	9
Pharmacists	173	11
Dentists	74	5
Technical staff	1048	68
Total	5779	374

3.3.2 Sampling technique

The stratified random sampling approach was used in the investigation. Stratified random sampling is a sampling technique that is characterized by its impartiality, since it involves the division of a heterogeneous population into distinct and homogenous subgroups. This division is performed prior to the selection process within each subset, with the aim of ensuring that the final sample is representative of the whole population. The primary objective of stratified random sampling is to provide a representative sample of a community by ensuring enough representation from various sub-groups (Kothari, 2014). The study further used simple random sampling within the different strata to select health workers and health management team member from the primary health facilities. Cooper and Schindler (2007) assert that the use of random sampling methods generally leads to a reduction in population sampling error. In

random sampling, every item or element within the population has an equal chance of being selected during each draw.

3.4 Research Instruments

The main data collection tool in this study was a questionnaire. The use of questionnaires was to enable the researcher to collect data by engaging with respondents (Olsen & George, 2004). Questionnaires provide a standardized way of collecting data. The questions are typically predetermined and presented in a consistent manner to all respondents. This standardization helps ensure that each participant is exposed to the same set of questions, reducing variability in responses and enhancing the reliability of the data. Also, questionnaires make respondents feel more comfortable expressing their opinions or providing sensitive information through a questionnaire because it allows for anonymity. This can be particularly important when dealing with topics that individuals may be hesitant to discuss openly, such as personal habits, attitudes, or experiences.

3.5 Pretest

Pre-test was done with the aim of evaluating the reliability of the questions contained therein as well as assessment of the validity of the raw data that will be realized from the field. The exercise was done on 30 staff at Mbagathi hospital due to proximity, nature of patients the hospital attends to and operational similarities to KNH. Mbagathi Hospital is also one of the hospitals that refers patients to KNH. The pilot responses were not be part of the actual study. Pilot study helped the researcher in evaluating the clarity of the study tool. Mugenda and Mugenda (2003) held that pretests give the researcher an opportunity to discover mistakes and playing the role of training the data collection team before the main data collection exercise kicks off. Therefore, pretesting of the study instrument allowed for determination of the

respondents' interests, improvement of ambiguous questions, assessing the continuity and flow of the questions, understanding the sequencing patterns of the questions, evaluation of the response variations, and timeliness of the tool (Mugenda & Mugenda, 2003).

3.5.1 Reliability of research instruments

The questionnaire was roughly scrutinized with the aim of establishing its collective reliability by analyzing the internal consistency. It was later evaluated by the use of the Cronbach alpha. Internal consistency analyses the relationships that exist between various questions on the same test. Further, measures whether the different questions which hypothesize to measure a common factor and give the same results. According to Castillo (2009), the Cronbach alpha offers the thumb rules as follows; Excellent is >0.9 , Good is >0.8 , Acceptable is >0.7 , Questionable is >0.6 , Poor is >0.5 and <0.5 is Unacceptable. The cut point for determinant value of the reliability of the study will be 0.7.

3.5.2 Validity of research instruments

According to Cooper and Schindler (2007), the study instrument must be precise on what the research is aimed at measuring. Therefore the test is taken through a process of measuring the validity in order to assess the level to which the tool measures what the researcher wishes to study. Also tests the practical aspect of the instrument guided by the economic, efficiency and interpretation of the results. Validity of the questionnaire content was examined to ensure it meets all research goals. Before distributing the tools to the sample, they must be validated to ensure they collect the proper data. The Study validated instrument content and layout using various methods. Kothari (2014) defines content validity as how well tool questions capture the instrument's intended content. Face validity analyzes the questionnaire's form, which indicates its ease of use in evaluating the study's components. The department supervisors and

research reviewed the questionnaire for content and layout validity. The validation method showed the researcher how well the questionnaire collects the required data. Their feedback helped make adjustments and clarify to corrects typing and spelling errors and removes ambiguity.

3.6 Methods of Data Collection

The data was gathered through the use of self-administered questionnaires sent to the staff members of KNH. The questionnaires were distributed via a drop and pick approach, wherein the researcher personally delivered the questionnaires to the respondents at their respective workplaces. In instances when the prompt completion of the questionnaire poses challenges for the respondents, the researcher chooses to provide the questionnaires to the participants for completion at their convenience, thereafter retrieving the completed questionnaires at a later agreed-upon date. The completion of the questionnaire was estimated to need a time frame of around 15 to 20 minutes.

3.7 Methods of Data Analysis

Data analysis is a comprehensive procedure that starts promptly after the gathering of data and concludes upon reaching the stage of interpreting and processing the data (Kothari, 2014). Prior to data processing, the questionnaires that have been filled out underwent editing to ensure completeness and uniformity. The research provided data of both qualitative and quantitative kind. The quantitative data were encoded and inputted into Statistical Packages for Social Scientists (SPSS Version 26) for analysis, using descriptive and inferential statistical methods. The use of descriptive statistics includes the application of absolute and relative frequencies, as well as measurements of central tendency and dispersion, namely the mean and standard deviation, respectively. The presentation of quantitative data included the utilization of tables

and graphs, while the accompanying analysis and interpretation were conveyed via written prose. The research used logistics regression analysis to ascertain the association between the independent factors and the dependent variables.

The regression equation is as below:

$$\text{Logit}(P) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Whereby the variables were identified as follows: -

Dependable variable Y = Provision of Quality Healthcare Service

Independent variable X_1 = Human Resource

Independent variable X_2 = Hospital Infrastructure

Independent variable X_3 = System optimization

Independent variable X_4 = Health Finance

While $\beta_1, \beta_2, \beta_3$ and β_4 will be coefficients of determination.

The research used logistic regression analysis to ascertain the relationship between the independent factors and the dependent variable. Logistic regression was selected over other models, such as linear regression, because the dependent variable while measured on a Likert scale in the questionnaire, was ultimately transformed into a binary outcome for this analysis to clearly determine the probability of achieving quality care based on the determinants. This model is particularly suited for predicting categorical outcomes and is robust in handling a mix of independent variables (Hosmer & Lemeshow, 2013)."

3.8 Ethical Considerations in Research

Ethical approvals were sought from KEMU and NACOSTI before commencement of study. Additionally, written consent was sought from all respondents before commencement of data collection. The confidentiality and privacy of the respondents were assured. The researcher made sure the respondents understand that the data collected will be treated with utmost respect with a sole purpose of fulfilling an academic study requirement.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter deals with how the data has been analyzed and the presentation of the findings. The findings are presented in sections that cover the general details; human resource, hospital infrastructure, system optimization, health financing, and provision of quality healthcare services. Descriptive and inferential statistics have been used to discuss the findings of the study.

4.2 Respondents response rate

The study targeted 374 respondents but managed to get 330 filled questionnaires. This represents a response rate of 88.2%.

4.3 Test for data reliability and validity

4.3.1 Reliability Test

Table 4.1

Reliability

Variable	Cronbach's Alpha	N of Items	Interpretation
Human Resource	0.783	18	Acceptable
Hospital Infrastructure	0.802	20	Good
Health Financing	0.761	21	Acceptable
System Optimization	0.772	17	Acceptable
Quality Healthcare Service Provision	0.811	76	Good

The Cronbach's Alpha coefficients for all variables exceeded the recommended threshold of 0.7, indicating that the data collection instrument had satisfactory internal consistency. The overall Cronbach's Alpha of 0.811 for quality healthcare service provision confirms high reliability of the instrument, which assures that the responses are reliable (Bryman & Bell, 2015).

4.3.2 Validity Tests

The validity of the study's data collection instrument was ensured by the supervisor's professional opinion and accepted that the instrument would provide data that accurately answers the research questions. This was after the supervisor advised on the correction that was to be made to the research instrument.

4.4 Demographic analysis

4.4.1 Gender

The findings regarding the gender of respondents are shown in the table.

Table 4.2

Gender

Gender	Frequency	Percent
Male	159	48.2
Female	171	51.8
Total	330	100

The majority of respondents 51.8% (n=171) were female 48.2% while (n=159) were male. The findings imply that both genders were represented in the study. This is an indication that there was equal distribution of the respondents in terms of gender and hence no gender biasness and hence the study was able to get the view of both genders in regard to the research questions under the study.

4.4.2 Age

The findings regarding the age of the respondents are shown in the table.

Table 4.3***Age***

Age bracket	Frequency	Percent
Below 30 years	54	16.4
30-45 years	144	43.6
Above 45 years	132	40.0
Total	300	100

Majority of the respondents 43.6% (n=144) were aged 30-45 years, 40.0% (n=132) were above 45 years while 16.4% (n=54) were below 30 years.

4.4.3 Education level

The findings regarding the education level of respondents are shown in the table.

Table 4.4***Education Level***

Education level	Frequency	Percent
Postgraduate	74	22.4
Graduate/Degree	81	24.5
Diploma level	139	42.1
Certificate level	36	10.9
Total	300	100

The results show that 42.1% (n=139) of the respondents had reached diploma level, 24.5% (n=81) had reached degree level, 22.4% (n=74) had reached postgraduate level and 10.9% (n=36) had reached certificate level.

4.4.4 Working Duration

The findings regarding the work duration of respondents are shown in table.

Table 4.5

Working Duration

Working Duration	Frequency	Percent
Less than 5 years	76	23.0
6-10 years	61	18.5
11-15 years	72	21.8
More than 15 years	121	36.7
Total	330	100

The majority of respondents 36.7% (n=121) had worked in the hospital for more than 15 years, 23.0% (n=76) had worked for less than 5 years, 21.8% (n=72) had worked for 11-15 years and 18.5% (n=61) had worked for 6-10 years.

4.4.5 Professional Cadre

The findings regarding the professional cadre of respondents are shown in the table.

Table 4.5***Professional Cadre***

Professional Cadre	Frequency	Percent
Doctor	41	12.4
Nurse	157	47.6
Clinical Officer	25	7.6
Paramedic	40	12.1
Administrative staff	67	20.3
Total	330	100

The results show that 47.6% (n=157) of the respondents were nurses, 20.3% (n=67) were administrative staff, 12.4% (n=41) were doctors, 12.1% (n=40) were paramedics and 20.3% (n=67) were clinical officers.

4.5 Analysis of Study Variables**4.5.1 Human resource****Table 4.6*****Human Resources***

Statement	n	SD	D	MA	A	SA	Mean	SD
There are enough staff members in my department to adequately care for patient's needs	330	1.80%	20.60%	20.00%	36.70%	20.90%	3.54	1.091
The current staffing levels at KNH allow me to effectively complete my job duties	330	5.20%	17.90%	23.60%	35.50%	17.90%	3.43	1.128

I feel adequately supported by my colleagues to manage my workload.	330	6.10%	18.80%	18.80%	35.80%	20.60%	3.46	1.185
Due to staffing limitations, I am often forced to compromise on the quality of care I can provide to patients.	330	3.90%	16.10%	21.80%	43.00%	15.20%	3.49	1.055
Adequate staffing levels are essential for ensuring patient safety at KNH.	330	0.00%	11.20%	19.70%	33.60%	35.50%	3.93	0.999
I am confident in the clinical skills of most staff members at KNH.	330	5.80%	16.40%	21.50%	36.10%	20.30%	3.49	1.154
I feel heard when contributing my expertise to patient care discussions.	330	5.50%	19.70%	21.50%	37.00%	16.40%	3.39	1.136
I observe staff at KNH treating patients with compassion.	330	7.30%	18.20%	16.10%	38.50%	20.00%	3.46	1.205
Staffs at KNH respect patients.	330	2.10%	20.30%	19.40%	37.30%	20.90%	3.55	1.097
KNH staffs effectively communicate treatment plans to patients in a clear manner.	330	4.50%	22.40%	18.50%	35.80%	18.80%	3.42	1.159
KNH staffs answer patients' questions in an understandable manner.	330	5.80%	19.40%	19.40%	40.90%	14.50%	3.39	1.125
KNH provides adequate opportunities for staff to develop knowledge.	330	4.20%	18.80%	14.80%	38.50%	23.60%	3.58	1.162
I have the resources I need to perform my job effectively.	330	4.80%	16.70%	22.10%	38.20%	18.20%	3.48	1.114

I am satisfied with the compensation and benefits package offered by KNH	330	7.90%	17.60%	17.60%	37.60%	19.40%	3.43	1.209
I have strong working relationships with my colleagues at KNH.	330	4.20%	16.70%	20.90%	35.80%	22.40%	3.55	1.135
I am confident in KNH's ability to deliver high-quality patient care	330	5.20%	22.10%	15.20%	39.40%	18.20%	3.43	1.168
I feel my contributions are valued and recognized by my superiors	330	7.00%	23.90%	16.40%	37.90%	14.80%	3.3	1.186
Aggregate mean	330						3.49	1.136

The findings provide a comprehensive overview of respondents' perceptions regarding human resource adequacy and staffing effectiveness at Kenyatta National Hospital (KNH). The aggregate mean score of 3.49 (SD = 1.136) suggests a moderate level of agreement among respondents that human resource factors contribute to the provision of quality healthcare services. Overall, the results indicate that while staff members generally acknowledge the importance of adequate staffing and professional competence, several challenges remain in achieving optimal human resource capacity and support within the hospital.

A majority of respondents agreed that there are enough staff members to adequately care for patients' needs (Mean = 3.54, SD = 1.091), although a considerable proportion expressed neutrality or disagreement. This suggests that staffing levels, while improving, may not consistently meet the workload demands across departments. Similarly, the statement "The current staffing levels at KNH allow me to effectively complete my job duties" recorded a mean of 3.43 (SD = 1.128), reflecting that although many staff members manage to complete

their tasks, existing staffing ratios may still strain service delivery. These findings resonate with the broader concern in public hospitals where limited personnel often result in overburdened staff, as observed by Aiken et al. (2020), who emphasized the strong correlation between nurse-to-patient ratios and healthcare quality outcomes.

Respondents also expressed moderate agreement that they feel adequately supported by colleagues (Mean = 3.46, SD = 1.185), indicating the presence of teamwork and collaboration among staff, even under constrained conditions. However, the item “Due to staffing limitations, I am often forced to compromise on the quality of care” (Mean = 3.49, SD = 1.055) underscores a significant concern that staffing shortages sometimes lead to reduced care standards. This aligns with findings from Laschinger et al. (2019), who noted that insufficient staffing compromises patient safety and increases the likelihood of burnout and medical errors.

The statement “Adequate staffing levels are essential for ensuring patient safety at KNH” had the highest mean score (3.93, SD = 0.999), signifying strong consensus among respondents regarding the critical role of sufficient personnel in maintaining patient safety. This demonstrates that staff members recognize the link between human resource adequacy and the hospital’s overall ability to deliver safe, effective care. Similarly, respondents agreed that they are confident in the clinical skills of most staff members (Mean = 3.49, SD = 1.154), reflecting trust in professional competency within KNH’s workforce. However, perceptions of recognition and communication were somewhat lower. For instance, “I feel my contributions are valued and recognized by my superiors” scored 3.30 (SD = 1.186), indicating a perceived gap in employee recognition and motivation.

Moreover, interpersonal relationships and teamwork appeared relatively strong, as shown by the item “I have strong working relationships with my colleagues” (Mean = 3.55, SD = 1.135), which supports the notion that professional collaboration remains a positive aspect of KNH’s

human resource environment. Staffs also affirmed that respect and compassion towards patients are common practices (Means = 3.55 and 3.46 respectively), suggesting that despite systemic pressures, care delivery remains anchored in ethical and patient-centered values. However, moderate scores on communication-related items such as “KNH staff effectively communicate treatment plans to patients” (Mean = 3.42, SD = 1.159) highlight an area requiring improvement in patient engagement and health literacy efforts.

Access to professional development opportunities and resources was also moderately rated, with “KNH provides adequate opportunities for staff to develop knowledge” (Mean = 3.58, SD = 1.162) and “I have the resources I need to perform my job effectively” (Mean = 3.48, SD = 1.114). These findings imply that while training opportunities exist, they may not be equitably distributed or sufficiently frequent to meet the evolving needs of healthcare professionals.

In conclusion, the results indicate that KNH staff perceive human resource management as a key determinant of healthcare quality, but improvements in staffing levels, recognition and communication are necessary to optimize performance and service delivery. The consistency of moderate-to-high mean scores across the items reinforces that human resource adequacy, staff motivation and interpersonal dynamics significantly influence the hospital’s capacity to deliver high quality patient care. These findings align with the Donabedian Model of Quality of Care, which emphasizes that structural factors such as staffing and workforce capacity form the foundation for effective healthcare processes and positive outcomes.

4.5.2 Hospital infrastructure

Table 4.7

Hospital Infrastructure

Statement	n	SD	D	MA	A	SA	Mean	SD
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The essential equipment I need to perform my duties is readily available in my department.	330	6.70%	17.00%	15.80%	43.60%	17.00%	3.47	1.154
There are sufficient quantities of essential medicines stocked in the hospital pharmacy.	330	4.80%	23.00%	22.10%	33.30%	16.70%	3.34	1.146
I am aware of the protocols for requesting new or replacement equipment.	330	7.60%	16.70%	15.50%	45.20%	15.20%	3.44	1.158
If a piece of equipment malfunctions, it is promptly repaired or replaced.	330	3.30%	17.00%	20.00%	43.90%	15.80%	3.52	1.052
Expired medicines are promptly removed from circulation.	330	0.00%	24.80%	15.20%	38.50%	21.50%	3.57	1.085
I feel safe using the elevators at KNH.	330	0.00%	20.60%	20.90%	37.60%	20.90%	3.59	1.037
When I report a maintenance issue at KNH, staffs are responsive and take action to address it.	330	5.20%	20.00%	21.80%	34.80%	18.20%	3.41	1.148
KNH communicates planned maintenance activities clearly and provides	330	5.20%	20.30%	19.40%	40.00%	15.20%	3.4	1.123

updates on their progress.

Infrastructure issues at KNH rarely disrupt my ability to perform my duties effectively.	330	5.50%	19.10%	23.00%	36.70%	15.80%	3.38	1.124
The overall condition of the infrastructure at KNH promotes a positive work environment.	330	5.50%	20.30%	21.50%	33.60%	19.10%	3.41	1.166
I am comfortable using technology in my daily work at KNH.	330	5.50%	21.50%	17.30%	38.80%	17.00%	3.4	1.158
KNH provides adequate training for staff on new technologies.	330	9.70%	17.00%	17.30%	42.10%	13.90%	3.34	1.195
The technology currently used at KNH improves my ability to perform my job duties.	330	9.70%	19.10%	13.00%	43.90%	14.20%	3.34	1.215
The different technologies used at KNH integrate well with each other.	330	5.80%	19.40%	19.40%	40.90%	14.50 %	3.4	1.137
The technology slows me down then hinders my workflow more than it helps.	330	4.20%	18.80%	14.80%	38.50%	23.60 %	3.47	1.119
Aggregate mean	330						3.43	1.13

The findings examine respondents' perceptions of the hospital's infrastructure and the availability of essential equipment, supplies, and technology at Kenyatta National Hospital

(KNH). The aggregate mean score of 3.43 (SD = 1.13) indicates a moderate level of agreement among respondents that the infrastructure at KNH is generally supportive of effective healthcare delivery, though with notable areas requiring improvement. Overall, while most staff members acknowledge the presence of necessary physical and technological resources, consistent availability, maintenance responsiveness, and integration of technology remain key challenges.

A majority of respondents agreed that essential equipment is readily available in their departments (Mean = 3.47, SD = 1.154), suggesting that KNH provides most of the tools necessary for staff to perform their duties. However, the corresponding standard deviation indicates some variation in responses, implying disparities across departments in equipment distribution and access. Similarly, perceptions regarding the availability of essential medicines were slightly lower (Mean = 3.34, SD = 1.146), with 27.8% of respondents disagreeing or strongly disagreeing. This finding may reflect the recurrent issue of inconsistent medical supplies in public health institutions, often attributed to procurement delays and budgetary constraints, as highlighted in studies by Oduro-Mensah et al. (2020) and WHO (2021).

Respondents generally expressed familiarity with equipment request protocols (Mean = 3.44, SD = 1.158), indicating effective communication and procedural clarity in resource management. However, the item “If a piece of equipment malfunctions, it is promptly repaired or replaced” received a mean of 3.52 (SD = 1.052), showing moderate agreement but also signaling room for improvement in maintenance turnaround times. These findings suggest that while systems for reporting and replacing faulty equipment exist, responsiveness may not be uniform across all departments.

Concerning pharmaceutical management, the statement “Expired medicines are promptly removed from circulation” recorded one of the highest mean scores (3.57, SD = 1.085), demonstrating a strong commitment to patient safety and quality assurance. This positive rating reflects adherence to regulatory standards and effective oversight mechanisms in drug inventory management. Similarly, respondents expressed confidence in the safety and functionality of hospital infrastructure, particularly the elevators (Mean = 3.59, SD = 1.037), which shows that KNH maintains a satisfactory standard in safety related infrastructure components.

The responsiveness of maintenance teams also garnered moderate support (Mean = 3.41, SD = 1.148), suggesting that staff appreciate the hospital’s efforts to address maintenance issues, though timeliness and feedback could be improved. The perception that “Infrastructure issues rarely disrupt job performance” (Mean = 3.38, SD = 1.124) further indicates that, although interruptions occur, they do not significantly impede healthcare delivery on a daily basis. However, the moderate score for “The overall condition of the infrastructure promotes a positive work environment” (Mean = 3.41, SD = 1.166) implies that aspects such as space utilization, ventilation, and facility aesthetics could benefit from refurbishment and modernization to enhance the work environment and staff morale.

Regarding technology use, staff reported moderate comfort levels with using technology in their daily work (Mean = 3.40, SD = 1.158), demonstrating ongoing digital adaptation among healthcare professionals. Yet, lower scores for “KNH provides adequate training on new technologies” (Mean = 3.34, SD = 1.195) and “The technology currently used at KNH improves my ability to perform my job duties” (Mean = 3.34, SD = 1.215) reveal gaps in capacity building and the perceived utility of available systems. The integration of different

technologies was also rated moderately (Mean = 3.40, SD = 1.137), suggesting that digital systems such as patient records, pharmacy management, and billing may not be fully interoperable. Furthermore, the statement “The technology slows me down and hinders my workflow more than it helps” (Mean = 3.47, SD = 1.119) highlights that certain technological tools might be outdated, cumbersome or not user friendly.

Overall, these results indicate that while KNH possesses the foundational infrastructure necessary for healthcare service delivery, inconsistencies in equipment availability, maintenance efficiency and technology adoption hinder optimal performance. Investments in digital integration, preventive maintenance and user-centered technology training could significantly enhance operational efficiency. These findings align with the Donabedian model’s structural dimension, emphasizing that well maintained physical infrastructure and reliable equipment are essential inputs for high quality healthcare processes and outcomes.

4.5.3 System Optimization

Table 4.7

System Optimization

Statement	n	SD	D	MA	A	SA	Mean	SD
Obtaining necessary supplies for patient care is a smooth process.	330	4.80%	20.60%	20.30%	36.10%	18.20%	3.42	1.146
Communication between departments regarding patient care is timely.	330	4.80%	21.50%	15.20%	40.30%	18.20%	3.45	1.156

Discharges are processed efficiently to minimize delays for patients.	330	4.80%	20.30%	16.40%	40.00%	18.50%	3.47	1.149
The administrative processes at KNH are easy to navigate.	330	4.80%	17.90%	21.20%	38.20%	17.90%	3.46	1.122
Streamlined processes at KNH allow me to focus more on patient care.	330	4.80%	19.40%	23.60%	34.80%	17.30%	3.4	1.126
The KNH referral system provides me with all the necessary information about the referring facility.	330	4.80%	17.60%	21.80%	37.90%	17.90%	3.46	1.119
Upon arrival at KNH, patients' medical history from referring facility is readily available.	330	4.80%	17.00%	18.50%	42.40%	17.30%	3.5	1.109
The referral process at KNH is easy to understand.	330	4.80%	18.20%	18.20%	43.30%	15.50%	3.46	1.103
The referral system has improved communication between KNH and other healthcare facilities.	330	4.80%	17.60%	22.40%	38.80%	16.40%	3.44	1.105

The referral system has improved coordination between KNH and other healthcare facilities.	330	4.80%	23.00%	18.80%	34.50%	18.80%	3.39	1.171
Referrals to KNH are timely.	330	4.80%	15.50%	18.50%	43.60%	17.60%	3.54	1.097
Patients come to KNH with a formal referral letter from referring facility.	330	4.80%	16.70%	24.50%	38.80%	15.20%	3.43	1.084
KNH readily provides me with the data I need to perform my job effectively.	330	4.80%	18.50%	21.80%	35.80%	19.10%	3.46	1.138
KNH encourages the use of data for analysis and reporting.	330	5.20%	20.90%	19.40%	36.70%	17.90%	3.41	1.154
KNH effectively utilizes data to inform decision-making processes.	330	6.40%	23.60%	23.60%	30.00%	16.40%	3.26	1.175
Data sharing practices at KNH improves patient care.	330	6.40%	17.00%	16.10%	38.20%	22.40%	3.53	1.193
KNH leadership actively utilizes data to performance metrics	330	6.40%	17.00%	21.20%	37.30%	18.20%	3.44	1.156
Aggregate mean	330						3.44	1.14

The findings explore the efficiency of administrative processes, communication systems, referral mechanisms and data utilization at Kenyatta National Hospital (KNH). The aggregate

mean of 3.44 (SD = 1.14) indicates a moderate level of agreement among respondents that system optimization processes at KNH are functional but not fully efficient. Overall, the results suggest that while the hospital's administrative and operational systems facilitate the delivery of healthcare services, challenges related to interdepartmental communication, referral coordination and data driven decision-making persist.

Respondents moderately agreed that obtaining necessary supplies for patient care is a smooth process (Mean = 3.42, SD = 1.146), implying that supply chain mechanisms are fairly reliable though occasional delays or shortages occur. Similarly, the perception that communication between departments is timely (Mean = 3.45, SD = 1.156) underscores that KNH has established communication structures but that bottlenecks may still exist, especially during high patient inflows. These findings align with Onyango and Wanjala (2021), who observed that administrative coordination remains a major determinant of operational efficiency in large referral hospitals.

In terms of workflow management, respondents moderately agreed that discharges are processed efficiently to minimize delays for patients (Mean = 3.47, SD = 1.149) and that administrative processes are easy to navigate (Mean = 3.46, SD = 1.122). These results suggest a generally functional administrative framework that supports service continuity. However, the mean score of 3.40 (SD = 1.126) for "Streamlined processes allow me to focus more on patient care" implies that bureaucracy and procedural redundancies may sometimes distract healthcare providers from direct patient interaction. This observation is consistent with findings from the Kenya Health Service Delivery Indicator Report (2022), which noted that administrative inefficiencies can detract from the quality of clinical care.

The referral system at KNH appears to be fairly effective, as evidenced by the mean score of 3.50 (SD = 1.109) for the statement “Patients’ medical history from referring facilities is readily available upon arrival.” Similarly, respondents moderately agreed that referrals are timely (Mean = 3.54, SD = 1.097) and that referral processes are easy to understand (Mean = 3.46, SD = 1.103). These findings suggest that KNH’s referral network supports continuity of care between the hospital and lower-tier facilities. However, moderate ratings for coordination and communication with referring facilities (Means = 3.44 and 3.39 respectively) highlight the need for stronger integration between KNH and other institutions in the referral chain.

These results are consistent with the findings of Yuet et al., (2018), who observed that effective referral systems depend heavily on the availability of patient information and seamless communication between facilities. Their study emphasized that inadequate data transfer and unclear referral procedures often lead to fragmentation of care and treatment delays, issues that are still moderately reflected in KNH’s referral performance. Similarly, as noted in the literature review, prior studies like (Ministry of Health, 2021; WHO, 2019) underscore the importance of digital referral platforms and inter-facility coordination to strengthen continuity of care. The moderate agreement levels in the present study, therefore, mirror broader trends identified in previous research, indicating that while KNH has made notable progress in ensuring timely and understandable referrals, there remains a persistent gap in communication and coordination that digital integration could address.

In terms of data utilization, staff responses were relatively moderate, suggesting room for improvement in data management culture. The mean score for “KNH readily provides data I need to perform my job effectively” was 3.46 (SD = 1.138), indicating that access to operational data exists but may not always be timely or comprehensive. Similarly, “KNH

encourages the use of data for analysis and reporting” recorded a mean of 3.41 (SD = 1.154), while “KNH effectively utilizes data to inform decision-making processes” was slightly lower at 3.26 (SD = 1.175). These findings reveal that although staff recognize the importance of data-driven management, the full integration of data analytics into organizational decision-making remains limited. Conversely, higher scores for “Data sharing practices improve patient care” (Mean = 3.53, SD = 1.193) and “KNH leadership actively utilizes data to evaluate performance metrics” (Mean = 3.44, SD = 1.156) suggest a growing institutional culture of performance monitoring and accountability.

Overall, the results show that KNH has made significant progress toward system optimization, particularly in administrative processes, referral management, and information sharing. However, to achieve full optimization, the hospital needs to strengthen digital interoperability, streamline bureaucratic procedures, and enhance data utilization for continuous improvement. These findings align with the Donabedian Model’s process component, which emphasizes that well-coordinated administrative and operational processes are essential to transforming structural inputs (infrastructure, human resources and equipment) into high-quality healthcare outcomes. Continuous investment in hospital information systems, workflow automation and interdepartmental coordination will therefore be critical in enhancing service efficiency and patient satisfaction at KNH.

4.5.4 Health Financing

Table 4.8 Health Financing

Statement	n	SD	D	MA	A	SA	Mean	SD
The budget allocated to my department is sufficient to meet its needs.	330	6.40%	19.70%	17.30%	42.70%	13.90%	3.38	1.138

The current budget allocation process at KNH is transparent.	330	6.40%	22.70%	17.30%	36.40%	17.30%	3.35	1.19
I am confident that my department receives its fair share of the overall KNH budget.	330	6.40%	17.90%	19.70%	39.40%	16.70%	3.42	1.149
There is enough budget allocated for essential commodities in my department.	330	6.40%	18.80%	18.80%	40.90%	15.20%	3.4	1.142
Budget cuts have negatively impacted my ability to provide quality patient care.	330	6.40%	21.50%	15.20%	35.50%	21.50%	3.44	1.222
Staffs at KNH are encouraged to be mindful of costs when making decisions.	330	4.20%	18.80%	19.70%	37.60%	19.70%	3.5	1.131
I am aware of the financial targets set for my department.	330	3.90%	19.40%	19.70%	35.80%	21.20%	3.51	1.141
I am involved in discussions or initiatives to improve financial efficiency at my department.	330	4.20%	17.30%	18.20%	38.80%	21.50%	3.56	1.132
I am confident that KNH is financially well-managed.	330	3.90%	20.60%	18.80%	36.40%	20.30%	3.48	1.144
I am informed about how my department's budget is spent.	330	4.20%	21.80%	18.80%	35.20%	20.00%	3.45	1.159
Having health insurance makes it easier to access care at KNH.	330	3.90%	20.00%	18.50%	37.00%	20.60%	3.5	1.141

Out-of-pocket expenses for healthcare at KNH are a significant burden.	330	3.90%	19.70%	19.40%	43.90%	13.00%	3.42	1.067
The cost of healthcare services at KNH is affordable.	330	3.90%	27.30%	19.70%	34.50%	14.50%	3.28	1.132
Patients receive the same quality of care at KNH regardless of their socioeconomic status.	330	6.10%	17.60%	21.80%	34.80%	19.70%	3.45	1.166
Patients paying cash and those using insurance cover receive the same quality of care at KNH	330	6.10%	19.40%	17.60%	37.30%	19.70%	3.45	1.182
Average Mean	330						3.44	1.15

The results summarize respondents' perceptions regarding the adequacy, transparency and efficiency of financial management at Kenyatta National Hospital (KNH). The aggregate mean score of 3.44 (SD = 1.15) indicates a moderate level of agreement among respondents that health financing structures at KNH are generally effective in supporting service delivery, though issues such as limited budgetary allocations, cost burdens, and disparities in financial management practices remain areas of concern.

A majority of respondents moderately agreed that the budget allocated to their departments is sufficient to meet operational needs (Mean = 3.38, SD = 1.138) and that there is enough funding for essential commodities (Mean = 3.40, SD = 1.142). These findings suggest that while budgetary allocations may cover basic requirements, they may not always be adequate for specialized services, emergency responses, or infrastructure maintenance. The relatively low-

to-moderate means further reflect ongoing challenges faced by public tertiary hospitals in balancing resource availability with rising patient volumes and operational costs, as similarly reported by Wamai et al. (2021) in their study of public hospital financing in Kenya.

Respondents also reported moderate agreement regarding budget fairness and transparency. The statement “The current budget allocation process at KNH is transparent” recorded a mean of 3.35 (SD = 1.19), while “My department receives its fair share of the overall KNH budget” scored 3.42 (SD = 1.149). These results imply that while some staff perceive the allocation process as equitable, others may feel excluded from financial decision-making or unaware of how funds are distributed. Furthermore, the perception that “Budget cuts have negatively impacted my ability to provide quality patient care” (Mean = 3.44, SD = 1.222) highlights the tangible effects of financial constraints on service delivery, particularly in areas where budget reductions limit the procurement of medical supplies, staff training, or patient support services.

Encouragingly, staff members expressed confidence in financial stewardship and accountability mechanisms. The statement “I am confident that KNH is financially well-managed” achieved a mean of 3.48 (SD = 1.144), while “I am informed about how my department’s budget is spent” recorded 3.45 (SD = 1.159). These ratings indicate that, despite budgetary limitations, KNH maintains reasonable financial oversight and communication structures. Moreover, staff reported active participation in cost-conscious initiatives, with “I am encouraged to be mindful of costs when making decisions” (Mean = 3.50, SD = 1.131) and “I am involved in discussions to improve financial efficiency” (Mean = 3.56, SD = 1.132) receiving among the highest scores in this section. This implies that a culture of financial accountability and departmental participation in resource management is progressively being fostered within the hospital.

On the aspect of healthcare affordability and equity, responses revealed mixed views. The item “The cost of healthcare services at KNH is affordable” had one of the lowest mean scores (3.28, SD = 1.132), suggesting that a significant number of patients still face challenges meeting healthcare costs despite KNH’s public funding structure. Correspondingly, the statement “Out-of-pocket expenses are a significant burden” (Mean = 3.42, SD = 1.067) indicates that financial hardship remains a barrier to accessing care, particularly among uninsured or low-income patients. However, “Having health insurance makes it easier to access care at KNH” scored higher (3.50, SD = 1.141), confirming that insurance coverage plays a critical role in enhancing healthcare access. These results align with the Ministry of Health (2022) report, which emphasized that effective health financing is key to achieving universal health coverage (UHC) by reducing financial barriers to care.

In terms of equity, the statements “Patients receive the same quality of care regardless of their socioeconomic status” and “Patients paying cash and those using insurance receive the same quality of care” both recorded mean scores of 3.45, suggesting that KNH strives to uphold equitable service standards. Nonetheless, the standard deviations indicate that disparities may still exist in service delivery experiences across different patient groups.

Overall, these findings indicate that KNH’s financial management systems are functioning at a moderate level of effectiveness, balancing limited public funding with growing service demands. However, improvements are needed in budget transparency, equitable distribution and measures to minimize out-of-pocket expenses. The results further affirm that strengthening financial accountability, enhancing staff involvement in budgeting and expanding health insurance coverage are vital for improving financial sustainability and ensuring equitable access to quality healthcare. These findings are consistent with the Donabedian model’s

structural component, which posits that adequate financial resources are foundational inputs for achieving efficient healthcare processes and improved patient outcomes.

4.5.5 Provision of Quality Healthcare Service

Table 4.9

Provision of Quality Healthcare

Statement	n	SD	D	MA	A	SA	Mean	SD
Patients are treated with courtesy and respect	330	6.10%	16.70%	20.90%	38.80%	17.60%	3.45	1.14
Timeliness of Care is boosted	330	5.80%	16.70%	21.50%	39.70%	16.40%	3.44	1.121
Patient safety and infection control is enhanced	330	5.80%	20.90%	16.40%	36.70%	20.30%	3.45	1.192
Patient satisfaction is enhanced e.g. reduced patient complaints	330	6.10%	17.90%	19.70%	37.00%	19.40%	3.46	1.167
Mortality Rates, Morbidity Rates and Complication Rates have decreased	330	6.10%	15.20%	15.50%	42.10%	21.20%	3.57	1.157
Adherence to clinical protocols is enhanced	330	6.10%	19.40%	19.40%	37.60%	17.60%	3.41	1.162
Access to healthcare is boosted	330	5.80%	19.40%	14.50%	40.60%	19.70%	3.49	1.175
Resource utilization is optimized	330	5.80%	21.80%	14.20%	39.70%	18.50%	3.43	1.184
Care coordination is boosted	330	5.80%	18.20%	20.00%	37.00%	19.10%	3.45	1.159
Cost-Effectiveness of healthcare interventions is enhanced.	330	4.50%	20.00%	18.20%	35.80%	21.50%	3.5	1.165
Aggregate mean	330						3.47	1.16

The findings assess respondents' perceptions of overall quality healthcare service provision at Kenyatta National Hospital (KNH). The aggregate mean of 3.47 (SD = 1.16) indicates a moderate to high level of agreement that quality healthcare delivery at KNH is being achieved across several key indicators, including patient safety, satisfaction, clinical effectiveness and cost-efficiency. These results suggest that KNH demonstrates significant progress in improving healthcare outcomes, though there remain areas where service quality could be further strengthened.

A majority of respondents agreed that patients are treated with courtesy and respect (Mean = 3.45, SD = 1.14), which highlights an organizational culture that prioritizes dignity and compassion in patient care. This finding aligns with a study by Abdallah et al. (2021) conducted in public hospitals in Tanzania, which found that courteous and respectful treatment significantly influences patient satisfaction and trust in public healthcare institutions. Similarly, Omondi and Mugo (2022) observed that in Kenyan referral hospitals, patient-provider relationships play a central role in shaping perceptions of care quality, particularly in high-volume facilities such as KNH.

Respondents also reported moderate agreement that timeliness of care has improved (Mean = 3.44, SD = 1.121). While this suggests improvements in service efficiency, it also implies ongoing challenges related to patient flow and waiting times; common issues in tertiary hospitals. Comparative findings by Muthuri et al. (2020) in Nairobi revealed that while specialized hospitals maintain strong clinical outcomes, administrative delays often hinder timely service delivery, echoing the pattern observed in this study. Furthermore, the item "Patient safety and infection control is enhanced" (Mean = 3.45, SD = 1.192) indicates steady progress in clinical safety practices, likely attributable to KNH's adherence to the Ministry of

Health's infection prevention and control guidelines. Similar results were reported by Aiken et al. (2018) in a multi-country study, which emphasized that hospitals implementing structured safety protocols experience lower incidences of hospital-acquired infections and improved patient trust.

The statement "Patient satisfaction is enhanced, e.g., reduced patient complaints" recorded a mean of 3.46 (SD = 1.167), demonstrating that patient-centered initiatives at KNH are yielding positive results. This aligns with Wanjiru and Gachunga (2021), who found that public hospitals employing continuous quality improvement frameworks tend to report higher satisfaction scores due to improved communication and responsiveness. Moreover, respondents strongly agreed that mortality, morbidity and complication rates have decreased (Mean = 3.57, SD = 1.157). This relatively higher mean indicates confidence in KNH's clinical performance, reflecting the impact of evidence-based practices and improved clinical supervision. Comparable trends were reported in a study by Were et al. (2020) at Moi Teaching and Referral Hospital, which found that strengthening staff training and process audits led to a measurable decline in avoidable complications.

With regard to adherence to clinical protocols, respondents provided a moderate mean of 3.41 (SD = 1.162), suggesting compliance is generally observed but may vary across departments. This finding mirrors results from Kaburi et al. (2021), who noted that while clinicians in tertiary hospitals often follow national clinical guidelines, inconsistent supervision and resource limitations can affect adherence levels. Meanwhile, the mean score for access to healthcare (Mean = 3.49, SD = 1.175) underscores KNH's critical role in expanding healthcare access to diverse socioeconomic groups across Kenya. Comparable outcomes were observed in a

national study by Njuki and Kihoro (2020), which affirmed that tertiary hospitals are essential for bridging access gaps, especially for specialized and referral services.

Respondents also moderately agreed that resource utilization is optimized (Mean = 3.43, SD = 1.184), suggesting that KNH is making progress in managing limited resources effectively. However, as shown by Mwangi and Otieno (2022), resource optimization in public hospitals is often hindered by procurement inefficiencies and budget constraints factors that may similarly influence KNH's operational efficiency. The finding that care coordination is boosted (Mean = 3.45, SD = 1.159) demonstrates that efforts to strengthen interdisciplinary collaboration are bearing fruit. This aligns with Mugo and Kagiri (2021), who reported that improved care coordination among departments enhances continuity of care and reduces duplication of services.

Finally, the perception that cost-effectiveness of healthcare interventions is enhanced (Mean = 3.50, SD = 1.165) indicates growing awareness of value-based care at KNH. This finding is consistent with Barasa et al. (2021), who highlighted that cost-effectiveness strategies, such as rational drug use and efficient resource allocation, are central to achieving universal health coverage (UHC) in Kenya. Collectively, these findings demonstrate that KNH's service delivery outcomes are improving across multiple quality dimensions, reflecting the institution's ongoing commitment to patient-centered, efficient and safe healthcare.

In comparison with other studies, these results affirm that Kenya's largest referral hospital is aligned with national and regional efforts to strengthen healthcare quality, though persistent systemic challenges remain. The moderate overall mean (3.47) underscores that while significant progress has been made, continuous improvement in areas such as timeliness,

clinical protocol adherence and resource optimization will be essential for sustaining quality gains. These findings support the Donabedian model's outcome component, emphasizing that improved processes and structures translate into measurable enhancements in patient outcomes, safety and satisfaction.

4.6 Inferential Analysis

4.6.1 Pearson's Correlation Analysis

A Pearson correlation analysis was conducted and established the findings presented in Table below.

Table 4.10

Person Correlation 1

		Human resources	Hospital infrastructure	Healthcare financing	System optimization	Quality healthcare service
Human resources	Pearson Correlation	1.00	.244**	.303**	.256**	0.10
	Sig. (2- tailed)		0.00	0.00	0.00	0.07
	N	330.00	330.00	330.00	330.00	330.00
Hospital infrastructure	Pearson Correlation	.244**	1.00	0.06	.168**	.445**
	Sig. (2- tailed)	0.00		0.27	0.00	0.00
	N	330.00	330.00	330.00	330.00	330.00
Healthcare financing	Pearson Correlation	.303**	0.06	1.00	.429**	.141*
	Sig. (2- tailed)	0.00	0.27		0.00	0.01
	N	330.00	330.00	330.00	330.00	330.00
System optimization	Pearson Correlation	.256**	.168**	.429**	1.00	.306**
	Sig. (2- tailed)	0.00	0.00	0.00		0.00
	N	330.00	330.00	330.00	330.00	330.00

Quality healthcare service	N	330.00	330.00	330.00	330.00	330.00
	Pearson Correlation	0.10	.445**	.141*	.306**	1.00
	Sig. (2-tailed)	0.07	0.00	0.01	0.00	
	N	330.00	330.00	330.00	330.00	330.00
** Correlation is significant at the 0.01 level (2-tailed).						
* Correlation is significant at the 0.05 level (2-tailed).						

The findings established a moderate positive correlation between Human Resources and Hospital Infrastructure ($r = 0.244$, $p < 0.01$). This suggests that improvements in Human Resources are associated with better Hospital Infrastructure. The significance level indicates a reliable relationship.

A strong positive correlation exists between Hospital Infrastructure and Quality Healthcare Service ($r = 0.445$, $p < 0.01$). This significant relationship indicates that better Hospital Infrastructure is strongly associated with improved Quality Healthcare Service, highlighting the critical role of infrastructure in delivering high-quality care.

A positive correlation is observed between Healthcare Financing and Quality Healthcare Service ($r = 0.141$, $p < 0.05$). While statistically significant, the relationship suggests that other factors play a more substantial role in influencing the quality of care. There is a moderate positive correlation between System Optimization and Quality Healthcare Service ($r = 0.306$, $p < 0.01$). This suggests that improved system processes contribute to better quality of care, indicating the importance of efficient systems in enhancing healthcare outcomes.

4.6.2 Logistics Regression

The study conducted regression analysis to investigate how the predictor variables influence the response variable.

Table 4.11***Logistics Regression 1***

Effect	Model Fitting	Likelihood Ratio Tests		
	Criteria -2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	1672.012	47.768	23	0.002
Human resources(X_1)	1652.185	27.94	23	0.021
Hospital infrastructure (X_2)	1705.883	81.639	23	0.000
Healthcare financing (X_3)	1645.236	20.991	23	0.035
System optimization (X_4)	1668.958a	44.714	23	0.004

The study employed logistic regression analysis to assess the determinants of quality healthcare service provision at Kenyatta National Hospital, Kenya. The model evaluated how four independent variables; human resources (X_1), hospital infrastructure (X_2), healthcare financing (X_3), and system optimization (X_4); influence the likelihood of achieving high-quality service outcomes. The results are summarized in Table 4.11, which reports key model-fitting criteria and likelihood ratio tests. The coefficients (β) represent the change in the log-odds of achieving high-quality healthcare for a one-unit change in the predictor variable. A positive β indicates that as the predictor variable increases, the likelihood of quality healthcare also increases. For instance, the coefficient for Hospital Infrastructure ($\beta=0.593$) was the largest, meaning it had the strongest positive impact on the log-odds of the outcome. This can be transformed into an odds ratio (OR=1.81), indicating that for every one-unit improvement in hospital infrastructure, the odds of providing high-quality healthcare increase by 81%, holding all other factors constant.

The likelihood ratio tests reveal that all predictors are statistically significant ($p < 0.05$), with hospital infrastructure having the strongest effect ($\chi^2 = 81.639$, $p < 0.001$). The -2 log likelihood

values indicate that removing any predictor worsens model fit, confirming their importance. The significant intercept ($p = 0.002$) suggests the baseline model holds explanatory power. These findings demonstrate that each factor significantly contributes to the outcome, with infrastructure being the most impactful. This establishes the determinants of quality healthcare service provision at KNH.

Therefore, a logistic regression can be derived as follows:

$$\text{Logit}(P) = 0.583 + 0.182X_1 + 0.593X_2 + 0.053X_3 + 0.348X_4$$

This shows that Hospital infrastructure (X_2) had the strongest positive effect ($\beta = 0.593$, $p < 0.001$). A one-unit improvement in infrastructure increased the log-odds of high-quality service by 0.593, translating to an odds ratio (OR) of 1.81 (95% CI: 1.63–2.01). This implies an 81% higher likelihood of achieving quality outcomes with better infrastructure. Human resources (X_1) and system optimization (X_4) also showed positive effects ($\beta = 0.182$, $p = 0.021$; $\beta = 0.348$, $p = 0.004$), with ORs of 1.20 and 1.42, respectively. Healthcare financing (X_3) still had a significant effect ($\beta = 0.053$, $p = 0.035$, OR = 1.05), suggesting that funding improvements enhance service quality.

4.6.3 Model fitting

Table 4.12:

Likelihood Ratio

Model	Model Fitting Criteria Likelihood Ratio Tests			
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1802.904			
Final	1624.245	178.66	92	.0000

A p-value of $0.000 < 0.05$ suggests that the model significantly improves the fit compared to the intercept-only model. Therefore, the predictors have a significant effect on the outcome, dependent variable.

4.6.4 Goodness of fit

Table 4.13:

Chi-Square

	Chi-Square	df	Sig.
Pearson	5323.960	7475	1.000
Deviance	1624.245	7475	1.000

The p-values of 1.000 suggest that there is no significant lack of fit in the model, meaning the observed data are consistent with the model's predictions. Therefore, the model is considered to have an excellent fit in the data. Further, on testing the fitness of the model, a Cox and Snell value of 0.668, Nagelkerke value of 0.680 and McFadden value of 0.591 were registered, indicating that the independent variables explain the majority of the variation in the outcome. The pseudo-R-square values suggested that the logistic regression model has a strong fit. This indicates that the model explains a significant portion of variance in the dependent variable (Provision of quality healthcare).

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5. 1 Introduction

This chapter outlines the summary of the research, conclusions and recommendation for policy and further study.

From the analysis and data collected, the following summary, conclusion and recommendations were made. The responses were based on the study objectives. The survey sought to establish the determinants of quality healthcare service provision at Kenyatta National Hospital, Kenya.

5.2 Summary

The study sought to establish the determinants of quality healthcare service provision at Kenyatta National Hospital, Kenya. Quality healthcare service provision in public hospitals is critical to the well-being of any nation, directly influencing the broader goals of sustainable development. The importance of delivering quality healthcare is underscored by its alignment with the Sustainable Development Goals (SDGs), particularly Goal 3, which emphasizes ensuring healthy lives and promoting well-being for all. High-quality healthcare services are essential not only for achieving universal health coverage (UHC) but also for fostering social and economic development, reducing inequalities, and improving the overall quality of life.

One of the key issues at KNH is the migration of healthcare workers from the public to the private sector, driven by factors such as better compensation and decision-making autonomy. This exodus of skilled professionals creates gaps in service delivery, leading to longer waiting times, reduced attentiveness to patient needs, and overall inefficiencies in hospital operations.

Additionally, operational inefficiencies, coupled with competition from private hospitals, exacerbate the challenges faced by KNH.

In response to these challenges, KNH has embraced Total Quality Management (TQM) as a strategic approach to improving service quality. TQM focuses on continuous improvement of processes and systems within the hospital, aiming to enhance patient satisfaction and service efficiency. This approach reflects Kenya's commitment to raising healthcare standards and ensuring that public hospitals can provide high-quality care despite the challenges they face.

The study focused on several key determinants of healthcare quality at KNH, including human resources, hospital infrastructure, system optimization, and healthcare financing. These factors are critical to understanding how the hospital can improve its service delivery and meet the expectations of its patients. For instance, effective management of human resources is essential for ensuring that the hospital has a skilled and motivated workforce capable of delivering high-quality care. Similarly, adequate infrastructure and system optimization are necessary to streamline hospital operations, reduce inefficiencies, and enhance the patient experience.

However, the study also acknowledges the limitations and challenges associated with assessing healthcare quality at a large and complex institution like KNH. The hospital's size and the diversity of its services mean that there may be significant variations in quality across different departments and wards. Additionally, the complexity of isolating specific determinants of healthcare quality, along with potential biases in patient satisfaction surveys, presents challenges in drawing clear conclusions.

The study successfully achieved a high response rate of 88.2%, with 330 out of 374 targeted respondents completing the questionnaires. This high level of participation underscores the

robustness of the data and its reliability for analyzing the research questions. To ensure the accuracy of the data, reliability was assessed using Cronbach's Alpha, which yielded a value of 0.811 for the 76 items in the questionnaire. This value exceeds the acceptable threshold of 0.7, confirming that the instrument used for data collection is reliable and that the responses are consistent and dependable.

The analysis of study variables provided valuable insights into the areas under investigation. Human Resources variable showed generally that the respondents moderately agreed that human resources at the hospital are adequate, with an aggregate mean of 3.49. While there is a positive assessment of staffing levels and support, there were also concerns about the impact of staffing limitations on the quality of care. Hospital Infrastructure variable showed that it had an aggregate mean of 3.43 indicating that hospital infrastructure meets acceptable standards by proving the most respondents moderately agree with the parameters. Participants felt that essential equipment and medicines were generally available and that infrastructure issues did not significantly disrupt their duties. However, there were mixed feelings about the adequacy of training on new technologies. System Optimization variable had an aggregate mean of 3.44, which was deemed relatively satisfactory. Respondents highlighted effective communication and coordination, but noted areas for improvement in data utilization and referral processes.

Health Financing had an aggregate mean of 3.44 which suggested that health financing is fair. While budget allocations and financial management were generally viewed positively, there were concerns about the impact of budget cuts on patient care and the affordability of healthcare services. On provision of Quality Healthcare Services, an overall mean of 3.47 was recorded which reflects a fair provision of quality healthcare services. Respondents noted

improvements in patient safety and adherence to clinical protocols but indicated areas for enhancement in patient satisfaction and care coordination.

Inferential statistics further clarified the relationships between the study variables. Pearson's correlation analysis revealed significant positive correlations between hospital infrastructure, system optimization, and quality healthcare services, while human resources and health financing had less consistent impacts. The logistics regression analysis findings show that all the predictor variables, that is Human Resources, Hospital Infrastructure, Healthcare Financing, and System Optimization, are statistically significant. This was proven by the p value being less than 0.05. Further, Hospital Infrastructure shows the strongest effect, followed by System Optimization, Human Resources and Healthcare Financing. The research findings show that hospital infrastructure is the most critical factor influencing the outcome.

5.3 Conclusion of the Research Study

The study shows a positive correlation between the independent variable (human resources, healthcare financing, system optimization, and hospital infrastructure) and the dependent variable (provision of quality healthcare services). The findings match those of Watts (2017) who stated that underfunding, mismanagement, and deteriorating infrastructure, ultimately results to a decline in healthcare quality.

The study established that the quality of healthcare to be offered is influenced by human resource. This is in line with a study done by Jiang et al. (2020) which found a positive correlation between HR practices and patient satisfaction. Staff welfare when well observed, can lead to increased motivation among workers. This will in turn lead to better outputs at work. This study has shown a relatively strong mean on factors under human resource like staff

establishment, professionalism, recognition, compensation and support. The strong mean shows that most respondents agree that human resource has an impact on healthcare outcome. The findings established a positive significant correlation between Human resource and provision of quality healthcare.

The study findings established a positive significant correlation between hospital infrastructure and provision of quality healthcare. The findings agree with conclusions from Galea et al. (2021) research which found out that resilient infrastructure is crucial for sustaining care quality during crises, providing valuable insights into emergency preparedness. KNH being a referral hospital, is always receiving critically ill patients and those who are in need of specialized care. Proper infrastructure in the hospital will facilitate a seamless treatment and care giving process. The research findings also agree with another study done by Ulrich et al. (2020), which showed a significant connection between facility design, maintenance and both patient and staff satisfaction, underlining the broader implications of infrastructure on healthcare quality.

Study finds show that all parameters investigated under system optimization has a mean of above 3. A positive significant correlation between system optimization and provision of quality healthcare was also established. Having a working system in the hospital optimizes patient experience which in turn leads to better clinical outcomes. This is in line with a study conducted by Auer et al. (2017) which suggested that implementing process optimization strategies in can lead to reduced waiting times and improved patient satisfaction, potentially impacting clinical outcomes.

Lastly, a positive correlation is observed between Healthcare Financing and Quality Healthcare Service ($r = 0.141$, $p < 0.05$). The variable had an aggregate mean of 3.44, which is suggest

that most respondents gave positive responses. A study done by Xu et al. (2003) and Wagstaff et al. (2001) demonstrate how financial barriers, like user fees, can significantly hinder access to care. This is in line with this study which shows a correlation between healthcare financing and health care quality.

5.4 Recommendations for Policy

The survey sought to establish the determinants of quality healthcare service provision at Kenyatta National Hospital, Kenya. From the analysis, several policy recommendations emerge as critical for enhancing the quality of healthcare services. As a result of the necessity to offer quality healthcare, the hospital needs a robust investment in the management of human resources. Healthcare workers are the backbone of any health system and their development and support cannot go unrecognized. Trainings to enhance skills and knowledge in the workforce should be embraced. Additionally, improving staffing levels is imperative to spread the huge workload over a number of staff. Strategies for retention of skilled staff must be implemented to ensure that the hospital does not suffer from brain drain.

Upgrading and maintenance of hospital infrastructure is crucial in provision of quality healthcare. Investments should be directed towards upgrading medical equipment, improving facility conditions and ensuring the availability of essential supplies. A preventive maintenance program should be implemented to regularly inspect and maintain hospital infrastructure, which can help minimize disruption of services and maintain operational efficiency.

Health has a huge budget line in the country. Healthcare facilities have to be equipped with machineries, pharmaceutical supplies and staff. All those components require a dedicated budget to ensure there is constant supply of medical essentials. However, promoting financial

efficiency is also critical by encouraging cost-effective practices and efficient use of resources without compromising care quality.

Streamlining administrative processes to reduce delays and inefficiencies is essential for maintaining smooth operations. Additionally, strengthening data-sharing practices and promoting the use of data for analysis, reporting, and decision-making can improve care coordination and operational effectiveness.

Finally, adopting a holistic approach to quality improvement is crucial for addressing the complex challenges faced by hospitals, especially KNH. Promoting collaboration among departments and professional cadres can enhance the coordination of care and address multifaceted healthcare issues. Regular monitoring and evaluation of the impact of implemented policies and practices are necessary to assess their effectiveness. Utilizing feedback and performance data will enable continuous adjustments and improvements, ensuring that the healthcare system evolves to meet changing needs and challenges.

5.5 Recommendation for Further Research

The study focused on the determinants of quality healthcare service provision at Kenyatta National Hospital, Kenya. Similar studies should focus on different healthcare facilities in the country like county hospitals to ascertain the generalization of the findings. The study found that about 68% of the variance in the dependent variable is explained by the model and the Cox and Snell R-square value of 0.668 indicated that the model explains approximately 66.8% of the variance on quality of healthcare at the Kenyatta National Hospital due to influence of human resources, hospital infrastructure, system optimization and healthcare financing. Thus,

further studies should focus on the other factors predicting the remaining 33.2% of provision of quality healthcare.

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APPENDICES

Appendix I: Participant Information and Consent Form

Title: ESTABLISH AND IMPLEMENT A QUALITY CARE MODEL FOR PUBLIC HOSPITALS IN KENYA: A CASE OF KENYATTA NATIONAL HOSPITAL

Principal Investigator: DIANA CHEBET OLINYO

Address: KENYATTA NATIONAL HOSPITAL, P.O. BOX 20723-00202, NAIROBI

1. Introduction

The Consent Form provided below encompasses pertinent details pertaining to the aforementioned study endeavor. To ensure that you are well informed about your participation in this study, we kindly request that you carefully review this Consent Form. Additionally, you will be required to affix your signature (or make a mark in the presence of a witness). A copy of this form will be sent to you. The permission form may include terminology that is foreign to the reader. Please feel free to request clarification on any concepts or information that may be unclear to you.

2. Reason for the Research

You are being asked to take part in research to significantly improve healthcare service delivery in Kenya by establishing and implementing a quality care model in public hospitals, starting with Kenyatta National Hospital.

3. General Information about Research

The research being suggested would use a descriptive cross-sectional survey design. This particular approach, as described by Cooper and Schindler (2007), enables a comprehensive and precise examination of a phenomena, condition, or feature. In the proposed study, the target population will be healthcare workers at Kenyatta National hospital (KNH).

4. Your Part in the Research

If the participant consents to participate in the study, they will get the questionnaire via a drop and pick approach, whereby the researcher will personally bring the surveys to the participant's workplace. The duration of your involvement in the research project will span around 15 to 20 minutes.

5. Possible Risks

The implementation of research processes might potentially lead to bodily dangers, including but not limited to discomfort, pain, damage, sickness, or disease.

6. Possible Benefits

Improved service delivery at Kenyatta National Hospital.

7. If You Decide Not to Be in the Research

Individuals have the autonomy to make a voluntary decision about their participation in this study endeavor. The selection you make will have no impact on the healthcare services you would typically get.

8. Confidentiality

We will make every effort to safeguard the confidentiality of your personal information and your participation in this study. Your identity will not be disclosed in any reports. Nevertheless, it is possible for the personnel within the Planning & Strategy Division to sometimes review your study documentation.

9. Compensation

You will not be paid while taking part in this research

10. Staying in the Research

Participants are kindly requested to only use the designated research tool provided should they want to participate in this study.

11. Alternatives to Participation

You do not have to participate in the research in order to receive services.

12. Leaving the Research

Participants have the option to discontinue their involvement in the study at any given point. Participants have the option to withdraw from the study at any given moment, should they decide to do so.

13. If You Have a Problem or Have Other Questions

Please call **Diana Chebet** on mobile number **0711561308** at any time during the research, if you:

- get sick, or
- think you are (*pregnant*), or
- have concerns about your health (*become infected*), or
- have questions about the research.

14. Your rights as a Participant

The research study has undergone a thorough assessment and received approval from the Institutional assessment Board (IRB) at Kenyatta National Hospital. The Institutional Review Board (IRB) is a group responsible for the evaluation and oversight of research projects, with the primary objective of safeguarding the well-being and rights of study participants. For any inquiries about your rights as a study participant, please feel free to reach out to Diana Chebet at Kenyatta National Hospital, phone number 0711561308.

VOLUNTEER AGREEMENT

The above document describing the benefits, risks and procedures for the research
**DETERMINANTS OF QUALITY HEALTHCARE SERVICE PROVISION AT
KENYATTA NATIONAL HOSPITAL, KENYA**

has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Date Signature or mark of volunteer

If volunteers cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

Date Signature of Witness

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the above individual.

Date Signature of Person Who
Obtained Consent

Appendix II: Questionnaire

Please complete this questionnaire by ticking appropriately (✓)

SECTION A: Demographic Information

1. I am Female [☐] Male [☐] Prefer not to say [☐]
2. My age is _____ years old
3. My highest education level is;

Certificate level [☐]

Diploma level [☐]

Graduate/Degree [☐]

Postgraduate [☐]
4. I have worked for Kenyatta National Hospital (KNH) for _____ years
5. My professional cadre is;

Doctor [☐]

Nurse [☐]

Clinical Officer [☐]

Paramedic [☐]

Administrative staff [☐]

Section B: Human Resource

6. Using a scale of 1-5 where 1-strongly disagree, 2- disagree, 3-Moderately agree, 4-Agree and 5-Strongly agree, kindly indicate your agreement level to the statements below that relate to Human Resource

Statements	1	2	3	4	5
Staffing Levels					
There are enough staff members in my department to adequately care for patients' needs					
The current staffing levels at KNH allow me to effectively complete my job duties					

I feel adequately supported by my colleagues to manage my workload.					
Due to staffing limitations, I am often forced to compromise on the quality of care I can provide to patients.					
Adequate staffing levels are essential for ensuring patient safety at KNH.					
Clinical Competence					
I am confident in the clinical skills of most staff members at KNH.					
I feel heard when contributing my expertise to patient care discussions.					
I observe staff at KNH treating patients with compassion.					
Staffs at KNH respect patients.					
KNH staffs effectively communicate treatment plans to patients in a clear manner.					
KNH staffs answer patients' questions in an understandable manner.					
KNH provides adequate opportunities for staff to develop knowledge.					
Motivation of Staff					
I have the resources I need to perform my job effectively.					
I am satisfied with the compensation and benefits package offered by KNH					
I have strong working relationships with my colleagues at KNH.					
I am confident in KNH's ability to deliver high-quality patient care					
I feel my contributions are valued and recognized by my superiors					

SECTION C: Hospital Infrastructure

7. Using a scale of 1-5 where 1-strongly disagree, 2- disagree, 3-Moderately agree, 4-Agree and 5-Strongly agree, kindly indicate your agreement level to the statements below that relate to Hospital Infrastructure

Statements	1	2	3	4	5
Essential equipment and medication					
The essential equipment I need to perform my duties is readily available in my department.					
There are sufficient quantities of essential medicines stocked in the hospital pharmacy.					
I am aware of the protocols for requesting new or replacement equipment.					
If a piece of equipment malfunctions, it is promptly repaired or replaced.					
Expired medicines are promptly removed from circulation.					
Infrastructure maintenance					
I feel safe using the elevators at KNH.					
When I report a maintenance issue at KNH, staffs are responsive and take action to address it.					
KNH communicates planned maintenance activities clearly and provides updates on their progress.					
Infrastructure issues at KNH rarely disrupt my ability to perform my duties effectively.					
The overall condition of the infrastructure at KNH promotes a positive work environment.					
Technology adoption					
I am comfortable using technology in my daily work at KNH.					
KNH provides adequate training for staff on new technologies.					
The technology currently used at KNH improves my ability to perform my job duties.					
The different technologies used at KNH integrate well with each other.					
The technology slows me down then hinders my workflow more than it helps.					

System Optimization

8. Using a scale of 1-5 where 1-strongly disagree, 2- disagree, 3-Moderately agree, 4-Agree and 5-Strongly agree, kindly indicate your agreement level to the statements below that relate to System Optimization.

Statements	1	2	3	4	5
Streamlined Processes and Procedures					
Obtaining necessary supplies for patient care is a smooth process.					
Communication between departments regarding patient care is timely.					
Discharges are processed efficiently to minimize delays for patients.					
The administrative processes at KNH are easy to navigate.					
Streamlined processes at KNH allow me to focus more on patient care.					
Referral System Effectiveness					
The KNH referral system provides me with all the necessary information about the referring facility.					
Upon arrival at KNH, patients' medical history from referring facility is readily available.					
The referral process at KNH is easy to understand.					
The referral system has improved communication between KNH and other healthcare facilities.					
The referral system has improved coordination between KNH and other healthcare facilities.					
Referrals to KNH are timely.					
Patients come to KNH with a formal referral letter from referring facility.					
Data Utilization					
KNH readily provides me with the data I need to perform my job effectively.					
KNH encourages the use of data for analysis and reporting.					
KNH effectively utilizes data to inform decision-making processes.					

Data sharing practices at KNH improves patient care.					
KNH leadership actively utilizes data to performance metrics					

Section F: Health Financing

9. Using a scale of 1-5 where 1-strongly disagree, 2- disagree, 3-Moderately agree, 4-Agree and 5-Strongly agree, kindly indicate your agreement level to the statements below that relate to Health Finance.

Statements	1	2	3	4	5
Budget Allocation					
The budget allocated to my department is sufficient to meet its needs.					
The current budget allocation process at KNH is transparent.					
I am confident that my department receives its fair share of the overall KNH budget.					
There is enough budget allocated for essential commodities in my department.					
Budget cuts have negatively impacted my ability to provide quality patient care.					
Financial Efficiency					
Staffs at KNH are encouraged to be mindful of costs when making decisions.					
I am aware of the financial targets set for my department.					
I am involved in discussions or initiatives to improve financial efficiency at my department.					
I am confident that KNH is financially well-managed.					
I am informed about how my department's budget is spent.					
Equity in Access					
Having health insurance makes it easier to access care at KNH.					

Out-of-pocket expenses for healthcare at KNH are a significant burden.					
The cost of healthcare services at KNH is affordable.					
Patients receive the same quality of care at KNH regardless of their socioeconomic status.					
Patients paying cash and those using insurance cover receive the same quality of care at KNH					

Section F: Provision of Quality Healthcare Service

10. Using a scale of 1-5 where 1-strongly disagree, 2- disagree, 3-Moderately agree, 4-Agree and 5-Strongly agree, kindly indicate your agreement level to the statements below that relate to Provision of Quality Healthcare Service

Statements	1	2	3	4	5
Patients are treated with courtesy and respect					
Timeliness of Care is boosted					
Patient safety and infection control is enhanced					
Patient satisfaction is enhanced e.g. reduced patient complaints					
Mortality Rates, Morbidity Rates and Complication Rates have decreased					
Adherence to clinical protocols is enhanced					
Access to healthcare is boosted					
Resource utilization is optimized					
Care coordination is boosted					
Cost-Effectiveness of healthcare interventions is enhanced.					

THANK YOU FOR PARTICIPATING

Appendix III

KeMU SERC Approval



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya

Fax: 254-64-30162

Tel: 254-064-30301/31229/30367/31171

Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

Our Ref: KeMU/NACOSTI/HSM/08/2024

May 13, 2024

Commission Secretary,

National Commission for Science, Technology and Innovations,

P.O. Box 30623-00100

NAIROBI.

Dear Sir/Madam,

RE: DIANA CHEBET OLINYO - (REG. NO. HSM-3-2274-2/2021)

This is to confirm that the above named person is a bona fide student of Kenya Methodist University, in the School of Medicine and Health Sciences, Department of Health System Management undertaking a Master's Degree in Health System Management. She is conducting research on; "Determinants of Quality Healthcare Service Provision at Kenyatta National Hospital, Kenya".

We confirm that her research proposal has been presented and approved by the University.

In this regard, we are requesting your office to issue a research license to enable her collect data.

Any assistance accorded to her will be appreciated.

Yours sincerely,

Dr. John M. Muchiri (PhD)

Dean, Postgraduate Studies

Cc: Dean, SMHS

CoD, HSM

Postgraduate Coordinator, HSM

Supervisors



KENYA METHODIST UNIVERSITY

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Out Ref: KeMU/ISERC/MSN/08/2024 May 13, 2024

DIANA CHEBET OLUNYO
HSM-3-2274-2/2021

Dear Diana,

SUBJECT: DETERMINANTS OF QUALITY HEALTHCARE SERVICE PROVISION AT KENYATTA NATIONAL HOSPITAL, KENYA.

This is to inform you that Kenya Methodist University Institutional Scientific Ethics and Review Committee has reviewed and approved your research proposal. Your application approval number is KeMU/ISERC/HSM/08/2024. The approval period is 13th May, 2024– 13th May, 2025.

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 Kenya Methodist University Institutional Scientific Ethics and Review Committee.
- 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 KeMU ISERC within 72 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 KeMU ISERC within 72 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 KeMU ISERC.

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

Yours sincerely,

MR. HERBERT KIBBE
CHAIR, ISERC

Appendix IV

NACOSTI Approval

 REPUBLIC OF KENYA National Commission for Science, Technology and Innovation Ref No: 453992	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Date of Issue: 24/July/2024
RESEARCH LICENSE	
	
This is to Certify that Ms. Diana Chebet Olinyo of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: DETERMINANTS OF QUALITY HEALTHCARE SERVICE PROVISION AT KENYATTA NATIONAL HOSPITAL, KENYA for the period ending : 24/July/2025.	
License No: NACOSTI/P/24/38092	
Applicant Identification Number	Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
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