ENTREPRENEURIAL SUPPLY CHAIN PRACTICES, HEALTHCARE FINANCING AND PERFORMANCE OF PUBLIC HOSPITALS IN KENYA

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DECLARATION

This thesis is my original work and has not been presented elsewhere for a degree or any other award.

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In loving memory of my parents. Mr. Julius Ndung'u John & Mrs. Liberatah Wanjiku Kamau. May God grant you eternal rest and May His perpetual light shine upon your souls forever, until we meet again.

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LIST OF ABBREVIATIONS/ACRONYMS

BETA	Bottom-Up Economic Transformation Agenda
BCG	Bacillus Calmette-Guérin
CEO	Chief Executive Officer
ECIDP	Embu County Integrated Development Plan
ESCM	Entrepreneurial Supply Chain Management
F/Y	Financial Year
GDP	Gross Domestic Product
GoK	Government of Kenya
HMIS	Healthcare Management Information System
ICT	Information and Communication Technology
ICU	Intensive Care Unit
JIT	Just in Time
KEMSA	Kenya Medical Supplies Authority
MEDs	Mission for Essential Drugs and Supplies
MES	Management Equipment System
MOH	Ministry of Health
NACOSTI	National Commission for Science Technology & Innovation
NHI	National Health Insurance
NHIF	National Health Insurance Fund
RBV	Resource Based View
RDT	Resource Dependency Theory
ROT	Resource Orchestration Theory
SCM	Supply Chain Management
SDGs	Sustainable Development Goals
SET	Schumpeterian Entrepreneurship Theory
SMEs	Small and Medium Enterprises
SHA	Social Health Authority
UDA	United Democratic Alliance
UHC	Universal Health Coverage
UN	United Nations
USD	United States Dollar
WHO	World Health Organisation

DEFINITION OF TERMS

Effectiveness	It relates to the achievement of organisational goals.
Entrepreneurial	This refers to the tendency and ability of an organisation to act like entrepreneurs through being proactive, adopting innovation and being risk takers, thus creating opportunities to generate value for the organisation.
Entrepreneurship	It is the spirit of taking risks, identifying opportunities, and creating innovative solutions to address market needs. It involves the initiation and management of a new business venture by developing an idea into a profitable enterprise.
Entrepreneurial Supply Chain Practices	Supply chain practices that adopt opportunistic entrepreneurial practices. These practices are established upon innovation, pro-activeness and risk-taking. These practices enable a supply chain to recognise and respond to market opportunities and customer needs efficiently.
Financial Viability	The ability of a firm to generate funds for daily and long-term operations
Healthcare Financing	This refer to the ability of a public hospital to acquire, make available, and utilise resources.
Innovative Inventory Management	Adoption of new technologies, research, and development initiatives to manage resources in the public healthcare facility
Organisational Relevance	An organisation can adapt to changes in the operating environment.
Performance	Output from the public hospital. Relate to mortality rates, referrals, employee satisfaction, and reduced complaints.
Proactive Strategic Sourcing	Adoption of supplier relationships and procurement planning in the public healthcare facility.
Public hospital	A facility that receives most of its capitation from the government and provides healthcare services to the members of the public.
Risk Taking	The ability of a public hospital to commit enormous resources to unknown and uncertain ventures to stimulate growth and gains.

ABSTRACT

The Kenya Vision 2030 development blueprint aspires to promote good health and well-being. Consequently, the Government of Kenya has instituted reforms aimed at achieving good health. These reforms include the establishment and revamping of the Kenya Medical Supplies Authority (KEMSA) and a recent establishment of the Social Health Authority. Despite these reforms, there is poor performance in the public hospitals in Kenya. To ensure efficient, financially viable and relevant service delivery, the entrepreneurial supply chain is critical, in public hospitals. Therefore, the study focused on entrepreneurial supply chain practices, healthcare financing, and the performance of public hospitals in Kenya. Specifically, the study investigated the effect of innovative inventory management on the performance of public hospitals in Kenya, the influence of proactive strategic sourcing on the performance of public hospitals in Kenya, and the effect of risk taking on the performance of public hospitals in Kenya. The study also sought to establish the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The study used resource orchestration, resource dependency, and Schumpeterian entrepreneurship theories. The study adopted a positivism philosophy and utilised descriptive and explanatory research designs. The study's target population was 243 public level 4, level 5 and level 6 hospitals in Kenya. The sample size was 151 public hospitals selected through proportionate sampling and simple random sampling techniques. The unit of observation was 302 respondents. The study utilised primary data collected through a semi-structured questionnaire, whose validity was evaluated using face and content analysis, while reliability was checked through the use of Cronbach Alpha with an acceptable coefficient value of 0.7. The collected data was analysed descriptively and inferentially, while qualitative data was analysed thematically using content analysis. The findings revealed that innovative inventory management, proactive strategic sourcing, and risk taking have a positive and statistically significant relationship with the performance of public hospitals in Kenya. The study revealed a statistically significant moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and performance of public hospitals in Kenya. The study concluded that the adoption of entrepreneurial supply chain practices improves performance of public hospitals and therefore recommends the chief executive officers and medical superintendents of public hospitals to adopt innovative inventory management, proactive strategic sourcing and risk taking as they promote healthcare service delivery, enhance hospital financial viability, reduce operational costs, enhance hospital reputation and increase effectiveness. The study recommends the Ministry of Health, Social Health Authority, Treasury and County Executive Committee member for Health in the county governments to institute policies and reforms that promote entrepreneurial supply chain practices and sustainable healthcare financing in order to improve the performance of public hospitals in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The right to health is a fundamental human right affirmed clearly in global, regional and national health frameworks. As human beings, our health is a great sense of concern. Human beings consider health as a basic essential asset as good health enable people to take care of their daily activities, while ill health makes it difficult for people to attend to our daily activities (United Nations, 2025). Healthcare is fundamental in enriching public health across the globe and access to healthcare services promote and maintain health, prevents and manages diseases while achieving equity in health by removing disparities (Lim *et al.*, 2023). Consequently, leaders across the globe whose countries are member states of the World Health Organisation (WHO) aim to continuously improve healthcare systems for all, in a bid to achieve this basic human right.

According to WHO (2025), the enjoyment of the right to health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. The first mention of the right to health was in the WHO constitution of 1946. The constitution elaborates health as a state of physical, mental and social well-being and not just the absence of disease. The constitution further states that it's the task of every government to ensure that the health of all peoples in their country is promoted and protected.

The 1948 Universal Declaration of Human Rights Article 25 mention that every person has the right to a standard of living characterised by adequate health and well-being for him/herself and his/her family. This well-being considers factors such as food, shelter, clothing and medical care (United Nations, 2025). The 1966 International Covenant on Economic, Social and Cultural Rights Article 12 recognise the right of everyone to enjoy highest attainable standards of physical and mental health. This can be achieved through reduction of stillbirth and infant mortality rates, prevention and control of epidemics and other diseases and creation of conditions that assure access to medical attention in the event of any sickness (United Nations, 2025).

Since 1966, advancements have been made to promote the fulfillment of this right. The United Nations (UN) third Sustainable Development Goal (SDG) aspires to ensure healthy lives and promote well-being for all people at all ages. The African Union

Agenda 2063 possess pillars aimed at high standards of living, improved quality of life and well-being for all people, healthy-well-nourished citizens and the expansion and equitable access to quality healthcare services for all across the globe and in the African continent (Simeoni & Kinoti, 2023).

The East Africa Community (EAC) Vision 2050 postulates that by the year 2050, the East African countries' per capita income will grow tenfold to USD. 10,000, consequently moving the nations to middle-income countries. The change in income status in East Africa will be established upon 100% access to healthcare services by the citizens which will be achieved through; increased healthcare financing, recruitment, training and retention of the healthcare workforce, improved distribution and access to safe, affordable and quality medicines, vaccines and medical technologies and harmonised healthcare legislations (East Africa Community, Vision 2050).

The Kenya 2010 Constitution, the Vision 2030 agenda, the Kenya Universal Health Coverage (UHC) Policy (2014-2030), a Sessional Paper No. 2 of 2017, the Health Act 2017, the Big Four Agenda and the Bottom-Up Economic Transformation Agenda (BETA), all aim to increase access to quality healthcare for all Kenyan citizens; be it promotive, curative, preventive, rehabilitative or palliative care and promote health tourism into the country for socio-economic development (Ministry of Health, 2020).

The Kenya Vision 2030 aims at promoting health tourism into the country through positioning Kenya as a destination for specialised medical and health services by training and retaining specialised expertise, giving Kenyans access to specialised medical services within the country and creation of employment in specialised healthcare (GoK, 2023). This consequently results in improved quality of life and overall good health for Kenyan citizens (Simeoni & Kinoti, 2023).

Healthcare in the world can be traced back to ancient Greece where public hospitals were established by the Byzantine Empire in the early 4th century. Way later in the 19th century, the birth of modern-day healthcare happened. In 1860, the first medical school in the world was established by Florence Nightingale who was a healthcare entrepreneur and nurse. Fast forward to the 21st century, advancements in healthcare are diverse with the proliferation of public and private healthcare facilities offering a vast array of

healthcare services, being prevalent. All these facilities are established with the major goal - maximising health outcomes by promoting good health (Lim *et al*., 2023).

Good health is a state of well-being and not just the absence of disease and access to good health is an essential service in any country, as it inspires productivity, growth and sustainable development. Good health is established upon reduction of global maternal and child mortalities, end to infectious and non-communicable diseases, end to substance abuse, reduction of road traffic accidents and the achievement of universal healthcare for all (United Nations, 2023). Additionally, to achieve good health there should be prevention and treatment of substance abuse, reduction of deaths and injuries from traffic accidents and ensuring universal access to sexual and reproductive health. Achieving good health also incorporates achieving UHC, by ensuring equal access to medical care to all, while protecting the public from financial constraints and ensuring retention of healthcare workforce (United Nations Global Summit, 2023).

Good health inspires society to thrive and become productive, while the fear of sickness stalls production, consumption and overall human well-being. Diseases stagnate a nation's economy by disrupting business continuity and creating supply chain disruptions, resulting in a very low annual Gross Domestic Product (GDP) (Smith *et al*., 2019). According to UN (2025) at least over 400 million people lack access to basic healthcare and 40% of the said people lack social health protection. Good health as a right has several entitlements that should be achieved. These entitlements include social protection which provides equality of opportunity for everyone to enjoy this basic right, access to essential medicines and vaccines, timely access to basic health amenities, access to information and education related to healthcare and the participation in decision making and policy formulation in areas regarding health (United Nations, 2025).

To achieve good health, a lot of money is spent on providing healthcare services with the annual global healthcare spending standing at USD 7 Trillion as of 2022. In the United Kingdom every €5 spent €1 is spent on healthcare, while in Africa as of 2018, healthcare spending in the GDP was at 7% in Kenya, 4.6% in Mozambique, 5% in Ethiopia and Nigeria respectively and 6.5% in Ghana. The increase in healthcare spending has brought a considerable increase in per capita spending in the world. Healthcare spending figures are gradually rising due to a rise in the ageing population,

more complex diseases requiring complex medications and other technical/institutional aspects facing the healthcare systems (Anderson *et al*., 2022).

Despite heavy healthcare expenditure, services provided in public hospitals across the globe are not commensurate with the resources invested therein (Di Giorgio *et al*., 2022). The situation is further complicated due to uncertainties that exist in the healthcare supply chains that consequently affect the utilisation of healthcare resources by the people (Lau *et al.*, 2022). There is continuous inaccessibility, unavailability and unaffordability of public healthcare services across the globe (Dixit *et al*., 2020).

The provision of day-to-day services to patients and consumers is not done in a timely and effective manner with patients waiting for long hours in queues to access healthcare services (Iyengar *et al*., 2023). Zeferino *et al*., (2023) emphasise that global public healthcare systems face similar challenges ranging from an ageing population, low digitisation and adoption of new technologies, increasing demand for health services, immense drug and medical personnel shortage and financial challenges. Specifically, the utilisation of healthcare systems in Europe, the USA, Asia and Africa is faced with inadequate supply and unequal distribution of healthcare facilities, poor product sourcing, unavailability of healthcare personnel, low technology use, lack of essential medicines, poor supplier relationships, lack of procurement planning, the upsurge of medical tourism to foreign countries and the rapid expansion of private healthcare facilities (Iyengar *et al*., 2023).

According to Alumran *et al*., (2021), the Kingdom of Saudi Arabia as of 2021 had 274 public hospitals, where more than half of the hospitals are moving towards privatisation to improve accessibility and quality of healthcare services. In Indonesia, private hospitals are on a rise due to the inefficiencies encountered in the public healthcare sector. Additionally, the Indonesian healthcare expenditure is at 2.8% of the GDP. 47% of the hospital treatment expenses are paid out-of-pocket by the citizens due to the inefficiencies in the public insurance payments. Notwithstanding, the introduction of the National Health Insurance (NHI) by the Indonesian government which was aimed at reducing the high financial burden, there remain gaps in the public healthcare sector as NHI emphasises curative care making preventive access to healthcare difficult.

The WHO Eastern Mediterranean Region experiences weak governance and leadership in healthcare, insufficient healthcare funding, shortage of healthcare workforce, lack of essential medicines, poor procurement and sourcing practices, rapid expansion of private healthcare facilities and increased out-of-pocket payments by patients (WHO, 2022). In Africa, the disease burden for communicable and non-communicable diseases are on the rise and this is attributed to inadequate access to essential medicines, unaffordability of healthcare services and high out-of-pocket payments by the residents. Noteworthy, in Africa, most medicines are imported making the affordability by patients hectic (Adebisi *et al*., 2022). The dilapidated state of public hospitals in Africa results in very high levels of medical brain drain and medical tourism out of Africa. Specifically, in Nigeria, over 5,000 people leave the country every month to seek treatment abroad causing an overall loss of 1.2 Billion USD every year (Oleribe *et al*., 2019).

An additional of over 18 million health workers are needed globally to help achieve the UHC agenda by the year 2030. The possibility of achieving UHC is a concern since there is an estimated shortage of doctors with a figure of 15 million by 2030 (Quamruzzaman, 2020). Specifically, in Kenya, 5 healthcare workers serve a total population of 1000. Lack of capacity to serve the total population is another blow, as 1.5 healthcare facilities serve 1000 people with only 50 hospital beds to serve a total of 100,000 people.

In South Africa and across the world, half of the population have problems accessing essential medicines. In the USA in 2022 over 450 types of drugs were in shortage, inclusive of oncology treatments for cancer patients. In Europe, 91.8% of pharmacists have experienced drug shortages over the last 4 years. This shortage of drugs and essential supplies has been attributed to delays in awarding tenders, lack of manufacturing capacity making a country rely heavily on imports, long supplier lead times, failure of suppliers to meet demands and general payment issues with suppliers. The provision of essential medicines relies heavily on an efficient supply chain system which is the focus of this study (Modisakeng *et al*., 2020)

Despite the Government of Kenya (GoK) interventions through implementation of both international goals and national frameworks, arguably, there is very minimal and slow progress towards the achievement of good health for Kenyans. Notably, Kenya has

made strides in improving healthcare access and quality ranking second in Africa on the Health Access and Quality (HAQ) index but this still falls below the global average. While the country's HAQ score is rising, challenges persist (MoH, 2024). Public hospitals in Kenya face a commonplace challenge; Unavailability of medicines, equipment, and essential supplies with only 33% of public hospitals having adequate stock for 90 days or more and 67% accounting for an unavailable medical stock for up to 30 days or more (Barasa *et al*., 2020). This has been attributed to delays in procurement and lack of a decentralised drugs and medical supply procurement system at the county level (Masaba *et al*., 2020; Osetinsky *et al*., 2020). The MoH (2025) reiterates that there are periodic stock-outs in public hospitals due to inadequate healthcare financing for supporting procurement and inadequate planning and execution of the procurement process.

Despite Kenya being a major pharmaceutical market player, there is still inadequate drugs. The Kenyan pharmaceutical market stood at USD 1 million in 2017 totalling to 50% and 8% of the pharmaceutical market in East Africa and Africa, respectively. The value is expected to grow to USD 197 million in 2026. The country grapples with low production of non-pharmaceutical products with heavy importation being prevalent to a tune of 90%. The imports are obtained from majorly China and India (United States Government, 2022).

As at 2024, there were only 26 registered manufacturers of pharmaceuticals in Kenya in the Pharmacy and Poisons Board register. Only about 40% to 60% of the established manufacturing capacity by the pharmaceutical companies is in use and just 30% of the pharmaceutical needs are being met locally. 70% of the pharmaceuticals demand is met through imports. Artemisinin which is used to produce antimalarial drug is the only active pharmaceutical ingredient produced in Kenya and 100% of it is exported for purification (MoH, 2025).

Various interventions aimed at spurring drugs manufacturing capacity locally have been instituted. A presidential directive of 2024 stipulated that Kenya should ensure 50% of the 4,000 essential drugs purchased by the public sector are manufactured locally. The creation of both regulatory and operational incentives such as pricing preferences at KEMSA where 15% of price preference and discounts for local manufacturers is issued and procurement of certain medication strictly from Kenyan manufacturers are some of

these initiatives. Despite the GoK efforts to incentivise the development and operationalisation of local pharmaceutical manufacturing, the country is still facing drug shortages (GoK, 2024).

The lack of medicines greatly contributes to low access of essential medicines which results in high morbidity and mortality rates (Barasa *et al*., 2020). In the year 2020, the Kenyan annual mortality rate was 420,000 persons where 64%, 26% and 10% represent deaths from communicable and non-communicable diseases, violence and injuries respectively. With the expected population increase the deaths are likely to increase in the next few years with 20%, 10% and 10% respectively (Kenya Universal Health Coverage Policy, 2020). According to UN (2025) every 2 seconds someone aged between 30 and 70 years dies prematurely due to non-communicable diseases such as cardiovascular, diabetes, cancer and chronic respiratory disease.

Most hospitals in Kenya lack diagnostic services, ambulatory services and human resources specialists. Specifically, public hospitals lack dialysis machines, laundry, theatre and imaging equipment and are characterised with an absence of basic medical items such as pregnancy kits or a functioning glucometer among others. The comprehensive coverage for non-communicable diseases is low. Specifically, cancer treatment is low with only 23% of cancer patients having access to radiotherapy services. Kenya has only one PET Scan (Positron Emission Tomography) in the public hospitals located at the Kenyatta University Teaching and Referral Hospital (KUTTRH) increasing the waiting period of cancer results with over 6 months with more than 3,000 cancer cases every year (Ouma *et al*., 2020). Diabetic patients are faced with discontinuation of essential medicines and a low doctor-to-patient ratio of 0.6 to 1000 every year which results to high mortality rates (Osetinsky *et al*., 2020).

The disease burden for chronic and infectious diseases in the country is on a steady rise with 14% of adults having 3 or more risk factors for cardiovascular diseases and 25% having hypertension or diabetes (Osetinsky *et al*., 2020). The medical tourism rate in Kenya is high with roughly 7,000 to 10,000 people leaving the country yearly to seek medical attention abroad citing long awaiting periods in hospital queues, high costs of inefficient treatment, lack of medical specialists and specialised equipment and essential drugs (Dustan *et al*., 2023).

A recent report by the Kenya Council of Governors (2024) indicates that in public hospitals, only 14 doctors are available to serve 10,000 Kenyans resulting in long waiting times for patients in hospital queues. The report indicates a high level of medical brain drain, where 591 doctors are away on study leave and 135 doctors who have completed their studies and ready to work are likely to remain in foreign countries in place of rendering their healthcare expertise in Kenya.

Healthcare workers form a crucial component of the healthcare supply chain since a well-functioning healthcare system requires well-motivated staff. However, the job attendance by the available medical personnel in Kenya is poor resulting in poor service delivery (Schneller *et al*., 2023). There is the absence of support infrastructure for staff in the Kenyan public hospitals coupled with non-participation in decision making which creates an environment where the employees feel underutilised. This results in excessive brain drain to countries with favourable working conditions (Ngure & Waiganjo, 2018). Further, computer illiteracy, lack of basic computer training and the inability to share information via advanced database systems are among the vast problems facing clinicians and medical personnel in Kenya (Mumaraki, 2019).

Despite the Management Equipment Services (MES) leasing option by the national government which was meant to scale up medical infrastructure at the county level, access to diagnostic services in Kenyan public hospitals is low, with a majority of patients forced to obtain diagnostic services from external service providers (Masaba *et al*., 2020). The Kenya Kwanza United Democratic Alliance (UDA) manifesto for the year 2022-2027 concurs that in Kenya, there is weak physical infrastructure, inadequate medical equipment and weak data collection in the healthcare sector (UDA, 2022). Technology use in the form of Health Information Systems (HIS) which has been reported as a possible solution for workforce and inventory management as it addresses medical personnel and resources shortages, missing salaries, skills imbalances and geographical misdistribution of human and physical inventories is minimally used in Kenya (Jaboob *et al*., 2019).

Vian (2020) recognises that corruption is a major obstacle in the realisation of most human rights such as good health and well-being. Price manipulation, theft of resources such as drugs, diversion of patients from public to private hospitals, use of state-owned resources while charging for their use, sub-optimal procurement of drugs and medical

supplies, a desire to jump the queue by patients while seeking preferential treatment, mismanagement of resources, ghost workers, absenteeism, informal workers, dual practice and sub-standard medicines are forms of corruption very prevalent in the Kenyan public healthcare sector (Kabia *et al*. 2020).

Generally, the Kenyan public healthcare systems are faced with a myriad of supply chain challenges ranging from lack of pro-activeness, innovativeness, and risk-taking in service delivery, lack of service integration, inadequate skills and knowledge of the human resources, lack of human resource deployment based on skills, inadequate staff members, lack of unified information base, recurrent stock-outs of essential medicines, missing essential technologies, no financial protection for people living with diseases and limiting procurement policies (Kenya National Infection Prevention and Control Plan for Health Care Services, 2021-2023).

A functioning public healthcare system should have available and sufficient quantity of healthcare facilities within a state. These facilities should be accessible to all members of a country including children, youth, the elderly and persons living with disabilities. The facilities should have well-trained healthcare professionals, adequate medicines, hospital equipment and proper sanitation (United Nations, 2025). The provision of appropriate products and medicines to patients at the best price, time, location and condition is the major characteristic of an efficient healthcare supply chain. The increasing needs of an ageing population, the expectations of a more discerning healthcare consumer and disparities in health status, affect the provision of this fundamental service of healthcare (Schneller *et al*., 2023).

According to Mutisya & Ndeto (2024) the level of patient satisfaction, efficiency and turn-around time in public healthcare facilities is low across all levels of hospitals in Kenya. In 2022, the level of patient satisfaction in national and county referral hospitals was 67.8% with an average of 55.3 minutes waiting time which is 25.3 minutes higher than the expected waiting time of 30 minutes. In addition, Ojwang (2022) observed that 82.50% of public health facilities in Kenya experienced stock outs in medical supplies, pharmaceutical supplies and medical equipment in 2020.

The WHO proposes a framework that depicts the building blocks of a healthy healthcare system; service delivery, healthcare workforce, Healthcare Management Information

Systems (HMIS), medicines and technology, financing and leadership and governance. These outcomes are easily achieved in the presence of efficient and effective healthcare supply chain systems as they maximise the effectiveness and efficient utilisation of resources thus reducing morbidities, mortalities, economic losses and poverty (Lugada *et al*., 2022).

Efficient supply chain management is a crucial life-saving factor as it serves as a useful link in the delivery of preventive, diagnostic, curative treatment and management of illnesses services to the end user who in this case is the patient (Betcheva *et al*., 2020). The healthcare supply chain management is dynamic and integrates manufacturing resources, vendors, and delivery of goods and services to patients. Subramanian (2020) emphasises that an efficient and effective healthcare supply chain should ensure the availability of healthcare givers, equipment and medical supplies at an affordable cost to enhance quality to the end consumer (Iyengar *et al*., 2020).

The healthcare supply chain is tasked with demand planning, consumption and shortage recognition in the medical industry. Additionally, products, information and financial resources flow through the healthcare supply chains (Ketchen & Craighead, 2020). Akbari *et al*., (2021) further postulate that supply chain management optimises economic resources and helps in healthcare sector crisis management by embedding organisational resources to a customer focus, a systems approach and a strategic orientation. The creation of customer value and an end-to-end integrated entity are aspects advocated by effective supply chain management (Betcheva *et al*., 2020).

In a bid to promote effectiveness, product visibility and agility, efficiency and adaptability in the supply chain operations, the entrepreneurial supply chain was developed and it revolves around a mindset of finding solutions and developing creative ideas in daily organisational operations, all for the benefit of an organisation. Whereas there is substantial debate regarding the benefits and viability of entrepreneurial traits in supply chains, organisations are adopting entrepreneurial practices in supply chains in a bid to improve effectiveness, organisational relevance and financial viability (Mumaraki, 2020).

Apostolopoulos *et al.,* (2021) note that the proliferation of private hospitals is on the basis of public hospitals being unable to meet the healthcare needs of the population.

Ray and Pal (2022) identify entrepreneurship in healthcare as a key solution to such operating challenges. Entrepreneurship is now considered a fundamental area of business operations and transcends patient care to incorporate human resources and supply chain management amongst other business operations. The healthcare sector is very distinct from other service sectors and is closely entrenched to public demands. Consequently, the healthcare managers should be proactive and gain necessary knowledge that help address these public concerns and maximise health outcomes.

Universities have evolved from education-centred to research-centred and then to entrepreneurial universities. Most researchers postulate that hospitals will evolve in a similar trajectory. Shin *et al.*, (2024) recognise that an entrepreneurial hospital changes direction from being treatment-centred to being innovation-centred by actively engaging in research and development activities that promote commercialisation of healthcare services. In such a hospital, the main agenda is discovering and meeting the unmet medical needs of the patients and creating better service delivery. These hospitals are established through shared technologies, mutual relationships and expansive networks. In earlier days' hospitals had one fundamental role, provision of medical services. Currently, the hospitals are required to provide innovative products, processes and services and, provide a hybrid logic that bridges entrepreneurship and service delivery.

Grazier (2015) postulates that the hospital culture is a delicate and complex environment characterised by rarely imitable assets, such as knowledge that requires entrepreneurship to manage. The entrepreneurial hospital should invent on regular unique resources that redefine healthcare systems and the bonds of social solidarity and livelihood. Wang *et al*., (2021) provide examples of entrepreneurial practices in a hospital and they revolve around the use of new technologies to provide healthcare services and assist in recovery. An example of this technology is telepresence robotics such as the Giraffe Robot developed in Sweden. This robot aids elderly people mostly living alone and independently to stay connected to their family members and receive treatment in a timely manner. It allows for remote monitoring, communication and interaction between the patient and caregiver, doctors and loved ones. This robot is a large machine that has a desktop computer that is easily raised at an angle that nods like the head of a giraffe in agreement to create a positive patient experience, a zoom camera that captures and sends details to caregivers promptly and a night vision switch that

provides interactions with the primary user - the patient. This robot can also be accessed by secondary users such as doctors and care givers ensuring maximum provision of healthcare services.

Ray & Pal (2022) highlight the entrepreneurial activities in a hospital further by highlighting that hospitals introduce more technological factors that aid in service delivery such as remote care, 3D printing images for x-rays, precision medicines and more advanced medical facilities that help stimulate service delivery. Mishra & Pandey (2023) note that entrepreneurship in healthcare requires an action-oriented approach with a human resource that has a unique skill set. It is until recently during the COVID-19 pandemic that entrepreneurship gained popularity through telemedicine use to increase healthcare access (Ray & Pal, 2022).

Sawyerr & Harrison (2022) note that despite the efforts by hospitals to become entrepreneurial during the COVD-19 pandemic, majority of the healthcare supply chains across the globe failed with the most evident failure being the strain on provision of Personal Protective Equipment (PPE) where the demand exceeded supply. This put the lives of many healthcare personnel and patients in danger considering the high rates of infections. In Italy, many of the patients and healthcare professionals died and this was partly attributed to the inadequate supply and access to PPEs.

To try alleviate this shortage, the Centre for Disease Control and Prevention in USA recommended reuse of single-use PPEs and restricted access to PPEs with a preference to more serious cases. Other patients used scarfs and bandanas as alternatives. The healthcare industry in Ireland resorted to high-level disinfection for PPE recycling and tailored production of PPEs. In all these, the susceptibilities of healthcare supply chains had compromised the health, safety and well-being of the people. Consequently, the need for prepared entrepreneurship in supply chain management in the healthcare sector (Sawyerr & Harrison, 2022).

Regardless of how and when entrepreneurship adoption occurs in an organisation, the aim should be to maximise organisational output thus creating entrepreneurship leadership (Daraojimba *et al*., 2023). Entrepreneurship leadership in the healthcare supply chain establishes vision that help in service recovery and strategic value creation.

Organisational and supply chain parties put their efforts together, collectively looking for ways to improve processes and finding new ones.

Supply chains become more proactive and recognise challenges before they occur and this increases adaptability in the uncertain operating environment. The supply chain members become more aware of events that might disrupt their operations and anticipate possible courses of action, allowing them to beat competition. The organisations invest in more uncertain ventures to maximise outcomes both in the short and long run (Haq & Aslam, 2023).

1.1.1 Organisational Performance

Expansive literature has been published on organisational performance but there exist debates on how performance should be operationalised. The majority of scholars mention organisational performance as a key indicator of success and, that it relates to the fulfilment of organisational objectives (Faisal *et al*., 2023; Gichui & Atambo, 2023; Munala & Riany, 2023). Since organisational performance is embedded in a diverse number of stakeholders, both financial and non-financial measures of performance have been utilised over time. The financial measure of performance is considered narrow and more relevant to profit-making businesses, while non-financial measures of performance provide a clear picture of the utilisation of organisational resources and establish the organisation's competitive position in the operating environment (Munala & Riany, 2023).

A study by Cheah (2022) incorporated both financial and non-financial aspects of performance, specifically: - customers, product, services, profitability and increase in market share. A study by Karisa & Wainaina (2020) in public hospitals incorporated financial and non-financial measures of firm performance specifically: - enhanced customer satisfaction, reduced mortalities, increased revenue collection and new products/services introduction.

Khanna (2024) define hospital performance as the achievement of a desired medical/clinical outcome or a medical administrative target. The author notes that public hospitals are in a crisis as they are meeting sub-optimal performance. There is existence of finite resources aimed at meeting infinite healthcare demands of a more discerning and ageing population. It is imperative to improve performance of the public hospitals in order to serve the public better. In Australia, a 17% decline has been

observed in elective surgery timeframe despite an increase in the cost. There is an observed ineffective utilisation of healthcare resources in the country with hospitals failing to meet their targets.

Krupička (2021) take note that public organisations differ from private organisations even in the case of hospitals. Additionally, the author notes that the concept of hospital performance especially in the public sector goes beyond finances, stakeholder demands and market positions. There are six dimensions of measuring public hospital performance; clinical effectiveness, staff orientation, efficiency, responsive governance, safety and patient centeredness. Further the study takes into consideration healthcare financial strength, patient service and marketing as key aspects of performance. Organisational performance in public hospitals is entrenched in service delivery which should be done effectively and efficiently as argued by Omolloh *et al*., (2023). There is a need to plan supply chain inputs in a bid to progress towards customers' expectations (Kosklin *et al*., 2023).

The performance of hospitals began in the mid-19th century through the works of Florence Nightingale, a nurse who concerned herself with investigating sanitary conditions of hospitals in London, and how sanitary conditions affect disease morbidity and mortality. In this regard, she developed a statistical analysis software that collected and analysed data that focused on in-patient mortality rates. The data she obtained compared hospitals' sanitary conditions and helped to obtain an understanding of the association between the sanitary conditions of hospitals, the disease morbidities and mortality rates. The works of Amory Codman who was a medical doctor practicing in Boston enhanced Nightingale’s work by focusing on services received in the hospital and aftercare for the patient. This allowed real-time tracking of patients through in-patient and home-based managed care resulting in efficiency and organisational relevance (Mumaraki, 2020).

According to Machuki *et al*., (2023) in the healthcare sector, service delivery is measured through efficiency which aims at maximising the economic use of organisational resources. This relates to the measuring of the overall contribution of supply chain parties to the value chain. Comparisons are made between inputs and output whereby the output can include health outcomes among other metrics. An efficient supply chain ensures supplies in a hospital are received at the right time making

them accessible to patients which maximises health outcomes. The study by Machuki *et al*., (2023) also incorporates quality, speed, accessibility and effectiveness in the healthcare sector as measures of performance.

According to Hashmi *et al*. (2021), healthcare performance is a crucial entity as it involves the patients, clinicians, broader public and the government among other stakeholders. The performance of hospitals significantly varies from other conventional services. At the same time, public hospitals are less autonomous in their management and operations to act for unconditional conformity on the stake of public health. Besides, public hospitals usually are criticised and alleged for poor accountability, misuse of resources and maladministration.

According to Mwihia (2020) the performance of hospitals is a major element that influences the quantity and quality of service delivery. This performance should be measured on the basis of stated goals which exhibit the values of different stakeholders amongst them patients, governments and other regulators. According to WHO (2020), measuring performance of public hospitals in third world nations is not only hard but also controversial due to scarcity of relevant information. Measuring hospital performance according to Mwihia (2020) can be established on service improvement, waiting times, resource management, efficiency, patient safety and health and life expectancy.

Healthcare sector performance improvement aims at maximising both output and efficiency in the hospital processes while maximising patient satisfaction by having quality healthcare services. Public hospitals are faced with rising pressure to improve healthcare outcomes from various stakeholders. Performance in the healthcare sector is best measured through effectiveness, financial viability and organisational relevance. Effectiveness relates to the degree to which the public hospital achieves set goals, while financial viability is the ability of a public hospital to remain afloat over time. Relevance relates to the degree to which stakeholders consider the services offered in public hospitals to be able to meet their needs (Ilangakoon *et al*., 2020).

The three measures of performance that are effectiveness, financial viability and organisational relevance were used to operationalise the performance of public hospitals in this study. Good performance is reaped by institutions that can withstand changes

that arise due to competition in their operating environment. Managers have the role of eliminating performance bottlenecks, while creating and sustaining highly motivated employees (Mwihia, 2020).

1.1.2 Entrepreneurial Supply Chain Practices

Entrepreneurship is a major and significant concept in the area of management research, arts, engineering and sciences. Many authors have studied entrepreneurship with each having different conceptualisations. Entrepreneurship has focused on the how, by whom and with what effects business opportunities and other opportunities in the operating environment, create future services and goods. There is the concept of opportunity recognition as the core of entrepreneurship (Ratten, 2023).

Ketchen & Craighead (2021) highlights the dangers of satisfaction and the importance of entrepreneurial adaptation in the rapidly changing and highly uncertain operating environment by an organisation. Organisations should be alert to recognise changes in the operating environment rather than waiting for drastic changes in order to act which may lead them to poor performance. Scholars and managers alike have continued to recognise the benefit of entrepreneurship in dealing with organisational problems present in their operating environment. This led to the birth of entrepreneurial supply chain management at the beginning of the 21st Century in a bid to promote positive customer experience, minimise risks for all supply chain parties and achieve effective service and quality management (Ketchen & Craighead, 2021).

The entrepreneurial supply chain management cannot exist without an entrepreneur. Grazier (2015) define an entrepreneur as an individual who envision the future better, sees the world differently, seize opportunities that other individuals fail to notice and perceive risks differently. An entrepreneur has an anticipatory behaviour that enables him/her to always envision the development of novel business so as to improve organisational responsiveness to rising needs. This is a creative individual who brings growth into an organisation.

Individually, supply chain management and entrepreneurship have enjoyed meteoric rises in industrial practice and scholarly research over the last three decades. Supply chain management has been recognised as a critical organisational component that stimulates success and productivity (Goldsby *et al*., 2024). This is because supply chains revolve around the provision of final goods to consumers who in return pay a

price for the provided goods. Any supply chain is built by various parties whose role is to contribute to the overall end product to be provided to consumers.

According to Habib *et al*., (2022) the term supply chain management was brought to life by Keith Oliver in 1982. Keith defines supply chain management as a process that involves planning, controlling and implementing operations of a supply chain with an aim of maximising customer needs. Since introduction, the concept of supply chain management has been operationalised and researched by many scholars and authors in different ways. Consequently, there is no standard definition of the contents of supply chain management.

Participants in a supply chain are constantly making decisions that affect how they manage supply chain drivers. The supply chain drivers are: production which relates to the conversion of raw materials to create final products that deliver value to consumer. The decisions made here include the type of product to produce and the quantities. Another driver is inventory which are the raw materials that assist in day to day operations of an organisation. Decisions regarding inventory revolve around the quantity of inventory to hold as too much inventory causes an increase in operating costs while low inventory results to shortages.

Location is another significant driver in a supply chain as it determines where production of goods takes place and where inventory is stored. The decisions made should consider the proximity of consumers and production plants. Transportation is also an essential part of a supply chain as it serves as the link between producers and consumers. Information flow in a supply chain greatly influences decision making. Therefore, accurate information should be provided in a timely and efficient manner to stimulate productivity.

Supply chain management is established upon commitment, trust, organisational norms, compatibility and management support. Commitment enhances belief in an existing relationship. Through trust, an organisation obtains value through shared learning and risks, while organisational norms help supply chain partners seek mutual collaboration. Compatibility and management support maximises the success of the supply chain relationship by incorporating key decision makers. A supply chain encompasses various parties who depend on each other to provide value. Supply chains usually have

conflicting needs such as having high customer value, which calls for an organisation to have high inventory levels. In this way, organisations need to work together through mutual agreements to reduce inefficiencies (Ndung'u, 2021).

Machuki *et al*., (2023) emphasise that supply chain management is a critical organisational activity that allows smooth operations. In its initial stages, supply chain management was regarded as clerical work, but over the years, the function has occupied a strategic role in organisations as it helps deal with competition and shape an organisation's macro environment. In the healthcare sector, the supply chain has been attributed to cost efficiencies and improvement in organisational products.

Supply chain management in hospitals involves planning, procurement, storage and distribution of medical supplies to ensure that patient care is effective and uninterrupted. Through procurement, hospitals are able to acquire right products at the best price and through inventory management, the hospitals are able to track stock levels and avoid disruptions arising from excess or less stock (Cortes *et al*., 2021). Supply chains are considered a combination of management activity, management process and management philosophy. By management philosophy, a supply chain is regarded as a single entity made up of many entities including suppliers and customers, whose main role is ensuring the smooth flow of products from the point of source to the final customer. In this arrangement, the entities that form a supply chain are integrated through resource sharing and innovation to provide value-addition in the process. To manage supply chains effectively, there should be simultaneous efforts by the supply chain parties. These efforts should be geared towards enhanced customer service levels and improved operational efficiencies (Cortes *et al*., 2021).

The supply chain as a management activity is viewed not as a single firm but as a combination of strategies that should be coordinated to provide an end product to consumers. In this arrangement, resource sharing is critical to distribute equally the losses and compensations across the supply chain entities. The supply chain as a management process addresses the strategic actions that focus on aligning the supply chain relationships and the flow of information and materials across firms to add value to the organisation and provide high-value products to customers. A firms supply chain is an integral part of the market it serves therefore, the supply chain should be responsive to market requirements and should do so in a way that supports business

operations. The strategy adopted by any supply chain should be geared towards fulfilling customer needs (Cortes *et al*., 2021).

Entrepreneurship has been identified as creative destruction where organisational resources are combined to exploit available opportunities in the marketplace (Goldsby *et al*., 2024). Introduction of a new product in a market place, introduction of a new method of doing things, opening a new market, creation of a new industry or organisation and the constant lookout for a new supply source of a firm raw materials are all entrepreneurial activities. Entrepreneurship is viewed as a driver for economic growth as entrepreneurs are always challenging the status quo. They introduce change which can temporarily destabilise the economy but is necessary for long-term development. Entrepreneurs are visionary and they take risks as found appropriate.

According to Gauthier *et al*., (2021), entrepreneurship is embedded in managerial mind-sets, decision-making processes, strategic objectives and actions in an organisation. In governmental organisations, entrepreneurship aims at value creation which solves societal problems. Amid growth and competition, governmental organisations are tasked with new ways of doing things to surpass competition (Oladimeji *et al*., 2019). This is achieved through entrepreneurship, which involves creating a vision and solutions from nothing or from a problem and the results are improved economic activities, the building of wealth and job creation (Gauthier *et al*., 2021).

Research in the area of entrepreneurship and supply chain is scanty with Handsfield *et al*., (2009) being among the first to integrate the two disciplines. His study revealed that entrepreneurship can stimulate productive supplier relationships. Ketchen and Craighead (2020) combined strategic management, supply chain management and entrepreneurship to investigate how the three disciplines can aid organisations during the COVID-19 pandemic. Recent research connects supply chains to entrepreneurship through entrepreneurial supply chain management which connects customers to suppliers based on innovative ideas. Amid challenges, it is arguably important to introduce a new, innovative, proactive and risk-taking approach to improve visibility, agility, efficiency and adaptability in supply chain operations. This ultimately leads to the development of new businesses and the management of existing ones effectively (Ketchen & Craighead, 2020).

The management of global health is a very complex issue that requires increased firm and supply chain capabilities, innovation and entrepreneurship. Thus the need for this study (Liu *et al*., 2020). In the global arena, healthcare industry faces a myriad of challenges but in Africa, most of the challenges are reportedly man-made and avoidable. These problems can be solved with the adoption of entrepreneurial supply chain management (Oleribe *et al*., 2019). To promote a positive customer experience, minimise risks for all supply chain parties and achieve effective service and quality management, entrepreneurial supply chain management is necessary for the healthcare sector. The idea can be thought through customers, competitors, suppliers, internal processes and growth and learning perspectives (Ketchen Jr & Craighead, 2021).

The adoption of entrepreneurship in a supply chain can be through Omni-channel and last-mile delivery. The Omni-channel helps in the orchestration of supply chain resources across distribution channels, thus creating more contact points, while the last-mile delivery entails supply chain agility, resilience and service recovery. An agile supply chain responds to customer needs in turbulent markets, while a resilient supply chain recovers from disruption. Through service recovery, a supply chain can take actions to solve problems that face customers, while retaining the customers. It is worth noting, that the adoption of entrepreneurship relies on a vast number of conditions which are the existence of entrepreneurial opportunity, orientation, optimal distinctiveness and bricolage (Ketchen Jr & Craighead, 2021).

Sengura & Renyan (2024) highlight that an entrepreneurial opportunity refers to a discovery or an idea created by an entrepreneurial organisation which is usually lucrative in the long run. Entrepreneurial orientation is the creation of autonomy, competitive aggressiveness, risk taking, innovativeness, and proactiveness in organisational processes. Optimal distinctiveness is the sole existence of an organisation as a legitimate entity, so that the norms and organisational traditions help achieve competitive advantage. Bricolage is defined as using entrepreneurship to achieve what is at hand at the moment. It is the utilisation of resources that are rejected or ignored by other organisations.

Ratten (2023) explain the adoption of entrepreneurship as the ability to identify potential business opportunities and exploiting them through creating new resources or recombining existing ones in order to commercialise products. This is done in

consideration of regulations that affect the supply chain operations. Internally owned resources such as manpower also affect the adoption of entrepreneurship as there should be a proper mix of resources for entrepreneurship to thrive. In its development stage, entrepreneurship was considered an individual rather than a collective effort. This established stereotypes for entrepreneurs who were now considered business owners. With time, entrepreneurship has evolved and is now considered in diverse angles as depicted below.

In the current supply chains, there exists artisan entrepreneurship which involves utilisation of artistic abilities to create new products and services. In this way, unique products are created. Examples of such entrepreneurs include jewellery makers. Another form of entrepreneurship is the COVID-19 entrepreneurship. Developed in the year 2020 during the COVID-19 pandemic, this form of entrepreneurship involves creation of a new innovation or business in the midst of a crisis. Creative entrepreneurship is common in the service industry specifically, the arts and entertainment sector. This calls for breaking routine activities with a blend of new ways of accomplishing tasks. These are some of the forms of entrepreneurship present in current supply chains. All these forms of entrepreneurship require an ecosystem that is conducive and supportive (Ratten, 2023).

According to Goldsby *et al*., (2024), there is a lack of routine research in the area of entrepreneurship and supply chain management. This can be attributed to divergent ideas regarding risk whereby, entrepreneurs are risk takers and supply chain managers are risk averse. Further, entrepreneurial supply chain management is a new concept but should incorporate customers, competitors, suppliers, innovation and internal processes and should be studied in depth. In light of the highly uncertain business environment, where there is ambiguity, complexity and volatility organisations are advised to encourage their supply chain professionals to adopt an entrepreneurial mindset to explore the untapped avenues for entrepreneurship that provide alternatives in supply chain operations.

Traditional supply chains are established on a foundation of minimising costs, maximising efficiency and achieving economies of scale (Ketchen & Craighead, 2021). This is viable in the context of minimal uncertainty. In a turbulent operating environment, entrepreneurship is critical. The entrepreneurial supply chain is more

aggressive compared to the traditional supply chain as it breaks organisational inertia and comfort. Kloep (2020) emphasises that entrepreneurial supply chains can align participants in an entire supply chain which reduces risks and hazards. This is through a strategic collaboration between entities that produce products and services which maximise efficiency and effectiveness.

In the traditional supply chain, there is less visionary thinking with supply chain performance being measured on metrics that emphasise more on customer satisfaction, cost reduction and asset utilisation. These are critical measures of performance but they constantly fail to recognise the growth in revenue and customer satisfaction brought about by the supply chain. Over the years, credit has not been given to supply chain and logistics as being great contributors to revenue growth, yet supply chain influences the success and failure of products (Goldsby *et al*., 2024).

Investigating the intersection between entrepreneurship and supply chain management is imperative to establish new ways of doing things in supply chain operations. The development of entrepreneurial orientation is a strategic effort by any organisation that allows smooth penetration in a dynamic environment. Entrepreneurial orientation is a strategic posture whereby firms engage in market and product innovation, take first actions in innovations and business operations and engage in risky ventures. Entrepreneurial orientation in a supply chain enhances company survival and adaptability to changes (Cortes *et al*., 2021).

Specifically, entrepreneurship is built upon innovativeness, proactiveness and risk taking (Cortes *et al*., 2021). Kloep (2020), emphasises that entrepreneurial supply chain practices are established through risk taking, innovation orientation, relational capital, proactive orientation and coordination capability. These practices increase effectiveness and efficiency throughout supply chain delivery channels and introduce relevant changes that lead to efficient resource utilisation and improved firm performance.

Innovation is described by Hamdan & Alheet (2020), as the experimentation of new techniques, methods, products and services to effectively respond to market changes (Mumaraki, 2020). It is the participation in creative activities by an organisation through the launching of new products and experimenting with new processes, whether in

production or the overall delivery of products and services to stimulate competitive advantage through superior performance (Cortes *et al*., 2021).

Innovativeness according to Kalyar *et al*., (2024) refers to the capability of a firm to transform opportunities into realities. It is more of an organisational culture and it relies on adapting new practices instead of relying on the old techniques. This is promoted through extensive research and development which helps to select new operational techniques. Innovativeness should be the norm as it is an imperative and not an option. According to Gauthier *et al*., (2021) innovativeness in hospitals can be through seeking new funding sources, introducing new products/services and identifying new ways of delivering value to consumers.

Proactiveness is a forward-looking perspective that enables organisations to be early market movers and beat the competition easily (Mumaraki, 2020). Proactiveness helps organisations beat the competition and identify new opportunities in the operating environment (Cortes *et al*., 2021). Risk taking is the commitment of enormous resources by organisations to unknown ventures to stimulate organisational growth (Mumaraki, 2020). In an environment of risk taking, bold investments are made in undiscovered areas (Cortes *et al*., 2021).

Entrepreneurial supply chain practices in this study revolved around innovative inventory management, proactive strategic sourcing and risk taking. Innovative inventory management according to Smith (2024) is essential techniques that help achieve efficiency, reduce costs and maximise customer satisfaction in any competitive environment. To navigate competition and industrial pressures, organisations should adopt innovations in managing inventory to breed differentiation in products. A differentiated product will avoid unnecessary use of resources or inventory, creating a balance in organisational operations as there will be no stock-outs or obsolescence (Cortes *et al.,* 2021).

Okello *et al*., (2020) recognises that public hospitals are required to manage adequate inventory in order to discharge their duties effectively. However, in Kenya, stock management in the public hospitals is poor resulting to poor hospital performance. A common challenge is the determination of appropriate levels of inventory to keep that will ensure patients' needs are met. According to Okello *et al*., (2020) 60% of mortality

rates in Siaya county are attributed to drug unavailability. low ICT utilisation, and inadequate medicines, equipment and human resources. According to Toroitich *et al*., (2021), only 14% of public hospitals are stocked with essential medicines continuously, for 90 days or more. The order fill rate for essential medical supplies at KEMSA for the FY 2022/2023 was 51% resulting in huge drug shortages at the county pharmacies (Medium Term Expenditure Framework, 2023).

Evidently, inventory is a critical organisational component, as too much of it causes obsolescence, while inadequacy leads to shortages and delayed service delivery. Inventory management strikes a balance between demand and supply and promotes business continuity. Inventory management in the past was considered unnecessary but as time goes by organisations are realising the need to manage inventory, more so innovatively. In this study, the sub-variables for innovative inventory management were new technology use and the 'Just in Time' (JIT) inventory philosophy.

There is a need for innovativeness in inventory management which involves the management and control of a large number of medical resources, needed and stocked in the healthcare sector. Low levels of technology use where healthcare facilities still use old/mundane practices and techniques have been mentioned as a hindrance to quality healthcare systems in Africa (Shibabaw *et al.,* 2022). Hence the need for this study. Adoption of new technologies in inventory management such as the Internet of Things and Radio Frequency Identification (RFID), helps reduce waiting times, avert risks and reduce costs in hospitals. The JIT philosophy on the other hand ensures necessary inventories are delivered when needed thus freeing up capital expenditures and promoting organisational efficiency. The JIT principle reduces inventory costs and aligns production needs with warehouse requirements (Ajayi *et al.,* 2021).

New technology use allows organisations to forecast their demand accurately, identify production and consumption patterns, enhance flexibility by improving cash flow, streamline operations, reduce human error in operations and provide visibility in the entire supply chain. Innovations in inventory management not only stimulate performance in an organisation, but also enhance decision-making and organisational responsiveness to market needs (Smith, 2024).

Omaghomi *et al*., (2024) note that in the rapidly changing healthcare operating environment, innovation has emerged as a critical pillar of strengthening health outcomes and maximising the utilisation of healthcare resources. By embracing innovations in hospital operations, delivery of high-quality services is guaranteed. The study by Omaghomi *et al*., (2024) utilises the use of new technology such as electronic health records management and telemedicine as measures of innovative inventory management in hospitals. The study highlights that by adopting new technologies, hospitals can share and analyse patient information easily which allows for better integration and communication among various service points in the hospital. Telemedicine allows for remote diagnostics and real-time tracking of patient health signs. Additionally, telemedicine empowers patients to participate in their recovery journey which improves satisfaction.

Use of new technologies such as the medical internet of things creates value in both preventive and promotive healthcare, especially in monitoring chronic illnesses. Patients are using new technologies to monitor their health. New devices that monitor heart diseases and diabetes are being used by doctors to keep track of their patients' health. Patients do not need to visit the doctor physically and this greatly saves on costs and improves patient satisfaction (Indiazi, 2021).

According to the MoH (2024) Kenya passed an act of Parliament- the Digital Health Act of 2024. This Act is aimed at developing a digital ecosystem that provides end-to-end visibility of the entire healthcare value chain. This will promote access to health services through both private and public hospitals. This initiative will build the necessary infrastructure to enhance the healthcare system operations such as medicine dispensation through telemedicine and data management including proper health records keeping.

Proactiveness is the propensity to look ahead, analyse market/industry trends and take action on the identified opportunities. This promotes the introduction of new products at a pace that is ahead of competitors (Hossain *et al*., 2022). When done correctly, proactiveness shapes the firm macro environment rather than the firm depending on the environment (Hamdan & Alheet, 2020). This helps create strategic relationships, alliances and collaborations with industry partners thus reducing supply chain uncertainties (Gauthier *et al*., 2021).

Pro-activeness is a change in organisational posture to seek new opportunities through anticipatory and action-based behaviour toward the future needs and wants of customers (Mumaraki, 2019). Proactiveness in a supply chain enables a firm to make necessary changes that shape the competitive behaviour of the industry. This can be done through upstream or downstream supply strategies and partners which bring in value to an organisation (Cortes *et al.,* 2021).

Amongst such strategies is strategic sourcing which transcends purchase acquisition as it incorporates the establishment of supplier relationships to create a competitive advantage. Strategic sourcing is a critical component of organisational growth especially in the midst of competition as it helps reposition an organisation product offering to match the demands of different customers with the organisational supplies. This creates value for money for the customer and brings in resources to the organisation (Cankaya *et al*., 2020).

The purchasing function plays a critical role in boosting organisational performance but in the public healthcare sector, the practice is still immature. Immaturity is evidenced by the lack of a practice referred to as proactive strategic sourcing, which is built upon the creation of supplier relationships to stimulate a smooth and efficient flow of supplies. Proactive strategic sourcing transcends purchase acquisition as it incorporates the establishment of supplier relationships to create a competitive advantage. It is a critical component of organisational growth especially in the midst of competition (Cankaya *et al*., 2020). The establishment of long-term supplier relationships reduces costs and price volatility, while enabling firms to evaluate supplier performance. Conversely, planning for procurement aggregates organisational needs, reduces emergency purchases and integrates expenses with set budgets (Changalima *et al.*, 2022).

Proactive strategic sourcing in this study was built on supplier relationships and procurement planning. The establishment of long-term supplier relationships reduces costs and price volatility while enabling firms to evaluate supplier performance. A mutual relationship between suppliers and organisations promises to reduce risks and costs, create value, and sustain competitive advantage. Conversely, planning for procurement aggregates organisational needs, reduces emergency purchases and integrates expenses with set budgets (Changalima *et al*., 2022).

The increasingly changing needs in the healthcare environment complicate the delivery of healthcare services and this calls for effective management of buyer and supplier relationships to stimulates performance. Suppliers play a critical role in promoting organisational success. Supplier relationships provide a backbone for improved performance by allowing for price negotiations and enhancing cost savings through improving value for money (Ndung'u *et al*., 2023).

In an environment of long-term supplier relationships, there is mutual problem-solving, information sharing, constant communication, mutual planning and continuous improvement initiatives which consequently breed superior performance and a win-win situation between both parties, i.e. buying organisations and suppliers. A strategic supplier relationship will additionally incorporate supplier quality management, through mutual collaboration making it easy for both parties to understand and anticipate their needs, reduce uncertainty and facilitate a flexible response.

Proactive strategic sourcing establishes relationships with many suppliers and helps to mitigate risks in disruptive environments, while improving agility and resilience. It involves planning procurement/sourcing, research and development, contract establishment and supplier relationship management. Procurement planning is a basic organisational management process that influences performance directly, especially in the public sector as it helps in identifying quantities, specifications, the framework for delivery, identifying the source of supplies, negotiation and establishing relationships (Frederico, 2023).

This is because the process ensures efficient utilisation of resources and encompasses needs identification, supplier selection and budgeting. It is a foundational brick that minimises costs and risks associated with procurement as it gives room for accountability within public sector organisations (Omondi *et al*., 2024). Planning for procurement in any public sector organisation enhances the procurement performance of the said organisation by ensuring needs are adequately identified and budgeting is done efficiently to promote outcomes (Mwangi & Wabala, 2021). To adequately plan the procurement process in any organisation, an integration between procurement and supply chain practices should be done so that efficiency and effectiveness are maximised (UNOPS, 2021).

Cortes *et al*., (2021) note that proactiveness in the sourcing function enables the firms to realise that competition goes beyond competitors' actions to incorporate the entire supply chain. This is because, for the creation of a final product, the combined efforts of several entities are needed. This interdependence calls for co-creation, knowledge sharing and enhanced capabilities, which improve the competitive advantage of organisations. It is worth noting that to achieve this sustained competitive advantage, the supply chain should be a strategic focus of an organisation where the top management is involved in daily operations.

Risk taking enables an organisation to break away from routine core businesses and engage intensively in the unknown by seizing available opportunities (Astrini *et al.,* 2020). In the healthcare supply chains, there are more risks than opportunities. The service therein is unsafe where in-patients are at risk of contracting infections during hospital stays or due to medication errors. The return on investment is usually questionable in the medical value chain as healthcare facilities emphasise more on sick care rather than ensuring people are well. There is a need for entrepreneurial supply chain practices in the form of risk taking to obtain joy in serving the sick (Barry, 2022).

Risk taking drives healthcare firms to seize business opportunities under uncertain environments to gain a competitive advantage. This entails the propensity to engage in activities that may harm the business but have returns in the long run. Traditional healthcare managers consider risk-taking as a costly venture, however, in modern knowledge risk-averseness is the costly evil (Pratono *et al.,* 2020). This study utilised collaborative leadership behaviour and income generating opportunities as risk taking sub-variables.

Abdelwahab *et al*., (2024) defines collaborative leadership approach as where a collaborative leader emphasises on mutual respect, shared decision making and teamwork. It is the creation of a culture of team work where the team members are valued and their contributions respected. Collaborative leadership behaviour in an organisation, entails the self-efficacy of leaders who engage in recognising opportunities, planning and managing resources (McGee & Terry, 2022).

According to Mwihia (2020), there exist a strong relationship between management of a hospital and its performance. In order to achieve superior performance, a hospital must

have trained clinical managers and managerial autonomy. Organisations are mirrors of their top management as the top leadership influences success or failure. Abdelwahab *et al*., (2024) emphasise that collaborative leadership involves the power sharing among individuals in an organisation. It is an essential component of achieving performance in organisations. To establish collaborative leadership in an organisation, there should be the presence of the following; a symbiotic relationship, shared assets, mindfulness and the capacity to lead.

A symbiotic relationship is a collaboration in which healthcare team members have well stipulated roles and they adapt to changes as found appropriate. Shared assets are situations that encourage hospital workers to share expertise, talents and knowledge within their work. Mindfulness is awareness of situations as they occur and the capacity to lead is the eagerness to accept responsibility and lead. Collaborative leadership behaviour in a hospital significantly promote patient care, improves service delivery and ensure hospitals stay afloat.

According to Ang'ana & Kilika (2022), collaborative leadership ensures organisational outcomes are achieved through collective efforts and intelligence. The power of a team is greater than that of an individual and the collective insights of a team are greater. Leaders ought to influence individuals to contribute more value into the firm. This breeds shared aspirations and trust. Success and organisational performance depends on creating an environment of mutual respect, trust and shared aspirations where all employees can contribute fully and openly to achieving collective goals.

Collaborative leadership entails getting the right mentality in the employees, reducing operational charges in the organisation and viewing beyond the boundaries of the company by clearly taking strategic risks, developing harmony and healthy relationships in the organisation, and maintaining the capability to connect smoothly with others. Collaborative leadership style is being present as a leader and making your followers know their value by enhancing their creativity which overly boost their morale and productivity thus stimulating overall firm performance (Maalouf, 2019).

The presence of declining budgets while the demand for services in the healthcare sector increases calls for the adoption of risk taking behaviour. This will help to develop new revenue streams to improve the healthcare sector by providing adequate resources to

carry out day-to-day activities. Planning and managing resources in the presence of declining budgets create new revenue streams and create a competitive advantage for organisations (Hodgson *et al*., 2021).

Alasiri & Mohammed (2022) note that the Saudi Vision 2030 a transformative agenda by the Kingdom of Saudi Arabia Government has greatly transformed the public sector especially in the area of public healthcare. Great levels of public private partnerships are being witnessed in the healthcare sector and this has contributed to a significant growth in the country's GDP. It is anticipated that for the Kingdom to be able to catch up with the population growth an additional 20,000 hospital beds are needed by the year 2035. Having this in mind, the government of Saudi Arabia has engaged in risk taking in very high income generating opportunities amongst them private partnership to help alleviate this growing burden. Private partnerships aid in healthcare infrastructure development and maintenance thus reducing financial burden on the public sector.

Marten & Sullivan (2020) in their paper - Hospital side hustles: Funding conundrums and perverse incentives in Tanzania's publicly-funded health sector, take note that hospitals for a long time have undertaken income generating activities to create more revenue. These income generating opportunities are not in their mandate of providing healthcare to the public and they are aimed at bolstering revenue to keep the hospitals running. The authors divide income generating done in a public hospital into two; projectification income generating opportunities aimed at appealing private donors and market-based income generating opportunities targeting wealthy consumers. In the midst of inadequate funding in most countries across the globe, adoption of either of the income generating opportunities is aimed at bolstering revenue and providing healthcare to the citizens.

Marten & Sullivan (2020) critically explain how a public hospital in Tanzania utilised an income generating opportunity to obtain necessary funding to run their business operations and meet the needs of the public. By the year 2017, Mandhari hospital a mission hospital serving over 30,000 people was on the brink of collapsing. The management had to look for ways to survive. The administrators strategized on how to increase their income in order to support their daily operations. The administrators came up with a new idea - renting wedding gowns to the people in surrounding villages. Renting of European-wedding gowns was a growing trend among women. Therefore,

the hospital purchased the wedding gowns at a low cost and set up retail shops in the hospital palliative care unit. These shops were run by the palliative care nurses. Well, in as much the shops generated income, the possibility of losing the hospital mission is very high. There should be a balance between income generating opportunities and the provision of healthcare to the citizens with the latter holding more weight.

Innovative inventory management, proactive strategic sourcing and risk taking rely on efficient communication with suppliers as this help share expectations that benefit the organisation. In such an environment it becomes easier to innovate strategies that easily work in the supply chain, identify risks and make strategic steps as found appropriate. An entrepreneurial supply chain manager must prepare through proper planning and monitor every step of the supply chain by thinking holistically while maximising control and minimising risks (Kloep, 2020).

Ketchen Jr & Craighead (2021) argue that several constraints exist in the adoption of entrepreneurship in supply chains. Insufficient entrepreneurial zeal, unsatisfactory strategic focus, lack of leadership and attention to entrepreneurship, inadequate commitment and lack of education and training on entrepreneurship are some of the constraints. They further argue that despite these constraints, utilisation of available resources in an entrepreneurial way possesses great success. Healthcare systems should take available resources and identify entrepreneurial ways to deliver customer service. Since healthcare supply chains aggregate different parties who provide goods and services, there is need to adopt innovativeness, pro-activeness, and risk-taking in their supply chain practices all in a bid to improve performance (Mumaraki, 2019).

Entrepreneurship is regarded as ‘low lying fruits’ ready for pick-up (Gauthier *et al.,* 2023). This study investigated the reality of this statement by focusing on entrepreneurial supply chain practices and how they impact on performance of public hospitals in Kenya. The entrepreneurial supply chain practices were operationalised as follows: innovative inventory management utilised new technology use and a ‘Just in Time’ (JIT) inventory philosophy; proactive strategic sourcing was built on supplier relationships and procurement planning, while risk taking used collaborative leadership behaviour and income generating opportunities.

According to Cortes *et al*., (2023), the development of an entrepreneurial orientation is a strategic effort by organisations that help them exploit opportunities in the environment they work in. As technologies evolve and markets change in high speeds, organisations need to take calculated risks, become proactive in their actions and pursue innovation as key strategic efforts to achieve superior performance. Some actions taken by organisations such as introduction of new products and services are challenging as there is a great level of interdependencies in supply chains. However, when effectively and collaboratively done, they breed superior performance. This issue therefore, underscores that successful entrepreneurial endeavours require effective supply chain management practices.

1.1.3 Healthcare Financing in Kenya

Healthcare financing according to the National Council for Population and Development (2018) is the process of mobilising, accumulating, and allocating resources to cater to individual and collective health goals in a country. Healthcare financing is built on three constructs; resource mobilisation, resource pooling, and resource allocation, and aims to avail required resources to hospitals thus promoting the performance of hospitals (Munala & Riany, 2023).

Nungo *et al*., (2024) postulate that healthcare financing is a critical component in a healthcare system as it determines the ability of that healthcare system to contribute to the fundamental fulfillment of the right to health. Malakoane *et al*., (2020) identify that chronic underfunding of the public healthcare sector has consistently affected the ability of public hospitals to provide healthcare services across the globe. In South Africa, the public healthcare sector is underfunded despite the rising burden of sickness. The absence of adequate funding has resulted in poor healthcare workforce morale, long waiting times for patients, insufficient disease control and low stock levels of medical supplies.

The situation in South Africa is mirrored to a great extent in Mauritius whereby the healthcare financing budget falls way below the Abuja Declaration. The national government funds only 2% of the healthcare budget which makes it difficult for the members of the public to efficiently access healthcare services in the public hospitals. Over 15% of the disease burden in Mauritius fall under communicable diseases, but the country is not eligible for the Global Alliance Vaccination Initiative that provides

investments and finances to support immunisation programmes. This raises the burden of non-communicable diseases in the country (Nundoochan, 2020).

The adoption of entrepreneurial practices in an organisation is embedded in the availability and efficient utilisation of resources as this affects the effectiveness and quality of services offered in an organisation (Kijkasiwat & Phuensane, 2020; Kairu *et al.*, 2021). Healthcare financing in Kenya dates back to 1965 when a Sessional Paper number 10 that focused on African socialism was developed. The key aim of this Paper was the provision for and equitable access to healthcare by Kenyan citizens. One year later in 1966, the National Health Insurance Fund was established to majorly serve the people through a hybrid payment mechanism (National Council for Population and Development, 2018).

The working class pays for their healthcare expenses while the government caters for those who cannot meet healthcare costs. In 1983, the national guidelines for primary healthcare were drafted and utilised. This led to the abolition of user fees in the country. Budgetary constraints started being prevalent in the management of healthcare in the country. Consequently, in 1989 the government re-introduced user fees as a revenue-generating project to provide more funds and resources for healthcare. Fast forward to 2004, the user fees were abolished again only to be re-introduced in 2010 (National Council for Population and Development, 2018).

Later in 2010, a Sessional Paper birthing UHC was presented and implemented with some of the fruits borne being the introduction of a free maternal healthcare programme christened *Linda Mama* in 2013. In 2017, the UHC was embedded in the Big Four Agenda of the national government to achieve equitable access to the basic human right-the right to health. Currently, public healthcare in Kenya is cost-shared whereby the national exchequer and county governments' budgetary allocations finance up to 47.6%, user fee grants from the national government and households' out-of-pocket expenditure finance up to 26.6%, donors contribute 19.1% and the private health insurance pays 6.7% of total healthcare expenditure (National Council for Population and Development, 2018).

The total combined budget for health in the national and county governments for the F/Y 2015/2016 was 7.7% and 7.6% in the 2016/2017 F/Y. There have been considerable

improvements in healthcare financing in Kenya with an improvement noted in the F/Y 2015/2016 where the healthcare budget in the country was 7.7% from 5.5% in F/Y 2013/2014. The increments are aimed at achieving the Abuja Declaration target of 15%. The County government's budgetary allocation has been facing an upward trajectory with allocations for health standing at 25.2% of the total county budgets in F/Y 2017/2018. This translates to Kshs. 92 billion up from Kshs. 85 billion in F/Y 2016/2017. The government budget for healthcare in F/Y 2019/2020 was Kshs. 121 billion and in F/Y 2021/2022 was Kshs 119 billion (Kairu *et al*., 2021).

In FY 2016/2017 the funding distribution across counties was uneven with 7 counties (Isiolo, Embu, Kitui, Kirinyaga, Laikipia, Tana River and Narok) of the 47 counties, failing to receive any funding for the Healthcare Information Management System. This disparity is heavily attributed to high donor dependency which comprised of over 95.2%. Other private stakeholders contributed to over 51% of the total budget for healthcare but this was focused on health information and monitoring (Ministry of Investments, Trade and Industry, 2024).

In the Kenyan public healthcare, there is limited financial resources to adequately fund robust data analytics infrastructure. Investing in advanced tools, training, and maintenance becomes challenging without sufficient financial backing. It is worth noting that county governments in Kenya are expected to reduce the barriers that limit access to public healthcare in their regions through equitable allocation of resources. To be able to do this, counties receive conditional funding to offer healthcare services which include the *Linda Mama* programme that promotes access to free maternal services. Additionally, county governments benefit from medical fee reimbursements for the eliminated user fees and receive medical equipment leasing options from the national governments (Barasa *et al.,* 2020).

In this case, each county receives a minimum of 15% consolidated income and 0.5% equalisation fund to cater to the marginalised communities. Devolution has brought about positive effects in healthcare service delivery but this has been accompanied by a heavy share of challenges such as inadequate healthcare financing at the county level and unequal distribution of resources across the country which has resulted in inadequate healthcare coverage which undermines the right to health (Mwangi & Wabala, 2021).

The co-ordination between the national and county government post devolution has been weak which undermines service delivery in public hospitals. This has led to inadequate healthcare funding characterised by an unpredictable flow of finances, lack of contingency financial planning and weak proposals regarding the transition of hospitals to sustainable financing techniques. In Kenya priority programmes such as HIV/AIDs prevention programmes significantly revolve around donor funding but there is still a lack of structures and policies that support sustainable financing, making it hard for donors to finance healthcare in the country further undermining the outcomes of the priority projects (World Bank, 2023).

Several structural changes have taken place since 2010. McDade *et al*., (2021) highlight that the transition of Kenya from a low-income to a low-middle-income country in 2014 reduced significantly the level of donor funding. The transition meant a complete transition from the World Bank International Development Funding (IDF) to less concessional funding from the International Bank for Reconstruction and Development (IBRD). 8 years later in 2022, Kenya entered the Gavi transition, which is a period of 5 years' transition aimed at increasing domestic funding through improved budgetary allocations by the national government and increased insurance payments by the public and the government, while reducing Gavi funds dependency until the Country is considered self-funding.

Di Giorgio *et al*., (2022) note that Kenya's healthcare financing landscape keeps evolving with the national and county governments' contribution increasing, while the donor funding for healthcare shrinks. Over the last 2 decades, government funding for healthcare has increased by a total of 25% as revealed in the budget allocations and expenditures of the FY/2018/2019. Across the 20 years, contributions by households have reduced by a margin of 6% from 30% in 2009/2010 to 24% in FY 2018/2019. Additionally, the level of donor funding has reduced by half over the same period, from 32% to 18%. The recent COVID-19 pandemic stimulated donor financing but this was a temporary injection as a steady and downward donor funding trajectory has been observed.

Effective 1st October 2024 NHIF transitioned to the Social Health Authority (SHA). The latter will manage social insurance in the country and strive to alleviate the financial burden for contributors by reducing hospital bills. SHA is mandated to manage three

funds, unlike NHIF. These funds include: The Primary Healthcare Fund which will be tax funded and cater for basic healthcare services in dispensaries and private facilities through government financing. Under this fund, beneficiaries need to register with the Social Health Insurance Fund but not necessarily to have paid premiums. The Social Health Insurance Fund is another fund that will cater to broader health insurance coverage. This fund is compulsory for all Kenyans and for you to benefit, you need to be a full paid member accessing Level 4 to Level 6 hospitals (Ministry of Health, 2024).

The Emergency, Chronic and Critical Illness Fund is another fund that will fund urgent serious health conditions. To benefit from this, the Social Health Insurance Fund must have been depleted. One does not have to be fully paid member to benefit. SHA will breathe new life into public healthcare as it encapsulates accidents and emergencies, outpatient and inpatient, maternal and child health, mental and rehabilitation, kidney care, surgical operations including transplants, medical radiology/imaging, and overseas treatment as some of the services Kenyans will enjoy through this hybrid financing system of healthcare (Ministry of Health, MoH 2024).

Comparatively, public hospitals have continued to obtain adequate funding from private funders. In 2016, United States Agency for International Development (USAID) engaged in a partnership with Sidian Bank and the Medical Credit Fund. This partnership provided Kshs. 2 Billion in loans to private hospitals in Kenya. This initiative was aimed at bridging the financial gap by reducing collateral for loans requirements for healthcare operators. The Eastern and Southern African Trade and Development Bank has invested a total of USD 122.5 million as at 2025 to bolster the private healthcare sector (MoH, 2025).

The MoH (2024) notes that the health sector in Kenya has undergone significant transformations, characterised by a blend of both private and public players. Over the last decade, healthcare in Kenya has strategically repositioned itself to a more self-reliant system with a reduction of external donor dependence for healthcare resources being witnessed. This is attributed to intensive technological advancements and implementations of policies and frameworks. Recently, in 2024, the country passed four critical acts of parliament aimed at accelerating the achievement of the right to health; the Social Health Authority Act 2024, the Facility Improvement Fund Act 2024, the

Digital Health Act 2024 and the Primary Healthcare Act 2024. These acts are aimed at addressing inadequate financing and weaknesses in the public healthcare system.

The existence of a regulatory framework such as the Public Procurement and Asset Disposal Act of 2015 has greatly impacted on the resource availability in the healthcare sector. Growing political ambitions of increased local manufacturing of healthcare essential products and technologies has presented a great opportunity for the private players in the healthcare sector. Local production guarantees a continued supply of medical resources at an affordable cost (MoH, 2024).

A fundamental belief in the Kenyan public healthcare financing is that an increase in the government's budgetary allocation and out of pocket expenditure by the members of the public to the healthcare sector should result in commensurate healthcare service improvement. However, this has not been the case as most ring-fenced funds to support the improvement of healthcare are wrongly utilised. More so, public hospitals focus more on curative than preventive care, thus undermining health outcomes (Manda *et al*., 2021).

The Government of Kenya recognises the significance of financing as a crucial factor for the achievement of UHC. The establishment of the Kenya Health Financing Strategy (2020–2030) is one of the initiatives adopted to support this agenda. The strategy mission is to 'ensure adequacy, efficiency and fairness in financing of health services in a manner that guarantees all Kenyans access to the essential health services that they require'. The objectives of this strategy are to: mobilise resources required to provide the essential health services for Kenyans, maximise value for money and efficiency in the management and utilisation of available healthcare resources and ensure equity in mobilisation and allocation of healthcare funds, which maximises fairness in utilisation (MoH, 2025).

To achieve the first objective of mobilising resources, the strategies to be adopted are; achievement of a progressive increase in total government allocation i.e. from both national and county, mandatory prepayments of health insurance to replace out of pocket payments and this should be guided by affordability by Kenyans, establish specific programmes capable of obtaining external funding especially those that focus

on innovativeness and the scrapping off of direct out of pocket payments for essential service in healthcare centres (MoH, 2025).

In order to achieve objective two of maximising value for money, the Government of Kenya needs to establish and manage a national health fund to help manage national resources and donor resources effectively, to ensure ring-fenced resources are properly utilised, establishment of county health fund in each of the 47 counties for resources owned and issued to county governments, establishment of an autonomous Social Health Insurance Fund for the management of pooled healthcare resources and institutionalisation of voluntary insurance mechanisms that complements health insurance (MoH, 2025).

According to MoH (2025) the third objective of ensuring equity in resource allocation will be achieved through universal equitable access to the defined Essential Package for Health and by having a functional nationally managed hospital accreditation system that will guide resource allocation. Additionally, there should be establishment of a country-wide incentive-based reward mechanism for hospital aspiring and achieving equity in resource allocation. Arguably, the Kenya Health Financing Strategy recognises that the current health financing situation in Kenya is inadequate. A paradigm shift is imperative in the country to successfully achieve more money and resources for health, be it domestic or donor resources and improve access to health, while reducing financial burden for the patients (MoH, 2025). It is against this backdrop that this study hypothesised that healthcare financing has no moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The indicators for healthcare financing were the availability of resources and utilisation of resources.

The availability of healthcare resources plays a critical role in stimulating the performance of public hospitals as they influence the quality of services, operational efficiency, organisational relevance in the form of patient outcomes and overall efficiency. Limited resources and high demand for healthcare resources is a common condition facing the public healthcare sector across the globe, with the Kenyan healthcare landscape the problem being more prevalent (Nyawira *et al*., 2022).

Chereches and Pirlea (2019) argue that the utilisation of healthcare resources determines the effectiveness, organisational relevance, and quality of healthcare services in public hospitals. Efficient utilisation promotes optimal performance and value for available resources. However, several factors in Kenya undermine the efficient utilisation of resources with the most prevalent being corruption. Vian (2020) recognises that corruption is a major obstacle in the realisation of most human rights such as good health and well-being in Kenya.

Price manipulation, theft of resources such as drugs and medical supplies, diversion of patients from public to private hospitals, use of state-owned resources while charging for their use, sub-optimal procurement of drugs and medical supplies, a desire to jump the queue for patients while seeking preferential treatment, mismanagement of resources, ghost workers, absenteeism, informal workers, dual practice and sub-standard medicines are prevalent in the Kenyan public healthcare (Kabia *et al*. 2020).

1.1.4 Public Hospitals in Kenya

Kaitany (2022) define a public hospital as organisations, actions and people that promote and maintain individual and community health. The performance of this hospital goes beyond the clinical services factors. According to Mwihia (2020), modern medicine came into Kenya through the Imperial British East Africa Company, the missionaries and the Kenyan Government after independence. Health services in the country were stimulated by the construction of the Kenya-Uganda railway by the British colonialists. The construction began in 1898 and involved over 20,000 labourers. In the year 1899, the railway reached Nairobi and in 1901, the construction began in Kisumu. However, by the time the railway reached Nairobi, there was a smallpox outbreak. At that time, there were only four medical doctors stationed at Kikuyu, Machakos, Mombasa, and Kismayu. The disease outbreak led to the death of many labourers due to the low doctor to patient ratio.

Following the completion of the railway, Nairobi was made the capital of both the British government and the railways. The officers operating there stimulated the development of healthcare services. This was also followed by many missionaries making it into the country. Dr. Ludwig Krapf, a German citizen sent by the Church Missionary Society went to Rabai in coastal Kenya and established an eight-bed hospital. Later, the Native Civil Hospital (now Kenyatta National Hospital) was

established in 1900, and by the year 1908, it had a total of 45 beds for inpatients and a flow of over 7,000 patients. In 1910, another hospital was established at Fort Hall (currently, Murang'a) (Mwihia, 2020).

In 1910, there was another major outbreak of smallpox disease which led to the establishment of Mathari National Teaching and Referral Hospital, to help serve as a smallpox isolation centre. In 1912, the British colonial government through the London School of Tropical Medicine sent Professor William J. Simpson to Africa and Kenya, to specifically investigate the sanitary conditions of hospitals. One of his major discoveries was making distinctions between curative and preventive medical care and this led to great milestones in the development of efficient healthcare in the early 1910's. In 1919, the Provincial Commissioners of the time met and highlighted the need to extend healthcare services to rural areas, and the training of African natives to enable them provide healthcare services in the local dispensaries. This was based on the argument that a public hospital is a sign of government activity that a native can understand (Mwihia, 2020).

In 1926, the third public hospital was established, Lady Grigg Maternity, and later renamed Pumwani Hospital in 1944. The Scotland missionaries established hospitals in Chogoria, Thogoto, and TumuTumu which were later handed over to the Presbyterian Church of East Africa (PCEA) in 1956. In the year 1963, just after independence, the Department of Health was renamed the Ministry of Health and Housing. This was a sign of government prioritisation for healthcare with the recognition that healthy citizens, will help build a healthy nation. This translated to heavy budgetary allocations to help establish more hospitals (Mwihia, 2020).

Before and after independence, healthcare in the country was centralised with the members of the public accessing healthcare freely. The major focus by the government was to beat illiteracy, disease and poverty, whereby for a citizen to access the healthcare they started from home to dispensary to a health centre to district, provincial, and later national hospital. The provision of free medical services went on until 1989 when the World Bank advised the introduction of user fees and the establishment of hospital boards to help obtain finances for the public hospitals (Mwihia, 2020).

Currently, there are 9696 healthcare facilities in the country whereby over 4600 of these healthcare facilities are operated by both the county and national levels of the Government (Simeoni & Kinoti, 2023). The national level healthcare facilities are operated by the MoH and they are categorised as Level 6. They include; Kenyatta National Teaching & Referral Hospital, Kenyatta University Teaching Research & Referral Hospital, Mathari National Teaching and Referral Hospital, Moi Teaching and Referral Hospital, National Spine Injury Referral Hospital, Nakuru Level 6 Hospital and Mwai Kibaki Hospital.

The MoH also houses several semi-autonomous government agencies amongst them; Kenya Biovax Institute, Kenya Health Professions Oversight Authority, Institute of Primate Research, Kenya Hospital Authority Trust Fund, Kenya Medical Research Institute, Kenya Medical Supplies Authority, Kenya Medical Training College, Kenya National Public Health Institute, Kenya Tissue and Transplant Authority, National Health Insurance Fund now Social Health Authority and the National Cancer Institute (MoH, 2025)

The MoH in collaboration with the aforementioned agencies deal with social health protection, policy formulation, provision of technical support, promotion of medical tourism, establishment of digital health programmes and provision of quality healthcare services to Kenyans. The health sectors' mission is "To build a progressive, responsive and sustainable Health care system for accelerated attainment of the highest standard of health to all Kenyans'' (MoH, 2025).

The public hospitals in Kenya are organised in a six-tier system. Level 1 to Level 6 are managed by the county government, while Level 6 are managed by the national government. The County Governments have Departments of Health mandated to manage the Level 1 to Level 5 public hospitals, promoting primary healthcare, managing ambulance services, licensing and controlling the undertakings; that sell food to the public, veterinary services (excluding regulation of the profession), cemeteries, funeral parlours and crematoria (MoH, 2025)

Level 1 public hospitals are community health units offering preventive health and early screening of diseases. These hospitals are meant to serve 5,000 Kenyans who live in a single community. A family is assumed to have 5 members so that 20 households are

expected to be handled by 1 community resource person and 1 community unit with 5,000 people to have 50 resource persons. The 50 healthcare personnel are supervised by 1 health extension officer who operates in a nearest dispensary. In these healthcare facilities, preventive and promotive services are offered.

Level 2 public hospitals are health clinics or dispensaries, with one dispensary serving 3 communities i.e. about 15,000 people. These hospitals provide preventive, curative, and promotive services. Additionally, they offer outpatient services with patients requiring inpatient care being referred to a health centre. Level 3 public hospitals are comprehensive health centres that serves over 30,000 people. They offer 24/7 inpatient and outpatient services and maternity.

Level 4 are sub-county public hospitals offering specialist care, diagnostics services, and outpatient/inpatient care. They serve over 100,000 people and have at least one specialist in every department. Level 5 are secondary referral county hospitals providing comprehensive services, internships for medical students, and training for medical staff. Level 6 is a national teaching and referral hospital offering specialised care (Africa Health Business, 2021; Mwihia, 2020).

All the hospitals both at the county and national level are tasked with the provision of equitable and affordable healthcare services to all at the highest quality standards (Mumaraki, 2019). This should be in line with the Kenya Vision 2030 agenda of promoting health tourism into the country through positioning the country as a destination for specialised medical and health services, training and retaining specialised expertise, giving Kenyans access to specialised medical services within the country and creating employment in specialised healthcare (GoK, 2023). The study focused on level 4, 5 and 6 public hospitals. These hospitals consume between 30% to 50% of the national and county healthcare budgets and serve a population of over 1,000,000 patients annually (Simeoni & Kinoti, 2023).

Rastoka *et al*., (2022) highlight that the outbreak of the novel corona virus in 2020 threatened public healthcare systems across the globe. More supply chain demands were created in the healthcare systems. Governments all over focused on investing more healthcare funds and expanding healthcare resources be it human or physical resources

among other measures. 5 years later, today, the novel virus is behind us but the public healthcare continues to face a myriad of challenges.

A rise in ageing population, advancement in technologies, high patient expectations amongst other factors are challenges facing public hospitals across the globe. Public hospitals in Kenya face supply chain problems which include inefficient demand forecasting, a lack of a decentralised procurement system at the county level, low ICT utilisation and risk taking levels, and inadequate medicines, equipment, and human resources, poor procurement planning and low supplier relationships. A recent report by the Kenya Council of Governors (2024) indicates that in public hospitals, only 14 doctors are available to serve 10,000 Kenyans, resulting in long waiting times for patients in hospital queues. The report indicates a high level of medical brain drain, where 591 doctors are away on study leave and 135 who have completed studies are likely to remain in foreign countries in place of rendering their expertise in Kenya. Most public hospitals operate for 8 hours resulting in underutilisation of invested capacities (Toroitich *et al.,* 2021).

According to Mwihia (2020) the WHO requirements include 23 doctors and midwives per 10,000 people. Kenya has an average of 1 doctor, 12 midwives and nurses for 10,000 people with shortfalls of this resource-person figures being more prevalent in rural settings. The country's expectation for devolution was to reduce challenges in the healthcare sector. However, devolution came with a reduction of county levels autonomy in operating these hospitals, reduced community involvement and public participation in health matters and non-alignment of priorities among the two levels of government.

Entrepreneurial behaviour has been linked by various researchers to improved organisational performance by offering solutions to problems in the healthcare supply chain. This is through introduction of new ways of doing things by improving processes, being proactive and always staying alert to industry changes. Healthcare entrepreneurship bring in entrepreneurial skills aimed at improving the public hospital mission (Rastoka *et al*., 2022). In this regard, we postulate that the adoption of entrepreneurship in public healthcare stimulates quality of public healthcare services.

Rastoka *et al*., (2022) elaborate that public hospitals incorporate trained staff, robust response structures, adequate infrastructure and interactions mechanisms that are all in line with international health standards. Innovation allows for institutional changes to allow an organisation remain relevant to the customers. Innovation in the healthcare sector across the globe is aimed at improving service delivery. Proactiveness in healthcare ensure patients' needs are met promptly. Risk taking reduces negative outcomes in the long run.

Glover *et al*., (2024) highlight that hospitals have adopted the highlighted entrepreneurship activities in order to improve economic and societal well-being. In an environment of entrepreneurship, the public hospitals are able to build effective supply chain management systems, which allow for accurate forecasting of patients demands hence holding adequate inventory, proper planning for procurement with suppliers and enhanced risk taking (Kaitany, 2022).

1.2 Statement of the Problem

An aspiration of the Kenyan Government in the Vision 2030 plan is to transform lives through equitable, high-quality, and affordable healthcare to all, by improving public healthcare (GoK, 2021). To achieve this, the Kenyan Government has instituted various reforms and policies in the healthcare sector; BETA, UHC, the Fourth Medium Term Plan (2023-2027) establishment and revamping of Kenya Medical Supplies Authority (KEMSA) and a recent establishment of the Social Health Authority in October, 2024, all aimed at promoting good health for all (Ministry of Health, 2023).

However, despite these government interventions and heavy budgetary allocations, the quality of services offered in public hospitals keeps deteriorating. There is lack of adequate personnel, medicines, equipment and expertise, inadequate infrastructure characterised with inadequate specialised equipment, lack of innovation and ICT utilisation, low levels of risk taking characterised with routine practices, inefficient demand forecasting and a lack of a decentralised procurement system at the County level. All these challenges affect the effectiveness, financial viability, and relevance of public hospitals in Kenya (Okoth, 2021)

A functional entrepreneurial supply chain system is the backbone of quality public healthcare and improved organisational performance, as it guarantees the provision of

quality healthcare services in a timely and efficient manner (Olutuase *et al*., 2022). Therefore, the central objective of this study was to uncover the influence of entrepreneurial supply chain practices on the performance of public hospitals in Kenya. The research also focused on the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

1.3: Objectives of the Study

The study was guided by both general and specific objectives.

1.3.1 General Objective

The general aim of the study was to investigate the effect of entrepreneurial supply chain practices, healthcare financing and performance of public hospitals in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study included:

1. To determine the relationship between innovative inventory management on the performance of public hospitals in Kenya.
2. To assess the relationship between proactive strategic sourcing on the performance of public hospitals in Kenya.
3. To analyse the relationship between risk taking on the performance of public hospitals in Kenya.
4. To establish the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

1.4 Study Hypotheses

The study hypotheses included:

H_{01}: Innovative inventory management has no significant effect on the performance of public hospitals in Kenya.

H_{02}: Proactive strategic sourcing has no significant effect on the performance of public hospitals in Kenya.

H_{03}: Risk taking has no significant effect on the performance of public hospitals in Kenya.

H_{04}: Healthcare financing has no moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

1.5 Scope of the Study

The study sought to establish the effect of entrepreneurial supply chain practices on the performance of public hospitals in Kenya. Additionally, the study sought to establish the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and performance of public hospitals in Kenya. According to NHIF (2024), there are 9696 healthcare facilities in Kenya comprising of both public and private hospitals. From the 9696, 243 are public Level 4, 5 and 6 hospitals. From the 243, 214 are Level 4 hospitals, 23 are Level 5 hospitals and 6 are Level 6 hospitals. The Level 4 and 5 public hospitals are operated by the county governments, while the level 6 hospitals are operated by the national government. The study scope was limited to the 243 public hospitals in Kenya. During data collection, the study focused on the procurement and supply chain officer/equivalent and the finance officer. This is because the supply chain officer and the finance officer are knowledgeable about the entrepreneurial supply chain and healthcare financing and performance, respectively.

1.6 Justification of the Study

Public hospitals in Kenya are faced with insistent challenges comprising of frequent stakeouts of essential medicines, weak procurement systems, and inefficiencies in supply chain management that compromise service delivery and customer satisfaction. Despite government reforms and health sector devolution to counties, many public hospitals still struggle with inadequate resource allocation, delayed procurement processes and limited institutional and operational capacity, resulting to poor patient outcomes characterised by high mortalities and morbidities among others. A focus on supply chain practices particularly through entrepreneurial approaches provides cherished intuitions into how public hospitals can their performance. Furthermore, with healthcare financing constrained and demand for quality services rising, this study is justified in its potential to generate evidence that informs policy, guides hospital administrators, and supports sustainable healthcare delivery in line with Kenya's UHC agenda. Under the Vision 2030 blueprint, the dominant aspiration is the transformation of the country into a newly globally competitive-industrialised state that promotes medical tourism in the country. This can be achieved through increased access to public healthcare that can be achieved through the adoption of entrepreneurial supply chain practices in public hospitals.

1.7 Significance of the Study

Improving the performance of public hospitals is critical in promoting the quality of healthcare services and ensuring equitable access to healthcare by all populations which reduces disparities and improves healthcare outcomes. In addition, by improving the performance of public hospitals through entrepreneurial supply chain practices, a nation contributes to the achievement of SDGs and this provides a global importance of this study. In this regard, the study findings will benefit the following: -

a. The Kenyan Government, Regulatory Bodies and Policymakers

The Ministry of Health is mandated to formulate and implement policies revolving around healthcare. Insights from the study may help in designing future policies that may incorporate entrepreneurial supply chain practices and promote sustainable financing in the area of healthcare. Sustainable financing may ultimately reduce donor dependency to fund healthcare in Kenya consequently promoting continuous access to public healthcare by members of the public.

The National Treasury may benefit from the study findings by adopting innovative financing mechanisms highlighted in the study. These mechanisms include but are not limited to public-private partnerships, increased capitation in healthcare insurance to promote risk pooling, and selling health bonds. This may alleviate the budgetary constraints facing public healthcare in Kenya. In addition, the study weighs the impact of the country's spending patterns regarding universal health care which may stimulate the implementation of sustainable spending approaches and formulation of reasonable healthcare policies based on facts and evidence as uncovered from the research study findings.

The Social Health Authority may utilise the study findings to help optimise the healthcare insurance scheme to ensure adequate risk pooling and timely disbursement of the contributions to public hospitals, as the availability of resources influences the performance of public hospitals. The Governors of County Governments in conjunction with the County Executive Committee member for health in each of the counties of Kenya may benefit from this study by being able to prioritise the mobilisation of resources for healthcare service delivery in their specific counties. The obtained resources will stimulate healthcare service delivery and venturing into uncertain markets by the public hospitals which will eventually make the hospitals self-reliant.

The Kenya Medical Practitioners and Dentists Council (KMPDC) may use the study to develop guidelines and policies that promote effective healthcare personnel development. This will provide a pool of healthcare professionals who are tech-savvy and risk-oriented. Additionally, the KMPDC will be able to identify key training areas continuously so that the professional development of its members is up to date.

b. Administrators and Managers of Public Hospitals

The Chief Executive Officers, Medical Superintendents, Board of Trustees, Hospital Councils and other top officials in the public hospitals may utilise the study findings by applying the study recommendations in the area of entrepreneurial supply chain practices. This will streamline the operations in the healthcare supply chain, enhance healthcare financing and promote the quality of healthcare services in public hospitals. In addition, the study findings will promote strategic allocation of resources in public hospitals as insights around healthcare financing will ensure funds are directed to the most effective areas in healthcare such as the purchase of drugs and diagnostic equipment, which will promote patient care and hospital operations. In addition, the public hospital's management boards of trustees can get enlightened on various types of health care financing strategies existing in the financial market hence authorise the facility administrators and managers on the best-suited method to raise more finances to improve the existing and even expand health care services in their hospitals.

The procurement/supply chain managers can leverage the study findings and utilise entrepreneurial supply chain practices as these practices reduce errors, enhance supplier relationships, promote efficient procurement planning, ensure timely delivery of healthcare supplies, reduce inefficiencies and minimise stock outs. Effective entrepreneurial supply chain practices will ensure that public hospitals have new technologies that enhance patient satisfaction by reducing mortality and morbidity rates and ensuring better health outcomes. The heads of finance in the public hospitals may use the insights obtained from the study to streamline budgeting, allocation of resources, and planning their finances in the public hospitals. Healthcare professionals and hospital staff members can understand the interconnection between entrepreneurial supply chain practices, healthcare financing, and the performance of public hospitals where they work. This will promote better alignment between individual capabilities and healthcare service delivery.

c. Academic Institutions

There is limited research focusing on the interaction between entrepreneurial supply chain practices, healthcare financing, and public hospital performance in Kenya. This study fills this gap by providing insights that are unswervingly appropriate to Kenya's public healthcare environment. In addition, the findings of this study provide the basis for future comparative and longitudinal research that track long-term effects around the areas of entrepreneurship in healthcare supply chains, healthcare financing and the performance of organisations. Consequently, the findings can be utilised in policy briefs of universities which ultimately enrich the national policy framework. This study provides valuable knowledge on how entrepreneurial supply chain practices can be adapted and implemented in low and middle-income countries (LMICs), contributing to the global discourse on public healthcare management.

The study findings can inform the development of relevant training programmes embedded on entrepreneurship in healthcare supply chains which can help prepare students for real-life tasks and challenges. The academic institutions can use the study to form a basis for student's research projects consequently giving learners exposure and hands-on skills. Additionally, the study can be used by academic institutions to develop continuous programmes for healthcare workers consequently enhancing the sector competency.

d. International Donors and Non-Governmental Organisations (NGO)

The study provides a data-driven connection between entrepreneurial supply chain practices and healthcare financing. This allows donors to allocate resources in high priority, high impact interventions. By better understanding entrepreneurial supply chain practices, donors and NGOs will design programmes that are based on an entrepreneurial mindset. Such programmes not only promote resilience but are sustainable. Through supporting supply chain entrepreneurship, donors and NGOs contribute to a more resilient healthcare supply chain which maximises health outcomes for the members of the public. NGOs who are focused on the area of healthcare will utilise the findings to develop action plans and interventions that support entrepreneurship in healthcare and provide an environment for sustainable financing. This will ensure donors align their funding and support programmes to promote healthcare delivery in Kenya.

e. Public Hospitals Service Providers

The suppliers of public hospitals may utilise the study findings to better understand the hospital's needs and provide tailor-made solutions that foster strategic partnership and effectiveness. By understanding entrepreneurial supply chain practices, the service providers will ensure consistent demand for their services. Insights on healthcare financing will enable service providers negotiate better and faster contracts with more consistent payments, consequently reducing their cash flow.

By adopting some of the entrepreneurial supply chain practices such as innovativeness in inventory management, the service providers will improve their responsiveness and service delivery making them obtain a competitive edge above other competitors. Additionally, the study provides opportunities for service providers to leverage on hospital resources such as technology to increase their competitiveness and address the ever changing demands of healthcare.

The providers of diagnostic equipment will be able to use other methods of selling such as leasing to stimulate smooth healthcare operations. Financial institutions such as banks and other investors will identify future investment opportunities in the area of healthcare and utilise the opportunities in an entrepreneurial way.

f. Healthcare Industry Professional Bodies

The professional bodies will utilise the study insights to advocate for evidence-based policies that are efficient, and that promote entrepreneurship adoption in healthcare supply chains. Additionally, the professional bodies will have a clearer understanding of what works in the healthcare supply chain and healthcare financing therefore, they will be able to develop standards that will ultimately promote better patient care in hospitals. The study findings will inform the design of training programmes targeted for various professionals in the healthcare sector. These training programmes can incorporate entrepreneurial skills in supply chain in order to enhance staff competency.

Specifically, the Kenya Association of Supply Chain Management (KASCM) will use the study findings to organise training and workshops that stimulate the best procurement and supply chain practices among healthcare workers. The Kenya Medical Association (KMA) will use the findings and push for the implementation of the study's recommendations which will enhance efficiency and effectiveness in public healthcare. The study findings can be utilised to show the role of coordination between healthcare

supply chain parties. By revealing this interconnectedness, relationships are established on shared values and mutual benefit.

g. The General Public

The public will better understand how entrepreneurial supply chain practices especially, innovative inventory management, proactive strategic sourcing and risk taking affect public hospital performance and operations. By better understanding this relationship, the public expectations on these hospital improves thus translating to reliable healthcare services by the hospitals. Additionally, the public will be able to promote transparency in resource use by the hospitals consequently reducing misappropriation.

The public can gain more knowledge on healthcare financing that exists in other parts of the world in comparison to what is currently observed in Kenya. It will enable them to weigh whether the elected leaders have substantially done enough in the area of healthcare financing and whether they are prudent administrators of the resources dispensed to them.

1.8 Limitations of the Study

This study faced several limitations. First, reliance on self-reported information from healthcare workers and administrators introduced the possibility of response bias, particularly on sensitive issues such as procurement inefficiencies and service delivery gaps. Resource and time constraints restricted the depth of field observations and follow-up interviews, limiting a more nuanced understanding of contextual challenges. Lastly, the dynamic nature of Kenya's public healthcare system shaped by policy reforms, devolution, and fluctuating funding means that the findings should be interpreted with caution, as they may change over time.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents the theories that anchored the study, the empirical review of previous studies, a conceptual framework displaying the relationship between the study variables, a summary and identified gaps from the reviewed literature.

2.2 Theoretical Review

The study was informed by resource orchestration, resource dependency and the Schumpeterian entrepreneurship theories.

2.2.1 Resource Orchestration Theory

The Resource Orchestration Theory (ROT) emerged from the Resource Based View (RBV) theory. The RBV developed by Barney in 1951 has various limitations that is, it fails to define a resource in a straight-forward manner making it difficult for one to differentiate resources from inputs (Ndung'u, 2021). The RBV focuses on internal resources within a firm rather than opportunities available in the external environment making it static to external changes (Furnival *et al*., 2019). In addition, the RBV fails to explain the role of managers in the transformation of resources into capabilities that can bring a competitive advantage to an organisation (Queiroz *et al*., 2022).

The highlighted criticisms led to the development of the ROT. Resource orchestration identifies managerial activities through resource management and asset orchestration. The existence of critical resources in the supply chain calls for proactive actions by managers, who routinely identify the complementary resources and fit them together to improve performance (Sirmon *et al*., 2011). Resource management entails the structuring, bundling and leveraging of resources (Fawcett *et al*., 2022).

Structuring is the acquisition, accumulation and disposal of resources, while bundling refers to steadying, inspiring and ground-breaking resources. Leveraging entails mobilising, coordination and deployment of resources. To obtain the full value of resources, the structuring, bundling and leveraging activities should be performed simultaneously to bring value to an organisation (Zeng *et al*., 2023). According to ROT, an organisation possesses various resources including human, information technology, capital equipment, knowledge, organisational culture and management which when effectively structured, bundled, leveraged and managed for a particular market,

contribute to a sustained competitive advantage and superior performance in organisations (Fawcett *et al*., 2022).

Asset orchestration on the other hand is the assortment, arrangement, and positioning of assets in a supply chain (Fawcett *et al.,* 2022). The existence of assets forms abundant resources in an organisation and the role of the manager is to integrate these assets and resources to form a competitive advantage. Therefore, asset orchestration will result to the selection, configuration and deployment of assets that are benefitting the resources available in a supply chain to achieve competitive advantage (Fawcett et al., 2022).

Resource orchestration is critical for the development of an entrepreneurial supply chain because in the current business operating environment, there exist limited resources. Resource constraints are even worse for entities that serve public interest such as public healthcare facilities. Budgetary constraints facing counties in Kenya limit supply chain efficiencies. This results to supplies shortages and detrimental loss of lives. In the presence of resource constraints, resource orchestration is essential to help combine and rearrange resource to create value for the organisation and the customer (Ghalwash & Ismail, 2022).

When combined, asset orchestration and resource management form resource orchestration which is an entrepreneurial engagement and organisational routine that helps obtain synchrony. The ROT explains that managers should engage in the resource acquisition, development and transformation process to create sustainable capabilities that boost performance (Fawcett *et al*., 2022). Orchestration of resources creates a shared vision and provides productive opportunities for growth and better performance throughout a supply chain and organisation (Ndung'u, 2021).

A firm exists to achieve a sustained competitive advantage through heterogeneous resources. This is stimulated in an environment of resource orchestration and therein, entrepreneurship and better performance happen (Dang-Pham *et al*., 2023). Resource orchestration is a proactive engagement, a routine that helps obtain synchrony in an organisation. Changes in the marketplace calls for proactive managerial thinking and in return supply chain co-ordination and integration, information sharing and unity in a supply chain is established (Fawcett *et al*., 2022).

Public hospitals need to boost their resource orchestration capabilities to achieve entrepreneurial supply chain practices. Adoption of entrepreneurship in a supply chain can be through Omni-channel and last-mile delivery. The Omni-channel helps orchestrate supply chain resources across distribution channels thus creating more contact points, while the last-mile delivery entails supply chain agility, resilience and service recovery. An agile supply chain is able to respond to customer needs in turbulent markets, while a resilient supply chain is always able to recover from disruption. Through service recovery, a supply chain can take actions that solve problems that face customers while retaining the customers (Ketchen & Craighead, 2021).

Supply chain disruptions are easily identified through resource orchestration by creating alertness, efficiency and resilience throughout the supply chain. Supply chain disruptions affect the flow of supplies and pose a huge challenge to hospital operations, thus the need for entrepreneurial strategies. In adopting resource orchestration, public hospitals reduce supply shortages waiting time, increase the number of available beds and provide supplies effectively, while identifying obsolete resources, thus enhancing performance (Hassan & Mahmoud, 2021).

Effective entrepreneurial supply chain practices ensure the strategic acquisition and management of resources, ultimately contributing to the hospitals' competitive advantage and improved performance in delivering healthcare services. Through resource orchestration, a public hospital strategically aligns the acquisition of resources with the hospital's goals, creating accurate specifications for medical equipment, pharmaceuticals and other resources. Additionally, in the presence of resource constraints, the ROT helps combine and rearrange resources to create value and serve the public interest (Ghalwash & Ismail, 2022).

2.2.2 Resource Dependency Theory

The resource dependency theory (RDT) was developed by Pfeffer and Salancik (1978). According to RDT, the performance of an organisation is embedded in resources that exist in the operating environment. These resources have a high potential to impact business strategic decisions (Omisakin *et al*., 2022). The RDT explains the process of resource acquisition and utilisation in an organisation; where over-reliance on external parties for an organisation's resources reduces the firm independence and consequently affects performance. Therefore, the main viewpoint of the RDT is the reduction of an

organisation's dependence on other organisations for resources and an increase in organisations' dependence on themselves (Wang *et al*., 2020).

The RDT has been used to explain the relationships between an organisation and the environment in which it operates. Mutual relationships according to RDT are established through collaborative behaviour (Katila *et al*., 2022). The development of relationships promotes customer service and reduce the costs of operations. Supply chains consists of various stakeholders who operate independently. Among the parties, are suppliers who influence success (Jawaad & Zafar, 2020). The relationships established between suppliers and buyers help communicate expectations together. This collaborative practice helps in problem solving, technology co-development, customer responsiveness and product differentiation; all aimed at improved service delivery (Numan *et al.,* 2020).

RDT has been used widely to explain supply chain disruptions and uncertainties which results from dependencies in an operating environment. Uncertainties and resource constraints in an organisation's supply chain results to managers proactively securing resources within their environments to survive (Yeager *et al.,* 2014). The lack of resources needs inter-organisational partnering and relationships. The need for resources to survive is addressed by RDT (Malatesta & Smith, 2014).

Ansmann *et al*., (2021) note that public hospitals across the globe are facing increasing pressure to deliver quality healthcare services despite heavy budgetary and resource constraints. External pressures that exist in the healthcare operating environment require public hospitals to think about surviving in resource-constrained environments and deliver equitable healthcare services to all. In a low munificent healthcare environment, the access and availability of resources is limited. Healthcare workers, drugs and supplies and equipment among other resources are limited, but the demand for healthcare is rising. Healthcare reforms are also changing making the operating environment for public hospitals more hostile. To counter this problem, the use of entrepreneurial supply chain practices is key as these practices synchronise resources making it easy to obtain greater value for the organisation (Katila *et al*., 2022).

Resource acquisition and utilisation are achieved in the availability of two constructs; environmental munificence and hostility. Environment munificence relates to

the availability, accessibility and location of resources for use in an organisation. A highly munificent and low hostile operating environment promotes the adoption of entrepreneurship in an organisation, while the lack of a munificent operating environment forces organisations out of entrepreneurship as they major on managing scarce resources to obtain a competitive advantage (Omisakin *et al*., 2022).

The lack of organisational resources needs inter-organisational partnering and mutual relationships; which according to RDT, are established through collaborative leadership behaviour and they help to proactively secure organisational resources amid scarcity and budgetary constraints, thus promoting business continuity (Katila *et al*., 2022). Partnerships created through resource needs result in joint planning and decision-making, information and resources sharing, long-term-supplier relationship, new ventures, collaborative behaviour, supply network visibility, and inventory control resulting in improved organisational performance (Spieske *et al*., 2021).

Information is a critical organisational resource in the healthcare sector. However, the degree to which information is available is very low. This establishes a problem in decision making. Supply chains consists of high level of interconnectedness and relationships, with collaborativeness being aimed to improve information sharing. Collaborative relationships are essential between suppliers and buyers. Coopetition becomes necessary to build a huge resource base. This can be easily done in the presence of new technologies (Omisakin *et al*., 2022).

2.2.3 Schumpeterian Entrepreneurship Theory

The Schumpeterian entrepreneurship theory (SET) was developed by Schumpeter at the beginning of the 20th century. According to Schumpeter, entrepreneurship relates to creative destruction where entities destroy equilibrium and create new conditions in the marketplace. Changes occurring in the economy create opportunities that can be utilised for the benefit of the organisation (Vaz-Curado & Mueller, 2019). Entrepreneurship focuses on new products, processes and innovations available in an organisation. The theory postulates that organisations should motivate, inspire and recognise developments that are beneficial and that organisations should have the impulse to fight competition in a bid to prove superiority and success in the industry (Mehmood *et al*., 2019).

Entrepreneurship is the lifeline of any economy as it is a struggle between the new and the old, most productive against less productive, new supply sources against old sources, risk-taking versus risk-averseness with all activities aimed at breaking routine and introducing new business ideas and ways of doing things. These activities are prone to error, which in entrepreneurship is given accolades rather than criticisms. Trying is appreciated in entrepreneurship and results in the creation of a new product, production process, market, supply source, and re-organisation all aimed at improved performance (Behr & Storr, 2022).

Utilisation of opportunities in an arbitrary manner results in a stall in organisational improvements after a particular time. However, the existence of uncertainty in the operating environment equates to organisational opportunities. Opportunities, according to Schumpeter are seized through innovation, proactiveness and risk-taking. The environment is always open to creative individuals who can make choices differently from the rest. Opportunities are created through the introduction of information that arises due to changes in the environment. As these changes occur, leadership is keen to identify and be bold enough to partake in novel choices (Vaz-Curado & Mueller, 2019).

Utilisation of these available opportunities requires entrepreneurial thinking to leverage performance. According to the SET, organisations should always be on the lookout for opportunities in the marketplace and the identified opportunities should thereafter be developed effectively, to ensure the efficient provision of quality customer service (Callegari & Fedder, 2021). The healthcare sector is highly dynamic and volatile whereby the supply cannot often equate demand and the present demands cannot equate the future demand. The technology used today will be rendered obsolete in the near future. Therefore, abundant resources are constantly considered for survival of entrepreneurship. Technology should be adopted to favour consumers and to respond to supply chain demands. The utilisation of available resources is advocated by Schumpeter who also emphasises that these resources should be used more productively and differently so as to build greater advantage (Vaz-Curado & Mueller, 2019).

However, it is worth noting that entrepreneurship is not easy and usually faces resistance. Change such as adoption of entrepreneurship is customarily a painful process, but if well supported, entrepreneurship in the healthcare supply chain breeds

better performance. This is attributed to the ability of entrepreneurial leaders being alert and bold to break away from the norm thus creating room for identifying better supply sources, utilisation of technology, strengthening of supplier relationship, development of new businesses, collaborative behaviour and improved quality in the healthcare sector (Callegari & Feder, 2021).

2.3 Empirical Review

This section presents the empirical evidence from past research on entrepreneurship in supply chains, healthcare financing, and performance of organisations.

2.3.1 Innovative Inventory Management and Performance

Innovation is the experimentation of new techniques, products, and services in an organisation. It is more of an organisational culture that relies on adapting new practices in place of old techniques. It is an imperative not an option as it stimulates growth and productivity in an organisation. Innovations break from the routine and normal firm processes to give birth to a vision that stimulates performance by overcoming competition. It is a core competency that builds the future of an organisation in a highly dynamic operating environment (Ferreira & Marques, 2021).

Innovations in organisations majorly takes two forms; goods and processes innovations. These innovations interplay and influence performance of organisations to a certain degree, and aim at providing satisfaction to the end consumer. Process innovations influence how organisational activities are done by laying out clearly the procedures, routines, rules and communication. Process innovation majorly focus on internal operations which establishes efficiency. On the other hand, product innovation influences the way a good is made and how fit the final commodity is in meeting customer needs. (Kalyar *et al*., 2024).

Product and process innovations interact and influence one another to promote organisational performance (Hamdan & Alheel, 2020). According to Klofsten *et al*., (2018) innovation in an organisation occurs in two processes: exploratory and exploitative innovation. In exploratory innovation, organisations develop novel products of processes that meet the demands of the marketplace while in exploitative innovation, the quality of existing processes and products is enhanced through establishing more processes and products and expansion of organisational knowledge.

Organisations that adopt either of the aforementioned innovations are able to provide better quality products and processes and this enable them beat competition.

Otolo *et al*., (2024) identify innovativeness as a culture that greatly supports new ideas, experimentation, new products and technologies. In this culture, organisations achieve greater advantage in the operating environment. The tendency of an organisation to support creativity and improve processes through new technology use improves the organisation's competitive advantage. In most countries, innovation in the public sector has been in the mind of many and for a long time has been depicted as a myth. However, in recent times, public entities are engaging in novel practices which has enhanced efficiency and effectiveness in service delivery.

Public hospitals across the globe are faced with continuous hardships ranging from myriad of diseases, change in lifestyles which causes high disease burden, inadequate healthcare personnel, budgetary constraints amongst others. Despite these challenges, the public hospitals are tasked with the provision of medical services to stimulate growth and prosperity. The provision of healthcare services in the public hospital is expected to be followed by commercialisation. This balance is established through innovations which can take place at any level in the public hospital, but with one major goal of enhancing competitive advantage and performance (Valka *et al*., 2020).

In the knowledge-based economy, there is increased technology and competition that faces businesses. The healthcare sector is of no excuse. In this sector, technology changes have increased. Technologies and innovativeness help cope with these changes as they provide knowledge sharing platforms, technologies promote innovation. This is through reduction of order lead time and improvement of overall business processes (Kaylar et al, 2022).

The public healthcare sector in Kenya is rapidly growing with over 7,000 public hospitals competing among themselves. This competition is aimed at revealing the capabilities in the operating environment while providing quality healthcare. The operating environment of the public hospitals is characterised by great levels of resource constraints. Regardless of these challenges, the public hospitals are tasked with provision of quality healthcare to the society. Innovativeness has proven to be a crucial

contributor to dealing with such challenges as it exploits the constraints and uses the constraints as opportunities for organisational growth (Otolo *et al*., 2024)

Ketchen Jr & Craighead (2021), elaborate that innovativeness in inventory management can be achieved through new technology use and JIT principle. The healthcare landscape is rapidly evolving and innovations in hospital operations can help optimise resources, increase efficiency, enhance better health outcomes, and improve overall patient care (Omaghomi *et al*., 2024). According to Ilangakoon *et al*., (2020), the healthcare sector requires high-quality services to sustain the well-being of the people. It is a sector that is rapidly growing due to increased population, urbanisation, and changing lifestyles and diets. The use of new technologies can aid the sector through improvements in the operational performance of the healthcare supply chain.

The worldwide costs for healthcare are estimated at a total of 18.28 trillion dollars by the year 2040. There is a need to incorporate technology and innovation in the delivery of healthcare services (Rimberia, 2022). Technology is a unique organisational resource that can be leveraged to deliver strategic benefits for an organisation. Technology in a hospital has the unique capacity to provide quality healthcare, reduce healthcare costs, and improve patient experience. This is through improved coordination and integration amongst the hospital departments which allows for a seamless flow of accurate healthcare data for patients.

According to MoH (2019) Kenya has insufficient information technology hardware that includes computers, printers, servers and other accessories. This makes it difficult to support the healthcare information systems developed in the country. A 2018 Kenya Health Facility Assessment survey revealed that, overall, 50% of the facilities in the country had a communication equipment, and 31% had a computer with internet access. However, the hospitals that had these resources varied across regions with majority being in big towns. Specifically, Nairobi had 77% of the hospitals having a computer with internet connectivity. Laikipia followed with 57%. Hospitals with a computer and internet connectivity in Lamu, Baringo and West Pokot were 10%, 10% and 5%, respectively.

Through new technologies such as cloud computing and internet of things (smartwatches, wireless sensors e.t.c.), hospitals can access patient data in real time

making it easy for doctors to make smart decisions that improve healthcare outcomes. Big data analytics help analyse disease patterns and predict the prevalence of diseases. This is a critical asset during epidemics as it can help prevent its spread while ensuring organisational resources are well utilised. The Internet of Things has sensors that monitor inventory levels in real time, which enables quick replenishment of orders when they are needed. Through machine learning, organisations are able to analyse demands and predict supply chain disruptions. Cloud computing ensures real time data sharing among supply chain parties thus maximizing coordination (Ilangakoon *et al*., 2020).

Currently, the globe is experiencing Industry 4.0 which is the fourth industrial revolution that is more service-oriented than product oriented. This era involves the use of the Internet of Things, communication infrastructures, and big data to provide services that improve efficiency, reduce costs, help access real-time data, new product development, and boost the competitive advantage of service firms. If utilised in the healthcare sector, Industry 4.0 is referred to as Health 4.0 (Ilangakoon *et al*., 2020). Some of the new technologies introduced by Health 4.0 in the healthcare sector include smart pharmacies, personalised patient care and medicine-centre, body area networks, and sensors to enable doctors to access patient data online (Kaylar *et al*., 2022).

The application of Industry 4.0 is based on real-time service provision for the patients, which creates interactions with the autonomous virtual systems (Kaylar *et al.*, 2022). New technology use can help in reducing the estimated high healthcare costs, improve agility, flexibility, scalability, and quality, and enhance interactions thus optimising healthcare resources. Electronic health records, the Internet of Health Things, and mobile communication networks are all new technologies that can be used by public hospitals to promote operations. Management healthcare systems help negotiate contracts with suppliers, process claims, enhance resource optimisation and decision-making for the reallocation of resources, and automate consumables and medication (Al-Jaroodi *et al*., 2020).

The use of new technologies such as telemedicine in a supply chain improves service delivery. In the USA, the Los Angeles Department of Health developed a tele-retinal screening programme which has reduced the wait time for eye-care specialists by 895 persons and improved the annual rates for screening by 16%. Patients with skin rashes

can email or WhatsApp a digital photo and get mobile treatment thus improving effectiveness (L.A. County, Department of Public Health, 2023). In Ethiopia, the use of Telemedicine is considered a favourable tool for healthcare service delivery and most public hospitals in the country have implemented it (Rimberia, 2022).

The adoption of new technology specifies the value needed by the user who in this case is the patient thus eliminating non-value-adding processes such as longer waiting times in queue. Information technology is a new resource that builds an organisation's competitive advantage. When utilised in a hospital, IT delivers strategic benefits through enhancing integration and coordination amongst hospital departments. Patient record capturing, management of medicines, wards, and equipment, wearable patient care devices, and RFID imaging services are amongst the IT services that breed improved performance in a hospital (Illangakoon *et al.*, 2021).

Omaghomi *et al*., (2024) notes that the Mayo Clinic in the USA has adopted a comprehensive Electronic Health Records (EHR) system which has significantly improved patient care management. The system allows for seamless access to healthcare records which enhances decision making throughout the hospital. In Cleveland Clinic, the use of telemedicine has provided successful virtual consultations and follow-ups which reduces the waiting time and promote patient accessibility. In the IBM Watson for Oncology centre in the USA, the use of robotics and artificial intelligence has greatly impacted the treatment decision for cancer patients. The Johns Hopkins Medicine's PatientPal application has stimulated patient engagement in their healthcare journey by allowing the patients timely access to health records, giving them capacity to reschedule their appointments and providing educational resources that maximises health outcomes.

The public hospitals in Kenya are tasked with the provision of preventive and curative care. For curative care, the pre-medical diagnosis is a critical step that influences health outcomes. The use of Health 4.0 through digital screening of diseases and management of illnesses will ensure optimal utilisation of hospital resources for preventive healthcare other than treatment of diseases. Other sectors such as the Ministry of Health and KEMSA will use Health 4.0 to forecast medical requirements and plan on resource allocation. In the healthcare sector, the patient is the primary customer and several healthcare organisations across the globe (Mayo Clinic Division of Cardiovascular

Diseases, hospitals in Tanzania and Malaysia, Virginia Mason Medical Centre among others) have implemented Health 4.0 through sorting, set-in-order, shine, sustain and standardised approach to improve patient care. This approach is focused on removing redundant activities that fail to add value to patient care and help in managing hospital inventory.

According to Smith (2024), inventory management entails overseeing the acquisition, storage, and dispatch of organisational inventory. It involves creating and maintaining a balance between supply and demand to ensure that costs and waste are minimised. Public organisations operate with minimal resources in a highly competitive environment. To beat the competition, organisations have realised the full potential of managing inventory as it helps in demand planning, improving agility, and enhancing customer satisfaction. The healthcare sector experiences excessive inventory accumulation, shortages and obsolescence more than any other sector. Shortages lead to loss of life which makes hospitals face liability lawsuits, while oversupply results in expired products, pilferage, and excessive wastage (Essila, 2022). People are finding it difficult to visit hospitals when sick since pharmacies at a retail level are treating low-acute illnesses which is easily manageable with minimum inventory levels (Barry, 2019).

Over 2 billion people do not have access to basic medicines, resulting in more human misery and suffering. In Kenya, the availability of healthcare supplies remains low despite the Vision 2030 Agenda stipulating equitable access and availability of healthcare supplies. There is an urgent need for inventory optimisation and control through efficient new technology use (Karamshetty *et al*., 2022). This can be achieved through the JIT inventory principle. Medical supplies are recognised as indispensable for an effective and efficient healthcare facility. Shortages are unaffordable since liabilities and loss of lives are the result. Additionally, oversupply means expired products, pilferages, redundancies, and wastages. Reportedly, the healthcare sector experiences inventory accumulation, obsolescence, and shortages than any other sector (Essila, 2023).

JIT is an inventory management strategy that aims to minimise inventory holding costs by receiving goods when they are needed in the processing of a consumer demand. The goal for JIT is to reduce inventory costs, increase efficiency, improve cash flow, reduce

obsolescence and supply disruptions by reducing ordering, holding, and shortage costs of inventory (Song *et al*., 2020). Developed by Toyota Company in the 1970s, this principle focuses greatly on reducing waste so as to synchronise demand and supply. It is founded on demand driven production where what is produced s what consumers need. The suppliers on the other end deliver smaller raw materials when needed creating an environment of relationship and trust as the turnaround times are very many (Essila, 2023). Smith (2024) postulates that the JIT principle minimises inventory holding by synchronising organisational supply and demand.

Innovative inventory management in the healthcare sector should be compatible with its operations. This should entail capacity planning, resource allocation, demand forecasting, and other operational activities. The existence of a vast inventory base in the healthcare sector; pharmacies, operating rooms, Intensive Care Units (ICU), and wards, require optimal stocks that will minimise lead time and consequently save lives. The pressure to reduce costs and increase service delivery is critical in hospitals.

Omaghomi *et al*., (2024) did a review in Nigeria that focused on innovations available in hospital management. The review identified the use of technologies in the form of Electronic Health Records being the dominant technology used in the hospital setup. The study also recognised that Telemedicine has improved access to healthcare services for people. Specifically, the review noted that the Mayo clinic in the USA utilises Electronic Health Records to enhance patient records coordination. In Cleveland Hospital, Telemedicine adoption has improved the population accessing healthcare services by providing virtual consultations. The study by Omaghomi *et al*., (2024) delves deeply into the use of the Internet of Things and how it impacts access to the right to health. The current study goes further and integrates new technology use in inventory management and how it impacts the performance of public hospitals in Kenya.

Smith (2024) studied innovative inventory management techniques for start-up organisations. The study noted that start-ups aiming at achieving efficiency, and effectiveness, minimising costs, and improving customer satisfaction, adopt innovations in inventory management. Pasupuleti *et al*., (2024) studied how to enhance supply chain agility through proper inventory management techniques realised through using machine learning and artificial intelligence. The study revealed that the use of

Internet of Things such as robotics, RFID, and ERP promotes supply chain visibility, reduces inventory costs, and promotes superior performance in a dynamic operating environment.

A study by Shibabaw *et al*., (2023) highlighted that inventory optimisation and management are critical for enhanced firm performance. The study also found out that inventory management and technology use is done at low levels in Kenya. Cesarelli *et al*., (2021), looked into innovative inventory management models with a focus on outsourcing, virtual inventory, and lateral transhipments. The study established that innovativeness in the supply chain promotes better performance. The current study looked into technology use and research and development as measures of innovativeness in inventory management. Hashmi *et al*., (2021), used inventory management as a mediator in the case of state-funded hospitals in Pakistan and found a full mediation of inventory controls on inventory management and performance. The current study utilised inventory management built upon new technology use and just in time inventory as an independent variable.

A study by Ilangakoon *et al*., (2020) assessed the extent of utilisation and adoption of Industry 4.0, lean supply chain concepts and how they impact the operational performance of hospitals in Sri Lanka. The study focused on the Internet of Things, cloud computing, and big data as measures of Industry 4.0. For measures of operational performance, the study adopted waiting time and resource utilisation. The study revealed a weak positive and significant relationship between technology use and operational performance. The study revealed that new technology adoption in the Sri Lankan healthcare sector is quite low and is currently in the development stages.

The study concluded that for a hospital to move from curative to preventive care, it should integrate new technologies in service provision. The study in Sri Lanka focused on only two public hospitals (Dompe eHospital and Colombo North Teaching Hospital) and focused on resource utilisation and waiting time as measures of operational performance. The current study focused on 243 public hospitals in Kenya and incorporated effectiveness, organisational relevance, and financial viability as measures of hospital performance.

Another study by Stoumpos *et al*., (2023) assessed technology acceptance and digital transformation in the healthcare sector. The study done in Greece revealed that innovations play a critical role in the delivery of healthcare services. The study performed a systematic bibliographic review using the Wester and Watson methodology and identified that adoption of telemedicine is a growing approach in the healthcare sector that needs to be utilised. The current study focused on utilisation of new technology in inventory management of public hospitals in Kenya.

Belfiore *et al.,* (2022) studied the level of utilisation of internet of things in healthcare and found out a positive and significant relationship between new technology use and service delivery in the hospitals. The study concluded that hospitals have been able to enhance information flow from patients to various points of use, dispatch medicines easily to patients and integrate processes thus promoting operational efficiency. The current study utilised new technology use to assess effectiveness, financial viability and relevance of public hospitals in Kenya. Mahajan *et al.,* (2024) examined the use of innovations in inventory management and how they affect the financial performance of Small and Medium Enterprises in Hungary. The study also looked into managerial skills and how they affect adoption of innovations in inventory management. The study utilised a mixed method approach collecting data from 73 inventory managers. The study revealed that the adoption of innovations in technology promotes better financial performance and recommends adopting inventory management techniques that are innovative and the embracing of continuous improvement in inventory management.

Truong (2023) analysed the impacts of inventory management on performance of listed manufacturing firms on Ho Chi Minh City Stock Exchange (HOSE). The study adopted a descriptive research design with cross sectional secondary data for a period of 10 years starting from 2010 to 2019 being collected from 50 manufacturing firms. The empirical findings established that inventory management significantly relates to firm performance of manufacturing firms in Vietnam.

A study by Abu Zwaida *et al*., (2021) focused on the optimisation of inventory management to prevent drug shortages in the hospital supply chain. The study found out that the use of new technologies in order refilling for drugs reduced the drugs shortages in the hospitals significantly. Additionally, the study found out that managerial support help in the adoption of new technologies in a supply chain by

providing resources and creating a supportive environment where new innovations can be developed and tried. Abebaw *et al*., (2022) studied factors influencing the innovation ecosystem in public universities in Ethiopia. Utilising panel data analytics for data collected between 2016 and 2020, the study revealed that the adoption of innovation boosts graduate employability in public universities.

2.3.2 Proactive Strategic Sourcing and Performance

Proactiveness is the propensity to look ahead, analyse market/industry trends and take action on the identified opportunities. This promotes the introduction of new products at a pace that is ahead of competitors (Hossain *et al*., 2022). When done correctly, proactiveness shapes the firm macro environment rather than the firm depending on the environment (Hamdan & Alheet, 2020). This helps create strategic relationships, alliances, and collaborations with industry partners, thus reducing uncertainties (Gauthier *et al*., 2021). Proactive strategic sourcing is key to improving the efficiency and adaptiveness of healthcare systems. The primary goal of healthcare is to promote equity, quality of care, efficiency, and responsiveness to citizens. Proactiveness in strategic sourcing can help meet these goals even in the midst of high demand (Montas *et al*., 2022).

Proactive strategic sourcing establishes relationships with many suppliers and help to mitigate risks in the disruptive environments and improve agility and resilient. It involves planning procurement/sourcing, research and development, contract establishment and supplier relationship management. Planning sourcing help in identifying quantities, specifications, framework for delivery, identifying source of supplies, negotiation and establishes relationships (Frederico, 2023).

Proactive strategic sourcing is key in improving the efficiency and adaptiveness of healthcare systems. The primary goal of healthcare is to promote equity, quality of care, efficiency and responsiveness to citizens. A surge in demand for healthcare can be addressed through proactive strategic sourcing (Montas *et al.,* 2022). Public hospitals obtain funds from the public and donors. These funds ought to be utilised efficiently and effectively to breed more benefits. The goal for public healthcare is to protect the poor and to achieve this, governments are rethinking the sourcing function to include proactiveness.

Across regions, the adoption of proactive strategic sourcing relates to government regulations and, the administration of national health insurance with pharmaceutical companies, suppliers, patients, and all relevant supply chain parties being part of the process. The adoption of strategic sourcing practices is demanding and complex as it calls for committing funds to priority populations, and interventions and creating initiatives that enhance equity in access to healthcare. Proactive strategic sourcing addresses problems in advance so that risks and negative consequences are avoided (Munyua *et al*., 2022). A study on strategic sourcing by Wanjiku & Mwangangi (2019) postulates that strategic sourcing enhances firm profitability. Another study by Ndung'u *et al*. (2023) revealed that strategic sourcing boosts the performance of milk processors in Kenya.

Among the key factors in an organisation are boosting responsiveness, improving the quality of products and services offered to customers, and achieving effectiveness in business operations. However, these goals are not met easily, especially in a competitive operating environment where uncertainty prevails and demands keep evolving. There is constant market uncertainty whereby demands change frequently, the supplier's lead time differs and there is product and information delay.

Proactive strategic sourcing comes in handy to aid an organisation improve profitability and effectiveness by establishing close relationships between the business and the vast base of partners that conduct operations with the firm. Both upstream and downstream linkages/partnerships are established in an environment of partnerships. Additionally, processes and activities that build customer value are built through partnerships and this ensures that the goods/services delivered to the final consumer and/or customer are of greater value (Vlahakis *et al*., 2020). Proactive strategic sourcing is a long-term approach to identifying supply sources while enhancing continuity. Through this approach, which encompasses searching for a supply base, selecting the suppliers, and having the goods delivered from the suppliers, firms can get supplies at competitive prices, lower their expenses, and increase effectiveness and efficiency and thus contribute to overall organisational performance (Munyi, 2024).

Proactive strategic sourcing is built by many concepts but majorly revolve around supplier selection and relationships, procurement planning amongst other concepts. Asadabadi *et al*., (2023) highlight that strategic supplier selection refers to a process of

identifying, choosing, and evaluating suppliers to ensure they are aligned with their strategic objectives and organisational needs. It is a fundamental process that ensures an organisation achieves a competitive advantage and optimises its supply chains. Strategic supplier selection is a critical supply chain management activity that causes great implications for a firm performance, as careful selection of suppliers helps a firm achieve product quality and market competitiveness. It is critical to invest in a robust supplier selection process to ensure sustained performance (Schramm *et al*., 2020).

Collaborative supplier relationships and the availability of proper strategies in procurement planning help improve healthcare performance (Oliech & Mwangangi, 2019). Sukati *et al*. (2020) recognise that long-term supplier relationships should be reciprocal in nature to form a basis for mutual benefit between suppliers and organisations. This stimulates an environment embedded in continuous improvement and shared responsibility which improves the quality of services offered in an organisation. Supplier relationships enable firms to deal with uncertainties or challenges that affect firm performance such as communication gaps and conflict of interests. Mutual relationships with suppliers help reduce supplier lead time ensuring they respond to organisational needs swiftly. Additionally, in an environment of mutual collaboration, there is collaboration in development of new products and efficient communication. Organisations can negotiate long-term contracts in an environment of trust and mutual relationship as there is a clear forecast of demand and this lowers the purchase costs.

Muema (2021) evaluated the effect of long-term supplier relationships in organisations and found that when a firm focus on fewer suppliers, it can foster stronger bonds that lead to resource sharing and innovation. Villena *et al*. (2021) postulate that supplier relationships encourage innovation through access to new shared technology and the customisation of products. They further highlight that supply chain resilience is built upon supplier relationships through enhanced risk mitigation and risk sharing, strategic alignment for both parties which boosts efficiency, trust, and transparency which promotes the sharing of confidential information and joint problem solving for effective gains.

According to Islami, (2022), supplier relationships require a high degree of coordination between the firm and the suppliers. In an environment of long-term supplier

relationships, there are mutual problem-solving, information sharing, constant communication, mutual planning, and continuous improvement initiatives which consequently breed superior performance and a win-win situation between both parties that is organisations and suppliers. A strategic supplier relationship will additionally, incorporate supplier quality management through mutual collaboration making it easy for both parties to understand and anticipate their needs, reduce uncertainty, and facilitate a flexible response.

Supplies sourcing in the counties in Kenya is mainly through KEMSA. This semi-autonomous government agency procures medical supplies for county health facilities from various source among them being foreign countries. The purchased items are then stored in a centralised county healthcare facility/warehouse awaiting dispensation. Every year, the county public hospitals procure from KEMSA at the rate of 79%, from the Mission for Essential Drugs and Supplies at 28% and the remaining 2% from private-for-profit distributors (Toroitich *et al*., 2022).

Despite having multiple supply sources, there is increased unavailability, stock-outs, and unaffordability of medicines in public hospitals in Kenya. In most public hospitals in Kenya, only 45% of essential medicines are available. 67% accounts for unavailable stock, for up to 30 days or more. Only 14% of Kenyan public hospitals are stocked continuously for 90 days or more. The available medicines are sold at high mark-up prices resulting in increased out-of-pocket burden to the members of the public and exploitation of patients at private hospitals (Toroitich *et al.,* 2021). The majority of the Kenyans who earn less than a dollar forgo treatment resulting in severe illness and probable death. On the other hand, the medicines that are highly priced deteriorate leading to more adverse implications. Additionally, a lack of qualified personnel to offer prescriptions results in poor dosage (Munene, 2022).

The County Governments, donors and the MoH have tried to implement strategies that are aimed at efficient supply chain management where there is reliable stocking options and strategies for essential medical supplies. This will help meet the growing demand for patients through uninterrupted access to medical services. Notably, USAID developed a quantification tool named QuanTB that forecasts demand and reduces stock outs for tuberculosis drugs. Such great efforts are affected by supply chain issues at the national level at KEMSA (MoH, 2025).

A study by Krop & Iravo (2024) in West Pokot county, Kenya assessed the effects of supplier selection and relationship on the procurement performance of public sector organisations and revealed that when a firm engages in strategic supplier selection and relationship, they are able to achieve value for money, timely delivery and quality of services and goods. Odhiambo (2023) who studied supplier selection and relationship criteria in Nairobi City County revealed that on top of high quality of products, an organisation also benefits from shared technological capacities and innovations which are crucial features for enhancing organisational performance.

The use of unco-ordinated logistics management information systems poses a challenge in ascertaining demand and supply, thus prolonged lead times and low supply (Kenya Health Sector Strategic Plan, 2018-2023). A continuous and adequate supply of medicines is a key element in managing diseases (Modisakeng *et al*., 2020). Collaborative supplier relationships and the availability of proper strategies in procurement planning help improve healthcare performance (Oliech & Mwangangi, 2019).

Planning for procurement helps in identifying sources of supply, determining resource quantities and their specifications, enhancing negotiations, establishing supplier relationships, and framework for delivery (Frederico, 2023). According to Baldeh *et al*., (2023), the Kenya medical supply chain is the fastest growing in East Africa with a high dependency level on outsourced raw materials from India. The heavy importation raises the cost of medicine which adds an extra burden to Kenyans. Ndolo *et al*., (2023) highlight that globally, healthcare supply chains face challenges in matching demand and supply where demand usually exceeds supply thus the need for proactive strategic sourcing which will not only match demand and supply but also advance the primary goal of healthcare which is to promote equitable quality healthcare and enhance efficiency and responsiveness to citizens (Montas *et al*., 2022).

Mwangi & Wabala, (2021) did a study on procurement planning and established that public sector organisations can get significant improvements in firm performance through efficient procurement planning. The study which utilised a multiple regression analysis recommends the adoption of procurement planning by public sector organisations among them public hospitals which is the target population of this study.

Another study by Salim & Kitheka (2019) in Mombasa County, Kenya found that procurement planning maximises value for money in budget-constrained environments. There have been significant incremental increases in budgetary allocations in county governments in Kenya but the overall healthcare funding in public hospitals remains insufficient with the county government expenditure covering only 38% of the primary healthcare expenses and national governments contributing to about 5.1% of the total budget to the Ministry of Health (GoK, 2020). With such low budgetary allocations, the ability of public hospitals to provide quality healthcare is undermined.

A breath of new hope is achieved in the abundance of procurement planning because a procurement plan stipulates the needed resources for essential medical supplies against available resources, therefore, minimising shortages and enhancing overall healthcare outcomes. A comprehensive study by Ahmed et al., (2021) on how procurement planning affects parastatals in Mombasa County Kenya revealed that planning for procurement is an integral organisational process that leads to improved financial performance, enhanced service delivery, and reduced operational costs. Omondi *et al*. (2024) investigated the role of procurement planning process amongst the public sector organisations in Kenya and confirmed that effective planning enhances service delivery and efficiency in operations.

A study by Oliech & Mwangangi (2019) established that strategic sourcing reduces shortages, and wastages, improves accountability, and makes services affordable to all. The study further recognised that poorly organised supply chains place the health of millions of Kenyans at risk. A recent shortage of Bacillus Calmette-Guérin (BCG) vaccines in Kenya was attributed to delays in sourcing (Simeoni & Kinoti, 2023). Proactive strategic sourcing ensures the availability of adequate supplies at the shortest lead times and competitive prices (Oliech & Mwangangi, 2019). In Thailand, the adoption of proactive strategic sourcing has reduced child mortality rates while in Ghana the quality of non-communicable disease treatment has improved (Munyua *et al.*, 2022).

Vlahakis *et al*., (2019), assessed proactive decision making behaviour in supply chain procurement. The study delved deeply into decision-making by focusing on planning, sourcing, making, delivering, and returning products. The study used Baye's causal relationship to depict the relationship between variables. The current study utilised a

quantitative approach and used proactiveness in the supply chain concept of strategic sourcing and not a decision-making concept. The study revealed that proactiveness in decision making positively influences supply chain procurement and overall firm performance.

Kaur & Singh, (2022) did a study on proactive and reactive procurement in the case of humanitarian supply chains. The focus was on building resilience in the supply chain. The current study emphasised the healthcare supply chain and entrepreneurship. The study was focused on building a model known as DEMATEL to assess the relationship between variables. The current study used a holistic conceptual framework to assess the relationship between entrepreneurial; and supply chain management practices.

Okangi (2019), considered the influence of proactiveness on the profitability of Tanzanian construction enterprises and revealed that proactiveness in organisational operations promote sustainable performance. Another study by Awais & Fantazy (2018) on the influence of proactiveness on the sustainability and performance of supply chains in Pakistan found out that proactiveness boost supply chain agility and responsiveness which in turn leads to greater performance.

2.3.3 Risk Taking and Performance

Risk taking entails the readiness of the public hospital to take advantage of opportunities, utilise resources and invest in projects that exist in an uncertain environment, and have uncertain returns. It is the propensity of the organisation's administration to take business-related perils in uncertain business terrains. Public hospitals that fail to take the intended risks usually fail but those that commit to risky ventures reap greater benefits (Otolo *et al*., 2024).

Risk-taking helps public hospitals to venture into unchartered waters. However, for the hospitals to do this, they require adequate resources. Among these resources, are risk-taking leaders who empower followers, share control and allow autonomous work. Collaborative leadership behaviour and income generating opportunities were used as risk-taking sub-variables. Collaborative leadership behaviour entails the self-efficacy of leaders who recognise opportunities, communicate consistently, collaborate effectively, show resilience, plan and manage resources (McGee & Terry, 2022). Risk-taking leaders empower followers, share control, and allow autonomous work through consistent collaboration and coaching (Dahleez *et al*., 2021).

According to Ang'ana & Ongeti (2023) collaborative leadership behaviour is established on continuous communication, active listening and deep reflection that guides decision making. In an environment of collaborative leadership, productive and high-quality relationships are established through mutual trust and this greatly impact organisational performance. Collaborative leaders encourage inclusivity, empower and engage employees in their decision making process.

Modha (2021) highlights leadership as having absolute control and decision over followers to stimulate organisational growth. The author highlights that collaborative leadership embraces diversity by promoting inclusivity, entails appreciating teammates and attending to their needs, while maintaining constructive criticisms to inspire good behaviour. Employees in any organisation are part of a team that has a leader. The employees have different behaviours that can either be classified as task work of teamwork. In task work, the employees have specific core competencies that allow them to perform activities. Such skills can include handling clinical procedures in the case of public hospitals. Teamwork is interactive and interdependent with individual efforts required to contribute to the bigger organisational outcomes. In this arrangement, each team mate possess specific roles and duties that contribute to the whole goal. In the environment of collaborative leadership, a balance is created between task work and team work by having a leader who inspire excellence.

The core values of collaborative leadership include establishing authentic relationships, renouncing egotism and control, inspiring trust and respect in every employee, advancing personal skills to enable employees handle diverse situations, using problems to create sensible outputs, rejecting silo's and blame game culture, decentralising activities, forming hybrid teammates who possess diverse skill sets, avoiding biased choices through enhanced decision making, enhancing open communication and feedback, establishing clearly defined goals, incorporating employee contributions into organisational plan and decision making so that they feel they are part of the organisation (Modha, 2021).

In an environment of collaborative leadership behaviour, there is the establishment of healthy human relationships among employees. This creates shared values and beliefs that stimulate common goals such are risk taking propensity. This in return improves performance (Otolo *et al.,* 2024). However, Modha (2021) notes that collaborative

leadership requires dedicated commitment from employees and adapting from a team work to a collaborative approach of work which may limit the output. Khanna (2024) notes that healthcare leaders who are collaborative can influence positive performance through both monetary or non-monetary incentives. Appropriate strategies for leadership help in complex decision making and upholding of an innovative culture. Leaders need to be enlightened on being active listeners, where they build trust with the employees and teams.

Modha (2021) assessed collaborative leadership from a dental perspective with an emphasis on stakeholder engagement and identification and ethical leadership in Britain. The study revealed that currently, organisations are establishing mutually beneficial relationships to stimulate organisational growth. Moore *et al.,* (2023) studied how to create leadership for the common good by integrating collaborative leadership behaviour in Integrated Care Systems. The study was conducted in the UK during the COVID-19 pandemic and revealed that collaborative leadership is a catalyst for change in organisations. This is because collaborative leadership focuses on building healthy mutually beneficial relationship among organisational stakeholders in place of organisational output.

Abdelwahab *et al*., (2020) did a study on collaborative leadership and how it stimulates productive work performance while assessing the mediating role of innovative behaviour of nurses. The research was carried out across three large university hospitals in Alexandria, Egypt, with data collected from 550 nurses working there. The study recognised that collaborative leadership behaviour is an imperative in the current turbulent healthcare environment. In the current operating environment, collaborative leadership is as an indispensable component of achieving performance in organisations.

The study further establishes collaborative leadership as a dynamic plan in any organisation that comprises four components; a symbiotic relationship, capacity to lead, shared assets and mindfulness. In the healthcare sector, a symbiotic relationship is a collaboration where healthcare workers mutually adapt to changing healthcare needs and have well stipulated roles. Capacity to lead relates to the acceptance of responsibility by the leaders, while shared assets are instances that stimulate healthcare professionals to share their skills and expertise within a team. Mindfulness are the deliberate efforts that guide actions in organisations as daily activities take place.

The presence of declining budgets while demand for services in the healthcare sector increases, calls for the adoption of risk taking behaviour in the form of income generating opportunities; which helps develop new revenue streams to carry day-to-day activities. A public sector entrepreneur identifies market opportunities within their landscape and optimises performance in a way that allows risk and recognises stewardship. This has increased the development of public-private partnerships such as outreach clinics in a bid to improve the performance of public hospitals. However, it is worth noting that there exist various setbacks to the adoption of entrepreneurship in the public sector. Most public servants lack entrepreneurial skills, making it difficult to practice entrepreneurship in service delivery. Another hindrance is the belief that commercialisation results in a loss of mission, goal, and idealism, making it difficult to improve performance in public entities (Hodgson *et al*., 2021).

Public hospitals across the globe receive funding from the government. With the reduced funding patterns, hospitals are undertaking the development of nursing colleges within the hospital to create opportunities for making more revenue. Other hospitals have diversified and differentiated their business approach to incorporate more specialised medical services with state of the art technology. These services attract consumers who can pay the premium needed. This approach help generates additional revenue streams and create a more comprehensive healthcare ecosystem (Toroitich *et al*., 2022).

Risk taking behaviour drives performance by seizing opportunities for business in uncertain environments. The risk taking activities that people partake in are usually considered harmful to any business but costly if avoided. Thus the need to maximise risk taking behaviour in a supply chain that faces a lot of risks. Hamdan & Alheet, (2020) looked into the influence of organisational risk taking on Small and Medium Enterprises in the United Kingdom. The study concluded that risk-taking positively influences firm performance. The study looked into the interconnection between risk taking and organisational culture. The current study addressed the risk taking concept individually.

Ruba *et al*., (2021) did a quantitative study to analyse the relationship between entrepreneurial orientation and the performance of Congolese Higher Education Institutions. The study failed to incorporate risk taking in the concept of supply chain

which the current study will look into, thus addressing the contextual gap. Adim & Poi, (2021), examined the relationship between entrepreneurial risk taking and the performance of women entrepreneurs. The study was done in River State Nigeria and identified that risk taking improves the performance of women entrepreneurs. The study focused on the liberal feminist theory, unlike the current study which utilised resource orchestration, resource dependency, and Schumpeterian entrepreneurship theory to establish the relationship between variables.

Visconti & Morea (2020) analysed the impact of healthcare financing on hospital performance and found a positive and significant relationship between healthcare financing and firm performance. The study revealed that healthcare financing is critical as it provides adequate resources that helps reduce operational costs and shorten lead times through timely purchases. This results in a change in the status of patients from sick to healthy as the hospital is well-endowed to conduct patient care. However, they note that there is a consistently low service delivery by public hospitals in low and middle-income countries in the world despite the overall healthcare financing increasing. This is mainly attributed to hospitals failing to look at the patient as a customer, consequently ignoring consumer-oriented value propositions. This has resulted in a lack of affordable, accessible, and effective healthcare for many people. The study recognises the supply chain as the backbone for access to affordable, safe, and effective healthcare, as it safeguards the significant financing resources committed to healthcare.

Njau & Abdul (2022) looked into revenue cycle management strategies and how they affect the financial performance of profit-making private hospitals in Nairobi. Key observations made were that hospitals are aggressively aiming to maximise the revenue they make. This has seen great investments in pharmacy services where medical supplies are sold to patients by pharmacies operated by the hospitals. Additionally, public hospitals have made investments in diagnostic services, where they offer the diagnostic tests to patients and outpatients referred to them. Though expensive, public hospitals have established private wings where patients pay for enhanced services, better accommodation, and shorter waiting times. This caters to patients who can afford to pay more for privacy and comfort, generating extra revenue.

2.3.4 Entrepreneurial Supply Chain Practices, Healthcare Financing and Performance

The operating environment of the public hospitals influences their strategic actions. Changes in the external environment are embedded on demand and supply, customer preferences and technologies, which increases uncertainties and risks. In this rapid uncertain environment, it gets difficult to project organisational outcomes. Firms get a difficult time trying to evaluate changes to institute and the proper response is they institute the changes. This can lead to an inverse relationship with performance. Short-term and long-term organisational success in such an environment becomes a mere dream. The ability to grow and survive for firms in such an environment is limited (Achi et al., 2022). In the developing economies like Kenya, the operating environment is characterised with poor law enforcement, limited resources and information, and limited market- supporting institutions. In such an environment, the acquisition of resources, utilisation and long-term planning is hindered (Achi et al., 2022). The growing competitive pressure in the operating environment pushes firms to shape up and use their supply chains to enhance competitive advantage and operational efficiencies.

Adhikara *et al*., (2022) explain that uncertainty in the healthcare sector increases unpredictability, increases costs and poor budgetary allocations. They found out that environmental uncertainty causes budgetary slacks, affect management control, thus creating more room for failure. Every entrepreneurial activity entails a particular level of uncertainty. Almost every supply chain is faced with uncertainty ranging from economic slowdowns, business interruptions, failure to innovate, legislative changes, distribution of supply chain failure and disruptive technologies that hinder performance (Matović, 2020).

To achieve equitable healthcare service provision to the citizens, any country in Africa will have to commit US $ 86 per capita and set aside 15% of GDP for healthcare provision. This was a commitment made by leaders of the African nations through the Abuja Declaration in the year 2001. 11 years later in 2011, only 27 African countries had increased their healthcare budgets to constitute 15% of the national GDP, with only South Africa and Rwanda surpassing this target. Fast forward to 2016, more than 19 nations had reduced their healthcare budgets. Since 2001, Kenya has been dragging behind in the achievement of this Declaration. The budget for healthcare in Kenya was

below half the Declaration level. Specifically, estimated budgets for 2012/13 on health were (7.8%); 2013/2014 (5.5%); 2014/2015 (7.5%); 2015/2016 (7.7%); 2016/2017 (7.6%); 2017/18 (8.2%); 2018/2019 (9.2 %) of the country's GDP (Rimberia, 2022).

To fund public healthcare, the Kenyan Ministry of Finance considers several factors; poverty levels in an area, population density, and land mass among other factors. These factors have greatly affected the 47 County Governments which now have to increase their budgetary allocations for health. In this regard, Counties are aiming to increase their healthcare budgetary allocation to 15% of their budgets. In the FY 2014/15, 38 counties allocated at least 15% of their budget to health. Despite the budgetary increase, the services offered in public hospitals are not commensurate (Rimberia, 2022).

Manda *et al*., (2020) recognise that operating efficiently requires the availability of healthcare financing. According to Asante *et al*. (2020), healthcare financing affects the performance of public hospitals. The authors suggest that improvements in public hospitals can be seen through the timely availability of funds and resources. The study adopted an Autoregressive Distributed Lag model to assess the relationship between variables. The current study used multiple regression to establish the relationship between variables. Siena & Riviello (2021) who examined challenges in healthcare financing in Sub-Saharan Africa confirm this. The study found that unavailability and inadequacy of resources affect access to quality healthcare services. Kabaniha *et al.* (2021) assessed healthcare financing, economies, and strategies for sustainable healthcare and found that planning for resource use stimulates performance.

Visconti & Morea (2020) analysed the impact of healthcare financing on hospital performance and found a positive and significant relationship between healthcare financing and firm performance. The study revealed that healthcare financing is critical as it provides adequate resources that helps reduce operational costs and shorten lead times through timely purchases. This results in a change in the status of patients from sick to healthy as the hospital is well-endowed to conduct patient care. However, they note that there is a consistently low service delivery by public hospitals in low and middle-income countries in the world despite the overall healthcare financing increasing. This is majorly attributed to hospitals failing to look at the patient as a customer consequently ignoring consumer-oriented value propositions. This has resulted in a lack of affordable, accessible, and effective healthcare for many people.

The study recognises, the supply chain as the backbone for access to affordable, safe, and effective healthcare as it safeguards the significant financing resources committed to healthcare.

Several factors affect healthcare financing as highlighted by Vian (2020). Corruption and misappropriation of funds are prevalent in most public hospitals in Kenya. For example, during the COVID-19 pandemic donations given by Jack Ma, a Chinese philanthropist of over USD 400 million, were misappropriated (Onwujekwe *et al*., 2019). Additionally, the funds collected through user fees in Kenya are not utilised properly as budgets are more of wish lists rather than improvements toward service delivery tools (Vilcu *et al*., 2019). Kiplagat & Musyoka (2021) sought to establish the effect of health sector grants on the quality and availability of healthcare in Kenya and recognised that Kenyan public healthcare receives a lot of funding from donors which if well utilised can help to improve the supply of drugs and promote quality healthcare.

Wachira (2024) studied entrepreneurial capabilities and how they influence Small and Medium Enterprises (SMEs) in Kenya. The study looked into SMEs in Thika Town, Kariobangi, & Kitui and looked into entrepreneurial capabilities in the form of innovation, leadership, marketing, and strategic capabilities. The study was moderated by information communication technology. The study revealed that the performance of SMEs in Kenya is positively influenced by the adoption of entrepreneurial capabilities. The current study adopted innovative inventory management, proactive strategic sourcing, and risk taking as the entrepreneurial supply chain practices and was moderated by healthcare financing.

Beka be Nguema *et al.,* (2022) assessed the effects of financing supply chains and how this affects organisational performance. The paper utilised the dynamic capabilities approach paper and collected data from 210 companies in mainland China. Structural equation modelling was used to test the proposed relationships. The findings revealed that availability of finances significantly promote supply chain performance and firm performance. Karamagi *et al*., (2022) note that rising healthcare expenditures have forced hospital managers to explore innovative ways of managing costs and generating revenue. When the leadership in a hospital understand the financial landscape they are in, they are able to make decision that foster their hospital economic advancement. They

are able to identify cost-cutting strategies and revenue creating techniques. By cutting costs, they are able to boost productivity and enhance capacity for service provision.

A deep understanding of a hospital's financial landscape empowers managers to make informed decisions and fosters economic advancement. Identifying cost-saving measures and revenue enhancement strategies is crucial for advancing hospital services both quantitatively and qualitatively. By pinpointing effective cost-cutting and revenue-boosting strategies, productivity and service provision capacity can be enhanced, enabling hospital managers to make sound, efficient, and pragmatic decisions (Riang'a *et al*., 2024).

Frese & Gielnik (2023) note that entrepreneurship is better performed under conditions of resource availability. This is known as bricolage where available resources are improvised or improved to create new resources. Entrepreneurs are called upon to identify and evaluate opportunities to implement a novel product. Another condition that should exist for entrepreneurship to thrive is financial bootstrapping which is an action strategy that finances another business. In such an arrangement, business finance themselves internally by acquiring resources within. In this way, risk is reduced significantly and businesses are able to sustain themselves.

Sturm *et al*., (2022) linked entrepreneurial orientation and supply chain and how it affects the performance. With data collection starting in November 2021 and lasting 14 weeks and targeting 2685 respondents, the study revealed that entrepreneurial orientation in the form of innovativeness, risk taking, competitive aggressiveness, proactiveness and autonomy significantly impact on performance. Proactiveness ease up the ability of an organisation to anticipate changes in future market conditions and ensures an organisation is prepared for supply chain disruptions. Innovativeness stimulates firm performance by encouraging productive efforts. Risk taking on the other hand establishes an environment of trying in unknown ventures that stimulate growth.

2.4 Summary of Literature

The study reviewed three theories related to entrepreneurial supply chain practices, healthcare financing, and the performance of public hospitals in Kenya. The resource orchestration, the resource dependency, and the Schumpeterian innovation theories. The resource orchestration theory focuses on the role of managers in the resource conversion process. It is an extension of the resource based view theory but put into consideration

how resources are structured, bundled and leveraged through managerial actions. Through structuring, an organisation is able to obtain and accumulate resources. Through bundling, the resources are combined to create more capabilities and by leveraging, the resources are released into the market effectively to enhance value.

The Resource Dependency Theory (RDT) explains how organisations depend on externally owned resources to survive in the operating environment. It takes note that firms are not self-sufficient because they rely on resources owned and controlled by other entities to service. Consequently, there is a need to create a balance in operations. This balance can be established through creation of long term relationship with external parties such as suppliers, to secure vital resources. This theory confirms that power is built on resource ownership. The more resources you have, the stronger you are in decision making in the supply chain.

The Schumpeterian innovation theory notes that innovation is a driver for economic growth. Entrepreneurs play a critical role in introducing innovations in an organisation. These innovations shape industries and disrupt market equilibriums. The empirical literature reveals how innovative inventory management in the form of new technology use and just-in-time inventory practices promotes organisational performance through reduced waiting times, enhanced responsiveness, and improved service delivery.

Proactive strategic sourcing was constituted by supplier relationships and procurement planning. Literature reveals that supplier relationships help reduce lead times and delays, promote product quality, and ensures continuous improvement in organisations. On the other hand, procurement planning helps organisations get supplies during shortages, improves negotiations, and saves on costs. Risk taking was built upon collaborative leadership behaviour and income generating opportunities. The literature reviewed revealed that leaders who inspire creativity and allow autonomy achieve greater success from employees. Organisations must commit resources to uncertain ventures as this generates income. The availability of resources influences a lot of factors in an organisation as resources help firms get supplies and run daily operations smoothly. On the other hand, the literature reviewed revealed that the utilisation of resources in an organisation at any point in time affects the success of the said organisation. It is of utmost importance that resources in an organisation are utilised effectively and efficiently.

2.5 Research Gaps

The reviewed literature revealed contextual, conceptual, and empirical gaps with the majority of the literature outlining challenges that face the performance of public hospitals around the globe (Iyengar *et al*., 2023; Zeferino *et al*., 2023; Adebisi *et al*., 2022; Di Giorgio *et al*., 2022; Lau *et al.,* 2022; Dixit *et al*., 2020; Oleribe *et al*., 2019). Most of these studies have been conducted in the area of public hospitals but in other countries other than Kenya making it difficult to generalise their findings in a Kenyan setting due to differences in operating environments. Specifically, Cesarelli *et al*., (2021) looked into an innovative business model for a multi-echelon supply chain inventory management pattern. Shibabaw *et al*., (2023) assessed inventory management practices and how they impact expenditures for rabies pharmaceuticals in public hospitals of Namibia.

Hashmi *et al*., (2021) assessed the mediation of inventory control in the case of publicly funded hospitals in Oman. Other studies have been done in other service sectors such as education. Ruba *et al.,* (2021) did a quantitative study to analyse the relationship between entrepreneurial orientation and the performance of Congolese higher education institutions. In addition, other studies had a very small sample size (Toroitich *et al*., 2021; Lau *et al.,* 2022) making the replicability of the study difficult.

In Kenya, several studies have been done in the area of entrepreneurial practices (Rimberia, 2022; Munene, 2022; Toroitich *et al.,* 2021) but few have focused on entrepreneurial supply chain practices in the form of innovative inventory management, proactive strategic sourcing, and risk taking in the public hospitals. Oliech & Mwangangi, (2019) evaluated the influence of strategic procurement on performance in level V hospitals in Kenya. Majority of these studies used exploratory research designs (Iyengar *et al*., 2023; Zeferino *et al*., 2023) with only a few utilising both exploratory and explanatory research designs (Rimberia, 2022; Munene, 2022). A summary of the research gaps in the area of entrepreneurship, supply chain practices, healthcare financing, and performance is provided in Appendix V.

2.6 Conceptual Framework

Figure 2.1 shows entrepreneurial supply chain practices as the independent variable, the dependent variable is performance of public hospitals and the moderator variable is healthcare financing. Entrepreneurial supply chain practices incorporate; innovative

inventory management built upon new technology use and just in time inventory; proactive strategic sourcing built upon supplier relationships and procurement planning; and risk taking which constitutes income generating opportunities and collaborative leadership behaviour. Healthcare financing is built upon availability of resources and utilisation of resources. Finally, performance of public hospitals in Kenya is built upon effectiveness, relevance and financial viability.

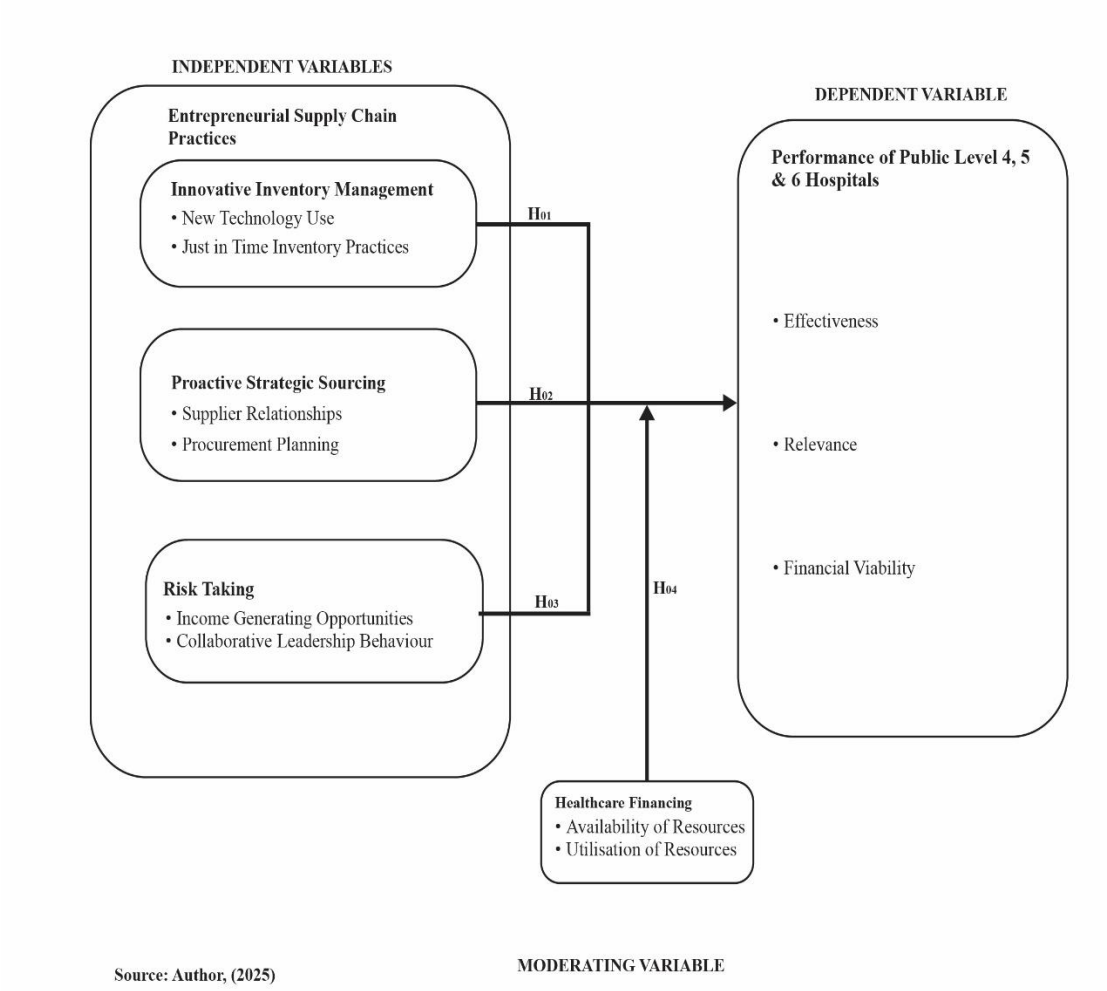

Figure 2. 1: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter presents the research philosophy, research design, study population, data collection instruments, operationalisation of study variables, data processing and analysis, diagnostic tests, and ethical considerations.

3.2 Research Philosophy

According to Khatri (2020), research philosophy determines; what to study, how to study it, and analyse it. The study utilised the positivism philosophy which view the world objectively by distancing the researcher from his/her personal views and interrogating data in a practical setting thus building actionable knowledge (Park *et al*., 2020). Positivism uses the views of respondents to develop solutions. In this study, the respondents from the public hospitals were not passive informants as they helped solve societal problems by providing practical solutions (Cordeiro, 2020).

3.3 Research Design

According to Kimiti (2021), there is no perfect design and no design exists in isolation. Research designs are combined to complement each other. In this regard, the study utilised two designs; the descriptive research design and the explanatory research design as utilised by Gichui *et al*., (2023). The descriptive research design helps obtain population characteristics and test hypotheses, thus preventing bias. The explanatory research design establishes causal and effect associations between variables enabling the researcher to manipulate data (Mishra & Alok, 2022). The two designs were found more appropriate to bring out the influence of entrepreneurial supply chain practices on the performance of public hospitals in Kenya.

3.4 Population

The study population for this study was 243 public hospitals in Kenya (NHIF, 2024). The 243 public hospitals in Kenya are classified into three levels; Level 4, Level 5 and Level 6. There are 214 Level 4, 23 Level 5 and 6 level 6 public hospitals. The classification of hospitals in levels is revealed in Appendix V. The study focused on level 4, 5, and 6 public hospitals as these hospitals consume between 30% to 50% of the national and county healthcare budgets and serve a population of over 1,000,000 patients annually arguably their performance influences livelihoods and contributes to better resource utilisation (Simeoni & Kinoti, 2023).

3.5 Sampling Design and Procedure

The study utilised Slovin's (1960) formulae to determine the sample size of hospitals to be used. The formulae is stated as:

$$n = \frac{N}{1+Ne^2}$$

Where; n is the sample size, N is the population and e is the margin of error. In this case, the population (N) is 243 and the margin of error is 0.05. The formulae gave a total of 151 public hospitals. The 151 public hospitals were divided into 3 strata based on the level of hospitals: Level 4, 5 and 6. From the 3 strata, proportionate sampling was used to decide the number of hospitals from each stratum to be utilised in the study giving a total of 133 level 4, 14 level 5, and 4 level 6 public hospitals as revealed in table 3.1. Proportionate sampling was used as it gives a better representation of the overall population (Mishar & Alok, 2022).

Table 3.1; Determination of the Sample

S. No	Level of Hospital	Methodology	Sample
1.	Level 4 Hospitals	214 hospitals in the 243 are Level 4 How many Level 4 hospitals will be there in 151 hospitals? X= (151 × 214) ÷ 243=133	133
2.	Level 5 Hospitals	23 hospitals in the 243 are Level 5 How many Level 5 hospitals will be there in 151 hospitals? X= (151 × 23) ÷ 243=14	14
3.	Level 6 Hospitals	6 hospitals in the 243 are Level 6 How many Level 6 hospitals will be there in 151 hospitals? X= (151 × 6) ÷ 243=4	4

Source: Author, (2024)

Purposive non-probability sampling was used to select the study informants in every public hospital, whereby 2 informants were used, the supply chain manager/equivalent and the finance officer/equivalent as they are knowledgeable about healthcare supply chain and organisational resources respectively.

3.5 Data Collection Instruments

According to Mazhar *et al*., (2021), the choice of data required determines the research tool to use in a study. The study used primary data to establish a relationship between variables. Primary data was collected using a semi-structured questionnaire which is a critical tool that provides an efficient and effective way of data collection in a short time (Krosnick, 2018). Mazhar *et al.*, (2021) note that questionnaires are easy to use and can reach a greater number of respondents within a short period. However, Einola & Alvesson, (2021) emphasise that it is important to explain to the respondents what is required of them when answering the questions to promote synergy.

The questionnaire had both open questions that allowed respondents to provide new insights and closed-ended questions that restricted respondents to certain categories. The close-ended questions had a 5-point Likert scale (Strongly Agree (SA) =5, Agree (A) =4, Neutral (N) =3, Disagree (D) =2, and Strongly Disagree (SD) =1. The questionnaire was divided into 2; public hospital demographics and entrepreneurial supply chain practices and performance. The innovative inventory management section had new technology use and JIT Philosophy, proactive strategic sourcing had supplier relationships and procurement planning. Risk taking had income generating opportunities and collaborative leadership behaviour. The moderator variable, healthcare financing had availability of resources and utilisation of resources. The dependent variable, the performance of public hospitals had effectiveness, relevance, and financial viability.

3.6 Operationalisation and Measurement of Study Variables

The independent, moderating and dependent variables were operationalised as depicted in Table 3.2.

Table 3.2: Operationalisation and Measurement of Study Variables

Variable	Nature of Variable	Indicator	Measure	Scale
Innovative Inventory Management	Independent	•New Technology Use •Just in Time Inventory Practices	1-5	Interval
Proactive strategic Sourcing	Independent	• Supplier Relationships • Procurement Planning	1-5	Interval
Risk taking	Independent	•Collaborative Leadership Behaviour •Income-generating opportunities	1-5	Interval
Healthcare Financing	Moderator	• Availability of resources • Utilisation of resources	1-5	Interval
Performance of public hospitals	Dependent	• Effectiveness • Relevance •Financial Viability	1-5	Interval

Source: Author, (2024)

The dependent variable, performance of public hospitals utilised effectiveness, relevance and financial viability. Innovative inventory management utilised new technology use and just in time inventory practices. Proactive strategic sourcing adopted supplier relationships and procurement planning while risk taking used income generating opportunities and collaborative leadership behaviour. The moderator variable, healthcare financing used utilisation of resources and availability of resources as the sub variables.

3.7 Pretesting of Research Instrument

Pretesting of research instruments reduces errors that can damage the questionnaire's effectiveness. Before the questionnaires were administered to the respondents, a pilot study was conducted to avoid biased responses and the inability of the informants to answer questions (Marcial & Launer, 2021).

3.7.1 Validity of the Research Instrument

Validity relates to the extent to which a research instrument measures what it was designed to measure. The study used face, content and construct validity by utilising similar variables; performance (dependent), entrepreneurial supply chain practices (independent) and healthcare financing (moderator) as those used by most previous researchers. Additionally, construct validity which links theory to measurement was established through a series of checks and therefore availed sufficient coverage of the questions guiding the study (Flake *et al.,* 2022).

3.7.2 Reliability of the Research Instrument

Reliability was tested through the test-retest method whereby the Cronbach alpha coefficient helped check the internal consistency. The researcher with the help of 5 trained research assistants distributed a total of 15 questionnaires to 15 public hospitals; 7 Level 4 public hospitals, 2 Level 6 public hospitals and 6 Level 4 public hospitals located across the counties. The acceptable threshold for this study was 0.7 as it is the optimal value as argued by Barbera *et al*., (2021). Values below 0.7 are considered too low while values above 0.9 present similar answers resulting in a great correlation. It is worth noting that the 15 public hospitals utilised in the pilot testing were excluded from the analysis. To maintain quality of data, the researcher and the research assistants clarified to the respondents on the need to maintain confidentiality during the data collection and piloting phase.

3.8 Data Collection Procedure

For ease of data collection, an approval letter from the University of Embu and a NACOSTI license were used. The questionnaires were hand-delivered with the help of 5 trained research assistants, who clarified the process of answering the questionnaire. The telephone numbers of the researcher and research assistants was issued for ease of assistance.

3.9 Data Processing and Analysis

This section presents how the data was analysed and reported.

3.9.1 Data Analysis

After collection, data was cleaned and classified according to similar characteristics and coded to promote easy analysis. Both descriptive and inferential statistics were used for data analysis. The descriptive statistics included means, percentages and standard

deviation. The multiple regression analysis was used to test the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The Analysis of Variance (ANOVA) was used to test the overall fitness of the model.

The combined multiple regression model is stated in Equation 3.1

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where; Y is the composite index for the performance of public hospitals, β_0 is constant, β is the slope, X_1 is Innovative Inventory Management, X_2 is Proactive Strategic Sourcing, X_3 is Risk taking, β_1 is the regression coefficient of variable X_1 (Innovative Inventory Management), β_2 is regression coefficient of variable X_2 (Proactive Strategic Sourcing), β_3 is regression coefficient of variable X_3 (Risk Taking), and ε is the error term.

3.9.2 Testing for Moderation

Moderation was tested using the equation recommended by Aiken & West (1991). In the first step, the predictor variables with the main effect were added to the model and in step two, the interaction term was added to the model to determine the moderation effect as shown in equation 3.2.

$$Y = \beta_0 + \beta_1 X_i {*} Z + \beta_2 X_2 {*} Z + \beta_3 X_3 {*} Z + \varepsilon \ldots\ldots\ldots\ldots\ldots \textbf{equation 3.2}$$

Where; Y is the dependent variable (performance of public hospitals), β_0 is constant, X_1 is the coefficient of the composite index of innovative inventory management * healthcare financing, X_2 is the composite index of proactive strategic sourcing * healthcare financing, X_3 is the composite index of risk taking * healthcare financing and e is the error term. A p-value of 0.05 will help accept or reject the hypothesis (H_{05}).

3.9.3 Diagnostic Tests

Before data analysis, diagnostic tests were conducted to ensure that the assumptions of linear regression were not violated as this would flaw the study findings as argued by Ndung'u (2021).

3.9.3.1 Sample Adequacy Test

The study utilised the Kaiser-Meyer-Olkin (KMO) test of sample adequacy to test if the sample size was adequate for use. The KMO test has values ranging from 0 to 1. A

threshold of 0.5 was used in this study to indicate whether the study sample was adequate (Hennink & Kaisser, 2022). The KMO test statistic in this study had a value greater than the 0.5 threshold signifying that the sample was adequate and that the sample was a representative of the entire study population. The KMO test also indicates that the variables have a common variance between them hence suitable for analysis as argued by Shrestha (2021).

3.9.3.2 Normality Test

According to Khatun (2021) testing normality is a critical component in regression as it helps to judge whether the data is normally distributed. The study utilised the Shapiro-Wilk test for normality. The test has values ranging from 0 to 1 and data is normally distributed if the P value is greater than the level of significance (Knief *et al*., 2021). The null hypothesis for this test is that the study population is normally distributed. The null hypothesis is rejected if the p-value is less than the alpha value and accepted if the p-value is greater than the alpha-value. The test results from the normality test in this study had p-values greater than 0.05, indicating that the data was normally distributed as argued by Khatun (2021).

3.9.3.3 Outliers Test

Sullivan *et al*., (2021) recognise outliers as values that are unlikely to happen and if they appear and remain ignored, they bring about significant incorrect results during regression. A single outlier case can lead to 100% statistical error in either direction, i.e., to the positive or negative direction. The Cook's distance was used in this study to check the presence of outliers. The Cook's distance has values ranging from 0 to 1 whereby values greater than 1 are considered to represent outliers that should be removed as argued by Sullivan *et al*, (2021). The study variables had Cook's distance ranging from 0 to 1. There were no values greater than 1, indicating the absence of outliers as argued by Arimie *et al*., (2020)

3.9.3.4 Correlation Analysis

Janse *et al*., (2021), recommend the use of Pearson's correlation coefficient to test linearity as it shows the relationship between variables. This means that an increase in one variable results in an increase in the other variable with the same measure. The correlation coefficient can either be negative or positive and will be used to indicate the strength of the relationship between variables as argued by Cong *et al*, (2022). The correlation results revealed Pearson's correlation coefficient values ranging between 0

to 1, indicating the existence of a positive correlation between variables as argued by Baak *et al*, (2020).

3.9.3.5 Homoscedasticity

According to Onifade & Olanrewaju (2020) heteroscedasticity is said to exist when the error terms have a non-constant variance. The presence of heteroscedasticity affects the regression estimation and it is therefore critical to address it. The study utilised the Breusch-Pagan Test for heteroscedasticity as recommended by Abdul & Matanmi, (2021). Values generated should be more than 1 to rule out the presence of heteroscedasticity (Nyakarimi, 2022). The Breusch-Pagan test was therefore used to test whether there exists a constant variance among study variables. The Breusch-Pagan test gave values of more than 1 in all the variables, indicating the presence of heteroscedasticity as argued by Manchinni *et al*., (2023).

3.9.3.6 Multicollinearity

Multicollinearity is said to exist if the independent variables are mutually linearly dependent. This means that the test aims to determine if there exists an inter-correlation among the independent variables (Ndung'u, 2021). The variance inflation factor (VIF) was used to test for multicollinearity between the variables. According to Nyakarimi (2022), VIF values greater than 10 indicate the presence of multicollinearity, and such values should be removed from the study. Consequently, variables with VIF above 10 and tolerance levels less than 0.1 were removed from the study as highlighted by Bayman *et al*., (2021).

3.9.3.7 Autocorrelation

To test autocorrelation, which is the association within a variable, the Durbin-Watson test statistic was used. The statistic ranges from 0 to 4 with a value of 2 and below indicating no autocorrelation. The study gave a Durbin-Watson test statistic value of 0.547 indicating no autocorrelation between variables as argued by Kabaila et al., (2021).

3.10 Qualitative Data Analysis

Lester *et al*., (2020) recognise that qualitative analysis is critical in any research as it helps the researcher develop deeper insights into any study or occurrence. Additionally, qualitative analysis enhances the meaning of any data. Lester *et al*, (2020) recognise that there is no single way of analysing qualitative data. However, thematic, content and basic interpretive analyses are the most commonly used methods of qualitative analysis.

The open-ended questions in the research instrument were analysed through content analysis. Questions and answers were classified according to common themes and then inferences were drawn and conclusions made. Content analysis captures issues not included in structured questionnaires (Mezmir, 2020).

3.11 Ethical Considerations

Zhang (2020), defines research ethics as the moral ideologies and principles that guide the research process. Research in ethics brings about compliance to a way of doing things. Drolet *et al*., (2023) define ethical issues as anything that can compromise moral values. They further outline plagiarism, falsification, not respecting participant's rights, and conflict of interest as some of the ethical issues in research. These ethical issues can occur either during research design, data collection and analysis or in knowledge communication of the findings. Regardless of where they occur, these ethical issues result in the loss of credibility of the entire research (Drolet *et al*.,2023). The study was conducted in compliance with the ethical norms whereby no respondent was coerced to participate in answering the questions and the privacy/confidentiality of the individual respondents and the hospital was maintained. The study findings were presented without the researcher's influence or manipulation.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter comprises the study findings, interpretations and discussion of the analysed data. The study aimed to establish the effect of entrepreneurial supply chain practices on the performance of public hospitals in Kenya and was moderated by healthcare financing. The components of entrepreneurial supply chain practices include; innovative inventory management, proactive strategic sourcing and risk taking. The dependent variable was the performance of public hospitals while entrepreneurial supply chain practices were the independent variables. The chapter presents response rate, public hospital demographics, pretesting of the research instruments, diagnostics tests for regression and descriptive and inferential statistics.

4.2 Pilot Test Results

Before the questionnaires were administered to the respondents, a pilot study was conducted to avoid biased responses and the inability of the informants to answer questions (Marcial & Launer, 2021). According to Table 4.1, 10 items were used to measure innovative inventory management, and they had an overall Cronbach Alpha of .853, while 11 items that were used to measure proactive strategic sourcing had an overall Cronbach Alpha of .965. Risk taking was measured by a total of 11 items which had an overall Cronbach Alpha of .798, while 7 items which measured healthcare financing had an overall Cronbach Alpha of .875. Performance of public hospitals was measured using a total of 25 items which had an overall Cronbach Alpha of .798. From Table 4.1, all the variables have an overall Cronbach Alpha above the optimal value of 0.7. According to Kennedy (2022), variables having an overall Cronbach Alpha of above 0.7 should be utilised in the study, hence all the variables in this study were utilised.

Table 4.1: Reliability Test Results

Variable	Items	Reliability (Cronbach Score)	Comments
Innovative Inventory Management	10	.853	Reliable
Proactive Strategic Sourcing	11	.965	Reliable
Risk Taking	11	.798	Reliable
Healthcare Financing	7	.875	Reliable
Performance of Public Hospitals	25	.798	Reliable
Overall Reliability		.858	Reliable

Source: Pilot Test Data (2024)

4.3 Response Rate

The study targeted 151 public hospitals in Kenya with the expected respondents being 2 from every hospital making the total respondents 302. From the 151 hospitals, a total of 123 public hospitals dully filled the questionnaires translating to a response rate of 81.47%. A response rate of 60% is considered adequate, while a response rate of 70% is considered very good for a study as argued by Nyakarimi, (2022). Therefore, the response rate of 81.79% was considered adequate for analysis.

4.4 Public Hospitals Demographics

The study sought to establish the background information regarding the level of the public hospital, number of healthcare personnel, number of patients served annually, total bed capacity for inpatients, presence of a procurement/supply chain office, presence of an operational pharmacy and laboratory and the availability of clinical services.

4.4.1 Level of Public Hospital

The respondents from the public hospitals were required to indicate the level to which their public hospitals fall and the results are depicted in Figure 4.1. According to Figure 4.1, 84% were level 4 public hospitals, while 13% were level 5 hospitals. A total of 3% were level 6 hospitals. The results revealed that majority of the hospitals that responded are level 4 public hospitals.

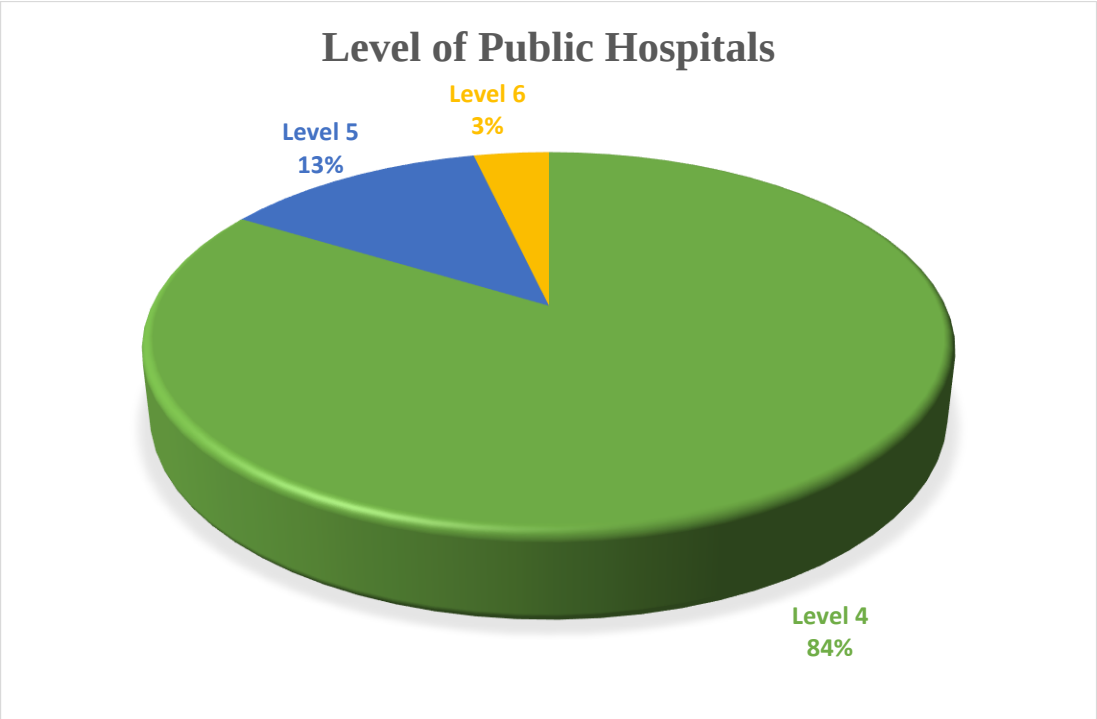

Figure 4.1: Level of Public Hospitals

Source: Research Data, (2024)

4.4.2 Category of Public Hospital in terms of Healthcare Personnel

The respondents from the public hospitals were required to indicate the category to which their public hospital falls in terms of healthcare personnel. The results are depicted in Figure 4.2. According to Figure 4.2, 41% of the public hospitals indicated that they have less than 50 healthcare personnel, while 40% of the public hospitals indicated that they have a total of between 50 to 100 healthcare personnel. 19% of the public hospitals indicated that they have a total of over 100 healthcare personnel. The majority of the public hospitals that they have a total of less than 50 healthcare personnel. A study by Okoroafor *et al.*, (2022) noted that Kenya as at 2020 had a total of 189,932 healthcare workers of the 189,932, 13,000 are medical doctors and specialists, 110,000 are nurses, 25,000 fall under the category of clinical services, 1344 and 987 were dentists and dental technologists. These numbers are further distributed across all the public hospitals in Kenya. These numbers are quite low considering they have to serve a population of over 45 million Kenyans.

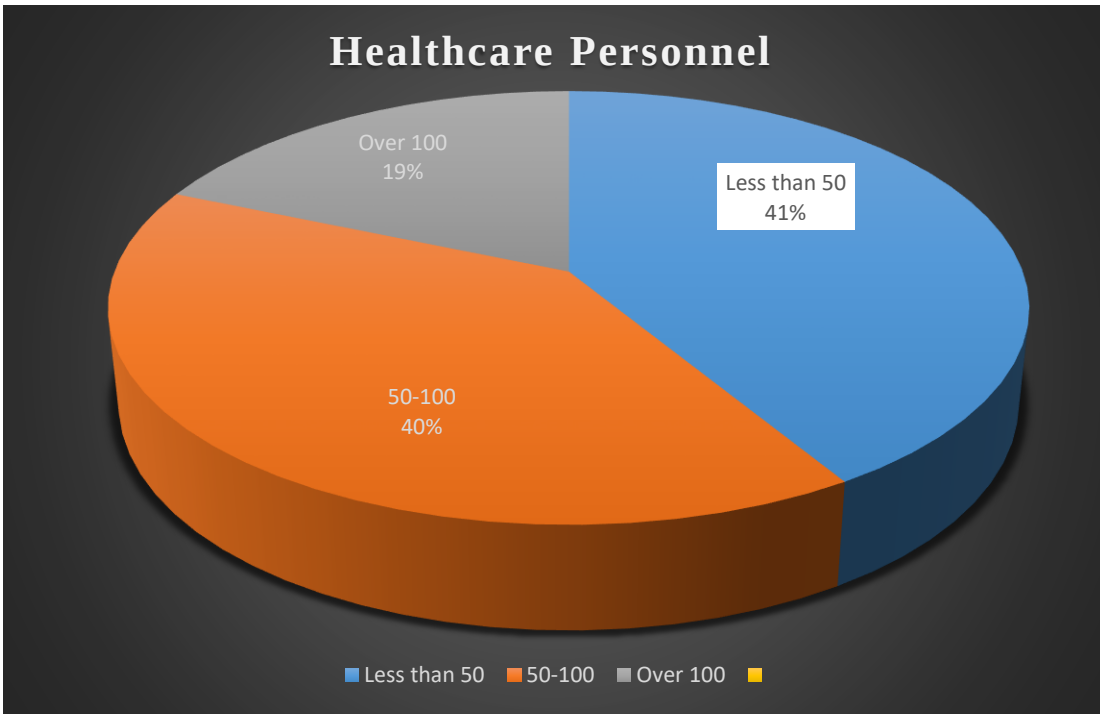

Figure 4.2: Categorisation through healthcare personnel

Source: Research Data, (2024)

Additionally, the MoH (2025) confirm the study finding that Kenya has at least 9 health workers per facility with a majority of about 52.7% serving in the urban healthcare facilities. The public hospitals have a proportion of 58.1% compared to private hospitals which have 41.9%. The low numbers of healthcare workers affect service provision.

4.4.3 Category of Public Hospital in terms of Patients Served Annually

The study sought to establish the category of public hospitals concerning the number of patients served annually. The results are shown in Figure 4.3. According to Figure 4.3, 7% of the public hospitals indicated that they serve a total of up to 100,000 patients annually, while a total of 51% of the public hospitals indicated that they serve a total population of between 100,001-199,000 patients annually. A total of 42% of the public hospitals indicated that they serve a total of over 200,000 patients annually. These findings are confirmed by the work of Zeng *et al*., (2025) who found out that the level of inpatient and outpatient admissions and visits were above 100,000. Zeng *et al*., (2025) further note that with great number of patients getting served per year, there results long queues and delays in treatment for patients. Additionally, staff burnout is experienced where the doctor patient ratio is very high.

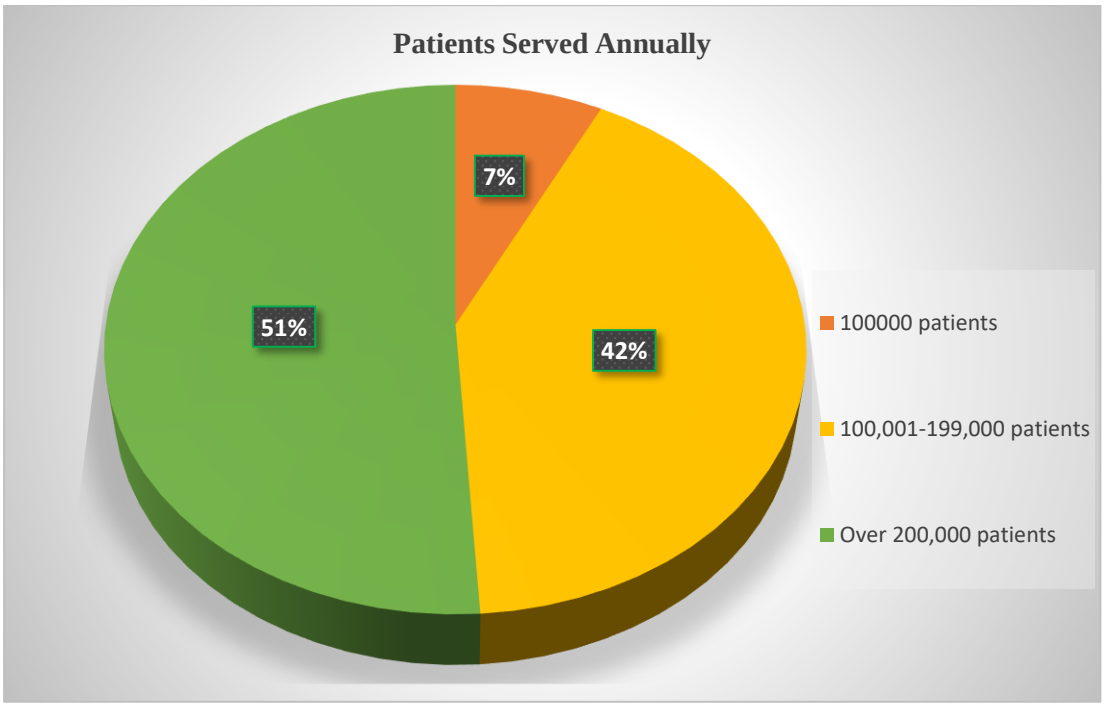

Figure 4.3: Categorisation through patients served annually

Source: Research Data, (2024)

4.4.4 Total Bed Capacity for Inpatients

The respondents from the public hospitals were requested to indicate the total bed capacity for inpatients in their hospitals. The results are depicted in Figure 4.4.

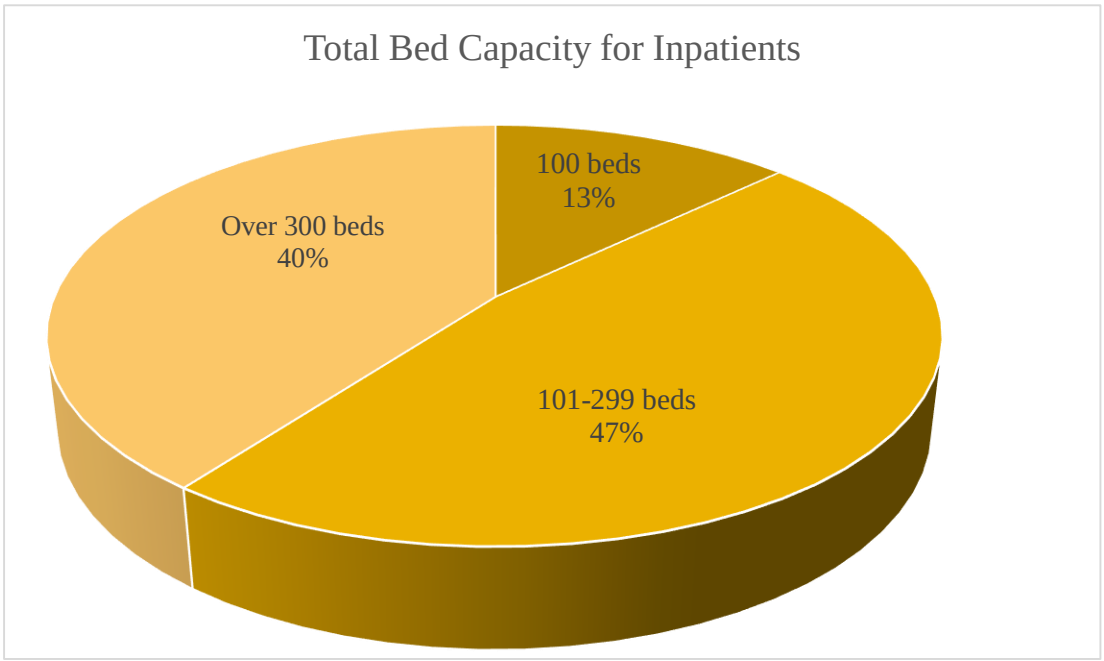

Figure 4.4: Total Bed Capacity for Inpatients

Source: Research Data, (2024)

From Figure 4.4 majority of the public hospitals indicated that their hospitals have a bed capacity of between 101 to 299 beds for inpatients. 40% of the respondents from the public hospitals indicated that they have over 300 beds for inpatients while 13% of the respondents from the public hospitals indicated that they have a total bed capacity of 100 beds for inpatients.

4.4.5 Availability of a Procurement/Supply Chain Office

The study sought to establish whether public hospitals have a procurement/supply chain office. The responses are shown in Figure 4.5. 50% of the hospitals have a procurement/supply chain office while 50% of the hospitals do not have a procurement/supply chain office in their public hospitals. According to WHO (2025), many public health facilities in low- and middle-income countries lack dedicated supply chain units, which leads to frequent stock-outs and inefficiencies.

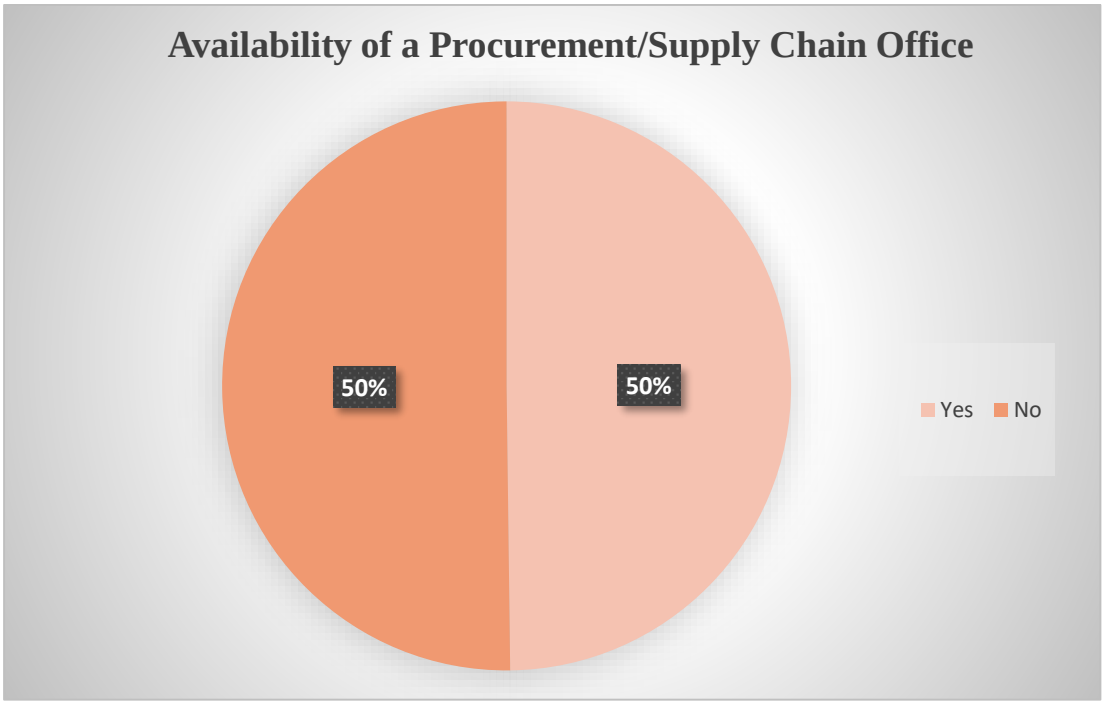

Figure 4.5: Availability of a Procurement/Supply Chain Office

Source: Research Data, (2024)

4.4.6 Availability of an Operational Pharmacy

The respondents from the public hospitals were requested to indicate whether they have an operational pharmacy and the results are portrayed in Figure 4.6. According to Figure 4.6, the majority of the public hospitals indicated that they have an operational pharmacy while 41% of the public hospitals indicated that they do not have an operational pharmacy. These findings are confirmed by the Kenya Health Facility

Census Report (2023) which revealed that about 60% of the public hospitals have a pharmacy that offers pharmacy services.

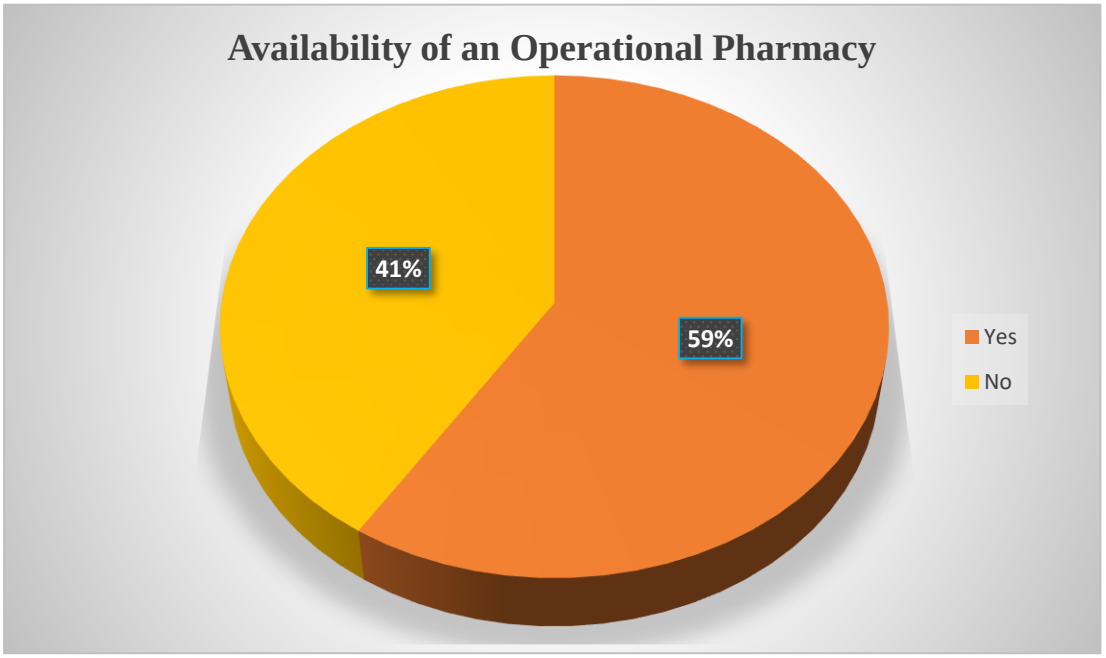

Figure 4.6: Availability of an operational Pharmacy

Source: Research Data, (2024)

4.4.7 Availability of an Operational Laboratory for Diagnostics Services

The researcher sought to establish whether public hospitals have an operational laboratory for conducting diagnostic services. The responses are depicted in Figure 4.7. The majority of the public hospitals (63%) revealed that they have an operational laboratory that offers diagnostics services. Additionally, 37% of the public hospitals indicated that they do not have an operational laboratory that offers diagnostics services. The operational pharmacies lacked various essential drugs thus affecting service delivery. These results echo the Kenya Health Facility Census Report of 2023 that revealed more than a half of the public healthcare facilities have an operational laboratory offering diagnostic services to patients.

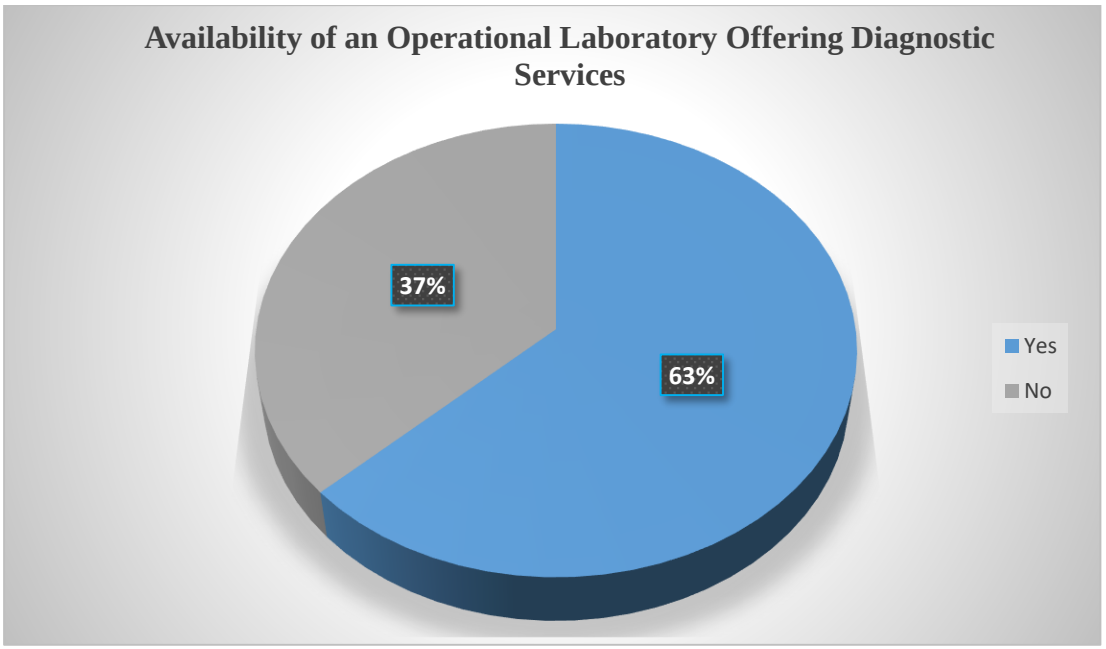

Figure 4.7: Availability of an operational laboratory offering diagnostics services
Source: Research Data, (2024)

4.4.8 Availability of Clinical Services in the Public Hospital

The researcher sought to establish the availability of clinical services in the public hospitals. The respondents from the public hospitals were requested to indicate whether they offer medical, Paediatric, surgical, gynaecological and obstetrics, radiology, renal dialysis, tuberculosis and HIV/AIDs comprehensive care, mortuary and autopsy, accident and emergency, dental, Ear, Nose and Throat (ENT), ophthalmology and maternity and antenatal clinical services. The results are depicted below. According to Figure 4.8, all the public hospitals provide medical and paediatrics services. A total of 52.2 % of the public hospitals offer surgical services while 64% of the public hospitals offer gynaecological and obstetrics services. Radiology and renal dialysis services are offered by 63.6% and 51.8% of the public hospitals, respectively. A total of 64% and 55.1% of the public hospitals offer Tuberculosis and HIV/AIDs comprehensive care and mortuary and autopsy services, respectively. A total of 69.6% of the public hospitals indicated that they offer accident and emergency services whereas 67.2% of these public hospitals offer dental services. ENT, ophthalmology, maternity, and antenatal clinics are offered by 64.8%, 67.8%, and 69.2% of the public hospitals, respectively. The findings confirm the Kenya Health Facility Census Report (2023) by the Ministry of Health who noted that 90% of the public hospitals offer outpatient services in the form of immunisation, maternity, rehabilitative, dental, laboratory and gynaecology.

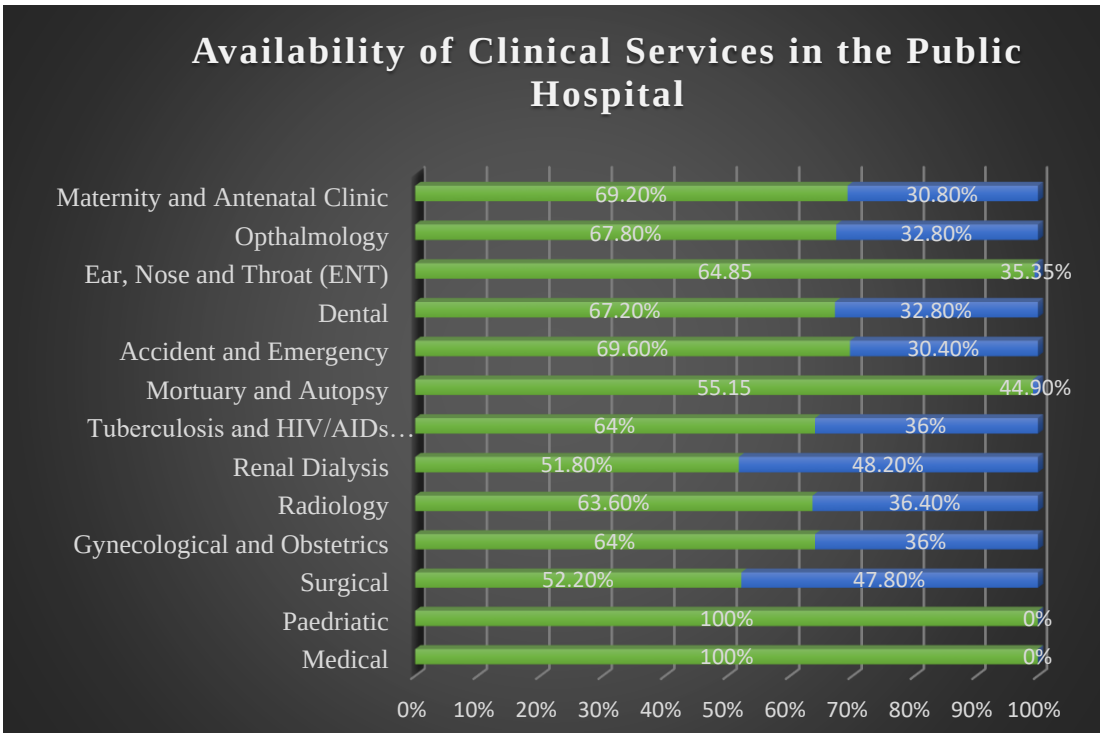

Figure 4.8: Availability of Clinical Services

Source: Research Data, (2024)

4.5 Descriptive Statistics

In this section, the study descriptive statistics of the independent, dependent, and moderating variables are provided. The study utilised entrepreneurial supply chain practices in the form of innovative inventory management, proactive strategic sourcing, and risk taking as the independent variable. The dependent variable was the performance of public hospitals while the moderating variable was healthcare financing. The study utilised a 5-point Likert scale where; Strongly Disagree (SD)=1, Disagree (D) =2, Neutral (N)=3, Agree (A) =4, and Strongly Agree (SA) =5. According to Nyakarimi (2022), data that appears in the form of an interval scale such as the Likert Scale is best measured using means and standard deviation.

4.5.1 Innovative Inventory Management and Performance of Public Hospitals in Kenya

The study sought to establish the effect of innovative inventory management on the performance of public hospitals in Kenya. The factors utilised for innovative inventory management included; ordering needed inventory, maintaining a buffer stock to prevent stock-outs, continuous improvement in inventory management, long-range planning with the involvement of staff, staff training to help them advance their skills and

competencies, use of new technologies for dispensing and delivering healthcare services, use of internet of things to provide healthcare services and manage inventory, availability, and utilisation of Enterprise Resource Planning (ERP), use of new technology to set reorder levels and inform about stock-outs and the use of technology for capacity planning, resource allocation, demand forecasting, and other operational activities. The descriptive statistics are presented in Table 4.2.

Table 4.2: Innovative Inventory Management on Performance of Public Hospitals in Kenya

Statement	N	Mean	Std. Deviation
Ordering inventory that is needed.	246	4.423	.8459
Maintaining a buffer stock to prevent stock outs.	246	4.512	.7689
Aiming at continuous improvement in inventory management	246	4.378	.7593
Long-range planning with the staff.	246	4.349	.7595
Undertaking staff training to advance their skills and competencies.	246	4.406	.8866
Use of new technologies for delivering services	246	4.321	.8303
Use of electronic Community Health Information systems and Internet of Things to provide healthcare services and manage inventory	246	4.256	.8235
Availability of an Enterprise Resource Planning System (ERP).	246	4.138	.9944
Use of new technology to set reorder levels and inform about stock outs	246	4.012	0.037
Use of technology for capacity planning, resource allocation, demand forecasting, and other operational activities.	246	4.203	.9996
Composite Mean and Standard Deviation	**246**	**4.203**	**.5437**

Source: Research Data, (2024)

The research findings shown in Table 4.2 depict a composite mean of 4.203 and a standard deviation of 0.5437. The composite mean and standard deviation indicate that the public hospitals strongly agreed that the parameters used for innovative inventory management affect the performance of public hospitals in Kenya. Specifically, the public hospitals order inventory that is needed (Mean=4.423, Std. deviation=0.849) and the public hospitals maintain buffer stock to prevent stock-outs (Mean=4.512, Std. deviation=0.7689).

The results reveal that the public hospitals aim at continuous improvement in inventory management (Mean=4.378, Std. deviation=0.7593) and engage in long-range planning

in collaboration with the staff (Mean=4.349, Std. deviation=0.7595). The public hospitals introduce new technologies for dispensing medicines and delivery of services such as Last in First Out (LIFO) and First in First Out (FIFO), safety stock, and Healthcare Management Information Systems (Mean=4.406, Std. deviation=0.8866). The public hospitals use electronic community health information systems and the Internet of Things, such as online platforms inclusive of websites, WhatsApp, SMS, Facebook, Instagram, and X, that do regular updates, to provide healthcare services and manage inventory (Mean=4.256, Std. deviation=0.8235).

The public hospitals have an operational Enterprise Resource Planning (ERP) System (Mean=4.138, Std. deviation=0.9944). The public hospitals use new technology to set reorder levels and inform about stock-outs (Mean=4.012, Std. deviation=0.037). The public hospitals use technology for capacity planning, resource allocation, demand forecasting, and other operational activities (Mean=4.203, Std. deviation=0.9996). The composite index results with a mean of 4.203 and a standard deviation of 0.5437 indicate that the public hospitals strongly agreed that the parameters used to measure innovative inventory management were effective.

The standard deviation of less than 1 for all the measures of innovative inventory management indicated that there were normal variations between the responses, that is, all the responses given by the respondents from the public hospitals did not differ widely. These results are similar to Ambekar *et al*., (2020) who found that the use of new technologies in inventory management in the form of ERP and the Internet of Things helps improve interactions, efficiency, and effectiveness between organisations. The results also agree with Balkhi *et al.,* (2022) who noted that inventory accounts for a very big portion of the healthcare industry, therefore, inappropriate inventory management leads to losses, overstocking, understocking, and loss of stability in organisations operations. There is a need to order inventory that is needed while maintaining a buffer stock to prevent stock outs.

Rejeb *et al*., (2020) advocate for the use of new technologies in organisations' operations such as inventory management to improve organisational efficiency, promote accessibility/convenience and help achieve sustainable competitive advantage. Further, Nunez-Merino *et al*., (2020) found out that new technology and innovations in inventory management improve organisational flexibility, agility, information sharing,

and coordination while reducing costs and risks. The results also align with Mandal (2020) who postulates that innovations in an organisation's operation such as managing inventory are critical in influencing organisational success.

4.5.2 Proactive Strategic Sourcing and Performance of Public Hospitals in Kenya

The second objective of the study was to find out the effect of proactive strategic sourcing on the performance of public hospitals in Kenya. The factors utilised for proactive strategic sourcing included; the establishment of a long-term relationship with suppliers, supplier involvement and development, efficient communication with suppliers, strategic identification of suppliers, involvement of suppliers in decision-making and problem-solving, provision of assistance to suppliers to improve product quality, planning of procurement process to receive orders even during shortages, coordination of organisational requirements to ensure bulk and timely purchases, availability of an existing procurement plan that establishes needs and ensures needs are met, availability of a pool of suppliers who are considered during purchases and the utilisation of people, processes, technology, and supply chain in the procurement planning and process. The descriptive statistics are presented in Table 4.3.

Table 4.3: Proactive Strategic Sourcing on Performance of Public Hospitals in Kenya

Statement	N	Mean	Std. Deviation
The Public hospital establishes long-term relationships with suppliers	246	4.036	.9599
The Public hospital engages in Supplier involvement and development	246	4.159	.9852
The Public hospital engages in efficient communication with suppliers	246	4.121	.7592
The Public hospital identifies suppliers strategically.	246	4.114	.7595
The Public hospital engages in mutual decision-making and problem-solving with suppliers	246	4.171	.8866
The Public hospital uses supplier's assistance to improve product quality	246	4.069	.8303
The public hospital plans the procurement process to receive orders even during shortages.	246	4.191	.8235
The Public hospital consolidates its requirements to ensure bulk timely purchases.	246	4.024	.9944
The Public hospital has an existing procurement plan that establishes needs and ensures the needs are met.	246	4.293	.4037
The Public hospital has a pool of suppliers considered during purchases.	246	4.106	.9996
The Public hospital utilises people, processes, technology, and supply chain in the procurement planning and process.	246	4.203	.5437
Composite Mean and Standard Deviation	**246**	**4.135**	**.6734**

Source: Research Data (2024)

Table 4.3 presents a composite mean of 4.135 and a standard deviation of 0.6734. The composite mean and standard deviation indicate that the respondents from the public hospitals strongly agreed that the parameters used for proactive strategic sourcing affect the performance of public hospitals in Kenya. The public hospitals establish long-term relationships with suppliers (Mean=4.036, Std. deviation=0.9599) and also engage in supplier involvement and development (Mean=4.159, Std. deviation=0.9852). The public hospitals engage in inefficient communication (Mean=4.121, Std. deviation=0.7592) and identify suppliers strategically (Mean=4.114, Std. deviation=0.7595).

The results revealed that the public hospitals engage in mutual decision-making and problem-solving with suppliers. Further, the results depict that the public hospitals use supplier's assistance to help improve product quality (Mean=4.069, Std. deviation=0.8083) and that the public hospitals also plan their procurement processes to receive orders even during shortages (Mean=4.191, Std. deviation=0.8235), and consolidates its requirements to ensure bulk timely purchases (Mean=4.024, Std. deviation=0.9944).

There exists a procurement plan that establishes needs and ensures that the needs are met (Mean=4.293, Std. deviation=0.4037). Additionally, the results revealed in Table 4.2 revealed that the public hospitals have a pool of suppliers considered during purchases (Mean=4.106, Std. deviation=0.9996) and that the public hospital utilises people, processes, technology, and supply chain in the procurement planning and process (Mean=4.203, Std. deviation=0.5437).

The composite index results with a mean of 4.135 and a standard deviation of 0.6734 indicate that the public hospitals strongly agreed with the parameters used to measure proactive strategic sourcing. The standard deviation of less than 1 for all the measures of proactive strategic sourcing indicated that the responses by the respondents did not differ widely. The study findings are similar to a study done by Fredrico *et al*., (2021) who identify strategic sourcing as the main process in an organisation that solely affects the decisions in a supply chain.

Further, they reveal that strategic sourcing stimulates positive returns in an organisation by creating a competitive advantage and ensuring a consistent supply of resources in an organisation. Strategic sourcing creates long-term supplier relationships and vision by incorporating knowledgeable personnel into the supply chain. Cankaya *et al*., (2020) reveals that strategic sourcing integrates the development of long-term supplier relationships through information sharing, supplier development, internal integration, and capabilities enhancement and this helps create value (Vanneste & Gulati, 2022).

4.5.3 Risk Taking and Performance of Public Hospitals in Kenya

The third objective of the study was to find the effect of risk taking on the performance of public hospitals in Kenya. This section presents the analysis of the effect of risk taking on performance. The factors utilised for risk taking included, setting aside funds to invest in new operations in uncertain environments, predicting industry changes and

taking action to provide quality healthcare, conducting SWOT and PESTEL analysis that shape avenues for generating income, leveraging new technologies to identify income generating ventures, public hospital leadership establishing an internal shared vision for risk scenarios, public hospital leadership engaging external stakeholders to identify issues that affect healthcare service delivery, public hospital management supporting departmental collaboration for better service delivery, incorporation of risk in strategic decision making, utilisation of public hospital resources efficiently to promote more capabilities and the public hospital leadership continuously seeking the opinions of employees to build strategies, policies and solve problems. The descriptive statistics are presented in Table 4.4.

Table 4.4: Risk Taking on Performance of Public Hospitals in Kenya

Statement	N	Mean	Std. Deviation
The Public hospital sets aside funds to invest in new operations in uncertain environments.	246	4.098	1.088
The Public hospital predicts industry changes and takes action to provide quality healthcare.	246	4.159	.9852
The Public hospital conducts SWOT and PESTEL analysis that help shape avenues for generating income.	246	4.121	.7592
The Public hospital leverages new technologies to identify income generating ventures.	246	4.114	.7595
The public hospital leadership establishes an internal shared vision and language for risk scenarios.	246	4.041	.8866
The Public hospital management engages external stakeholders to identify issues that affect healthcare service delivery.	246	4.069	.8303
The public hospital management is passionate, and zealous and establishes a strategic vision that inspires workers for better service delivery.	246	4.191	.8235
The Public hospital management supports departmental collaboration for better service	246	4.024	.4465
The Public hospital incorporates risk in strategic decision-making.	246	4.061	.933
The Public hospital resources are put into use efficiently to promote more capabilities.	246	4.073	.973
The Public hospital leadership continuously seeks the opinions of employees to build strategies, and policies and solve problems.	246	4.032	1.1293
Composite Mean and Standard Deviation	**246**	**4.069**	**.4053**

Source: Research Data (2024)

Table 4.4. presents a composite mean of 4.069 and a standard deviation of 0.4053. The composite mean and standard deviation indicate that the respondents from the public hospitals strongly agreed that the parameters used for risk taking affect the performance of public hospitals in Kenya. The public hospitals set aside funds to invest in new operations in uncertain environments (Mean=4.098, Std. Deviation 1.088). There was a prediction of industry changes that might affect public hospitals and actions to counter the changes. This is done in a bid to promote quality healthcare (Mean= 4.159, Std. deviation=0.9852). The public hospitals conduct a SWOT and PESTEL analysis that helps shape avenues for generating income (Mean=4.121, Std. deviation=0.7592).

The results revealed that the public hospitals leverage new technologies to identify income generating ventures (Mean=4.114, Std. deviation=0.7595) and that the public hospital leadership establishes an internal shared vision for risk scenarios (Mean=4.041, Std. deviation=0.8866). The results revealed that the public hospital management engages external stakeholders to identify issues that affect healthcare service delivery (Mean=4.069, Std. deviation=0.8303) and that the public hospital management is passionate, zealous and establishes a strategic vision that inspires healthcare workers for better service delivery (Mean=4.191, Std. deviation=0.8235).

The public hospital's management supports departmental collaboration for better service delivery (4.024, Std. deviation=0.4465), the public hospital incorporates risk in strategic decision making (4.061, Std. deviation=0.933), the public hospital resources are utilised efficiently to promote more capabilities (4.073, Std. deviation=0.973) and that the public hospital leadership continuously seeks the opinions of employees to build strategies, policies and solve problems (Mean=4.032, Std. deviation=1.1293).

The results are in tandem with Theresa & Hidaya, (2022) who found a strong level of agreement between risk taking and organisational performance. They argue that the higher the collaborative leadership behaviour in an organisation, the greater the performance of that particular organisation. Further, Ang'ana & Chiroma (2021) did a study that found a very strong agreement between variables used for risk taking and performance in organisations. Specifically, the study used collaborative leadership behaviour which they postulate that it's an inherent behaviour that helps organisations succeed by decentralising power, sharing knowledge, and creating a conducive

environment that encourages trust, a common vision, and a goal, thus better performance.

4.5.4 Healthcare Financing and Performance of Public Hospitals in Kenya

The fourth objective of the study was to find the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. In this section, an analysis of the moderating effect is displayed. The following healthcare financing factors were analysed; the public hospital has a planned budget that guides resource allocation, the public hospital receives funding from the County Government promptly and receives the funds in bulk and not in small bits, the public hospital receives resources from donors and other parties frequently and has autonomy in the utilisation of resources and allocates resources in a transparent and electronically visible and integrated process and possesses a collaborative spirit regarding resource use and availability. The descriptive statistics are presented in Table 4.5.

Table 4.5: Healthcare Financing on Performance of Public Hospitals in Kenya

Statement	N	Mean	Std. Deviation
The Public hospital has a planned budget that guides resource allocation.	246	4.08	0.904
The public hospital receives funding from the County Government promptly.	246	4.11	0.921
The public hospital receives funds in bulk and not in small bits.	246	4.10	0.951
The Public hospital receives resources from donors and other parties frequently.	246	4.08	0.987
The Public hospital has autonomy in the utilisation of resources.	246	4.03	0.964
The Public hospital allocates resources in a transparent electronically visible and integrated process.	246	4.07	0.919
The Public hospital possesses a collaborative spirit concerning resource use and availability.	246	4.33	0.987
Composite Mean and Standard Deviation	246	4.11	0.948

Source: Research Data (2024)

Table 4.5 presents a composite mean of 4.11 and a standard deviation of 0.948. The composite mean and standard deviation indicate that the respondents from the public hospitals strongly agreed with the parameters used to assess the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The public hospitals have a planned

budget that guides resource allocation (Mean=4.08, Std. Deviation 0.904). The public hospitals receive funding from the County Government promptly (Mean= 4.11, Std. deviation=0.921). The public hospitals receive funds in bulk and not in small bits (Mean=4.10, Std. deviation=0.951) and also receive resources from donors and other parties frequently (Mean= 4.08, Std. deviation=0.987).

The utilisation of resources is left in the autonomy of the public hospitals (Mean= 4.03, Std. deviation=0.94) and the public hospital allocates resources in a transparent, electronically visible, and integrated process (Mean= 4.03, Std. deviation=0.94). Finally, the study revealed that the public hospitals possess a collaborative spirit regarding resource use and availability (Mean= 4.33, Std. deviation=0.987).

The sub-variables for healthcare financing comprised of availability of resources and utilisation of resources. The results revealed above agree with previous studies, specifically, Bloodgood (2023) postulates that an organisation's set of resources which are available for utilisation and how efficiently they are utilised affect the capabilities, actions, and performance of that specific organisation. Therefore, strategic choices have to be made in the process of resource acquisition, maintenance, and utilisation as these resource management activities are considered prerequisites of superior performance in organisations.

Further, Kiran & Akbolat (2021) emphasise the need for planning healthcare resources as the lack of adequate resources affects access to quality healthcare in many countries around the globe. If a country lacks a clear measure of healthcare resource adequacy, the policy-making process is hindered to a great extent and the health outcomes are undermined. Therefore, healthcare financing become an imperative feature that stimulates the performance of hospitals in Kenya. Fattahi *et al*., (2023) note that the expansion of available healthcare resources is usually difficult as these resources are limited. This calls for resource sharing and redistribution. Availability is planned for and matched with demand and where possible collaborations are established and enhanced such as in the case of the Kenyan National Government collaborating with County Governments to achieve the MES leasing option.

4.5.5 Performance of Public Hospitals in Kenya

The dependent variable used in this study was the performance of public hospitals in Kenya. The study sought to explore the aspects of performance that exist in public

hospitals. Specifically, the study looked into the effectiveness, relevance, and financial viability aspects of firm performance. Effectiveness incorporated reduced mortality rates, increased referrals, reduced complaints, provision of a conducive working environment for employees, delivery of services without delay, having objectives aligned to the hospital mission, employees providing suggestions regarding efficient utilisation of resources, utilisation of healthcare workers to the best of their abilities, maximum utilisation of hospital resources and equipment and financial resources, frequent performance of assessment to gauge the hospital performance, reaction of the public hospital to eternal changes in policies and regulations and the control of overhead costs by the public hospital. The descriptive statistics are presented in Table 4.6.

Table 4.6a: Performance of Public Hospitals in Kenya - Effectiveness

Statement	N	Mean	Std. Deviation
The Public hospital mortality rates have reduced	246	4.06	1.13
The Public hospital receives increased referrals	246	4.11	0.96
The number of complaints in the public hospital has reduced.	246	4.93	0.41
The Public hospital provides a conducive working environment for employees	246	4.90	0.35
The public hospital delivers services without delay	246	4.80	0.53
The public hospital's objectives are in line with its mission.	246	4.96	0.30
The Public hospital employees can make suggestions about efficient resource use.	246	4.95	0.37
The Public hospital utilises healthcare workers to the best of their abilities	246	4.87	0.43
The Public hospital maximises the use of hospital resources and equipment	246	4.91	0.45
The Public hospital maximises the use of financial resources.	246	4.91	0.40
The Public hospital assesses to gauge their performance from time to time	246	4.78	0.78
The public hospital reacts to external changes in policies and regulations.	246	4.77	0.80
The public hospital controls overhead costs	246	4.35	1.27
Composite Mean and Standard Deviation	**246**	**4.72**	**0.63**

Source: Research Data (2024)

Concerning effectiveness, there is a composite mean of 4.72 and a standard deviation of 0.63. This means that the majority of the respondents agreed that the effectiveness of public hospitals has improved as a result of public hospitals adopting entrepreneurial

supply chain practices. The public hospital mortality rates have been reduced (4.06, S. D= 1.13) The public hospitals have received increased referrals (Mean=4.11, SD=0.96). The public hospitals have received a reduction in the number of complaints (Mean=4.93, SD=0.41) and provide a conducive working environment for employees (Mean=4.90, SD=0.35). The public hospital delivers services without delay (Mean=4.80, SD=0.53), has objectives in line with the mission (Mean=4.96, SD=0.30), allows employees to make suggestions about efficient resource use (Mean=4.95, SD=0.37), utilises healthcare workers to the best of their abilities (Mean=4.87, SD=0.43) and maximises the use of hospital resources and equipment (Mean=4.91, SD=0.45). Additionally, the public hospital maximises the use of financial resources (Mean=4.91, SD=0.40), assesses performance from time to time for better output (Mean=4.78, SD=0.78), reacts to external changes in policies and regulations (Mean=4.77, SD=0.80) and also controls overhead costs (Mean=4.35, SD=1.27).

The relevance aspect of public hospital performance was built upon the public hospital reviewing services regularly to reflect changes in the operating environment, conducting assessments regularly to detect changing customer needs, organising benchmarks with other hospitals, striving to improve the work environment, regularly balancing diverse stakeholder demands, conducting employee satisfaction surveys periodically and foreseeing the implementation of the findings and identifying the risk of corruption and undertaking strategies to mitigate corruption. The public hospitals reviews services regularly to reflect changes in the environment (Mean=4.13, SD=1.12), conducts need assessment regularly to detect changes in customer needs (Mean=4.16, SD=1.10) and benchmarks from other hospitals (Mean=4.20, SD=1.01). Further, the public hospitals; strive to improve the work environment (Mean=4.23, SD=1.00), regularly balances diverse stakeholders' demands (Mean=4.23, SD=1.07), conducts employee satisfaction surveys, periodically and foresees the implementations of the findings (Mean=4.10, SD=1.09) and identifies the risk of corruption and undertakes strategies to mitigate it (Mean=4.06, SD=1.20).

Table 4.6b: Performance of Public Hospitals in Kenya - Relevance

Statement	N	Mean	Std. Deviation
The Public hospital reviews services regularly to reflect changes in the environment.	246	4.13	1.12
The Public hospital conducts need assessment regularly to detect changing customer needs.	246	4.16	1.10
The Public hospital benchmarks from other hospitals	246	4.20	1.01
The Public hospital strives to improve the work environment.	246	4.23	1.00
The public hospital regularly balances diverse stakeholder demands.	246	4.23	1.07
The public hospital conducts employee satisfaction surveys, periodically and foresees the implementation of the findings.	246	4.10	1.09
The public hospital identifies the risk of corruption and undertakes strategies to mitigate it.	246	4.06	1.20
Composite Mean and Standard Deviation	**246**	**4.16**	**1.08**

Source: Research Data (2024)

The financial viability aspect of public hospital performance consists of the public hospital; working under a budget, identifying new sources of funding, gaining more revenues than expense, has sustainable resources to help in operational activities and has increased funding. The public hospitals work under a tight budget (Mean=4.41, SD=0.96), identifies new sources of funding (Mean=4.17, SD=1.07) and gains more revenues than expenses (Mean=4.19, SD=1.04). Further, the public hospitals have sustainable resources to help in activities (Mean=4.04, SD=1.22) and has received increased funding (Mean=4.19, SD=1.20).

Table 4.6c: Performance of Public Hospitals in Kenya - Financial Viability

Statement	N	Mean	Std. Deviation
The Public hospital works under a budget.	246	4.41	0.96
The Public hospital identifies new sources of funding	246	4.17	1.07
The Public hospital gains more revenues than expenses	246	4.19	1.04
The Public hospital has sustainable resources to help in activities.	246	4.04	1.22
The public hospital has received increased funding.	246	4.19	1.20
Composite Mean and Standard Deviation	**246**	**4.2**	**1.098**

Source: Research Data, (2024)

A study on the effect of entrepreneurial orientation and organisational culture on firm performance done by Khan *et al*., (2020) provided similar results whereby organisational performance is embedded in a high entrepreneurial orientation in a firm. Entrepreneurship in an organisation helps in business development, growth of revenues, and product development. Entrepreneurial practices are action-oriented activities in an organisation that aim at destabilising the status quo and creating new gains in an organisation. Therefore, there is a need for an entrepreneurial mindset in an organisation since the presence of entrepreneurship breeds competitive advantage. To achieve maximum organisational performance, entrepreneurial practices should incorporate new opportunities that breed advantage in a continuous process between discovery and the exploitation of identified opportunities (Ziyae & Sadeghi, 2020).

4.6 Inferential Analysis

In this subsection, the study presents the inferential statistics obtained from the study variables. The dependent variable of the study was the performance of public hospitals in Kenya and the independent variables were entrepreneurial supply chain practices in the form of innovative inventory management, proactive strategic sourcing, and risk taking. The relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya was moderated by healthcare financing. The study utilised linear regression to test the hypotheses. Consequently, this sub-section displays the diagnostic tests done before performing regression, Analysis of Variance (ANOVA), and the regression models for both the independent and moderating variables.

4.6.1 Diagnostic Tests

Diagnostic tests are critical before a regression is run as they help avoid model misspecifications or biased estimates as argued by Ndung'u, (2021). The study performed diagnostic tests in the form of sample adequacy, normality, outliers, correlation, homoscedasticity, multicollinearity, and autocorrelation as utilised by various researchers (Chege, 2021; Nyakarimi, 2022). Karisa & Wainaina (2020) concludes that a regression model must satisfy all the assumptions indicated above for it to be efficient.

4.6.1.1 Sample Adequacy Test

The study used the KMO test of sample adequacy and found a composite measure of 0.777, a significance level of 0.000 (significant), and communalities extraction values

of above 0.5 for all the study variables. Specifically, innovative inventory management had an extraction value of 0.769, proactive strategic sourcing had a value of 0.732, risk taking had a value of 0.773, healthcare financing had a value of 0.829 and the performance of public hospitals had a value of 0.743. According to Shrestha (2021) a KMO value of above 0.5 means that the sample size is adequate for use. Consequently, the KMO values obtained for all the study variables revealed that the sample was adequate.

4.6.1.2 Linearity Test

In regression analysis, variables are assumed to be linear. The linearity test adopted in this study was Pearson correlation which has values ranging from -1 to 1. Gakii *et al*., (2022) note that a Pearson correlation coefficient of between either negative or positive 0.7 to 1 is very strong, 0.6 is strong, 0.5 is moderate, 0.2 to 0.4 weak, and 0.1 is very weak. The results are given in table 4.7.

Table 4.7: Correlation Test for Linearity

Variable	Innovative Inventory Management	Proactive Strategic Sourcing	Risk Taking	Healthcare Financing	Performance of Public Hospitals
Innovative Inventory Management	R 1 Sig 0.00**				
Proactive Strategic Sourcing	R 0.866 Sig 0.01**	R 1 Sig 0.00**			
Risk Taking	R 0.795 Sig 0.00**	R 0.769 Sig 0.02**	R 1 Sig0.00**		
Healthcare Financing	R 0.853 Sig 0.02**	R 0.866 Sig 0.01**	R 0.543 Sig0.03**	R 1 Sig 0.00**	
Performance of Public Hospitals	R 0.893 Sig 0.03**	R 0.784 Sig 0.00**	R 0.753 Sig0.01**	R 0.872 Sig 0.02**	R 1 Sig 0.00**

Source: Research Data, (2024)

The correlation coefficient can either be negative or positive and it indicates the strength of the relationship between variables as argued by Cong *et al*., (2022). Based on this, the results provided in Table 4.7, reveal that innovative inventory management, proactive strategic sourcing, and risk taking have a positive significant relationship with performance of public hospitals in Kenya (R=0.893, 0.784, 0.753) respectively. All the independent variables had positive and significant Pearson Correlation coefficients

indicating linear relationships between the variables as argued by Theofani & Sediyono (2022). The moderator variable i.e. healthcare financing was positively significant positive to the performance of public hospitals in Kenya (R=0.872, Sig 0.02).

In the same vein of results as the current study are studies by Abebaw *et al* (2022) who found positive and significant relationships between innovativeness, proactiveness, risk taking, and firm performance. Orobia *et el*., (2020) revealed a positive significant correlation between inventory management and performance. Specifically, Munyi (2024) studied strategic sourcing as a tool for improving firm performance. The study revealed similar results to the current study whereby a positive and significant correlation was observed between strategic sourcing and firm performance.

Liu *et al*., (2023) on the other hand found a positive and significant correlation between risk taking and firm performance. Ifeagwu *et al*., (2021) did a study on health financing for UHC and performance and found a positive significant correlation between health financing and performance. When such positive and significant correlation results are observed, the dependent variable, which is performance of public hospitals in Kenya, can be regressed against the independent variables: innovative, inventory management, proactive strategic sourcing, and risk taking, and the moderator variable healthcare financing and the results be interpreted reliably (Theofani & Sediyono, 2022).

4.6.1.3 Outliers Test

Outliers are the data values that are very unlikely in a regression and they differ from all other values therefore raising suspicion. Ignoring such values results in misspecifications and wrong estimates as argued by Sullivan *et al*., (2021). To check outliers, the study utilised the Cooks distance which highlights that values greater than 1 are considered outliers and hence should be removed in the study. The study carried out this test and the results are in Table 4.8.

Table 4.8: Cook's Distance for Outliers

	Minimum	Maximum	Mean	Std. D	N
Cook's Distance	.013	.431	.021	0.344	246

Source: Research Data (2024)

From Table 4.7, the observed Cook's Distance was less than 1 hence there were no outliers in the study as argued by Andre (2022).

4.6.1.4 Multicollinearity Test

In regression, variables are assumed to lack multi-collinearity, where the independent variables are not correlated. To test this assumption, the Variance Inflation Factor (VIF) was used. The VIF measures how the independent variables regression factors are inflated as a result of the presence of multicollinearity. The results are in Table 4.9.

Table 4.9: Multicollinearity Test Results

Variable	Variance Inflation Factor
Innovative Inventory management	1.115
Proactive Strategic sourcing	1.111
Risk taking	1.004
Healthcare Financing	1.087
Performance of Public hospitals	1.342

Source: Research Data, (2024)

According to Kyriazos & Poga (2023), VIF should be below 10 to indicate the absence of multicollinearity. Consequently, the VIF values for the variables were below 10 indicating the absence of multicollinearity.

4.6.1.5 Normality Test

To check whether the data for the variables was normally distributed, the study utilised the Shapiro-Wilk test for normality. This test for normality has a threshold of values ranging from 0 to 1. Additionally, the significance levels for the observed values should be above the 0.05 p-value to signify the normality of the data. The normality test results are given in Table 4.10.

Table 4.10: Normality Test Results

Variable	Shapiro-Wilk Statistic	df	Sig.
Innovative Inventory management	.942	246	0.063
Proactive Strategic sourcing	.948	246	0.153
Risk taking	.979	246	0.091
Healthcare Financing	.987	246	0.171
Performance of Public hospitals	.952	246	0.060

Source: Research Data (2024)

According to Table 4.10, all the variables met the normality threshold of between 0 to 1 and all the p-values were significant as they were above the set threshold of 0.05.

Specifically, the following results were obtained: innovative inventory management (0.063>0.05), proactive strategic sourcing (0.153>0.05), risk taking (0.091>0.05), healthcare financing (0.171>0.05), and performance of public hospitals (0.060>0.05). The data was therefore normally distributed as argued by Wekesa *et al*., (2022).

4.6.1.6 Autocorrelation Test

In linear regression, there should be little or no autocorrelation at all to avoid model misspecifications. Autocorrelation is present when the regression outcomes of the variables are dependent on the previous outcome. To check this assumption, the Durbin-Watson test statistic was used. Regression of the predictor variables against the dependent variable was done and the outcomes are provided in Table 4.11.

Table 4.11: Autocorrelation Test Results

Model	R	R Square	Adjusted R Square	Std. Error of Estimates	Durbin-Watson Test Statistic
1	.718[a]	.516	.510	.2314116	1.828

Source: Research Data, (2024)

According to Chege (2021), the Durbin-Watson test statistic has a threshold of values ranging from 0 to 4 and the acceptable values range from 1.5 to 2.5. From the study, the Durbin-Watson statistic is at 1.828 revealing the absence of autocorrelation.

4.6.1.7 Homoscedasticity Test

Linear regression assumes that there exists a common variance between the independent variables. The common variance observed is known as homoscedasticity and was tested in this study using the Breusch Pagan test. For this test to satisfy a homogenous variance amongst variables, the observed p-values should be greater than 1. The results are given in Table 4.12.

Table 4.12 Homoscedasticity Test Results

Chi-Square	Df	Sig
.0542	231	.975

Source: Research Data (2024)

The results in Table 4.12 reveal the level of significance for the entrepreneurial supply chain practices is 0.975 (>0.05). According to Chege (2021), the rule of thumb for

homogeneity of variance amongst the independent variables is a significance level greater than 0.05. As per the obtained results, all the significance levels were above 0.05 revealing the absence of heteroscedasticity.

4.7 Testing of Hypotheses

The study's general objective was to investigate the effect of entrepreneurial supply chain practices on the performance of public hospitals in Kenya. The relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya was moderated by healthcare financing. To test these relationships, multiple linear regression was conducted at a 95% confidence level. Consequently, this section presents the results of these hypotheses.

4.7.1 Entrepreneurial Supply Chain Practices and Performance of Public Hospitals in Kenya

The study sought to establish the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The composite index of all the independent variables (innovative inventory management, proactive strategic sourcing, and risk taking) was regressed on the performance of public hospitals in Kenya. The results are captured in Table 4.13a.

Table 4.13a: Entrepreneurial Supply Chain Practices on Performance of Public Hospitals in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.718[a]	.516	.510	.214116

a. Dependent Variable: Public hospital performance

b. Predictors (Constant): composite index of entrepreneurial supply chain practices (innovative inventory management, proactive strategic sourcing, risk-taking)

Source: Research Data (2024)

From Table 4.13a, 51.6% of the variations in the performance of public hospitals in Kenya can be explained by entrepreneurial supply chain practices. An improvement in the performance of public hospitals in Kenya can be achieved through the adoption of entrepreneurial supply chain practices. These results are in line with Chamba & Chazireni (2023) did a study on adoption of entrepreneurial strategies in State-Owned Enterprises in Zimbabwe, Africa and how they affect performance of these organisations. The study found a positive and significant relationship between

entrepreneurial strategies and performance of state corporations. In recent times, the adoption of entrepreneurship has contributed ton competitive advantage and superior performance in organisations.

Another study by Wambua & Wairimu (2023) revealed a positive and significant association between entrepreneurial practices and performance of organisations. The authors identify entrepreneurs as secret weapons in an organisation who can leverage resources. Similar results are revealed by Bakker and McMullen (2022) who did a study in entrepreneurship for a shared theoretical conversation in Netherlands. The study found a positive and significant relationship between entrepreneurship and firm performance. Another study by Oo & Alison (2024) on the effect of entrepreneurship on crowd funding revealed similar results.

The results obtained above are in the same vein as a study by Ketchen & Craighead (2020) on the intersection between entrepreneurship, supply chain management, and strategic management which presented opportunities highlighted by COVID-19. The study found a positive and significant relationship between entrepreneurial adoption in supply chain management and performance of organisations. Further the study highlights that opportunities arise when they are sought for and organisational performance is improved when the identified activities are exploited. The study notes that supply chain opportunities are not always preordained, rather they require an entrepreneurial mind-set which allows greater productivity, creativity, and flexibility to bring in a boost in firm performance.

In the same cerebration is a study by Prayetno & Ali (2020) on entrepreneurial supply chain management competence: predictors of work motivation advocate which found a positive significant relationship between entrepreneurial supply chain management and organisational performance. The study found a positive and significant relationship between entrepreneurial capabilities in an organisation and firm performance. Liu & Wang (2022) concur with the observations in the current study and note that firms that are innovative achieve competitive advantage through product and process innovation; proactive firms can become first movers in a marketplace and firms that have a high-risk attitude achieve great success in innovative settings. The greater the entrepreneurial orientation in an organisation, the greater the organisational performance.

In the same line of thought is a study by Subramanian & Kumar (2024) in India that focused on entrepreneurial universities and found out that universities that adopt new technologies, introduce new programmes and faculties and invest in unchartered waters are able to provide quality education and utilise limited resources efficiently. Vargas-Zeledon & Lee (2024) did a comparative qualitative analysis of the enablers of entrepreneurship in an institution and found out that inclusive entrepreneurship stimulates organisational growth and reduces inequalities. Liu *et al*., (2023) assessed supply chain resilience, market access and enterprise innovation in China and found out that organisations that become resilient through adopting entrepreneurial supply practices are able to access markets easily and expand beyond local markets.

Alkharafi *et al*., (2024) explored the adoption of entrepreneurship in growing economies with a case of Kuwait and found out that risk-taking, proactiveness, innovation and motivation, stimulate economic growth and productivity in growing countries. Sharmaa *et al.*, (2024) utilised innovation and entrepreneurship to assess performance of hospitality and tourism industries in India and found out that the adoption of entrepreneurship helps in value creation and ensure client satisfaction.

Table 4.13b: ANOVA Results

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13.858	3	4.619	85.54	.000[b]
Residual	13.013	243	.054		
Total	26.871	246			

a. Dependent Variable: Performance of Public Hospitals

b. Predictors: (Constant): Innovative inventory management, proactive strategic sourcing, Risk-taking

Source: Research Data (2024)

From the ANOVA results given in Table 4.13b, it can be concluded that there exists a positive and significant relationship ($F=86.258$, sig <0.05) between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

Table 4.13c: Coefficients for entrepreneurial supply chain practices on performance of public hospitals in Kenya

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
	(Constant)	4.496	.281		15.99	.000
	Innovative inventory management	.1083	.042	.122	2.579	.010
	Proactive strategic sourcing	.33033	.026	.598	12.705	.000
	Risk taking	.226176	.032	.316	7.068	.000

Dependent Variable: Performance of public hospitals in Kenya

Research Data, (2024)

Equation 4.1 was used to predict the study variables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_{2+} \beta_3 X_3 + \varepsilon$$

Whereby; Where; Y is a composite index for the performance of public hospitals, β_0 is constant, β is slope, X_1 is Innovative Inventory Management, X_2 is Proactive Strategic Sourcing, X_3 is Risk taking, β_1 is the regression coefficient of variable X_1 (Innovative Inventory Management), β_2 is regression coefficient of variable X_2 (Proactive Strategic Sourcing), β_3 is regression coefficient of variable X_3 (Risk Taking), and ε is the error term.

Based on the findings provided in Table 4.13c, the predictor model incorporating the study variables is given in Equation 4.2.

$$Y = 4.496 + 0.1083 X_1 + 0.33033 X_{2+} 0.226176 X_3 + \varepsilon$$

Equation 4.2 provided above indicates that all the three entrepreneurial supply chain practices used in this study i.e. innovative inventory management, proactive strategic sourcing, and risk taking have a positive and significant relationship with the performance of public hospitals in Kenya.

The first objective of the study sought to establish the influence of innovative inventory management on the performance of public hospitals in Kenya. The hypothesis was as follows:

H_{01}: Innovative inventory management has no significant effect on the performance of public hospitals in Kenya.

The results in Table 4.13c reveal that the adoption of innovative inventory management practices has a significant and positive effect on the performance of public hospitals in Kenya ($\beta = 0.1083$; P-Value < 0.05). From this finding, the null hypothesis (H_{01}) was rejected meaning that a unit increase in the adoption of entrepreneurial supply chain practices in the form of innovative inventory management leads to a significant increase in the performance of public hospitals in Kenya by 10.83%.

These results are grounded by the theories utilised in this study. According to Fane *et al*., (2021) innovativeness in the supply chain relates to the supply chain's capability to adopt and encourage new ideas, processes, practices and the experimentation of these new processes to create new products/services. In this regard, innovativeness calls for a firm to invest in new technologies to improve their performance. The ROT postulates that to achieve alertness, efficiencies, effectiveness, and resilience in a supply chain and organisation, there is a need to be innovative. Innovative inventory management helps hospitals reduce supply shortages, and waiting time for patients, increases the number of available beds, and provides supplies effectively while identifying obsolete resources thus enhancing performance (Hassan & Mahmoud, 2021; Jenkins *et al*., 2023). Additionally, in the presence of resource constraints, the ROT helps combine and rearrange resources to create value and serve the public interest (Ghalwash & Ismail, 2022).

The results are similar to a study by Fanelli *et al*., (2021) who found a positive and significant relationship between innovativeness in the supply chain and firm performance. Another study by Hassan & Mahmoud, (2021) found similar results and concluded that innovativeness stimulates firm alertness, efficiencies, effectiveness, and resilience, consequently, reducing supply shortages, and waiting time for patients, increasing the number of available beds, and providing supplies effectively while identifying obsolete resources thus enhancing performance.

The findings of this study are also similar to the work of Moreira *et al*., (2024) who did a study on the dimensions of innovation in an organisation and found a positive and significant relationship between innovativeness and competitive advantage in an organisation. The study concludes that innovativeness is an organisational resource that stimulates posterity, economic growth, competitive advantage and progress in the rapidly changing business environment. Sang *et al.,* (2024) found similar results and concluded that being innovative enhances absorptive capacity of organisations and the role of supply chain collaboration in improving performance in China.

In the same cerebration is a study by Alfaqaei *et al*. (2024) who studied innovation management systems adopted by public organisations in the United Arab Emirates and how they influence performance. The study noted that organisations striving to attain excellence should undertake innovations in daily operations to offer superior products. Kulkov *et al.,* (2023) revealed similar results after they did a study on the adoption of entrepreneurship in healthcare. The study concluded that healthcare organisations that launch, and build new products and services by using new technologies can provide quality services to patients.

Mashayekhy *et al*., (2022) found similar results when they assessed the adoption of innovation in inventory management. The study concluded that organisations aiming at reducing prices of commodities, maximising customer service levels, reducing waste, conducting real-time decision-making, and enhancing responsiveness utilise new technologies (Internet of Things, IoT) such as control systems, sensors, and Radio Frequency Identification which help process big volumes of data such as demand and planning thereby reducing shortages.

Dovbischuck (2021) found similar results to the current study and concluded that adoption of new technologies stimulates new processes and procedures that serve as significant drivers of coping with environmental turbulence and hostility. Through innovative inventory management, organisations breed unique services and practices that stimulate a sustained competitive advantage. Illangakoon *et al*., (2021) confirmed the current study results when they investigated the adoption of Industry 4.0 and lean concepts in hospitals for healthcare operational performance improvement.

Similar results to the current study are also revealed in a study by Mansour *et al*., (2024) who investigated the correlation between organisational innovation and business excellence with a focus on private hospitals. The study found a positive and significant correlation between organisational innovativeness and business excellence. Innovations in the hospital processes enable a hospital to progress towards excellence and increase the satisfaction of patients. It is of critical importance that hospitals should ensure zero errors by improving sick care and the quality of life of patients that are hospitalised and served daily.

The current study results agree with Rastoka *et al*., (2022) who analysed the influence of entrepreneurship on the quality of public healthcare institutions and policies and found that there existed a positive relationship between innovativeness and the performance of public hospitals in Bosnia and Herzegovina. Bai *et al*., (2024) studied how innovation through digitalisation promotes productivity in China and revealed similar results to the current study. A positive and significant relationship was observed between innovativeness and economic growth.

The results revealed in Table 4.13c are similar to a study by Yoshikuni (2024) on the role of innovation in stimulating organisational growth. The study done in Brazil recognise innovation as the critical driver for organisational productivity and competitive advantage. The adoption of new technologies fosters knowledge management and shared decision making which in turn improves firm performance.

The second objective of the study sought to establish the influence of proactive strategic sourcing on performance of public hospitals in Kenya. The hypothesis was as follows:

H_{02}: Proactive strategic sourcing has no significant effect on the performance of public hospitals in Kenya.

The results in Table 4.13c reveal that the adoption of proactive strategic sourcing practices has a significant and positive effect on the performance of public hospitals in Kenya ($\beta = 0.33033$; P-Value < 0.05). From this finding, the null hypothesis (H_{02}) was rejected meaning that a unit increase in the adoption of entrepreneurial supply chain practices in the form of proactive strategic sourcing leads to a significant increase in the performance of public hospitals in Kenya by 33.033%.

The results obtained in the current study are similar to a study by Fan *et al*., (2021) who studied how being proactive enhances the supply chain capacity of service organisations. The study revealed a positive and statistically significant relationship between proactive supply chain activities and firm performance. The study notes that a proactive supply chain creates a competitive advantage by being the first to make changes in its products/services and technologies.

Another study by Munyi (2024) on the influence of strategic sourcing on firm performance revealed similar results as the current study and noted there exist dynamic customers in the marketplace who are demanding better products at cheaper prices with faster delivery periods and high reliability. Consequently, firms need to be proactive in managing their supply sources to ensure continuity in the delivery of services.

Tarigan & Siagian, (2021) studied the impact of proactive strategic sourcing in promoting organisational operations and found similar results to the current study. The study highlights that over 70% of a firm's cost falls under the costs of supplies making sourcing a significant determiner of a firm's profitability, thus the need for proactivity. Vlahakis *et al*., (2020) studied how supplier relationships stimulate business continuity and revealed similar results to the current study. The study concluded that supplier relationships enhance business continuity by increasing revenue.

Islami (2023) revealed similar results with the current study when he focused on how supplier relationships and organisational performance. The study recognised that supplier relationships require a high degree of coordination between the firm and the suppliers. A study by Oliech & Mwangangi (2019) revealed similar results to the current study and established that strategic sourcing improves firm performance through reduced shortages, and wastages, improves accountability, and makes services affordable to all. The study further recognised that poorly organised supply chains place the health of millions of Kenyans at risk. In Thailand, the adoption of proactive strategic sourcing has reduced child mortality rates while in Ghana the quality of non-communicable disease treatment has improved as a result of strategic sourcing (Munyua *et al.,* 2022).

The third objective of the study aimed at investigating the effect of risk taking on the performance of public hospitals in Kenya. The hypothesis was as follows:

H_{03}: Risk taking has no significant effect on the performance of public hospitals in Kenya.

The results in Table 4.13c reveal that the risk taking practices have a significant and positive effect on the performance of public hospitals in Kenya ($\beta = 0.226176$; P-Value < 0.05). From this finding, the null hypothesis (H_{03}) was rejected meaning that a unit increase in the adoption of entrepreneurial supply chain practices in the form of risk taking leads to a significant increase in the performance of public hospitals in Kenya by 22.6176%. Similar results as the current study are revealed in a number of studies.

Soomro *et al.,* (2024) studied the role of shared leadership in stimulating risk taking in organisations and found a positive and significant relationship between self-efficacy of leaders, risk taking and firm performance of construction projects. Collaborative leadership behaviour inspires risk taking opportunities in an organisation and entails the self-efficacy of leaders who recognise opportunities, communicate consistently, collaborate effectively, show resilience, and plan and manage resources (McGee & Terry, 2022). Similar results are also revealed by Hamdan & Alheet, (2020) who looked into the influence of organisational risk taking on Small and Medium Enterprises in the United Kingdom. The study revealed that risk-taking positively influences firm performance. Most organisations around the world have collapsed due to the risk averseness nature of their management. Organisations should take risks in a bid to improve their performance (Wimmer & Keestra, 2020).

Silva *et al*., (2021) looked into the impact of risk taking on firm performance and found out a positive and significant relationship between supply chain performance and risk taking. Zighan *et al*, (2022) revealed a positive and significant relationship between risk taking and firm performance and concludes that a firm willing to take risks by committing and allocating resources to new markets builds a strong foundation of enhanced performance. In this cerebration also is a study by Theresa & Hidayah, (2021) on owners of Micro, Small, and Medium Enterprises (MSMEs) in North Jakarta, which found a positive and significant relationship between risk-taking and the performance of SMEs.

Ajamobe, (2021) studied the impacts or risk taking in public organisations on performance and found a positive and significant relationship between firm

performance and risk taking. Additionally, the study notes that risk-taking is not exclusively grounded on suitable identification, valuation, and management of risks, but also integrates the level to which and how much risk is bearable in a public entity. It is the most audacious leader in an organisation that takes risks and who benefits in the long run. The higher the level of risk in an organisation, the more the level of information sharing, and this helps the organisation to achieve and maximise returns at a higher pace than rivals. The higher the risk-taking levels in an organisation, the higher the performance (Kadarusman & Rosyafah, 2022).

4.7.2 Moderating Effect of Healthcare Financing on the Performance of Public Hospitals in Kenya

The last objective of the study was to analyse the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The hypothesis tested is given below:

H_{04}: Healthcare financing has no moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

To test this hypothesis, two regression models were used as advocated by the moderation model by Aiken and West (1991).

Step One: Influence of entrepreneurial supply chain practices on the performance of public hospitals without the interaction of the moderating variable

In the first step, the entrepreneurial supply chain practices were regressed on the performance of public hospitals in Kenya. The regression results are shown below.

Table 4.14: Entrepreneurial Supply Chain Practices on Performance of Public Hospitals in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.718[a]	.516	.510	.214116

a. Dependent Variable: Public hospital performance

b. Predictors (Constant): composite index of entrepreneurial supply chain practices (innovative inventory management, proactive strategic sourcing, risk-taking)

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13.858	3	4.619	85.54	.000[b]
Residual	13.013	243	.054		
Total	26.871	246			

a. Dependent Variable: Performance of Public Hospitals

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
	(Constant)	4.496	.281		15.9	.000
	Innovative inventory management	.1083	.042	.122	2.57	.010
	Proactive strategic sourcing	.33033	.026	.598	12.7	.000
	Risk taking	.226176	.032	.316	7.06	.000

Dependent Variable: Performance of public hospitals in Kenya

Research Data, (2024)

According to Table 4.14, 51.6% of the variations in the performance of public hospitals in Kenya can be explained by entrepreneurial supply chain practices. An improvement in the performance of public hospitals in Kenya can be achieved through the adoption of entrepreneurial supply chain practices. The ANOVA results in Table 4.13 reveal a positive and significant relationship ($F=85.54$, $Sig<0.005$) between the entrepreneurial supply chain practices and performance of public hospitals in Kenya.

Step Two: The influence of entrepreneurial supply chain practices on the performance of public hospitals in Kenya with the interaction of the moderating variable

In this step, the interaction of the moderator variable was introduced in the relationship between the independent (entrepreneurial supply chain practices) and the dependent (performance of public hospitals in Kenya) variables. The results are revealed in Table 4.15.

Table 4.15a Regression results of the influence of entrepreneurial supply chain practices on the performance of public hospitals in Kenya with the interaction of the moderating variable

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	Sig
2	.720[a]	.519	.511	.2311554	.000[b]

a. Predictors: (Constant), Healthcare Financing, Innovative inventory management, Risk Taking, Proactive strategic Sourcing

Source: Research Data (2024)

According to the results in Table 4.15a, by introducing healthcare financing which is the moderator variable, the R square value increased to 51.9% consequently, healthcare financing improved the goodness of fit in the model by 0.2%. This translates to entrepreneurial supply chain practices and healthcare financing explaining 0.2% of the variations in the performance of public hospitals in Kenya.

Table 4.15[b]: ANOVA Results of Moderating Effect of Healthcare Financing

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13.940	3	4.647	81.53	.000[b]
Residual	13.931	243	0.057		
Total	26.871	246			

a. Dependent Variable: Performance of Public Hospitals

b. Predictors: (Constant): Healthcare Financing, Innovative inventory management, proactive strategic sourcing, Risk-taking

Research Data (2024)

Table 4.15[b] specifies that the regression model testing the moderating effect of healthcare financing was a good fit (0.000 < 0.05) signifying that the model was significant in predicting the moderating effect of healthcare financing.

Table 4.15c: Coefficients of the moderating effect of healthcare financing

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients	Sig.
1	(Constant)	4.394	.293		.000
	Innovative inventory management*health care financing	.1192	.044	.119	.012
	Proactive strategic sourcing *healthcare financing	.35712	.031	.577	.000
	Risk taking *healthcare financing	.24065	.037	.361	.000

a. Dependent variable: Performance of Public Hospitals in Kenya

b. Predictors (Constant): composite index of entrepreneurial supply chain practices (innovative inventory management, proactive strategic sourcing, risk-taking)

Research Data (2024)

From Table 4.15[c], the moderation model is provided as revealed in equation 4.3.

$$Y= 4.394 + 0.1192X_1*Z + 0.35712X_2*Z + 0.24065X_3*Z + \varepsilon$$

Where; Y is the dependent variable (performance of public hospitals), β_0 is constant, X_1 is the coefficient of the composite index of innovative inventory management * healthcare financing, X_2 is the composite index of proactive strategic sourcing * healthcare financing, X_3 is the composite index of risk taking * healthcare financing and e is the error term.

The model indicates that healthcare financing had a positive and significant moderating effect on the relationship between innovative inventory management and performance of public hospitals in Kenya (β = .1192; P-Value < 0.05); proactive strategic sourcing and performance of public hospitals in Kenya (β = .35712; P-Value < 0.05); risk taking and performance of public hospitals in Kenya (β = .24065; P-Value 70 < 0.05). This means that by introducing the moderating variable, the relationship between the independent variables and dependent variables improved. Several findings fall in the same vein as regards the influence of healthcare financing on performance.

Visconti & Morea (2020) did a study to analyse the impact of healthcare financing on hospital performance and found a positive and significant relationship between healthcare financing and firm performance. The study further reveal that healthcare financing is critical in a hospital as it provides adequate resources that helps reduce operational costs and shorten lead times through enhanced purchases. Sinambela *et al.,* (2022) concurred with the current study results when they assessed the impact of healthcare financing on organisational performance. They found a positive and significant relationship between availability of resource and the effectiveness of a public hospital. The study concludes that bulk resource acquisition leads to effective budgeting which promotes service delivery (Ferreira & Marques, 2021).

Another study by Amos *et al.,* (2022) provides findings similar to the current study and emphasise that the abundance of resources obtained from multiple donors and in bulk ensures medical supplies and healthcare personnel are available while providing resources for investing in infrastructure. This boosts trust and patient satisfaction. When a public hospital diversifies the donor funding portfolio, the overdependence on a single donor is reduced and this improves the financial stability of the hospital by ensuring a steady flow of resources into the hospital.

A study by de Almeida Botega *et al.,* (2020) revealed similar results with the current study and concluded that the availability of resources and utilisation of resources allow organisations make decisions faster which stimulates the allocation of scarce resources to key priority areas ensuring efficient utilisation of resources, promoting flexibility to changing needs, and improving the productivity of healthcare workers.

Yazdani *et al*., (2020) agreed with the current study results and concluded that availability of resources and utilisation of resources promote greater accountability and traceability which reduces the likelihood of misappropriation and mismanagement of public resources. Keats & Evans (2020) agree with the current study results and recognise that the availability of resources and utilisation of resources establishes a collaborative spirit and stimulates innovation, communication, trust and efficient allocation of resources to support achievement of organisational goals which all contribute to greater performance of a public hospital.

Volland (2020) agree with the current study results. He studied the moderating influence of healthcare financing on the relationship between entrepreneurship and firm performance and found a significant moderating effect. Adequate financing empowers hospitals to fully implement and leverage innovative and proactive supply chain practices, leading to improvements in efficiency, cost control, patient outcomes, and resilience. Additionally, organisations are able to undertake risky ventures that can greatly contribute to firm performance. Healthcare financing allows entrepreneurial supply chain practices in a public hospital; to generate long-term cost savings and sustainability, invest in human resources and expertise, increase resilience and reduce the likelihood of performance dips during crises, and maximise access to high-quality supplies which all improve the public hospital performance.

It can therefore be deduced that healthcare financing has a significant moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. Consequently, the null hypothesis that there is no moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya was rejected.

4.8 Summary Tests of the Hypotheses

The results for the tested research objectives and hypotheses, the decisions, and conclusions are presented in Table 4.16.

Table 4.16 Summary of Study Hypotheses

Research Objective	Research Hypothesis	Result	Decision
To determine the effect of innovative inventory management on the performance of public hospitals in Kenya.	H_{01}: Innovative inventory management has no significant effect on the performance of public hospitals in Kenya	Innovative inventory management had a statistically significant influence on the performance of public hospitals in Kenya (sig is.000)	Reject the null hypothesis.
To assess the effect of proactive strategic sourcing on the performance of public hospitals in Kenya.	H_{02}: Proactive strategic sourcing has no significant effect on the performance of public hospitals in Kenya.	Proactive strategic sourcing had a statistically significant influence on the performance of public hospitals in Kenya (sig is.000)	Reject the null hypothesis.
To analyse the effect of risk taking on the performance of public hospitals in Kenya.	H_{03}:Risk taking has no significant effect on the performance of public hospitals in Kenya.	Risk taking had a statistically significant influence on the performance of public hospitals in Kenya (sig is.000)	Reject the null hypothesis.
To establish the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.	H_{04}: Healthcare financing has no moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya	Healthcare financing had a statistically significant moderating influence on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya (sig is.000)	Reject the null hypothesis.

Research Data (2024)

The findings in Table 4.14 show that all the null hypotheses were rejected and it is therefore concluded that entrepreneurial supply chain practices have an influence on the performance of public hospitals in Kenya and that healthcare financing has a statistically significant moderating influence on the relationship between entrepreneurial supply chain practices and performance of public hospitals in Kenya.

4.9 Qualitative Data Analysis

In this section, the responses obtained from open-ended questions in the questionnaire are presented. The researcher utilised content analysis to analyse the qualitative data. The section is organised into 5 sections: innovative inventory management, proactive strategic sourcing, risk taking, healthcare financing, and performance of public hospitals in Kenya.

4.9.1 Innovative Inventory Management

The respondents from the 123 public hospitals were requested to indicate their level of adoption of innovative inventory management aspects in public hospitals. The study established that public hospitals order needed inventory, maintain a buffer stock to prevent stock outs, aim at continuous improvement in inventory management, engage in long-range planning with the staff, undertake staff training to help them advance their skills and competencies, introduce new technologies for dispensing medicines and delivering services such as M-Dawa, LIFO, safety stock and Healthcare Management Information System.

Further, the study revealed that public hospitals use Community Health information systems, the Internet of Things such as websites, WhatsApp, and X that do regular updates to provide healthcare services and manage inventory. The study also revealed the availability and use of Enterprise Resource Planning (ERP) in public hospitals and the use of new technology to set reorder levels and inform about stock-outs. Additionally, the study revealed that public hospitals use technology for capacity planning, resource allocation, demand forecasting, and other operational activities.

The respondents were asked to indicate the innovative inventory management ideas that they use to promote effective service delivery. The responses given were as indicated below:

'use of electronic inventory management systems and automated replenishment of stock which minimises human error and promote accuracy in information sharing while preventing medicines and supplies stock outs respectively'.

'Linking inventory management with social health insurance schemes such as National Health Insurance to promote efficiency in resource management'.

'Use of RFID to reduce stock-outs and losses'.

'Utilising mobile-based applications to monitor stock and track deliveries. Here in Turkana, the Regional Blood Transfusion Centre uses drones to deliver blood to rural areas and this has saved lives, especially by reducing maternal deaths.

'proper labelling, shelving, and storage procedure'

'Applying decentralised systems where individual hospital departments manage their stock, but all are intersected through a central database'.

'Maintaining lower stock levels and procuring supplies based on immediate or anticipated demand, reducing the need for large warehouses'.

'Data analytics for extrapolative inventory management to predict future inventory needs based on historical usage patterns and seasonal trends'.

'engaging health research experts in the community'.

The respondents were asked their views about the implementation of the Healthcare Information Management System (HMIS) in Kenyan public hospitals.

'it improves data accessibility and management by centralising records of patients. It is a nice initiative by the government.

'the system has helped us promote patient care and safety by promoting effectiveness and efficiency service delivery'

'When we started using the system, we achieved efficient resource allocation and utilisation but sometimes staff does not want to utilise the system as they view it as difficult'.

'through the system, we have achieved proactive disease surveillance which helps reduce disease burden'.

'the HMIS promotes faster delivery of healthcare, cost efficiency, and transparency and improves accountability'.

4.9.2 Proactive Strategic Sourcing

The researcher requested the respondents to state if the public hospitals engage in proactive strategic sourcing. The respondents indicated that public hospitals; establish long-term relationships with suppliers, engage in supplier involvement and development, engage in efficient communication, identify suppliers strategically, engage in mutual decision-making and problem-solving with suppliers, use suppliers' assistance to improve product quality, plan procurement process to receive orders during shortages, consolidate requirements to ensure bulk and timely purchases, has an existing procurement plan that establishes the hospital needs and ensures the needs are met, has a pool of suppliers considered during purchases and utilises people, processes, technology, and supply chain in the procurement planning and process.

The respondents were asked to state how the Kenya Medical Supplies Authority (KEMSA) affects the public hospital's procurement process. The responses are as indicated below: -

'KEMSA ensures uniformity in pricing and quality of healthcare products'.

'KEMSA causes delays and inefficiencies which cause slow deliveries and stock-outs of essential medical supplies'.

'Majority of times we receive reduced costs in procurement and the funds saved we use them in other essential areas'.

'The hospitals can receive high quality essential medical supplies'

'We experience long lead times when receiving hospital essential supplies'

'Sometimes the logistical challenges faced by KEMSA trickle down to us and result in shortages, delays, and lack of essential supplies.

'*Inefficiencies in KEMSA's operations reduce our ability to provide healthcare services'*

Further, the respondents were required to indicate how the availability of funds affects the hospital procurement process. The responses were as follows: -

'the public hospitals can do timely procurement of essential supplies'.

'we can engage in supplier's negotiations and get better prices for products'.

'with funding available, we can do long-range procurement planning and budgeting'.

'we curb procurement shortages by purchasing high-quality medical supplies in bulk'.

'We have improved our relationships with suppliers as we pay them on time and consistently'.

'we can take care of emergencies such as pandemics when we have funds available'.

'We have made long-term investments such as the purchase of diagnostic equipment'.

4.9.3 Risk Taking

The respondents were requested to indicate whether they adopt risk taking in their public hospitals. The study revealed that public hospitals set aside funds to invest in new operations in uncertain environments. It was revealed that the public hospitals predict industry channels and take action to provide quality healthcare and that the hospitals conduct a SWOT and PESTEL analysis that helps shape avenues for generating income. The respondents indicated that the public hospital: leverages new technologies to identify income generating ventures, leadership establishes an internal shared vision and language for risk scenarios, management engages external stakeholders to identify issues that affect healthcare service delivery, and is passionate, zealous and establishes a vision that inspires healthcare workers for better service delivery.

It was noted that the public hospital management supports departmental collaboration for better service delivery. Additionally, the study revealed that the public hospital incorporates risk in strategic decision-making and that the hospital's resources are put to use efficiently to promote more capabilities. Finally, the study revealed that the public hospital leadership seeks the opinion of employees to build strategies, and policies and solve problems.

4.9.4 Healthcare Financing

The respondents were requested to indicate the availability of healthcare financing in their public hospitals. The study revealed that public hospitals: have a planned budget that guides resource allocation, receive funding from the County Government promptly, receive funds in bulk and not in small bits, receive resources from donors and other

parties frequently, have autonomy in the utilisation of resources, allocates resources in a transparent a d electronically visible and integrated process and that the public hospitals possess a collaborative spirit regarding resource use and availability.

4.9.5 Performance of Public Hospitals

The respondents were requested to indicate some aspects they recognise as measures of performance in public hospitals in Kenya. The aspects were categorised into effectiveness, organisational relevance, and financial viability.

a. Effectiveness

The study revealed that if the public hospital mortality rates and complaints reduce while the number of referrals goes up, then improved performance is achieved. Further, it was revealed that if the public hospital provides a conducive working environment for employees, delivers services without delay, has objectives in line with the mission and employees can make suggestions about efficient resource use signify improved performance. Additionally, it was revealed that if the public hospital utilises healthcare workers to the best of their abilities, maximises the use of hospital resources, equipment, and financial resources, performs assessments to gauge their performance from time to time, reacts to external changes in policies, and regulations and controls overhead costs, there is the presence of improved performance.

b. Organisational Relevance

The study revealed that the public hospital achieves improved performance through reviewing services regularly to reflect changes in its operating environment, conducting need basement regularly to detect changing customer needs, benchmarking from other hospitals, striving to improve the work environment, regularly balancing diverse stakeholder demands, conducting employee satisfaction surveys periodically and foreseeing the implementation of the findings and identifying the risk of corruption and undertaking strategies to mitigate it.

c. Financial viability

The public hospital achieves greater performance when they work under a budget, identify new sources of funding, gain more revenues than expenses, have sustainable resources to help in activities, and receive increased funding.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study findings, the conclusions and recommendations made from the study findings and suggestions for future research.

5.2 Summary

An aspiration of the Kenyan Government in the Vision 2030 plan is to transform lives through equitable, high-quality and affordable healthcare to all by improving public healthcare. Various reforms, policies and budgetary allocations have been made all aimed at promoting good health for all. Despite these reforms, the performance of public hospitals keeps deteriorating. There is low effectiveness, organisational relevance and financial viability in the public hospitals and this is attributed to poor supply chain practices. There is inefficient demand forecasting, a lack of a decentralised procurement system at the County level, low ICT utilisation, inadequate medicines, equipment and human resources, minimal operating hours amongst others.

Literature advances a functional entrepreneurial supply chain system as the backbone of quality public healthcare and improved organisational performance, as it guarantees the provision of medicines, diagnostic services and healthcare human resources in a timely and efficient manner. Therefore, the central objective of this study was to uncover the influence of entrepreneurial supply chain practices on the performance of public hospitals in Kenya. The research also focused on the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The specific objectives of the study included to determine the effect of innovative inventory management on the performance of public hospitals in Kenya; assess the effect of proactive strategic sourcing on the performance of public hospitals in Kenya; to analyse the effect of risk taking on the performance of public hospitals in Kenya and to determine the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and performance of public hospitals in Kenya. The study population was 243 public level 4, 5 and 6 hospitals.

5.2.1 Influence of Innovative Inventory Management on the Performance of Public Hospitals in Kenya

The study sought to assess the extent to which innovative inventory management influences the performance of public hospitals in Kenya. The null hypothesis stated that innovative inventory management has no significant effect on the performance of public hospitals in Kenya. The regression coefficients revealed a statistically significant relationship between innovative inventory management and the performance of public hospitals in Kenya. From the study findings, it can be concluded that innovative inventory management has a positive and significant influence on the performance of public hospitals in Kenya. This led to the rejection of the null hypothesis. The findings in this study are similar to several other studies that also found a significant relationship between innovative inventory management and organisational performance.

5.2.2 Influence of Proactive Strategic Sourcing on the Performance of Public Hospitals in Kenya

The study investigated the influence of proactive strategic sourcing on the performance of public hospitals in Kenya. The null hypothesis of the study was that proactive strategic sourcing has no significant effect on the performance of public hospitals in Kenya. The regression coefficients revealed that the relationship between proactive strategic sourcing and the performance of public hospitals was significant. Consequently, it can be deduced that proactive strategic sourcing significantly influences the performance of public hospitals and this led to the rejection of the null hypothesis. The findings are in the same vein with several studies which found out that proactive strategic sourcing positively and significantly impacts organisational performance.

5.2.3 Influence of Risk Taking on the Performance of Public Hospitals in Kenya

The third objective of the study was to investigate the effect of risk taking on the performance of public hospitals in Kenya. The null hypothesis tested was that risk taking has no significant effect on the performance of public hospitals in Kenya. The regression coefficients revealed that the relationship between risk taking and the performance of public hospitals was significant. Consequently, it can be deduced that risk taking significantly influences the performance of public hospitals and this led to the rejection of the null hypothesis. The findings are in the same vein as several studies

done in the past which found out that risk taking positively and significantly impacts organisational performance.

5.2.4 Moderating Influence of Healthcare Financing on the Relationship between Entrepreneurial Supply Chain Practices and Performance of Public Hospitals in Kenya

The final objective of the study was to investigate the moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The null hypothesis tested was that healthcare financing has no significant moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The results revealed that healthcare financing has a statistically significant moderating influence on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. Consequently, the null hypothesis was rejected and the study concluded that healthcare financing has a statistically significant moderating influence on the relationship between the entrepreneurial supply chain practices and performance of public hospitals in Kenya. These findings are similar to those of other previous researchers who found out that healthcare financing has a significant moderating effect on the performance of organisations.

5.3 Conclusions

The right to health is a basic human right that promotes productivity and growth in a country. The right is affirmed clearly in global, regional and national health frameworks. The United Nations (UN) Sustainable Development Goals (SDGs) in the global level, the African Union Agenda 2063 and the East African Community (EAC) Vision 2050 in the regional level and the Kenyan 2010 Constitution at the national level. These frameworks possess pillars aimed at high standards of living, improved quality of life and well-being for all people, healthy-well-nourished citizens and the expansion and equitable access to quality healthcare services for all.

Healthcare is fundamental in enriching public health across the globe. In this regard, the public hospitals are key contributors to this basic human right across the globe. It is on this backdrop that the study sought to establish the influence of entrepreneurial supply chain practices on performance of public hospitals in Kenya. The study also sought to establish the moderating influence of healthcare financing on the relationship

between entrepreneurial supply chain practices and performance of public hospitals in Kenya. The findings helped the researcher to make several conclusions.

The first objective of the study found out that innovative inventory management is statistically significant and therefore, there exists a relationship between innovative inventory management and performance of public hospitals in Kenya. Ordering needed inventory, maintaining a buffer stock, aiming at continuous improvement, long range planing undertaking staff training, introducing new technologies for dispensing medicines and delivering services, use of electronic community health information system to provide healthcare services and manage inventory, operating an enterprise resource planning system, using new technology to set reorder levels and inform about stock outs and using technology for capacity planning, resource allocation, demand forecasting and other operational activities are aspects of innovative inventory management. These aspects when adopted, stir the performance of public hospitals in Kenya. From the study findings, the researcher concludes that the integration of technologies in inventory management such as internet of things ensures real time inventory tracking, efficient demand forecasting and reduces errors which ultimately builds on performance. Innovative inventory systems create more responsive and adaptable supply chains, allowing businesses to quickly adjust to market changes or disruptions.

Proactive strategic sourcing was built upon supplier relationships and procurement planning. From the findings, it was revealed that proactive strategic sourcing significantly influences the performance of public hospitals in Kenya. Public hospitals have established long-term relationships with suppliers and constantly engage in supplier involvement and development in the procurement process. There is efficient communication with suppliers and to be able to do this, the public hospital identifies the suppliers strategically, develops a pool of suppliers who are considered during purchases and engages them in mutual problem-solving and decision-making, while utilising the supplier's assistance to improve the quality of the products. Public hospitals have an existing procurement plan that allows them to plan for procurement and to receive supplies even during shortages, consolidate requirements to ensure bulky and timely purchases and utilises people, processes and technology and supply chain in the procurement planning and process. Consequently, the study observed that proactive

strategic sourcing activities in a public hospital help promote the hospital's performance.

In conclusion, proactive strategic sourcing is basically built upon two critical variables in this study: supplier relationship and procurement planning. By nurturing strong, long-term relationships with suppliers, public hospitals foster trust, ensure consistent quality of their supplies and promote collaboration. These relationships allow for a deeper understanding of suppliers' capabilities and performance which in turn helps identify potential issues before they become problems. This proactive approach minimises risks, enhances reliability and creates opportunities for joint innovation.

On the other hand, effective procurement planning ensures that the public hospitals are not only responsive to current demands but also well-prepared for future challenges. Through careful forecasting, data analysis and market trend evaluation, companies can anticipate their needs and make informed sourcing decisions. This foresight reduces the likelihood of disruptions, optimises inventory management and improves overall supply chain efficiency. Proactive strategic sourcing provides a forward-thinking approach that leads to cost savings, enhanced operational efficiency and stronger more resilient supply chains.

Risk taking constituted collaborative leadership behaviour and income-generating opportunities. The study findings revealed a statistically significant relationship between risk taking and performance and this led to the rejection of the null hypothesis which stated that risk taking has no significant relationship with the performance of public hospitals in Kenya. A conclusion was made that risk taking positively and significantly influences the performance of public hospitals in Kenya. The study observed that public hospitals are setting aside funds to invest in new operations in uncertain environments and to be able to do this, they predict industry changes and take actions to provide quality healthcare. Public hospitals are conducting SWOT and PESTEL analysis that help them shape avenues for generating income and as they do so they leverage new opportunities and technologies. The study concluded that the leadership and management in a public hospital; establishes a shared vision and language for risk scenarios, engages external stakeholders to identify issues that affect healthcare service delivery, is passionate and establishes a strategic vision that inspires healthcare workers for better service delivery, supports departmental collaboration,

incorporates risk in strategic decision making and continuously seek the opinion of employees to build strategies, policies and solve problems to improve the public hospital's effectiveness, financial viability and organisational relevance.

Risk taking enables public hospitals to leverage on their collective strengths while capitalising for opportunities for growth. Specifically, the authors conclude that collaborative leadership behaviour fosters a culture of open trust, shared decision making and transparent communication. Leaders who inspire collaboration are able to encourage their team members to achieve greater success by allowing trial and error. Income generating opportunities on the other hand help serve as avenues for growth in organisations.

The moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya considered two aspects, the availability of resources and the utilisation of resources. The study revealed that public hospitals; have a planned budget that guides resource allocation, receive funding from the County Governments promptly, receive funds in bulk and not in small bits, receive resources from donors and other parties frequently, have autonomy in the utilisation of resources, allocate resources in a transparent and electronically visible and integrated process and possesses a collaborative spirit regarding resource use and availability. Therefore, the study revealed the moderating effect of healthcare financing and this was supported by the rejection of the null hypothesis that healthcare financing has no significant moderating effect on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya.

In conclusion, healthcare financing creates a sustainable model that improves access, enhances quality of care and ensures that healthcare systems can meet the evolving needs of populations. By striking the right balance between resource availability and optimal use, healthcare systems can provide better outcomes, reduce inefficiencies and ensure long-term financial sustainability. The availability of resources such as financial capital, human resources and infrastructure is essential for the effective functioning of healthcare systems. Sufficient funding whether from public or private sources enables the acquisition of medical equipment, the recruitment and training of healthcare

professionals and the development of facilities. Without adequate resources, healthcare systems face limitations in providing quality care and meeting the needs of populations.

Equally important is the utilisation of resources. Efficient and strategic allocation of available resources ensures that healthcare services are delivered effectively and equitably. This involves optimising spending, minimising waste and ensuring that resources are directed to areas where they will have the greatest impact, such as preventive care, essential treatments and healthcare access for underserved communities. Effective resource utilisation also relies on data-driven decision making to assess healthcare needs and healthcare outcomes.

5.4 Recommendations

The study provides recommendations that are in line with the study objectives and research findings. The study revealed that the adoption of entrepreneurial supply chain practices positively influences the performance of public hospitals in Kenya. The study revealed a moderating influence of healthcare financing on the relationship between entrepreneurial supply chain practices and performance of public hospitals in Kenya.

5.4.1 Recommendations on Practice and Policy and Theory

This sections presents recommendations on practice, policy and theory.

a. Innovative Inventory Management

The study revealed that the adoption of innovative inventory management positively influences the performance of public hospitals in Kenya. Consequently, the study recommends the Chief Executive Officers (CEOs) and Medical Superintendents of public hospitals to adopt innovative inventory management practices in the form of new technology use and just in time inventory practices. This will ensure inventory management goals are aligned with the broad organisational goals and consequently the daily routine objectives are streamlined. These innovative inventory management practices will aid the public hospitals prepare for future unprecedented events among them being disease outbreaks and technological changes thus promoting continuous improvement in organisational processes while enhancing performance.

The study recommends the Chief Executive Officers (CEOs) and Medical Superintendents of public hospitals to adopt innovative inventory management practices in the form of new technology use as this helps in long-range planning for organisational resources. Long-range planning will ensure inventory management goals

are aligned with the broad organisational goals and consequently the daily routine objectives are streamlined. Long range planning develops a shared vision that stimulates productivity. A recent example is the COVID-19 pandemic which strained the limited healthcare resources resulting in severe damages including deaths. If public hospitals engage in long-range planning such pandemics can be navigated with ease as the staff will be equipped with the necessary skills, resources, and infrastructure to handle them. The Hospital Supply Chain Manager is recommended to adopt real-time inventory tracking technologies like IoT and RFID, as well as overseeing overall inventory management strategies.

The Human Resource Officers in public hospitals are recommended to continuously undertake staff training to help staff advance their skills and competencies in managing modern systems of inventory. Training stimulates efficiency in inventory management through real-time inventory tracking, demand forecasting, reduced wastages and discrepancies in inventory management. Additionally, training staff will help in efficient decision making such as allocating inventory and resources where they are most needed. In addition, trained employees can adhere to standard operating procedures which translates to cost savings and efficient time utilisation thus better performance of the public hospitals. Training staff and managing change fall under the purview of the Human Resources. It is recommended that the human resource managers should organise trainings for retooling of staff members in areas of new technology use.

The Research and Development Officer in public hospitals should undertake extensive research and consequently introduce new technologies to provide healthcare services and manage inventory. New technologies such as Healthcare Management Information Systems and electronic health records help maintain efficiency and accuracy in inventory management by reducing errors and ensuring needed inventory is available upon request consequently minimising delays. Investments in Telemedicine and mobile health applications should be considered as these are new technologies that improve patient care and boost overall health outcomes by allowing access to healthcare to remotely located patients. In counties like Turkana telemedicine has started working whereby the Regional Blood Transfusion Centre is utilising drones to deliver blood to areas where motor vehicles cannot reach. This has greatly contributed to the saving of lives. Artificial Intelligence is considered a *'low-lying fruit'* therefore public hospitals in Kenya should integrate new robotic systems to provide healthcare service delivery

and collaborate with teams, suppliers and departments for greater flexibility, communication and efficiency in service provision.

The Information, Communication and Technology (ICT) officer should ensure to have an organisation-wide technology that have a holistic approach to resources by centralising processes. This will promote service provision that boosts patient care and safety, streamlined financial management, improved transparency, data-based decision-making that can highlight pandemics, patient surges, drugs shortages among other critical areas and optimised control of inventory. The ICT Department should help in implementing cloud-based inventory systems, supporting automation of replenishment processes and ensuring technology integration and maintenance.

The pharmacy and procurement department should consider the implementation of new technologies in inventory management to monitor stock levels. Such new technologies can include RFID to capture medicines entering the store and leaving the pharmacy during dispensation. Excel and other computer software are tools that can be utilised to predict the usage of medicines by a hospital and consequently help prevent stock outs. The Ministry of Health plays a pivotal oversight role for all public hospitals in Kenya. The Ministry should use technology in the form of Kenya Health Information Systems (KHIS) and Healthcare Management Information Systems (HMIS) to ensure stock is standardised across all public hospitals in Kenya. The Ministry should strengthen existing technologies for inventory forecasting and inventory management systems to near real-time data to better anticipate demand and prevent stock outs. Finally, the Ministry should explore new technologically integrated supply chain systems that are linked with transport infrastructure and almost real-time data linking dispensing to quantification and procurement of essential medical supplies.

Kenya Medical and Supplies Authority (KEMSA) should implement new technologies with real-time inventory management systems to manage inventory. These systems include software such as Excel spreadsheets that can track stock levels and automate the ordering and reordering process while providing timely, accurate predictive data regarding hospital inventory demands and supplies. Other systems include RFID technology which tracks the movement of supplies and resources efficiently and transparently.

b. Proactive Strategic Sourcing

The study revealed that adopting proactive strategic sourcing positively influences the performance of public hospitals in Kenya. It is recommended that the Chief Executive Officers (CEOs) and Medical Superintendents of public hospitals should establish long-term relationships with suppliers and undertake supplier involvement and development as this promotes uninterrupted supply and minimises procurement disruptions. A long-term relationship with a supplier helps a public hospital to leverage cost cuts by negotiating better prices of commodities, organising bulk orders and having better payment plans for medical supplies. Training and development of suppliers create capabilities that ensure compliance with regulations by both organisations and the delivery of high-quality products.

The pharmacy and procurement departments of a public hospital are recommended to engage in supplier relationships that embed efficient communication. This allows the public hospital to engage in mutual decision-making and problem-solving with suppliers ensuring the availability of supplies thus promoting quality of healthcare services. To achieve this, the ICT Department should come on board and establish a centralised communication system for the whole organisation that connects the entity to external stakeholders, suppliers inclusive. This will boost transparency, reduce communication errors and boost real-time data delivery across departments.

KEMSA which is the main procurement body in Kenya is recommended to actively identify, evaluate and engage with suppliers who can meet the national healthcare demands. In tandem with the suppliers, KEMSA will be able to plan for procurement. This translates to contracting and having mutual relationships with suppliers who have quality products, meet regulatory requirements and comply with set industry standards. KEMSA should undertake supplier capacity-building programmes such as training, innovation and development. This will translate to improved capabilities to supply superior essential medicines consequently reducing the over-reliance on medical imports.

It is recommended that KEMSA implements centralised demand aggregation systems that consolidates orders from various counties to help improve their purchasing power and reduce costs. Additionally, KEMSA should develop dynamic procurement plans that are aligned to national health policies and priorities. This way, supply

needs are easily anticipated. It is recommended that KEMSA should establish buffer stock policies for essential medicines and equipment at their warehouses to complement JIT at hospital level. Finally, it is recommended that KEMSA should coordinate with local manufacturers to diversify sourcing and reduce dependence on imports.

Regarding supplier relationships, KEMSA is recommended to build long-term contracts with suppliers based on performance history, quality compliance and capacity to scale during crises. Additionally, KEMSA should develop and introduce supplier development programmes to improve local vendors' quality, reliability and compliance with regulations. The use of digital supplier portals for order tracking and real-time end to end communication should be done.

The Ministry of Health is recommended to establish holistic and comprehensive guidelines for procurement for public hospitals. The guidelines should revolve around procurement planning, supplier identification, evaluation, contract negotiations and management and supplier relationships. The guidelines can be developed with a centralised procurement model in mind. The identified suppliers for certain drugs, equipment and other medical supplies should provide the items in bulk and in a reliable manner to save on costs and enjoy economies of scale. The Ministry should increase budgetary allocation for essential health commodities to meet the quantified needs at both national and county levels

The Ministry is also recommended to develop national procurement policies that prioritise transparency, efficiency and alignment with health outcomes. Also, to facilitate data sharing platforms that integrate hospital and central procurement data for coordinated planning. The ministry should allocate funding based on evidence-driven procurement needs assessments and supply chain performance. The ministry is recommended to establish frameworks for emergency procurement and stockpiling for public health crises. The ministry is advised to monitor procurement compliance with national and international regulations, including quality and ethical standards and to oversee supplier accreditation and certification programmes to ensure quality and compliance. The ministry should provide and promote access to capacity building programmes for suppliers to meet regulatory requirements and monitor supplier performance and enforce corrective actions or sanctions when necessary.

Suppliers are urged to collaborate with procurement agencies such as KEMSA and the hospitals to better understand purchase patterns and adapt their production capacities to match these patterns. The suppliers together with third party service providers are requested to maintain supply and production flexibility so as to match demand and supply. Suppliers are recommended to invest in quality management systems that meet hospital regulatory requirements. Suppliers should engage in joint forecasting and demand planning with hospitals procurement teams. This can be done through frequent meetings and regular communication.

c. Risk Taking

The study revealed that the adoption of risk positively influences the performance of public hospitals in Kenya. A recent paradigm shift has broken the routine and exposes employees to autonomy in decision-making, giving them a responsibility and accountability for the decisions they make and the actions they take. To promote this, the researcher recommends transformative leaders who are collaborative as they will give employees equal opportunities to accomplish tasks and undertake risky ventures as found appropriate.

It is recommended that the Chief Executive Officers (CEOs) and Medical Superintendents of public hospitals should engage in calculated risk taking through income generating projects to adapt to healthcare challenges. In addition, it is recommended that the CEOs and medical superintendents should adopt collaborative leadership behaviour with a more flexible leadership style that support departmental collaboration, incorporate risk in strategic decision-making and continuously seek the opinion of employees to build strategies/policies and solve problems. This will reduce the bureaucracies present in public hospitals which limit the adoption of entrepreneurship.

The Research and Development office in a public hospital should consider performing situational analysis in order to undertake income generating activities. SWOT and PESTEL analysis shape other avenues of generating hospital income apart from healthcare service delivery. The recommendations provided after SWOT and PESTEL analysis should stimulate the public hospital to adopt cutting-edge mechanisms of healthcare delivery which help the hospital gain a competitive edge by providing high standards of healthcare.

The Ministry of Health, Social Health Authority (SHA) and KEMSA are recommended to engage with public hospitals to collaboratively identify issues that affect the healthcare supply chain and potential solutions. The case of COVID-19 needed a collaborative approach from all healthcare supply chain parties to provide personal protective equipment and other essential medical supplies. The Constitution of Kenya, SDGs and the Health Policy 2014–2030 of Kenya stipulate the healthcare goals of the country with the fundamental goal being the UHC agenda. To achieve this goal, the Ministry of Health, the SHA, KEMSA, CEOs and Medical Superintendents of public hospitals are recommended to engage in strategic decision-making at the organisational level. This will translate to the efficient utilisation of resources and the establishment of an internal shared vision and language for risk scenarios.

d. Healthcare Financing

The study established a significant moderating effect of healthcare financing on the relationship between entrepreneurial supply chain practices and the performance of public hospitals in Kenya. The study recommends the CEOs and Medical superintendents of public hospitals to have a planned budget that guides in resource allocation and use. The Finance Department in public hospitals should utilise efficient resource acquisition models that allow for more resources to be collected and consequently be utilised in the hospital.

Consequently, the Ministry of Health should explore innovative financing models for additional resources and be able to meet resource gaps that exist in the environment of resource constraints and such models include insurance. Another form of innovative financing model is the Public Private Partnership that brought about the Managed Equipment Service aimed at enhancing public hospitals' infrastructure and modernising healthcare services by the Kenyan Government in 2015. However, to stimulate the success of such programmes collaborative efforts between the various levels of government and key actors in the healthcare sector is critical. This should be in line with various developed platforms such as the Sustainable Development Goals (SDGs).

The National Treasury should increase the funding stipulated for healthcare through innovative financing mechanisms such as increased capitation and selling health bonds. Regarding the purchase of diagnostic equipment, the Treasury should allocate specific budgets to enable public hospitals to upgrade their technologies and infrastructure. The

National Treasury in tandem with SHA and the Ministry of Health should consider expanding access to insurance by Kenyans in the SHA by offering subsidies to low-income communities. The SHA on the other hand should expand insurance coverage for health and remit reimbursements to the County Governments on time to ensure continuous access to healthcare by the majority of Kenyans.

The donors: WHO, Community Based Healthcare Organisations, USAID and World Bank should make an effort to continue providing grants and support to healthcare projects in Kenya, especially in all areas of healthcare be it communicable, or non-communicable diseases and/or road traffic injuries. They should partner with the national Ministry of Health and County Governments to implement innovative measures of finance such as crowdfunding that promote access to healthcare by many Kenyans. The donors should support research in the area of healthcare and ensure knowledge from the research publications is well utilised.

The Kenyan Government through the Ministry of Health should aim to reduce dependency on donor funding to finance healthcare services in public hospitals. It is noteworthy that Kenya has been categorised as a Low-Middle Income nation which will consequently reduce donor funding and this will affect the provision of healthcare. The government should, therefore, mobilise resources locally through organised investments such as selling bonds and pooling insurance premiums to adequately provide for public healthcare service delivery.

Healthcare is a devolved function in Kenya. The Governors of County Governments in conjunction with the County Executive Committee members for health in each of the counties of Kenya should prioritise the mobilisation of resources for healthcare service delivery. The availability of resources will enable public hospitals to set aside funds to invest in new operations in an uncertain environment. Resources also stimulate the implementation of new healthcare policies. Immunisation against infections, the Linda Mama programme for maternal health and treating non-communicable diseases among other healthcare programmes need resources. The Ministry of Health, SHA, KEMSA and the County Governments should work together to ensure equitable allocation of resources so that the basic right to healthcare is achieved by all citizens across the country.

e. Contribution to Knowledge

This study contributes to knowledge. The tested hypothesis revealed that entrepreneurial supply chain practices affect the performance of public hospitals in Kenya. Consequently, the study contributes to the theories utilised in this study. The study contributes to the ROT by encouraging the structuring, bundling and leveraging of resources to obtain the full value of the said resources and achieve competitive advantage. The ROT notes the need to possess valuable resources and orchestrate them to achieve maximum impact. Public hospitals should possess resources such as the right medical and essential supplies, well-trained medical staff and technology which should be effectively integrated and coordinated to facilitate competitive advantage. Further, the ROT encourages organisations to reconfigure resources over time to achieve a sustained competitive advantage. It is worth noting that organisations operate in an environment compounded with a scarcity of resources. In such an environment the role of leadership in making decisions regarding the orchestration of resources is critical as leaders manage staff, implement effective technologies and enhance coordination amongst departments which collectively promotes efficiency in operations.

The study supports the RDT whose main viewpoint is the reduction of an organisation's dependence on other organisations for resources, and an increase in the organisation's dependence on itself. Organisations should take time to understand their dependencies on external parties such as suppliers, donors and regulators and consequently develop strategies to minimise their dependency on these external parties. The study confirmed the Schumpeterian Entrepreneurship Theory which advocates for creative destruction, where entities destroy equilibrium and create new conditions in the marketplace. The study recognised innovation as a key contributor to economic development by bringing in new technologies and practices. The study revealed that leaders in organisations should foster an innovation culture that encourages risk taking. The introduction of new business models such as public-private partnerships is advocated by this theory as these new models stimulate growth and sustained competitive advantage.

5.4.2 Suggestions for Further Research

The study aimed to establish the effect of entrepreneurial supply chain practices on the performance of public hospitals in Kenya. The study was moderated by healthcare financing. The study adopted innovative inventory management, proactive strategic sourcing and risk taking as entrepreneurial supply chain practices, while performance

was constituted by effectiveness, relevance and financial viability. Healthcare financing which was the moderator, utilised the availability of resources and utilisation of resources.

Future studies should look into other forms of entrepreneurial supply chain practices that can be embedded in autonomy or competitive aggressiveness and consider using the moderator which is healthcare financing as the mediator or independent variable. It is also recommended that the study be replicated in other areas such as manufacturing and in other countries as this study focused on the healthcare service sector in Kenya. Regarding conceptualisation, future studies can look into intrapreneurial supply chain practices and cover different theories from the ones used in this study. Finally, the global agenda for healthcare is UHC. Future studies should look into how the supply chain is interconnected with UHC and how it promotes efficiency in healthcare.

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APPENDICES

APPENDIX I: Introduction Letter

Ms. Hellen Njeri Ndung'u

University of Embu

P.O.BOX 6, 60100

EMBU

July, 2024

Dear Sir/Madam

REF: REQUEST FOR DATA COLLECTION

I am a student at the University of Embu pursuing a Doctor of Philosophy Degree in Business Administration (Procurement and Supply Chain Management). I am doing research on Entrepreneurial Supply Chain Practices, Healthcare Financing and Performance of Public Hospitals in Kenya. I would like to request you to contribute in this study by filling out the questionnaire attached.

The data you will provide will be kept safe and used only for the purpose of this study. Your confidentiality and anonymity will be maintained throughout the study. The NACOSTI research permit is also attached.

Yours faithfully,

Ms. Hellen Njeri Ndung'u
Researcher

APPENDIX II: Questionnaire

INSTRUCTIONS

This questionnaire has questions focusing on entrepreneurial supply chain practices, healthcare financing and performance of your public hospital. Kindly participate in the study by answering honestly and objectively as possible. Where you feel the need to give more information, kindly do not hesitate. The information obtained will only be used for the purpose of academic research.

SECTION A: DEMOGRAPHICS

Questionnaire Number	
Healthcare Facility	
Level of Healthcare Facility	
Current Designation/position	

For the following five questions (1,2,3,4 and 5), Kindly tick where appropriate.

1. Which category does the healthcare facility fall in terms of healthcare personnel?	1. Less than 50 2. 50 – 100 3. Over 100
2. Which category does the healthcare facility fall in terms of patients served annually?	1. 100,000 2.100,001– 199,000 3. Over 200,000
3. What is the total bed capacity for inpatients?	1. 100 2. 101- 299 3. Over 300
4. Does the Healthcare Facility have a procurement/supply chain office	1, Yes 2. No 3. Not Sure
5. Does the Healthcare Facility have an operational pharmacy	1. Yes 2. No 3. Not Sure
6. Does the Healthcare Facility have an operational Laboratory for Diagnostics services?	1. Yes 2. No 3. Not Sure

7. Are the following clinical services available in your healthcare facility? Kindly tick against the service.

Clinical Service	**Yes**	**No**
Medical		
Pediatric		
Surgical		
Gynecological and Obstetrics		
Radiology		

Renal Dialysis		
Tuberculosis and HIV/AIDs Comprehensive Care		
Mortuary and Autopsy		
Accident and Emergency		
Dental		
Ear, Nose and Throat (ENT)		
Ophthalmology		
Maternity and Antenatal Clinic		

SECTION B: ENTREPRENEURIAL SUPPLY CHAIN MANAGEMENT PRACTICES IN PUBLIC HOSPITALS

Instructions

Under each subheading, kindly tick appropriately. The Likert Scale runs from 1 to 5 whereby: **1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree**

INNOVATIVE INVENTORY MANAGEMENT ACTIVITIES

		1	2	3	4	5
1.	The public hospital orders inventory that is needed.					
2.	The public hospital maintains a buffer stock to prevent stock outs.					
3.	The public hospital aims at continuous improvement in inventory management					
4.	The public hospital engages in long range planning with the staff.					
5.	The public hospital undertakes staff training to help them advance their skills and competencies.					
6.	The public hospital introduces new technologies for dispensing medicines and delivering services such as M-dawa, LIFO and FIFO, Safety Stock and Healthcare Management Information System.					
7.	The public hospital uses electronic Community Health Information system, Internet of Things such as online platforms (Websites, WhatsApp, SMS, Facebook, Instagram and X) that does regular updates, to provide healthcare services and manage inventory					
8.	The Public hospital has an operation Enterprise Resource Planning System (ERP).					
9.	The public hospital uses new technology to set reorder levels and inform about stock outs					
10.	The Public hospital uses technology for capacity planning, resource allocation, demand forecasting and other operational activities.					

12. What are the Innovative inventory management ideas that the Public Healthcare Facilities implemented to help in healthcare service delivery……

13. What is your view about the implementation of Healthcare Management Information System (HMIS) in the Kenyan public Healthcare?.....

PROACTIVE STRATEGIC SOURCING ACTIVITIES

Instructions

Under each subheading, kindly tick appropriately. The Likert Scale runs from 1 to 5 whereby: **1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree**

		1	2	3	4	5
14.	The Public hospital establishes long-term relationships with suppliers					
15.	The Public hospital engages in Supplier involvement and development					
16.	The Public hospital engages in efficient communication with suppliers					
17.	The Public hospital identifies suppliers strategically.					
18.	The Public hospital engages in mutual decision making and problem solving with suppliers					
19.	The Public hospital uses supplier's assistance to improve product quality					
20.	The public hospital plans the procurement process to receive orders even during shortages.					
21.	The Public hospital consolidates its requirements to ensure bulk timely purchases.					
22.	The Public hospital has an existing procurement plan that establishes needs and ensures the needs are met.					
23.	The Public hospital has a pool of suppliers considered during purchases.					
24.	The Public hospital utilises people, processes, technology and supply chain in the procurement planning and process.					

25. Does KEMSA affect your procurement process. If Yes, how?…… …..……

26. How does availability of fund affect your procurement process?..... .....

RISK TAKING ACTIVITIES

Under each subheading, kindly tick appropriately. The Likert Scale runs from 1 to 5 whereby: **1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree**

		1	2	3	4	5
27.	The Public hospital sets aside funds to invest in new operations in uncertain environments.					
28.	The Public hospital predicts industry changes and take action in order to provide quality healthcare.					
29.	The Public hospital conducts WOT and PESTEL analysis that help shape avenues for generating income.					
30.	The Public hospital leverages on New technologies to identify income generating ventures.					
31.	The public hospital leadership establishes an internal shared vision and language for risk scenarios.					

32.	The Public hospital management engages external stakeholders to identify issues that affect healthcare service delivery.					
33.	The public hospital management is passionate, zealous and establishes a strategic vision that inspires healthcare workers for better service delivery.					
34.	The Public hospital management supports departmental collaboration for better service delivery.					
35.	The Public hospital incorporates risk in strategic decision making.					
36.	The Public hospital resources are put into use efficiently to promote more capabilities.					
37.	The Public hospital leadership continuously seeks the opinions of employees to build strategies, policies and solve problems.					

HEALTHCARE FINANCING

Instructions

Under each subheading, kindly tick appropriately. The Likert Scale runs from 1 to 5 whereby: **1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree**

		1	**2**	**3**	**4**	**5**
40.	The Public hospital has a planned budget that guides resource allocation.					
41.	The public hospital receives funding from the County Government in a timely manner.					
42.	The public hospital receives funds in bulk and not in small bits.					
43.	The Public hospital receives resources from donors and other parties frequently.					
44.	The Public hospital has autonomy in the utilisation of resources.					
45.	The Public hospital allocates resources in a transparent and electronically visible and integrated process.					
46.	The Public hospital possesses a collaborative spirit in regard to resources use and availability.					

PERFORMANCE OF THE PUBLIC HOSPITAL

Instructions

Under each subheading, kindly tick appropriately. The Likert Scale runs from 1 to 5 whereby: **1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree**

EFFECTIVENESS

		1	**2**	**3**	**4**	**5**
51.	The Public hospital mortality rates have reduced.					
52.	The Public hospital receives increased referrals					
53.	The number of complaints in the Public hospital have reduced.					

54.	The Public hospital provides a conducive working environment for employees					
55.	The public hospital delivers services without delay					
56.	The public hospital objectives are in line with its mission.					
57.	The Public hospital employees can make suggestions about efficient resource use.					
58.	The Public hospital utilises healthcare workers to the best of their abilities					
59.	The Public hospital maximises the use of hospital resources and equipment					
60.	The Public hospital maximises the use of financial resources.					
61.	The Public hospital performs assessment to gauge their performance from time to time					
62.	The public hospital reacts to external changes in policies and regulations.					
63.	The public hospital controls overhead costs					

RELEVANCE

		1	**2**	**3**	**4**	**5**
64.	The Public hospital reviews services regularly to reflect changes in the environment.					
65.	The Public hospital conducts need assessment regularly to detect changing customer needs.					
66.	The Public hospital benchmarks from other hospitals					
67.	The Public hospital strives to improve the work environment.					
68.	The public hospital regularly balances diverse stakeholder demands.					
69.	The public hospital conducts employee satisfaction surveys, periodically and foresee the implementation of the findings.					
70.	The public hospital identifies the risk of corruption and undertakes strategies to mitigate it.					

FINANCIAL VIABILITY

		1	**2**	**3**	**4**	**5**
71.	The Public hospital works under a budget.					
72.	The Public hospital identifies new sources of funding					
73.	The Public hospital gains more revenues that expenses					
74.	The Public hospital has sustainable resources to help in activities.					
75.	The public hospital has received increased funding.					

Appendix III: List of Public Hospitals in Kenya

S. No	Hospital	Level
1.	Pumwani Maternity Hospital	Level 5
2.	Mama Lucy Kibaki Hospital	Level 5
3.	Thika Level 5 Hospital	Level 5
4.	Nyeri Provincial General Hospital	Level 5
5.	Coast General Teaching and Referral Hospital	Level 5
6.	Jaramogi Oginga Odinga Teaching & Referral Hospital	Level 5
7.	Embu Teaching and Referral Hospital	Level 5
8.	Garissa County Referral Hospital	Level 5
9.	Kapsabet County Referral Hospital	Level 5
10.	Kakamega County General Hospital	Level 5
11.	Gatundu Level 5 Hospital	Level 5
12.	Kerugoya Level V County Referral Hospital	Level 5
13.	Nanyuki Teaching and Referral Hospital	Level 4
14.	Kilifi County Referral Hospital	Level 4
15.	Naivasha Level IV Hospital	Level 4
16.	Isiolo County Referral Hospital	Level 4
17.	Lodwar County and Referral Hospital	Level 4
18.	Kajiado County and Referral Hospital	Level 4
19.	Kandara Level IV Hospital	Level 4
20.	Makueni County Referral Hospital	Level 4
21.	Chuka County Referral Hospital	Level 4
22.	Runyenjes District Hospital	Level 4
23.	Mbagathi Hospital	Level 4
24.	Ruiru Sub-County Hospital	Level 4
25.	Emuhaya Sub-County Referral Hospital	Level 4
26.	Ishiara Level 4 Hospital	Level 4
27.	Machakos Provincial General Hospital	Level 5
28.	Moyale Sub-County Referral Hospital	Level 4
29.	Moi Teaching and Referral Hospital	Level 6
30.	Kenyatta University Teaching, Referral, and Research Hospital	Level 6
31.	Nakuru Level 6 Hospital	Level 6
32.	National Spinal Injury Referral Hospital	Level 6
33.	Mathari National Teaching and Referral Hospital	Level 6
34.	Mwai Kibaki Hospital	Level 6
35.	Meru Level 5 Hospital	Level 5
36.	Ngong Sub-County Hospital	Level 4
37.	Kitengela Sub-District Hospital	Level 4
38.	Ongata Rongai Sub county Hospital	Level 4
39.	Langata Health Centre	Level 4
40.	Butere District Hospital	Level 4
41.	Kihara Sub-District Hospital	Level 4
42.	Lari Sub County Hospital	Level 4
43.	Nyathuna Sub-County Hospital	Level 4
44.	Igegania Sub-District Hospital	Level 4
45.	Karatu L4 Hospital	Level 4

46.	Wangige Health Centre	Level 4
47.	Kikuyu Sub County Lussegetti	Level 4
48.	Kigumo Sub-County Hospital (Kigumo)	Level 4
49.	Lusigetti Sub County Hospital	Level 4
50.	Karuri Level 4 Hospital	Level 4
51.	Kiambu District Hospital	Level 5
52.	Karatina District Hospital	Level 4
53.	Matuu Sub District Hospital	Level 4
54.	Kathiani Hospital Machakos	Level 4
55.	Mwala District Hospital	Level 4
56.	Kangundo District Hospital	Level 4
57.	Mukurwe-Ini Sub District Hospital	Level 4
58.	Othaya Sub-District Hospital	Level 4
59.	Murang'a County Referral Hospital	Level 5
60.	Kangema Sub-District Hospital	Level 4
61.	Maragua District Hospital	Level 4
62.	Tigoni District Hospital	Level 4
63.	Lungalunga Health Centre	Level 4
64.	Kwale District Hospital	Level 4
65.	Msambweni District Hospital	Level 4
66.	Dol Sub County Hospital	Level 4
67.	Kibwezi Sub-District Hospital	Level 4
68.	Kinango Hospital Kwale	Level 4
69.	Kisau Sub-County Hospital	Level 4
70.	Matiliku District Hospital	Level 4
71.	Mbooni Sub-District Hospital	Level 4
72.	Mbeu sub-district hospital	Level 4
73.	Nyambene District Hospital	Level 4
74.	Kibung'a Sub District	Level 4
75.	Kinoro Sub-District Hospital	Level 4
76.	Kisegi Sub-District Hospital	Level 4
77.	Magutuni District Hospital	Level 4
78.	Marindi Sub County Hospital	Level 4
79.	Mathene District Hospital	Level 4
80.	Timau Sub-District Hospital	Level 4
81.	Muriranja District Hospital	Level 4
82.	Naivasha Sub County Hospital	Level 5
83.	Bahati District Hospital	Level 4
84.	Bondeni Sub County Hospital	Level 4
85.	El-Burgon Sub County Hospital	Level 4
86.	Kabazi Sub-District Hospital	Level 4
87.	Molo District Hospital	Level 4
88.	Nakuru Prison Hospital	Level 4
89.	Rongai Health Centre	Level 4
90.	Subukia Health Centre	Level 4
91.	Subukia Sub County Hospital	Level 4

92.	Mwatate Sub-District Hospital	Level 4
93.	Moi Hospital Voi	Level 4
94.	Bura Sub-County Hospital	Level 4
95.	Hola District Hospital	Level 4
96.	Taveta District Hospital	Level 4
97.	Sabatia Sub-County Hospital	Level 4
98.	Leheley Sub-District Hospital	Level 4
99.	Ngao Hospital- Tana River	Level 4
100	Korof Harar Sub District Hospital	Level 4
101	Uasin Gishu Memorial Hospital	Level 4
102	Kitui County Referral Hospital	Level 5
103	Migwani Sub-District Hospital	Level 4
104	Tseikuru Sub-District Hospital	Level 4
105	Kyuso District Hospital	Level 4
106	Katulani Sub-District Hospital	Level 4
107	Kanyangi Sub-District Hospital	Level 4
108	Thitani Health Centre	Level 4
109	Ikanga Sub-District Hospital	Level 4
110	Mwingi Hospital (Kitui)	Level 4
111	Mutitu Sub-District Hospital	Level 4
112	Kauwi Sub-District Hospital	Level 4
113	Mwingi District Hospital	Level 4
114	Transmara District Hospital	Level 4
115	Esani Sub Districy Hospital	Level 4
116	Engineer District Hospital	Level 4
117	J M Kariuki District Hospital	Level 4
118	Baragoi Sub District Hospital	Level 4
119	Maralal District Hospital	Level 4
120	Yala Sub-District Hospital	Level 4
121	Kimbimbi Sub-County Hospital	Level 4
122	Keroka District Hospital	Level 4
123	Kianyaga Sub-County Hospital	Level 4
124	Sagana Sub-County Hospital	Level 4
125	University Dental Hospital, Nairobi	Level 4
126	Njiru Health Centre	Level 4
127	Dagoretti Sub-County Hospital Mutuini	Level 4
128	Mathare North Health Centre	Level 4
129	Kianda 42 Hospital	Level 4
130	Njenga Hospital	Level 4
131	Kianjokoma Sub County Hospital	Level 4
132	Mbeere District Hospital	Level 4
133	Runyenjes Sub-District Hospital	Level 4
134	Iten County Referal Hospital	Level 4
135	Tharaka District Hospital	Level 4
136	Githongo District Hospital	Level 4
137	Mikumbune Sub District Hospital	Level 4

138	Mikinduri Sub-District Hospital	Level 4
139	Giaki Sub District Hospital	Level 4
140	Muthara Sub-District Hospital	Level 4
141	Mutuati Sub District Hospital	Level 4
142	Kanyakine Sub-District Hospital	Level 4
143	Kibirichia Sub District Hospital	Level 4
144	Bungoma County Referral	Level 5
145	Londiani District Hospital	Level 4
146	Tom Mboya Health Centre	Level 4
147	Nyahururu District Hospital	Level 5
148	Kilifi District Hospital	Level 4
149	Sultan Hamud Sub County Hospital	Level 4
150	Makindu District Hospital	Level 4
151	Kirwara Sub-District Hospital	Level 4
	TOTAL 151	

Source: Author, (2024)

Appendix IV: Summary of Research Gaps

Author	**The focus of the Study**	**Methodology Used**	**Findings**	**Gaps**	Focus of Current Study
Shibabaw, Nakambale & Bangalee, (2023	Assessed Inventory Management Practices and how they impact on expenditures for rabies pharmaceuticals in public hospitals of Namibia.	A cross-sectional, web-based questionnaire was used.	Inventory management was considered a key contributor to organisational performance. However, there is a need to train staff on effective inventory management in public hospitals.	The study utilised a cross-sectional online questionnaire to collect data. The study was done in Namibia and focused on inventory management in public hospitals.	The current study uses both walk-in and hand-delivered questionnaires and Survey Monkey to collect data and will incorporate innovativeness in inventory management in public hospitals in Kenya.
Cesarelli, Scala, Vecchione, Ponsiglione & Guizzi, (2021),	An Innovative Business Model for a Multi-echelon Supply Chain Inventory Management Pattern.	The study utilised proactive lateral transhipments as the inventory model.	The study revealed that innovativeness in a supply chain builds competitiveness and better performance.	The study utilised a simulation model with inventory information available in Python.	The current study will focus on finding out the effect of innovative inventory management through the use of questionnaires.
Hashmi, Amirah, Yusof & Zaliha, (2021	Assessed the mediation of inventory control in the case of publicly funded hospitals.	Quantitative research with a sample selected through multi-stage sampling was used. Regression was used to analyse data.	The study which used quantitative research with a sample selected through multi-stage sampling found a full mediating effect of inventory control and performance. Better services and reduction in costs are some of the key aspects	The study used inventory control as a mediating variable	The current study will use inventory management as an independent variable.

			improved by inventory control.		
Oliech and Mwangangi , (2019)	Evaluated the influence of strategic procurement on performance in the case of level v hospitals in Kenya.	The study used a stratified sampling method to gather data while the current study will use a census approach.	The study reeveled that strategic sourcing and supplier relationships influence the performance of public-level v hospitals in Kenya.	The study used a stratified sampling method to gather data. The study utilised multiple regression analysis.	The current study used proportionate sampling and multiple linear regression to assess the relationship between variables.
Vlahakis, Kopanaki & Apostolou, (2019)	Studied proactive decision making in procurement supply chain.	The study was quantitative and incorporated the use of the Bayes Network.	The research reveals that firms adopt various proactive decision-making skills that guide them to perform better by achieving cost-effectiveness.	The study looked into the purchasing process in totality. The study did not look into supplier relationships but addressed the make-and-buy decisions available for a firm. Unlike the previous study	The current study will focus on procurement planning and delve deeply into how it influences firm performance. The present study will emphasise the correlation between supplier relationships and performance. Additionally, the current study will use multiple linear regression.
Kaur and Singh, (2022)	Assessed the humanitarian supply chain by focusing on proactive and reactive models in procurement during the occurrence of disasters.	The study used quantitative reactive and proactive procurement models.	The results exposed that planning in procurement is necessary to deal with disasters and develop resilience.	The study looked into both reactive and proactive procurement models. The model revealed two mathematical models, heuristic and deterministic for use in planning procurement.	The current will look into proactive procurement or sourcing. The current study will focus more on developing causal relationships between the variables. Again, the study was done in India which is far more developed than the current area of study, Kenya.

Ruba, Westhuizen & Chiloane-Tsoka, (2021)	Did a quantitative study to analyse the relationship between entrepreneurial orientation and the performance of Congolese Higher Education Institutions		The research revealed that risk-taking, proactiveness and innovativeness are constructs that build entrepreneurial orientation; and they improve performance.	The study failed to incorporate risk taking in the concept of supply chain which the current study will look into, thus addressing the contextual gap.	The current study will incorporate risk taking as an entrepreneurial supply chain practice.

Appendix V: Study Population

S. No	Hospital-Level	Number
1.	Level 4 Public Hospitals	214
2.	Level 5 Public Hospitals	23
3.	Level 6 Public Hospitals	6
	TOTAL	**243**

Source: NHIF (2024)

Appendix VI: Sample Size Distribution

S. No	Level of Hospital	Population	Sample Size
1.	Level 4 Public Hospitals	214	**124**
2.	Level 5 Public Hospitals	23	**13**
3.	Level 6 Public Hospitals	6	**4**
	TOTAL	**243**	**151**

Source: Author (2024)

APPENDIX VII: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 790201

Date of Issue: 02/August/2024

RESEARCH LICENSE

This is to Certify that Ms.. Hellen Njeri Ndung'u of University of Embu, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Baringo, Bomet, Bungoma, Busia, Elgeyo-Marakwet, Embu, Garissa, Homabay, Isiolo, Kajiado, Kakamega, Kericho, Kiambu, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Mandera, Marsabit, Meru, Migori, Mombasa, Muranga, Nairobi, Nakuru, Nandi, Narok, Nyamira, Nyandarua, Nyeri, Samburu, Siaya, Taita-Taveta, Tanariver, Tharaka-Nithi, Transnzoia, Turkana, Uasin-Gishu, Vihiga, Wajir, Westpokot on the topic: ENTREPRENEURIAL SUPPLY CHAIN PRACTICES, HEALTHCARE FINANCING AND PERFORMANCE OF PUBLIC HOSPITALS IN KENYA for the period ending : 02/August/2025.

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