DETERMINANTS OF EFFICIENCY OF JAKAYA KIKWETE CARDIAC INSTITUTE IN TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN MONITORING AND EVALUATION (MAME)

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the senate of the Open University of Tanzania a dissertation titled; "**Determinants of Efficiency of Jakaya Kikwete Cardiac Institute in Tanzania"**in partial fulfilment of the requirements for the Master of Arts degree in Monitoring and Evaluation (MAME) of the Open University of Tanzania.

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Dr. Felician Mutasa

(Supervisor)

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Date

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DECLARATION

I, **Maulid Mohamed Kikondo,** declare that the work presented in this dissertation is original. It has never been presented to any other University or Institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of Arts in Monitoring and Evaluation [MA (M&E)].

……..……

Signature

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Date

DEDICATION

This dissertation is dedicated primarily to my loving father and mother Mohamed Kikondo and RukiaMaulid for what they have managed and continues to stand for in respect of my life under their parental advice and love for my future. The propensity of endurance, patience and tireless efforts towards my wellbeing and growth remains untold and immemorial.

Secondly, I dedicate to my Cousin Amri Ngoye for his support and inspiration; I appreciate his advice and encouragement during my study period, also to my loving kids Princenaseem, Princessabreena, Queenhythamrukia, Princessameerah and Kingmohamedidraq for their love and patience they showed to me when I was not around to them busy with studies. I heartedly pray to our good Lord to continue blessing them with longevity in good health and strength. Lastly and importantly is to my loving wife Mrs. Amina Maulid Kikondo.

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ABSTRACT

The study examined the determinants of efficiency of Jakaya Kikwete Cardiac Institute; specifically, the study examined the influence of available health professionals, cost effective medication, medical equipment and government support in enhancing efficiency of Jakaya Kikwete Cardiac Institute. The study employed explanatory research mixed research approach used to explain the causal effect relationship. Quantitative data were collected by the use of structured questionnaire from 176 respondents, furthermore interview guide was used to collect qualitative data from 10 key informants and analyzed using frequencies, percentage and multiple regression and qualitative data obtained were analysed using content analysis method. The outcome depicted clearly an observed positive and significant association with health professionals that there is a positive and significant relationship between health professionals, cost effective medication, medical equipment and government support efficiency, as signified with p-value that is less than 0.05. The study recommends the government to employ more cardiovascular surgeon and cardiovascular anesthesiologists, also to increase budget so that the number of Cath lab machines and modern intra aortic balloons pump to be added.

Keywords: *Cardiovascular Diseases, Medical Equipment, Health Professionals, Government Support.*

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CDV	Cardiovascular disease
CHWs	Community Health Workers
JKCI	Jakaya Kikwete Cardiac Institute
KMO	Kaiser Meyer Olkins
M&E	Monitoring and Evaluation
MLR	Multiple Linear Regression
NCD	Non Communicable Disease
PAR	Participatory Action Research
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Problem

Cardiovascular disease (CVD) is a type of ailment of which the blood vessels or heart or both are affected. Usually, blood vessels and heart diseases arise from different causes which might be congenital heart diseases and acquired heart diseases, the diseases are treated by different modality. These modalities could be by surgical means and, or by medication depending with the type of the diseases the patient is suffering in the year 2020. Cardiac and blood vessel diseases are type of anomalies of the cardiac disease, vascular diseases, valvular heart diseases and other disorders. It is agreed that above four out of five Cardiovascular mortality is caused by heart attacks and strokes while one third of the mortality affect patients prematurely in patient whose age are below 70 years (Afshin, *et al.*, 2019).

Globally, the challenge of cardiovascular diseases is disproportionately affecting the population, and according to WHO (2020) it is almost 33.0% of the people in worldwide suffered this problem. Heart and blood vessels pathology are the leading reasons for mortality world wide. It is almost that 17.9 patients died due to cardiovascular diseases within 2020, this is 33% of entire worldwide mortality of which it is 85% were caused by heart attacks and strokes. Above three quarters of CVDs mortality happened in middle- and low-income sovereign states(WHO, 2020).

In African region, the cost of cardiac and blood vessels disease is increasingly fast, now it is considered public health problem in whole African countries including Tanzania. Also, in African countries where health infrastructure was not favorable,

patients were sent abroad in seeking healthcare, this condition defined by the patients' medical conditions and difficulty levels (Carrera and Bridges, 2006). The situations which make people to go abroad for seeking healthcare are grouped into three categories: patients who travel seeking diagnosis and treatment for life-threatening conditions like transplant of visceral organs; non-life-threatening diseases like spine surgeries, total knee replacement and most bypass operations; and clinically optional diseases such as cosmetic procedures and plastic surgery. Other authors have categorized care sought as complex surgeries, elective surgeries and preventive surgeries (Henson, 2015; Menvielle, 2011).

In Tanzania, it has been reported that cardiac and blood vessels disease only are the cause of 13% of total, allnon-communicable diseases mortality in Tanzania among adult of 25-64 years old are mostly afflicted. Age related cardiovascular diseases death rates portray higher mortality rate within Tanzanian males as compared to female (473 against 382 in the population of 10,000). There is an increasing prevalence of cardiovascular diseases mortality rates starting with 9% to 13% from year 2012 to 2016 within the country, this is caused by growing trends of CVDs predisposing factors within the country(URT, Ministry of Health, 2018).

CVD's taken in isolation are found to be the cause for 13% of all non-communicable diseases mortality in Tanzania, while people who are aged 25-64 years are the mostly suffered (WHO, 2020). Age related cardiovascular diseases mortality percentage showed more mortality percent within male gender as compared with female gender (473 against 382 in 10,000 populations) in Tanzania (Chiwanga and Njelekela, 2018). This was able to be elucidated due to fact that gender variation

within psychosocial coronary predisposing factor such as excessive alcohol consumption, smoking and flavouring female.

Increased prevalence of cardiovascular diseases mortality percentage from 9-13% from 2015 to 2022 within the country (Kagaruki, 2020), example diabetes death rate is 29.2%, cancer death rate is 5.1 %, kidney diseases death rate is 9.7% as well as osteoporosis is 18.4% all these have been caused by increasing trends of cardiovascular diseases predisposing factors within the country. The major drivers of NCDs are lack of exercises, not recommended food health wise, the bad drinking habit and cigarette smoking. Strong measures need to be taken so that the rate of cardiovascular diseases will stop rising otherwise it is expected to rise if no measures are taken, eventually the rising trend will cause above one million death (WHO, 2020) in Tanzania.

High blood pressure is among leading predisposing factor for world death (WHO, 2018), it relatesto 45% and above in entire CVDs mortality and 51% caused by stroke (Isangula and Meda, 2018) in Germany. Blood pressure put in danger life of the population in Tanzania due to reasons such as overweight, obese, diabetes and alcoholism (Mosha, Mahande and Todd, 2019 and Kacholi and Mahomed, 2019). Prevalence of hypertension is 45% of grown people whose age is greater or equal to 25 years are suffering from hypertension. Untreated hypertension can result in increased medical complications, like cardiac diseases, kidneys diseases, diabetes, heart attack, dilated blood vessels, premature mortality, stroke and morbidity.

Alcohol consumption has been associated with increased CVDs risks, such as raised blood cholesterol, high blood pressure, platelet coagulation and increased fibrinolysis (WHO, 2015). Alcohol consumption is also related to increased risk of a trial fibrillation (an abnormal cardiac rhythm), cardiomyopathy, acute myocardial infarction, hemorrhagic stroke and ischemic stroke. Furthermore,Isangula and Meda (2018) mentioned unhealthy diet which is major reason for atherosclerotic plaque formation and development of high blood pressure.

Unhealthy eating habit is also reported to be key reasons for high blood pressure, elevated blood cholesterol, diabetes, overweight and obesity. Furthermore, Stanifer, Cleland and Makuka (2016) in their study in Kilimanjaro Tanzania found lazy people have 20% to 30% increased risk of all-cause of death due to cardiovascular problem, Also, it has been reported that people who always participate in physical activities like jogging have reduced risk for cardiovascular diseases. In addition, other social contributors of cardiovascular diseases include professional context like working habits, bad social relationship and isolation and ethnicity. Kinyanjui and Awuor (2019) mentioned behavioral changes and lifestyle, unemployment and job instability which cause the fear of losing a job has also reported to have an effect on Cardiovascular health.

Several measures are employed to reduce the problem of Cardiovascular disease in Tanzania, these include setting programmes on national non-communicable diseases, surveillance systems based on risks factors, capacitation of health workers, enhancement of cost effective medication and implementation of Tobacco Control and Global Strategy on Diet Convention Framework, further physical exercise and

Health and incorporating both primary and secondary prevention or rheumatic heart disease (Henson, 2015). Another measure employed by the government of Tanzania is construction of Jakaya Kikwete Cardiac Institute(JKCI), which is a public national specialized Cardiovascular teaching institute and research hospital which is located in Dar es Salaam (Gheorghe *et al.,* 2018).

JKCI started to operate as an independent institute on 1st July 2016 as a public institute under Ministry of Health in the United Republic of Tanzania; the Ministry is responsible for provision of cardiovascular care and treatments, conducting training and research activities in the country. This institute serves patients from all regions of United Republic of Tanzania who are referred from Regional and Referral as well as Designated hospitals for Cardiovascular medical care treatment. Apart from being a specialized University teaching institute it serves as Hospital that treats patients from all regions of Tanzania and even patients from allcountries of East African Region.

Furthermore after four years of operations the government formulated a task force to evaluate efficiency of JKCI on achieving Strategic Objectives for four years of its implementation. The objectives of JKCI include: i) reducing overall mortality and morbidity associated with cardiac conditions across all demographic groups at all levels within the health system by improving human resources capacity, training opportunities, procurement of supplies and equipment, strengthening of referral networks and conducting operation research ii) Establishing a qualified pool of specialists and support staff at all cadre levels through in service training, continuing education seminars and onsite mentoring programs in medical

management of CVDs iii) Strengthen CVC referral systems at all levels iv) Establishing mentored in service training programs for staff at identified regional and district level satellite centers to reinforce referral networks and strengthen human resource capacity in medical management of CVD v) Strengthening data collection and reporting on CVD to improve medical and patients management by reporting upon clinical and resource utilization between JKCI and all satellite referral centers vi) Building capacity in other hospitals in terms of training on cardiovascular issues vii) Conducting research for advancement and development of the profession.

From this evaluation, it was evident that the JKCI has recorded average successful implementation of most of its targets and their indicators as set out, some of the service provisions were found to be inefficiency. Moreover, the evaluation indicated that poor service provisions in some areas were associated with inadequate number of staff and other important infrastructures. Critical question to be answered was what are the determinants of JKCI efficiency? What needs to be done to enhance performance of this important cardiac institute in the country?

Previous scholars in the area of determinants of hospital efficiency such as Zuberi (2015) found inadequate of staff and costs charged for medicines hinder efficiency of referral hospitals. In that light it was reported that those costs could not be met by every patient attending the hospital. Furthermore, it was revealed that there are inadequate modern diagnosis facilities at MRH. Mwaseba, Mwangonda and Juma (2018) pointed out there are several factors for patients' choice of hospital which include cost of medication, availability of medicine and health professionals,

distance from the home to hospital. Furthermore, Manyisa and Aswegen (2017) depicted poor working conditions which encompass inadequate working tools, lack management support, manpower shortage were found to be the main reasons for inefficiency service delivery in many hospitals in African countries.

All in all, the studies by Give *et al.,* (2019) in Mozambique focused on how to strengthen referral hospitals, Irimu*et al* (2014) in Kenya determine causes of efficiency of health professionals in dealing in Kenya and found lack of enough funds for training and medical equipment, Pham and Vu (2019) in Vietnam focused on performance of public hospitals. All these studies were not conducted in cardiac institutes. Moreover, few studies that were conducted in Tanzania like a study done by Zuberi (2015) focused on customer satisfaction determinants at Mwananyamala referral hospital, also Mwaseba, Mwangoda and Juma (2018) in Tanzania assessed perception of patients on factors for choice of health care centre in Dodoma, and Kacholi, Kalolo and Mohamed (2021) also examine the performance of quality improvement teams and associated determinants in Regional hospitals in Tanzania.

All these studies conducted in Tanzania were just done to assess factors associated with performance and customer's satisfaction, hence there is limited empirical evidence available on the determinants of the efficiency of Cardiac Institute and this is the gap the current study intended to fill by focusing on availability of health professionals, effective medication, medical equipment and government support. In this light the study intended to examine determinants of efficiency of Jakaya Kikwete Cardiac Institute.

1.2 Statement of the Problem

The idea behind establishment of a specialized and University Teaching Institute namely Jakaya Kikwete Cardiac Institute (JKCI) is to serve patients from all regions of the United Republic of Tanzania and beyond for cardiovascular medical interventions while ensuring efficiency performance. The Institute has a total of 150 bed capacity attending approximately 400 inpatients and 700 outpatients per week. JKCI has a total of 44 doctors; some are highly specialized in cardiovascular diseases, and approximately 72 trained nurses. It is organized into five directorates namely; Directorate of Cardiology services, Directorate of Surgical Services, Directorate of Nursing Services, Directorate of Clinical Support Services and lastly the Directorate of Corporate Services.

Contrary to the reality on the ground, the performance of JKCI has been reported to be average ranging from average to inefficiency. Evidence indicated untimely service delivery, long queue and a lot of complaints (Nuhu, Mpambije and Ngussa 2020 and URT report, 2021). Furthermore, previous scholars such as Give *et al.*, (2019) in Mozambique, Irimu*et al.*, (2014) in Kenya, Pham and Vu (2019) in Vietnam focused on factors influencing efficiency of public hospitals and all these studies were focused on availability health professionals, uncommitted staff, long queue and distance and affordability medication and other services at the health facility level. Mwangoda and Juma (2018) reported that mismatch between the hospital's vision and reality, communication, objective mechanisms for monitoring and evaluating quality of clinical care, capacity for planning strategic change, management skills are the key determinants of hospital efficiency. However. all

these studies were conducted in public hospitals which were not cardiac institutes. In this light therefore the current study examined the determinants of efficiency of Jakaya Kikwete Cardiac Institute which is a cardiac institute as the name implies.

1.3 General Objective

The general purpose of the study was to examine determinants of efficiency of Jakaya Kikwete Cardiac Institute.

1.4 Specific Objectives of the Study

i. To ascertain the influence of available health professionals in enhancing efficiency of Jakaya Kikwete Cardiac Institute
ii. To explore the influence of cost effective medication in improving efficiency of Jakaya Kikwete Cardiac Institute
iii. To examine the influence of available medical equipment in improving efficiency of Jakaya Kikwete Cardiac Institute
iv. To determine the influence of government support in enhancing efficiency of Jakaya Kikwete Cardiac Institute

1.5 Research Questions

i. Howareavailable health professionals influence efficiency of Jakaya Kikwete Cardiac Institute?
ii. What is the influence of cost-effective medication in improving efficiency of Jakaya Kikwete Cardiac Institute
iii. What is influence of available of medical equipment in improving efficiency of Jakaya Kikwete Cardiac Institute

iv. What is the influence government support in enhancing efficiency of Jakaya Kikwete Cardiac Institute

1.6 Significance of the Study

The findings of the study are expected tobe theoretical and practical significance. Theoretically, the findings of the current study is also expected to make a profoundly contributions on the determinants of the efficiency of Jakaya Kikwete Cardiac Institute. The study findings are expected to be resourceful for other researchers, academicians and scholars, as it will form a basis for academic discussions on various aspects determinants of the efficiency of Cardiac Institutes. The study will also be a source of empirical information for other researchers who intend to conduct similar studies in Tanzania and outside the country.

Moreover, the study findings are expected to make a significant addition to the body of knowledge on the determinants of the efficiency of Cardiac Institute studies in developing countries particularly Tanzania. Furthermore, prospective researchers could make use of the findings to improve or apply tested theories. This study is expected to have practical implications for practitioners –health professionals and administrators in public health organizations. Policies and decision makers can use the findings to formulate or modify adapted policy interventions which stimulate efficiency of cardiac institutes and other health organizations. Furthermore, other health practitioners will be aware on what they can do to enhance efficiency of Jakaya Kikwete Cardiac Institute especially in providing financial support for buying medical equipment and training health professionals.

The study also is expected to provide important information to government officials, and other stakeholders who are responsible for development of policies, guidelines in public health organizations. This study hopes to contribute to the existing knowledge, address and provide the background information to research organizations, individual researchers and scholars who want to carry out further research in this area.

1.7 Scope of the Study

The current study assessed the determinants of the efficiency of Jakaya Kikwete Cardiac Institute Institute in Dar es Salaam. The influence of four major determinants namely; health professional, medical equipment, government support and cost effective service on efficiency will be particularly assessed as detailed in the conceptual framework.

1.8 Organization of the Dissertation

This dissertation has been organized into five chapters. Chapter one is an introductory chapter which contained; background of the problem, statement of the problem, objectives, research questions, significance of the study and scope of the study. Secondly, Chapter two is about literature review with definition of key concepts, theoretical literature review, empirical literature review, research gap, conceptual framework, hypothesis and operational definitions of the variables under study. Thirdly chapter three is about research methodology with description of the economic activities of the study area, research philosophy or paradigm, research design, research approach, population, sampling techniques, sample size, data collection methods, data analysis, validity and reliability as well as ethical

consideration. Chapter four presented results and discussion of the findings and chapter five presents summary, conclusion and recommendations

CHAPTER TWO

LITERATURE REVIEW

2.1 Definitions of Key Concepts

2.1.1 Cardiovascular Diseases

Cardiovascular diseases (CVDs) are the diseases which fall in a group of disorders of the heart and blood vessels (Give *et al.,* 2019). Cardiovascular diseases include coronary heart diseases which affectsheart muscles, cerebrovascular disease a disease affects brain, peripheral arterial disease which affect blood vessels which supplying the arms and legs. Another cardiac disease causesdamage to the muscle and valve of the heart also affects normal development and functions of the heart because of malformations of the structure of the heart and is also associated with pulmonary embolism clotting of the blood (WHO, 2021).

2.1.2 Medical Equipment

Medical equipment refer to equipment which are used for diagnostic therapeutic purposes which are essential for patient care, such as dressings, catheters, or syringes (Zuberi, 2015).They are also refers to a device which are used for medical purposes such dressing and injecting (Nuhu *et al.,* 2020).

2.1.3 Health Professionals

Health professional refers to a person who has been trained and developed in health and health related field and can work in health sector, examples of health personnel or professionals include; physicians, cardiologists, cardiothoracic surgeon therapists and laboratory technicians. In this study health professionals will include cardiovascular surgeons, cardiologists, cardiac anesthesiologists, perfusionist,

radiographers, technologists, intensivists, physiotherapists and nurses.

2.1.4 Government Support

Government support refers to any support provided by the government such as financial support or operating grants, management support in terms of training, counselling and sponsoring staff for further studies, subsidies, repayable or forgivable loans, reimbursable tax credits and loans guarantees (Mwaseba, Mwangonda and Juma, 2018). In this study government support will be determined by political will, allocation of enough budgets, and recruitment of enough experts and offering of sponsorship for health professionals to go for further studies.

2.1.5 Cost Effective Medication

Cost effective medication refers to medication that is both clinically and economically appropriate for a condition (Kacholi, Kalolo and Mohamed, 2021). It compares intervention to another. In this study cost effective medication will be determined by affordability of consultation fee, laboratory tests, medication, surgical procedures and affordability of specialized diagnostic cardiac procedures for a low-income earners.

2.2 Theoretical Framework

2.2.1 Principal Agent Theory

The study has been informed by Principal Agent Theory (Bossert, 1998) which postulates that when an entity like government or any organization or any person is able to make and implement decision on behalf of others and these decisions have implications are referred to as an agent. Example when the government of United

Republic of Tanzania through its Ministry of Health and parliamentarian members makes decisions on enhancing efficiency of service delivery in health sectors will be termed as Agency. Example in Tanzania such decisions include formulating supportive policies, allocating enough budgets for recruitment of health professionals and buying medical equipment and improving hospital infrastructures.

The hospital management and health workers are the agents that implement decision made for improved service delivery which in turn will reduce the preference of going abroad to access treatments of cardiovascular diseases. In the context of this study the government establishes clear goals and guidelines and provides guidelines and provides resources such as health professionals, medical equipment, management support and cost-effective medications to the efficiency of cardiac institute. The government is expecting health workers will work accordingly and serve large population of Tanzania. The limitations of the principal agency theory is that individuals are opportunistic, that is they constantly aim to maximize their own interest. Thus, there is no guarantee that agents will always act in the best interests of principals

2.2.2 Donabedian Quality of Care Theory

According to Donabedian in model there are three components of quality components namely technological quality, interpersonal quality and amenities. The model is concerned professionals with efficiency of treatments in ensuring quality service and in turn results to health benefits. In addition, the theory postulates that interpersonal quality in terms of having enough beds, qualified health professionals, medical equipment, management support and cost-effective medication. The theory

assumed that assessment of any health center is centred on structure, process and outcome(Donabedian, 1989). In this case Jakaya Kikwete Cardiac Institute can develop a culture of enhancing efficiency of service delivery in all its directorates in their day-to-day operations. Furthermore, the Donabedian theory postulates that there are several factors which facilitate efficiency of organization including health care in terms of quality it did not take into account how health professionals, medical equipment, cost effective medication and management support as determinants of efficiency of cardiac institute.

2.3 Empirical Literature Review

2.3.1 Influence of Available Health Professionals on Efficiency of Health Organization

Give *et al.,* (2019) in their study titled "*Strengthening referral systems in community health programs: a qualitative study in two rural districts of Maputo Province, Mozambique".* Specifically, the study objectives were based on challenges and factors associated with adoption of health management systems. The study used 22 key informants(Community health workers), supervisors and community leaders who were interviewed. Furthermore, the study conducted eight focus group discussions with 63 members from the Community. Data analysis were done through NVivo (v10).The study findings depicted that there are several barriers for effective performance of hospitals, these include lack of enough health professionals, uncommitted staff, long queue and distance and affordability of referral services at the health facility level.This study focused only on normal hospitals not cardiac institute and focused only on challenges and factors associated with adoption of

health management systems and not touched determinants namely health professional, medical equipment, government support and cost effective service.

Nnko, Nyang'au, and Odhiambo (2019) in the study titled *"Influence of workload on performance of nurses in regional hospitals in Tanzania".* The study used mixed research design dominated by quantitative approach with descriptive survey design. Data were collected using structured however before actual data collection pilot testing was done to enhance validity and reliability. The study was informed by Hezbergtwo factors theory. The population of the study was 410 and a sample of 387 was randomly picked. Data were analyzed using Pearson correlation, analysis of variance and multiple linear regressions.

The study revealed that a positive and significant relationship between employees' workload and performance of organization as ($r=0.443$, $p<0.05$). The study further found job rotation and teamwork affect employees 'performance while working part time was insignificantly affect employees' performance. The findings also indicated that there is positive and significant relationship between management support and nurses' performance. The study implies that hospital management should design proper work systems to facilitate improvement of quality and safety of care. Furthermore, the study recommends improvement of working conditions by providing enough working tools and enhancement of teamwork spirit.This study focused only on management support to nurses only and not touched other variables such as health professionals, medical equipment and cost effective medication as determinants of efficiency of cardiac institute.

Irimu*et al.,* (2014) in the study titled "*Factors influencing performance of health workers in the management of seriously sick children at a Kenyan tertiary hospital - participatory action research".* The study data were collected over eighteen-month period through participants observers in Participatory Action Research (PAR) as health care staff encountered. Furthermore, they were analyzed using descriptive analyze and the study revealed that availability of human resources was relatively undertaken while activities that required competent and professionalstaff were the challenge. Other barriers were mismatch between vision of hospital and reality, lack of serious monitoring and evaluation of hospital care, limited capacity in strategic management, inadequate management skills for change management, hierarchical relationships and inadequate adaptation of the intervention to the local context. In terms of variables this study did not coveredonhealth professionals, medical equipment and cost effective medication as determinants of efficiency specifically cardiac institute.

2.3.2 Influence of Cost effective Medication on Efficiency of Health Organization

Zuberi (2015) in the study titled "Assessment of factors influencing customer satisfaction in the public hospitals in Tanzania: a case of Mwananyamala referral hospital". The study employed mixed research approach. The study used a sample size of 70 respondents who were *conveniently* sampled from Mwananyamala Referral Hospital (MRH). Questionnaire, interview and documentary reviews were used to collect data. SPSS was used to calculate frequencies, percentages, mean and standard deviation for the study findings.The study found that, quality of service

delivery in MRH and performance of Doctors and nurses was low. In addition to that, it was revealed that costs charged for medicines are not fair. The costs are related to registration and diagnosis. In that light it was reported that those costs could not be met by every patient attending the hospital. Furthermore, it was revealed that there are inadequate modern diagnosis facilities at MRH. The study recommends that public hospitals should start offering its staff with customer care skills in order to help them increase their service delivery.The government should also strive to maintain high standard in healthcare provision in order to keep patients satisfied with the services they receive. The government should strive to increase the availability of facilities and medicines in MRH in order to boost healthcare provision in the hospital. Finally, the government and MRH should encourage the staff to treat patients with courtesy and respect in line with the provision of healthcare. This study covered factors determining customers satisfaction and did not touch determinants of efficiency. waseba, Mwangonda and Juma (2018) in the study titled *"Patients Perceptions on the factors for choice of Health Delivery in Dodoma Tanzania".* The study used structured questionnaire which had questions based on perception of patients on choice of health care center. Chi square and descriptive statistics were used to analyze data. The findings of the study show that there is strong association between age of a patients and choice of health care delivery, also the study found education, sex of respondents and patients' occupations were not related.

In addition, treatment cost, location of health Centre, availability of medicine were the key factors for patients' choice. The study implies that the management of the hospital is necessary to ensure there are affordable treatment costs and availability of medicine for all patients in public hospitals. Furthermore, the study asserted cost of service is among the key factors which facilitate customers' satisfaction and loyalty. The positive perception of customers towards service increased their satisfaction and increase sales and market share which in turn lead to economies of scale and strategic cost analysis. This study focused on factors influencing patients, choice of health delivery and not factors influencing choice of health care delivery.

2.3.3 Influence of Available of Medical Equipment on Efficiency of Health Organization

Pham and Vu (2019) in their study titled *"Factors influencing performance of public hospital in Vietnam".* The researchers collected data through questionnaire and a total of 42 public hospitals inVietnam were contacted in the Northern province of Vietnam from a sample size of 426 respondents. Correlation and regression analysis were employed to determine the influence of various factors on the performance of the hospital in Vietnam. Balance score card method was used to assess the influence of financial and non financial factors on the performance of the hospital. The study revealed that financial factors were found to have strong influence on performance of hospital as it facilitates availability of enough medication, equipment, training and recruitment of enough health professionals. Furthermore other non financial factors which were found to influence performance include mission and vision, internal process, availability of staff and management support.This study focused on

influencing performance of public hospital and focused on finance,mission and vision, internal process, availability of staff and management support which is not the case in the current variables as other variables like availability of health professionals, cost effective medication, availability of medical equipment and support from the government.

Kacholi and Mohamed (2019) in the study titled *"Sustainability of Quality improvement teams in Selected Regional referral hospital in Tanzania".* The study used quantitative cross descriptive research design. Both primary and secondary data were used in the study. Sustainability total score was the primary outcome whereas process, employee and organization sustainability of quality were the secondary outcome which were assessed using National Health Service Institute for Innovation and Improvement Sustainability Model self assessment. The study revealed that low participation of senior staff, poor infrastructures, and lack of medical equipment appeared to negatively affect the sustainability and performance of referral hospitals in Tanzania.This study was done in regional hospitals and not cardiac institute and the focus was on sustainability of quality improvement and not efficiency.

2.3.4 Influence of Government Support on Efficiency of Health Organization

Kacholi, Kalolo and Mohamed (2021) in the study titled "*Performance of quality improvement teams and associated factors in selected Regional Hospitals in Tanzania".* The study was conducted in four regional referral hospitals in Tanzania. Researchers collected data from 61 members of the quality assurance teams using self administered questionnaire. Data were analyzed using descriptive statistics (frequencies and percentages) and inferential statistics namely bivariate and

multivariate logistic regression. Findings of the study show that staff training (83.6%); employees communication (75.1%); teamwork spirit (71.5%); clear goals and responsibilities (70.2%); team size and composition (65.5%); and self appraisal and learning (56.2%) were considered as the main factors of team performance. Also lack of management support obtained the lowest score (36.1%).The study variables differs as it covered other variables namelyavailability of health professionals, cost effective medication, availability of medical equipment and support from the government.

Manyisa and Aswegen (2017) in the study *Factors affecting Working conditions in Public Hospitals.* The study specifically explored the working environment in public hospitals through comprehensive review of literature specifically research articles. Review of literature was conducted using various databases namely Google Scholar, Pub Med, Science Direct, EHBSCO, the LANCET and MEDLINE. Published Journal Articles in a peer reviewed journals published in English between year 2000 and 2014 were reviewed in the current study. Search terms namely: working conditions and work environment, management and leadership support, occupational health and safety, public hospitals and health care employees were used to access the relevant journal articles. Findings depicted that poor time management, poor infrastructure, inadequate financial and human resources and management support and manpower shortage were found to be the main contributors associated with poor working conditions which affect performance. The study also not covered variables namely availability of health professionals, cost effective medication and availability of medical equipment.

2.4 Research Gap

Previous scholars such as Give *et al.,* (2019) in Mozambique focused on how to strengthen referral hospitals, Irimu*et al* (2014) in Kenya determine main determinants performance of health care workers in management of sick children in Kenya, Pham and Vu (2019) in Vietnam focused on performance of public hospitals. Allthese studieswere not conducted in cardiac institutes. Moreover, few studies that were conducted in Tanzania like a study done by Zuberi (2015) focused on customer satisfaction determinants at Mwananyamala referral hospital,

Also,Mwaseba, Mwangoda and Juma (2018) in Tanzania assessed patients attitudes on the determinants for choice of health delivery in Dodoma and Kacholi, Kalolo and Mohamed (2021) also examine the performance of quality improvement teams and associated factors in Regional hospitals. All these studies conducted in Tanzania were just done to assess factors associated with performance and customers satisfaction, hence there is limited empirical evidence available on the determinants of the effectiveness of Cardiac Institute and this is the gap the current study intends to fill.

Kinyanjui and Awuor (2019) in the study titled "*Environmental Factors and Health Care Service Delivery under the Devolved system in Kenya".* Cross sectional descriptive research design was used and collection was through questionnaire, analysis and interpretations were done once. Also hundred (100) respondents from managerial posts were contacted from three levels 5 hospital at Kiambu County in Kenya. Analysis was performed using frequency, mean, percentage and results

depicted that lack of budgets, political influence, inadequate monitoring and evaluation as well as lack of enough competent staff were found to have negative impact on quality inservice delivery. The study also found support from the government had positive and significant association with performance in terms of revenue collection and availability of medical equipment.

2.5 Conceptual Framework

The conceptual framework for this study portrays the relationship between, independent and dependent variables, which are derived from the specific objectives. Independent variables include: availability of health professionals,cost effective medication, availability of medical equipment and government support. Dependent variable is efficiency of cardiac institute. This conceptual framework is developed from empirical and theoretical review of literature.

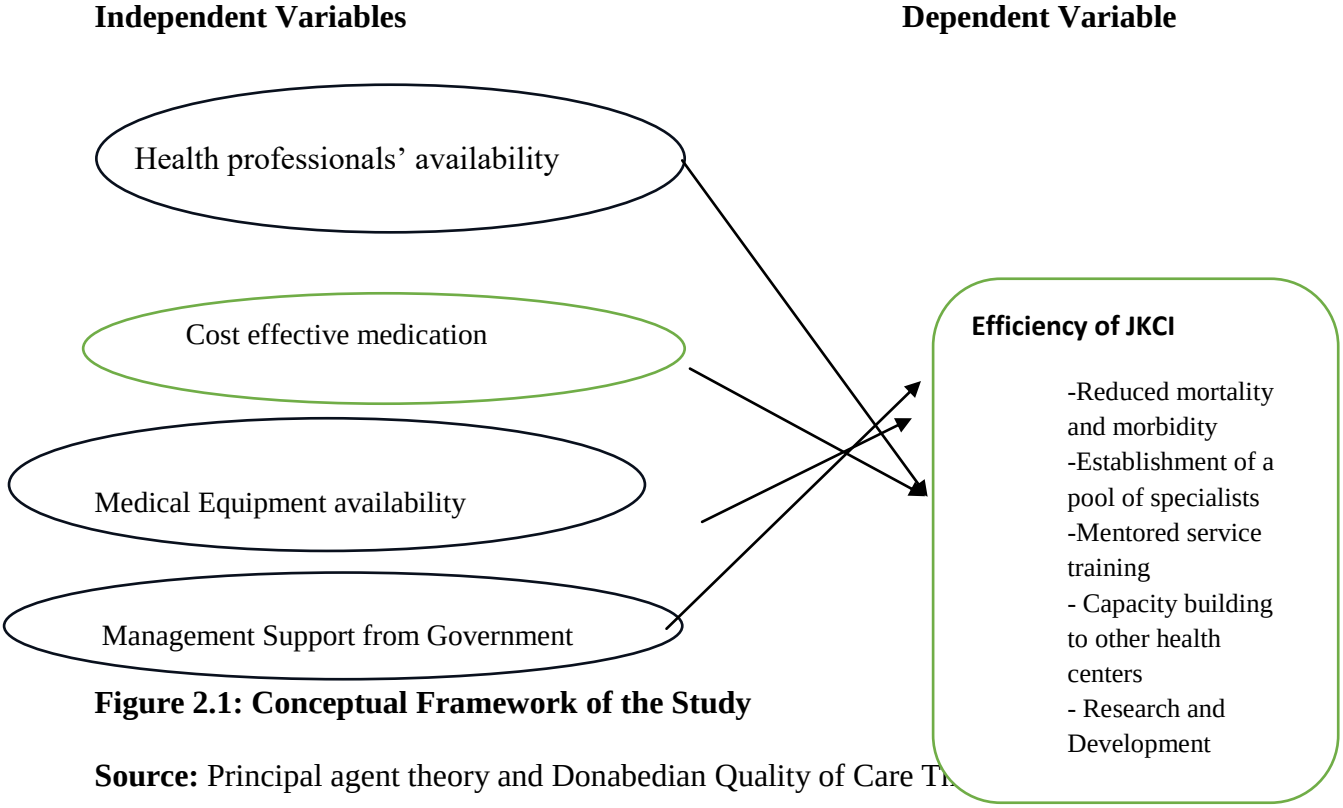

Figure 2.1: Conceptual Framework of the Study

Source: Principal agent theory and Donabedian Quality of Care Th

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is the process of systematically solving a research problem (Kothari, 2004). This chapter therefore presents the study area description and justification, paradigm, approach, study design, population, sample size, sampling technique, data sources, data collection, data processing and analysis. Also, this chapter presents Validity and reliability of the study findings and ethical considerations.

3.2 Research Design and Approach

3.2.1 Research Design

Explanatory research design was employed to test the existence of relationships among variables and validated a model, which can be used to explain efficiency of Jakaya Kikwete Cardiac Institute. It is also explanatory because it explains the causal effects relationships between health professionals, cost effective medication, management support, medical equipment and efficiency of Jakaya Kikwete Cardiac Institute. Since the study encompasses many variables where their influence and relationships are questionable on influencing efficiency, the use of explanatory research design is considered appropriate to provide expected findings (Saunders et al, 2016).

3.2.2 Research Approach

The study employed mixed research approach in order to assess the determinants of efficiency of Jakaya Kikwete Cardiac Institute in Dar es Salaam. The study is dominated by quantitative approach as the main reason is to determine the causal-effect relationship between health professionals, cost effective medication, management support, medical equipment and efficiency of Jakaya Kikwete Cardiac Institute. Quantitative research approach has also been chosen because it has ability to explain the causal effects relationships among variables and hypothesis testing of the collected data as stipulated by Saunders, *et al.*, (2016). The qualitative findings were collected to supplement the quantitative findings. The reason behind the use of qualitative data was to supplement quantitative findings.Qualitative research approach was also used to assess the attitudes and opinions of respondents on measures employed to enhance efficiency of JKCI. Qualitative data were used as supplementary explanations for quantitative findings as elucidated by Clark and Creswell (2011) and Creswell (2004)

3.3 Unit of Analysis

A unit of analysis is the key factor a researcher sets out to investigate from which evaluated knowledge is created upon study accomplishment (Kyessi, 2002). The study, therefore, considers Jakaya Kikwete Cardiac Institute as a unit of analysis. JKCI was generally selected owing the objectives of The objectives of JKCI include: i) reducing overall mortality and morbidity associated with cardiac conditions across all demographic groups at all levels within the health system by improving human resources capacity, training opportunities, procurement of

supplies and equipment, strengthening of referral networks and conducting operation research ii) Establishing a qualified pool of specialists and support staff at all cadre levels through in service training, continuing education seminars and onsite mentoring programs in medical management of CVDs iii) Strengthen CVC referral systems at all levels iv) Establishing mentored in service training programs for staff at identified regional and district level satellite centers to reinforce referral networks and strengthen human resource capacity in medical management of CVD v) Strengthening data collection and reporting on CVD to improve medical and patients management by reporting upon clinical and resource utilization between JKCI and all satellite referral centers vi) Building capacity in other hospitals in terms of training on cardiovascular issues vii) Conducting research for advancement and development of the profession.

3.4 Study Area

Jakaya Kikwete Cardiac Institute in Dar es Salaam was the study area, as the reason behind selection is due to the fact that it is the only hospital dealing with cardiovascular issues in the country. Further medical professionals working at Jakaya Kikwete Cardiac Institute was the unit of analysis of this study. The selection of Jakaya Kikwete Cardiac Institute is also associated with some complaints on cost of medication to be high and inadequate and unsustainable delivery of tertiary cardiovascular care services.

3.5 Population and Sampling

3.5.1 Population

The target population for the study is all health professionals and patients who were

317 out of which; Nurses and attendants(100), Specialist(21), Super specialists(22), GP(17) and Allied Medical Personnel (29), Supporting staff (60)and selected patients (68). Health professionals were chosen as unity of inquiry because they are the one who provide health care services to all patients who get services at JKCI. Therefore, from this population the study was expecting to have a better understanding on the determinants of efficiency of Jakaya Kikwete Cardiac Institute.

Table 3.1: The Study Population

Professional category	Number of Employees
Nurse attendants	100
Specialists	21
Super specialists	22
GP	17
Allied Medical Personnel	29
Supporting staff	60
Patients	68
TOTAL	317

Source: Human Resource Manager, JKCI (2021)

3.5.3 Sampling Design and Techniques

Saunder, et al., (2016) pointed out that there are two major types of sampling designs namely probability and non probability sampling with several sampling design techniques. In probability sampling, every individual has a known chance of being involved in a sample while in non probability sampling the individual has no known chance of being involved in a sample. However, in this study non probability sampling design with purposively sampling was employed because it enhances representation and reduces bias.

3.5.4 Sample Size

According to Hair, et al., (2006) a smaller group of subjects drawn from the

population in which a researcher is interested for purposes of drawing conclusions about the universe or population is termed as a Sample; Furthermore Kothari, (2014) adds having a large sample size provide a room for generalization of the findings to the entire populations as long as it is truly representative of the population.In this study, all health professionals (317) were used to determine the sample size using formula adopted from Kothari (2014)

$n = \frac{N}{1+N.e^2}$ (1) = 176

n= 176

Where n = size of samples, N = total population=317; e = standard error of sampling (5%) is tolerated. By entering each value of the variable into the formula (1) above, obtained large sample size of 176 respondents. The sample size is in line with argument of Hair *et al* (2006) who states that a research study designed to reveal factor structures should have more observations than variables, and that the minimum absolute sample size should be 50 observations. The random sampling method will be used to draw sample. Furthermore, proportion to size was employed to obtain sample in each sampling frame as shown 3.2.

Table 3.2: Sample Size in each Category

Professional category	Number of Employees	Sample per category
Nurse attendants	100	56
Specialists	21	12
Super specialists	22	12
GP	17	9
Allied Medical Personnel	29	17
Supporting staff	60	33
Patients	68	37
TOTAL	317	176

Source: Human Resource Manager, JKCI (2021)

The sample size for qualitative analysis was 10 respondents who are sufficient enough taking into account that Creswell (2014) suggests that the rule of thumb requires a sample size of 4 up 10 for phenomenological studies. Interview conducted to thefive(5) patients who receive treatment at JKCI and executive director of JKCI regarding various on the services and plans of the institute to grow.

3.6 Data Collection Methods

3.6.1 Structured Questionnaire

Quantitative data of the current study were collected by using structured questionnaire which were addressed to health professionals. Use of questionnaire was appropriate because it offers standardized systems of questions to collect measurable and factual data, to classify a specific group of people and their circumstances in statistical characterization (Goretti, 2018). Furthermore, use of questionnaire in this study because has enabled a researcher to capture data that are suitable for statistical analysis.

3.6.2 Semi structured Interview

According to Cooper and Schindler (2003) in depthinterview, focused group discussions and observations are the primary data collection techniques for gatheringqualitativedata in qualitative methodologies. In the current study semi structured interview was also used to capture qualitative data from key informants, where ten key informants namely executive directors and patients who receive services at Jakaya Kikwete Cardiac Institute.

3.6.3 Documentary Review

Secondary data was extracted from documents JKCI strategic plan which explain strategic objectives. Data were collected by reviewing and analyzing various relevant documents such as National Non communicable disease strategy of 2018, National health policy of 1990 and Health Sector Strategic Plan of July 2021 to June 2026 were reviewed accordingly.

3.7 Data Analysis

3.7.1 Descriptive Analysis

The study used descriptive statistics such as frequency and percentage in order to profile and gain an understanding of health professional demographic characteristics namely age, gender, work experience and respondents' level of education. Therefore, descriptive data analysis helped to gain an understanding on the general characteristics of the respondents in the study area and other useful information on efficiency at JKCI in Dar es Salaam.

3.7.2 Inferential Statistical Analysis

Inferential statistical analysis was used to determine the causal effects relationship among variables, here Linear multiple regression model was developed to find out the relationship between determinants (independent variables), which influence efficiency of cardiac institute (dependent variables). The multiple regression model was used because of having a single dependent variable and several predictor variables. The scales are measured in an ordinal scale specifically five-point Likert-scale format from "strongly disagree" (1) to "strongly agree" (5). Independent variables for this study were recorded as either numerical or categorical variables

thus, the following linear multiple regression models will be developed

$Y = \beta 0 + \beta 1X1 \ldots\ldots\ldots\ldots \beta nXn + e \ldots\ldots\ldots\ldots$

Y1 = Efficiency of cardiac institute

β0 = a constant showing intercepts for regression equation

β1- βn = independent variables coefficients (Health professionals, cost effective medication and medical equipment)

X1-Xn = independent variables

e = error term

Table 3.3: Operational Definitions and Measurements of Variables

Variable	Description of the variables	Measurement indicators	Scale measure	Source
Efficiency	Doing the right thing	Reduced Mortality	Ordinal scale	Nnko, Nyang'au, and Odhiambo (2019) Manyisa and Aswegen (2017); Kinyanjui and Awuor (2019)
		Reduced Morbidity	Ordinal scale	
		Establishment of a pool of specialists	Ordinal scale	
		Capacity Building	Ordinal scale	
		Research and development	Ordinal Scale	
Health professionals	A person trained who is working in the field of physical or mental health	Availability of Cardiovascular surgeon	Ordinal scale	Give *et al.*, (2019); Nnko, Nyang'au, and Odhiambo (2019)
		Availability of Cardiologists	Ordinal scale	
		Availability of Cardiac Anesthesiologists	Ordinal scale	
		Availability of Perfusionist	Ordinal scale	
		Availability of enough nurses	Ordinal scale	
Cost effective medication		Affordable doctor consultation fee	Ordinal scale	Mwaseba, Mwangonda and Juma (2018); Zuberi (2015)
		Affordability of laboratory tests	Ordinal scale	
		Price of medicine	Ordinal scale	
		Affordable surgical	Ordinal scale	

		procedures		
		Affordable specialized diagnostic cardiac procedures	Ordinal scale	
Medical equipment	Items used for therapeutic or diagnostic purposes essential for patient care	Available state of Arts Cathlab machine	Ordinal scale	Kacholi, Kaloloand Mohamed (2021); Pham and Vu (2019)
		Available heart lung machine	Ordinal scale	
		Presence of Intra Aortic Balloons pumps	Ordinal scale	
		Available ventilation machine	Ordinal scale	
		Available advanced lab equipment	Ordinal scale	
Government support	Provision of necessary support for health care delivery	Political willingness	Ordinal scale	Manyisa and Aswegen (2017); Kinyanjui and Awuor (2019)
		Allocation of enough budget	Ordinal scale	
		Recruitment of experts in the field	Ordinal scale	
		Sponsoring health professions who go for further studies	Ordinal scale	

Source: Research Findings, 2022

3.7.3 Assumptions of the Multiple Linear Regression

Linear multiple regression models will be used to determine the relationship between factors (independent variables), which influence efficiency of cardiac institute (dependent variables). Before running linear multiple regression models, the following assumptions about the data will be undertaken: sample size, multicollinearity, outliers, normality and linearity (Pallant, 2001).

Multicollinearity: refers to the relationship among independent variables and multicollinearity exists when independent variables are highly correlated (r=0.9 and

above). All independent variables will be subjected to correlation analysis and those that are highly correlated will be excluded from further analysis.

Outliers: since multiple regression is very sensitive to outliers (very high or very low scores), the extreme scores for both independent and independent variables will be checked as part of the initial data screening process. They will be checked by the use of scatterplot with the aim of identifying data points that are out on their own, either very high or very low, or away from the main cluster of points. Extreme outliers will be checked to determine whether data is entered correctly. Decisions will then be made to either remove or recode them down to a value that is not as extreme.

Normality: the residuals should be normally distributed about the predicted dependent variables (DV) scores. This will be checked from the residuals scatterplots of which residuals are defined as the differences between the obtained and the predicted dependent variable (DV) scores (Pallant, 2001).

Linearity: the residuals should have a straight-line relationship with predicted DV scores (Pallant, 2001).

3.8 Reliability and Validity

3.8.1 Validity

The validity of the study was censured by obtaining the expert opinion of seasoned researchers regarding the data collection instrument to ensure that it's; accurate, clear and produces the intended results in order to meet the research objectives. The instrument was then adjusted according to recommendations provided. Finally, a

pilot study was conducted to determine the accuracy of questionnaires and according to Bricki and Green, (2007), the main purpose of a pilot study is to identify accuracy of data collection instruments and how well the respondents understand its flow. The questionnaires were pretested on the selected sample of 10 health professionals to identify possible errors in measurements and to identify any unclear items for modification or exclusion.

Also, Kaiser Meyer Olkins was used to test the validity of the data as acceptable range is 0.5 and above. The current study's validity was determined using the SPSSversion 21and the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of sphericity, as shown in Table 3.4below. The Kaiser-Meyer-Olkin sample sufficiency index O, which compares the sizes of the observed correlation coefficients to the sizes of the partial correlation coefficients for the sum of analysis variables, was found to be 0.763 or 76.3 %, and it is reliable because it is greater than 0.5 or 50%, which is the cut-off.

Table 3.4: Validity

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	247.853
	Df	210
	Sig.	.038

Source: Field Data (2022)

3.8.2 Reliability

The cronbach’s coefficient alpha was used to determine reliability and as Rajasekar et al.(2006) note, cronbach’s coefficient alpha is frequently to determine the

reliability of study findings. Bricki and Green, (2007) recommend that reliability with cronbach's coefficient alpha of less than 0.60 is considered poor while 0.70 is considered acceptable and cronbach's coefficient alpha that exceeds 80% is considered appropriate.The study's reliability was determined using the Cronbach's alpha formula ($r\alpha = (\frac{k}{k-1})(1 - \frac{\sum\sigma}{\sigma}$); Where σ^2 = variance of one test item. Other variables are identical to the KR-20 formula. Reliability Statistics show the value of the coefficient alpha or Cronbach's alpha for all the three factors were above the cut off points hence suggest that their values for the internal consequence of the conceptual construction of the investigated scale are reliable. Refer table 3.5.

Table 3.5: Reliability Statistics

Variable	Number of items	Croncbach's Alpha
Health professionals	5	0.643
Effective medication	5	0.732
Medical equipment	5	0.631
Management support	4	0.873

Source: Field Data (2022)

3.9 Ethical Consideration

According to Rajasekar et al. (2006) adherence to research ethics is essential for obtaining reliable and valid results, therefore respondents were fully informed that the study is solely for academic purposes and all information obtained were treated with utmost confidentiality. Moreover, to further ensure confidentiality, respondents were cautioned against revealing their identity on the data collection instruments. Respondents were also be notified of the voluntary nature of their participation and that there would be no payment for participation to prevent bias. Respondents were

also treated with utmost respect and the researcher ensured that none is harmed owing to their participation in the study. Also, researcher observed financial institutions protocols which include clearance letter from Regional Authorities and other relevance authority as well the Open University.

CHAPTER FOUR

PRESENTATION ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter is all about presentation of the findings and discussions regarding determinants of efficiency of Jakaya Kikwete Cardiac Institute. The presentation and interpretation of the data focused on the objectives of the study which were; the influence of available health professionals, cost effective medication, availability of medical equipment and government support on efficiency of Jakaya Kikwete Cardiac Institute. In addition, the study was interested to understand the nature and characteristics of the respondents in the study area. This part reports the descriptive results, which helps to inform the fundamental description of the respondents under study in order to build the insights about it as well as helping in supporting the final analysis. Given this necessity, this section is also composed of respondent's sample distribution. Major findings of this study were presented using Tables and figures. The chapter begins with presentation of demographic characteristics of respondents.

4.2 Respondents' Demographic Characteristics

4.2.1 Respondents' Gender

A total of 176 (100%) respondents filled out the questionnaires for the study. Table 4.1 shows that of the total respondents, 87 (49.5 %) were males and 89 (50.5%) were females. The results demonstrate that the number of females employees at Jakaya Kikwete Cardiac Institute was slightly higher in comparison to the number of males. Despite of the differences, findings revealed that each group of gender was represented during the process of data collection.

Table 4.1: Respondents' Demographic Profile

Respondents' gender	Frequency	Percent
Male	87	49.5
Female	89	50.5
Total	176	100.0
Respondents Age		
20-29	52	29.4
30-39	56	31.6
40-49	50	28.4
50 and above	18	10.5
Total	176	100.0
Marital Status		
Single	43	24.2
Married	111	63.2
Divorce	13	7.3
Separated	9	5.2
Total	176	100.0
Respondents Education		
Primary	11	6.31
Secondary	15	8.40
Technical education	61	34.7
University degree	89	50.5
Total	176	100.0
Work Experience		
0-5 year	57	32.6
6-10 years	57	32.6
11-15 years	48	27.3
Over 15 years	13	7.4
Total	176	100.0

Source: Field Data (2022)

4.2.2 Respondents' Age

The study findings show that 52(29.4%) respondents were from the age group between 20 and 29 years. 56 (31.6%) respondents were from the age between 30 to 39 years. 50(28.4%) were from the age group between 40 and 49, and the remaining 18(10.5%) had age above 50 years. The statistics suggested that all age groups were considered during employments process in Jakaya Kikwete Cardiac Institute. However, a large number of employees(31.6%)were from the age group between 30

to 39 years. This implies that the age group between 30 and 39 years are the one who is at the product level and available in the labor market.

Furthermore, the study findings imply that the study comprised with the age of most economically active population with hard working and energetic group to provide good services delivery to the people. Findings from this study justify that employee in Jakaya Kikwete Cardiac Institute comprised all groups of employees from junior employees to seniors which assure the presence of succession as shown in Table 4.1. Not only that, many organizations including Jakaya Kikwete Cardiac Institute prefer this age group, though it is hard to retain such kind of employees because they are more ambitious and opportunistic.

4.2.3 Respondents Marital Status

Regarding employees' marital status the study found 43(24.2%) were single, 111 (63.2%) are married, divorce 13(7.4%) and 9(5.3%) were separated. These findings imply that majority of respondents were married. The findings suggest that all marital statuses were considered during the data collection process. The findings conform with of Matimbwa and Ochumbo (2018) who assert that married employees are less likely to quit their jobs than single individuals and more often fall in job lock.

4.2.4 Respondents' Education Level

Results reveal that the highest percentage 89(50.5%) of employees at Jakaya Kikwete Cardiac Institute hold bachelor degrees, followed by and 61(34.7%) of the respondents hold technical education, 15(8.4%) hold secondary education and the

remaining 11(6.31) attained certificate levels. The study further revealed that, Jakaya Kikwete Cardiac Institute has employees of various levels of education qualifications. These findings signify that respondents were educated enough to provide reliable response during data collection.

In addition, Table 4.2 show description of the respondents based on profession, the study revealed also 12 respondents were cardiovascular surgeons, 20 cardiologists, 17 General practioners, 4 Cardiac Anesthesiologists, 12 Nurses hold University degrees, followed by 7 perfusionists and 54 nurses hold technical education, 15 health attendants hold secondary education and 11 health attendants hold primary education.

Table 4.2: Respondents Education based on Education

Profession	**Primary**	**Secondary**	**Technical Education**	**University degree**
Cardiovascular surgeon	0	0	0	12
Cardiologists	0	0	0	20
General practioners (md)	0	0	0	17
Cardiac Anesthesiologists	0	0	0	4
Perfusionist	0	0	7	0
Nurses	0	0	54	13
Surgeons	0	0	0	10
Physicians	0	0	0	13
Health attendant	11	15	0	0
Total	11	15	61	89

Source: Field (2023)

4.2.5 Respondents Work Experience

Table 4.1 indicate that, 57(32.6%) of Jakaya Kikwete Cardiac Institute employees for more 6 to 10 years, similarly 57(32.6%) had work experience of less than five

years, 48(27.3%) had work experience between 11 to 15 years and the remaining 13(7.4%) had worked with medical institute for more than 15 years. These findings imply that employees of Jakaya Kikwete Cardiac Institute have different work experience.

4.3 Health Professionals and their Influence on Efficiency of JKCI

The researcherwas interested to understand if availability of health professionals have influencedon efficiency of Jakaya Kikwete Cardiac Institute, the focus was on cardiovascular surgeon, cardiologists, anesthesiologists, Perfusionists and nurses. The study findings revealed88(50.0%) of respondents were neutral on availability of enough cardiovascular surgeons. The reason behind why 50% of the respondents were neutral is due to the fact that number of cardiovascular surgeons is just half the total number required to meet the demand of the cardiac institute.Hence the implication is that the institute needs to add more cardiovascular surgeon to meet demand. Furthermore, 30(16.8%)of respondents' pointed out at Jakaya Kikwete Cardiac Institute there are no enough medical doctors who have advanced education and training in performing surgery on the heart and the major blood vessels around itwhile 64(36.4%) perceive existing doctors are quite enough.

Global Cardiac report (2020) is in line with the current study as 75% of the world do not have access to cardiac surgery when needed because of lack of enough cardiovascular surgeons, infrastructures, human resources and financial coverage and few cardiac institutes. Furthermore, in United States of America Grove*et al.,* (2020) reported a shortage of cardiovascular surgeons within the next ten years, which could reduce the service delivery or quality of care if non board certifies

physicians expand their role in cardiothoracic surgery or if patients must delay appropriate care because of a shortage of well-trained surgeons.

Table 4.3: Health Professionals

Health professionals	Disagree	Neutral	Agree
In this institute we have enough Cardiovascular surgeons	24(13.7%)	88(50.0%)	64(36.4%)
At JKCI there is enough cardiologists	30(16.8%)	39(22.1%)	108(61.1%)
At JKCI there is cardiac anesthesiologists	24(13.7%)	88(50.0%)	64(36.4%)
The number of Perfusionistsin the hospital meets the client's needs	33(18.9%)	33(18.9%)	109(62.1%)
At JKCI there is enough nurses	24(13.7%)	40(23.2%)	111(63.1%)

Source: Field Data (2022)

Further the study found 108(61.1%) declared that at Jakaya Kikwete Cardiac Institute there is enough cardiologists who treat diseases and conditions of the cardiovascular system, the heart and blood vessels, 39(22.1%) were neutral on whether cardiologists are very enough and the remaining 30(16.8%) disagree to have enough cardiologists. With these findings therefore the implication is that majority of respondents admitted that Jakaya Kikwete Cardiac Institute has enough cardiologists. This is also cemented by Grovet *et al.,* (2020) also asserted that it is very important for hospital to have enough cardiologists who can help patients with heart disease return to a full and useful life and also counsel patients about the risks and prevention of heart disease. Also, cardiologists should be involved in the treatment of heart attacks, heart failure and serious rhythm disturbances in all hospitals. These findings imply that having enough cardiologists is beneficial for patients and hospital as well as they help medical doctors while make decision about heart surgery, heart catheterization and angioplasty and stenting.

Regarding cardiac anesthesiologists'88(50.0%) were neutral on availability of enough anesthesiologists, 64(36.4%) declared that the number of anesthesiologists to be enough while 24(13.7%) disagreed. The reason why 50.0% being neutral was due to the fact the current number of the anesthesiologists is almost half the number required, hence to some extent it delays services to customers. Furthermore, these findings imply that at Jakaya Kikwete Cardiac Institute there are mixed feelings this is due to the fact that some perceive there are enough when compared to other health services while perceive not to be enough because sometimes it takes long time for patients to receive their services when attending clinics. In a situation where these anesthesiologists' are very few, it is very risks to the patients because anesthesiologists play a vital role in assessing a patient's medical readiness for surgery, as they are unique in their advanced knowledge of both the medical illness for the patients who is undergoing surgery may suffer as well as the effects on the body of the specific operation to be performed. Similarly, results were obtained by Nnko, Nyang'au, and Odhiambo (2019) who revealed that most of hospitals including cardiac institutes have no enough cardiac anesthesiologists.

In addition, on the number of Perfusionists in the hospital meet the client's needs, the study revealed 109 (62.1%) declared the hospital has enough, 33(18.9%) disagreed while same percent neither agreed nor disagreed. Perfusionists who operated heart lung machines, which is an artificial blood pump, which propels oxygenated blood to the patients' tissues while the surgeon operates on the heart. The findings imply that Jakaya Cardiac Institute has enough perfusionist as majority of respondents were very satisfied. According to Pham and Vu (2019) posited that

per fusionists are vulnerable to job induced sleep deprivation and fatigue and patients' safety may be jeopardized as a results. The study further pointed that lack of adequate perfusionistsmay lead to prolonged healing of wound, peripheral pulses are weak or absents, extended capillarity refilling, hair loss in the legs, changes in skin temperature, cold fingers and alterations in skins sensations. Furthermore, the study revealed that 111(63.1%) of respondents admitted that Jakaya Kikwete Cardiac Institute has enough nurses which is good for patients.

4.4 Cost Effective Medication in Improving Efficiency of Jakaya Kikwete Cardiac Institute

The study examined the influence of cost-effective medication in improving efficiency of Jakaya Kikwete Cardiac Institute. The researcher focused on consultation fee, laboratory tests affordability, cost of surgical procedures, cost of medicine and if At JKCI there is affordable diagnostic cardiac procedures. The study found 88(50.0%) of all respondentsagreed that the consultation fee charge is affordable, 64(36.4%) neutral on affordability of diagnostic cardiac procedures whereas 33(18.9%) disagreed that diagnostic cardiac procedures are very affordable.The findings imply that most (50.0%) declared that there isaffordable diagnostic cardiac procedures while 36.4% were neither agree nor disagreed, this is an indication that the cost is not so big and so low, furthermore the reason of charging consultation fee is because clients get professional advice. However, these findings differ with key informants' response whopointed out Jakaya Kikwete Cardiac Institute normally charge high consultation fee for outpatients, however it seems that those who complained more are those who pay in cash compared to

thosewith health insurance.

The qualitative findings contradict these findings as

*"This hospital charge high consultation fee for a person who fall under low income category, though for those who have health insurance are not complaining compared to those with no health insurance. It is true that the cost is high but in comparison to other hospitals is low…(**Patient 1, 16/03/2022**)"*

Similar findings were obtained by Oregan and Cullen (2018) reported that patients who receive free care attend more often with a subgroup attending very frequently, this finding suggested that on negative impact of fees on healthcare utilization. In addition to that, Zuberi (2015) revealed that costs charged for consultation and medicines are not fair. The costs are related to registration and diagnosis. In that light it was reported that those costs could not be met by every patient attending the hospital. Furthermore, it was revealed that there are inadequate modern diagnosis facilities at MRH.

Table 4.4: Cost Effective

Statements on cost effective	Disagree	Neutral	Agree
The consultation fee charge is affordable for most of the clients	24(13.7%)	64(36.4%)	88(50.0%)
The laboratory tests are very affordable compared to other institutes	30(16.8%)	39(22.1%)	108(61.1%)
The medicine is at the rate which can be accessed by majority	88(50.0%)	24(13.7%)	64(36.4%)
Surgical procedures offered at JKCI are very affordable compared to other institutes	33(18.9%)	33(18.9%)	109(62.1%)
At JKCI there is affordable diagnostic cardiac procedures	24(13.7%)	40(23.2%)	111(63.1%)

Source: Field Data (2022)

The study also shows108(61.1%) declared that laboratory tests are very affordable compared to other institutes as it less than 300,000. Furthermore, the study found 30(16.8%) disagreed that laboratory tests to be affordable and the remaining 39(22.1%) neither agreed nor disagreed. Also, JKCI offer not only affordable but also advanced technology for diagnosis and treatments of both cardiac and vascular issues. These laboratory tests which are affordable include laboratory work, blood tests, electrocardiogram and echocardiogram.

Furthermore 88(50.0%) disagreed that medicine is at the rate which can be accessed by majority. Likewise, 24(13.7%) neither agreed nor disagreed and the remaining 64(36.4%) declared that medicine is at the rate which is accessible to majority. With these findings, therefore the implication is that the cost of cardiovascular medication is high. As Khanijo et al., 2020) reported that there are variations for some essential cardiovascular medicines. Given the need of prolonged and often, lifelong treatment there is significant potential for cost saving based on chosen brand, highlighting the need for patient as well as prescriber education.

The study also finds 109(62.1%) admitted that surgical procedures offered at JKCI are very affordable compared to other institutes likewise the study revealed 111(63.1%) declared that at JKCI there is affordable diagnostic cardiac procedures. The findings are contrary to Grovet et *al.,* (2020) pointed out that most of hospital charge highly as surgery on the heart or vessels is often used to treat complications of heart diseases when blood isn't reaching the organ tissue, to correct congenital heart disease or to treat valvular heart disease from various causes. Also, the findings contradict the study results done by Makoto and Khera (2020) who revealed surgical

care for cardiovascular diseases is expensive with substantial costs associated with both perioperative care and the long-term health care needs in the postoperative period.

4.5 Availability of Medical Equipments and their influence on Efficiency of Jakaya Kikwete Cardiac Institute

In regards to available medical equipment and their influence on JKCI efficiency, the researcher posed several questions and here respondents were required to jot down and show the level of their agreement and disagreement. The questions based on availability of cathlab, heart lung machines, modern intra aortic balloons pump, ventilation machine and advanced lab machines. The study found 88(50.0%) denied that there is state of art cathlab machine at JKCI, 24(13.7%) neither agreed nor disagreed the availability of state of arts of cathlab machine and the remaining 64(36.4%) declared that there is a state of arts cathlabs machines at JKCI. The finding implies that in this institute there is no enough special imaging equipment used to see the arteries and check how well blood is flowing to and from the heart which affects service provisions.

Similar findings were obtained by Nuhu, Mpambije and Ngusa (2020) revealed that although public-private partnerships are hailed for supplementing the government efforts in provision of health services, institutional arrangements for smooth provision of these services are lacking. Several challenges encumber smooth provision of health services and these include inadequate medical equipment, inadequate resources, ineffective monitoring and evaluation and insufficient consultations between partners.

Table 4.5: Medical Equipment

Medical equipment	Disagree	Neutral	Agree
There is state of arts cathlab machine at JKCI	88(50.0%)	24(13.7%)	64(36.4%)
There is enough heart lung machines	30(16.8%)	39(22.1%)	108(61.1%)
There is enough modern intra aortic balloons pump at JKCI	24(13.7%)	88(50.0%)	64(36.4%)
The institute owns ventilation machines	33(18.9%)	33(18.9%)	109(62.1%)
We have enough advance lab equipment	24(13.7%)	40(23.2%)	111(63.1%)

Source: Field Data (2022)

The study further found there is enough heart lung machines as majority 108(61.1%) admitted. In addition, the study found 109(62.1%) admitted that there is enough ventilation machines, 33(18.9%) disagreed that JKCI do not own ventilation machine and the remaining 33(18.9%) neither agreed nor disagreed. These findings imply that at JKCI there is enough heart lung machines, the reason behind is due to the fact that they are highly used during and after heart surgery to maintain the circulation of blood and the oxygen content of the patient ‘s body. This finding also supported by Taylor (2021) the budget for ministry of health has increased in the past three years and this has enabled JKCI to buy enough heart lung machines, previously performing a heart bypass surgery costs Tsh 27m for a single patients’ abroad and if patients decide to undergo such surgery at JKCI he/she will have to pay between 8m and 10 million.

Regarding modern intra aortic balloons pump at JKCI, the study found mixed feelings as 88(50.0%) were neutral. The implication of the findings is that JKCI has modern intra aortic balloons pumps however it seems there are not enough. An intra

aortic balloon pump is a type of therapeutic device which help to pump more blood if the patient's body fail to pump by itself. Similar findings were obtained by Zuberi (2015) revealed that encounter challenges inadequate medical equipment like intra aortic balloon pumps, inadequate resources, ineffective monitoring and evaluation and insufficient consultations between partners. Lastly the study found at JKCI the laboratory has advanced laboratory equipment such as diagnostic equipment, cobas, ABG machine, biochemistry machine, hematological advanced machine, and advanced fridge for reagent safe keeping.

Also noted that at JKCI there is advanced ultrasound, spirometry, ventilators, defibrillator, hemodynamic monitoring and management which enhance efficiency of JKCI etc. Pham and Vu (2019) show that financial figures were the most important factors influencing on the performance of the hospitals because having enough financial capacity influence availability of enough medical staff, equipment, training etc other factors pointed out by respondents include customer, mission, internal process, availability of medical equipment training and staff development.

4.6 Government Support in Enhancing Efficiency of Jakaya Kikwete Cardiac Institute

Regarding government support and its influence on efficiency of Jakaya Kikwete Cardiac Institute the researcher focused on willingness of the government, budget allocation, government set enough budgets for experts' recruitment and provision of sponsorship to health professionals. The study revealed 88(50.0%) admitted the government is willing to support Jakaya Kikwete Cardiac Institute as it is owned by the government, the reason behind 50.0% is due to the fact that the support of the

government is partially not hundred percent, as some of operation cost are covered by the hospital itself.

These findings are in line with the qualitative results from a key informant, he said

> *"JKCI receive support from the government and for sure this has enabled the institute to grow day by day. Also, the number of patients who are referred abroad for heart related treatments has been reduced by 95 percent.Thanks for thework done by the government. In the past, government used to budget for about TZS 30 million for every patient sent abroad for treatment. Similar patient is now treated at JKCI at an average of 2million….. (**Director Finance and Administration)"***

Table 4.6: Government Support

Government support	Disagree	Neutral	Agree
The government is willing to support JKCI	24(13.7%)	64(36.4%)	88(50.0%)
The government has allocate enough budgets for running the hospital	108(61.1%)	39(22.1%)	30(16.8%)
The government set enough budget for experts recruitment	33(18.9%)	33(18.9%)	109(62.1%)
The government provides sponsorship health professions who go for further studies	111(63.1%)	40(23.2%)	24(13.7%)

Source: Field Data (2022)

Furthermore 108(61.1%) of respondentssaidthat the government has allocated enough budgets for running the hospital, however in the interview with Executive Director of JKCI.

> *"I asked the government to allocate the money used to take the patient abroad to the institute to enable it some of the costs including exemptions to patients who fail to pay bills. As in last one yearTsh 150 million was used to pay bills of people who could not do so. Furthermore the Director pointed out that despite the government providessupport also the institute has also received support from Israel and other stakeholder, as previously the institute could only conduct surgeries by 30 percent but with the support from stakeholders now it is 65 percent of all open heart surgeries are being done by our experts and the remaining 35 percent with assistance of medical teams from abroad…..(**Executive Director JKCI**)."*

Lastly 109(62.1%) declared that the government set enough budgets for health professional experts recruitment. Also 111(63.1%) disagreed that government to provide sponsorship health professions who go for further studies. These findings also supported by interview findings as one patient while responded on how he rate the services provided at JKCI he posited that

> *I have been treated in this hospital for three years now and I see improvement day by day, however there is a need of employing more staff especially doctors and laboratory technologists.Because of shortage of the staff,sometime it takes a whole day to wait laboratory results . I think the government should allocate enough money for recruitment and selections of experts, also have a budget for staff training and development….. (**Patient 2).***

4.7 Regression Analysis of the Influence of each Predictor on Efficiency

4.7.1 Testing of Model Assumptions

4.7.1.1 Multicollinearity

Multicollinearity exists whenever an independent variable is highly correlated with one or more of the other independent variables for r = 0.9 and above (Pallant, 2005). Table 4.7 presents the correlation matrix for independent variables and as revealed, they were not highly correlated, the maximum r =0.443. Therefore, all independent variables were included in the modeling procedure using a multiple linear regression model.

Table 4.7: Multicollinearity

Items			
1. Health professionals	R		
	Sig.		
2. Cost effective medication	R	.324**	
	Sig.	.000	
3. Medical equipment	R	.232**	.443**
	Sig.	.000	.000
4. Government support	R	.232**	.323**
	Sig.	.000	.000

Source: Field Data (2022)

4.4.2 Normality Test and Outliers of the Factors

Table 4.8: Normality of the Four Determinants

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis		Kurtosis critical ratio (c.r)
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error	
Health professionals	176	30	60	45.98	7.257	-.031	.146	-.515	.292	-1.7637
Cost effective medication	176	5.00	27.00	12.0072	7.08284	.995	.146	-.335	.292	-1.14726
Medical equipment	176	1	4	2.80	.714	-.285	.146	.018	.292	0.061644
Government support	176	3.00	17.00	11.0072	8.08284	.995	.146	-.335	.292	-1.14726
Valid N (list wise) 176	176									

Source: Field Data (2022)

The obtained Skewness values of the three factors in this study ranged between -0.285 and 0.995 and kurtosis values ranged between -1.597 and 0.225. The factors of the study were therefore univariate normal as all the skewness values obtained were less than 3 or greater than -3 and all obtained kurtosis values were less than 10 (Kline, 2005). Regarding multivariate normality assessed, the obtained kurtosis critical ratios (c.r)ranged between -1.7637 and 0.770548. The four factors were therefore multivariate normal as all the c.r values were less than 1.96 and greater than -1.96.

The model summary table 4.9 shows the strength of the relationship between the model and JKCI efficiency. R, the multiple correlation coefficients is the linear correlation between the observed and model predicted values of the dependent variable (KJCI efficiency). The Regression (R) square of 55.3% indicates that there is a good model fit since the R square is greater than 50%.

Table 4.9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.746[a]	.557	.553	.627

a. Predictors: (Constant), Health professionals, cost effective medication, medical equipment and government support

Furthermore, the use of p value in the ANOVA output determined whether the differences between some of the means are statistically significant. Table 4.10 shows that p value of 0.000 which indicates that there is significant influence of Health professionals, cost effective medication, medical equipment and government support on Efficiency of JKCI.

Table 4.10: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	186.833	3	62.278	158.555	.000[b]
	Residual	148.865	379	.393		
	Total	335.697	382			

a. Dependent Variable: JKCI efficiency

b. Predictors: (Constant), Health professionals, cost effective medication, medical equipment and government support

Furthermore, the regression analysis output confirmed that there is a significant positive correlation between health professionals, cost effective medication, medical equipment and government support efficiency, as evidenced by the p-value of 0.026 for medical equipment which is less than 0.05. Indicating that there is positive and significant relationship between medical equipment and Efficiency of JKCI. Saunder*et al.,* (2014), recommend that the p-value should be equal to or less than 0.05 to be significant. The regression analysis output confirmed that there is a significant positive relationship between health professionals and efficiency of JKCI a as the p-value is 0.014, which is less than 0.05. Saunder*et al.,* (2014) suggest that

the p-value should be equal to or less than 0.05 to be significant.

Table 4.11: Regression Coefficients' on the influence of each variable on Efficiency of JKCI

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.055	3.527		6.538	.000
	Health professionals	0.203	.107	.241	2.595	.014
	Cost effective medication	0.298	.135	.278	2.205	.038
	Medical equipment	0.188	.120	.195	2.165	.026
	Government support	0.203	.107	.241	2.205	.025

a. Dependent Variable: Efficiency of JKCI

Source: Field Data (2022)

Furthermore, the regression analysis output confirmed that there is a significant positive relationship between cost effective medication and efficiency of JKCI, as the p-value is 0.038, which is less than 0.05, likewise government support was also significant with p value of 0.025, indicating that there is positive and significant relationship between government support and efficiency of Jakaya Kikwete Cardiac Institute.

CHAPTER FIVE

CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This Chapter commences with conclusion and recommendations and winds up with recommendations for as well as areas for further studies. The conclusion was organized based on the specific objectives of the study and recommendations were drawn from the findings.

5.2 Summary of the Major Findings of the Study

The study examined the determinants of efficiency of Jakaya Kikwete Cardiac Institute; specifically the study examined the influence of available health professionals, cost effective medication, medical equipment and government support in enhancing efficiency of Jakaya Kikwete Cardiac Institute. The study employed explanatory research mixed research approach used to explain the causal effect relationship. Quantitative data were collected by the use of structured questionnaire from 176 respondents, furthermore interview guide was used to collect qualitative data from 10 key informants and analysed using frequencies, percentage and multiple regression and qualitative data obtained were analysed using content analysis method. The outcome depicted clearly an observed positive and significant association with health professionals that there is a positive and significant relationship between health professionals, cost effective medication, medical equipment and government support efficiency, as signified with p-value that is less than 0.05.

5.3 Conclusion

Regarding the influence of health professionals on efficiency of Jakaya Kikwete Cardiac Institute, the study concludes that there is positive and significant relationship between health professionals and efficiencyas mortality and morbidity has been reduced, also pool of specialists established, also other health centers have been capacitated to assist the institute. On the influence of cost effective medication on the efficiency of JKCI, the study conclude that consultation fee, cost of surgical procedures, diagnostic cardiac procedures and laboratory tests are affordable to many, but the challenge is on the cost of medication. Hence the study conclude the cost of medicine is high and majority of patients complained however in comparison with other institutes such Kilimanjaro Christian Medical Centre(KCMC), Mbeya Referral Hospital, Bugando Medical Centre (BMC) and Muhimbili National Hospital (MNH) it is somehow low.

Regarding the influence of medical equipment on efficiency of JKCI, the regression analysis pointed out that there is positive and significant relationship between medical equipment and efficiency. Fourthly on government support, the study also concludes that there is positive and significant relationship between government support and efficiency of JKCIas mortality and morbidity has been reduced, also pool of specialists established, also other health centers have been capacitated to assist the institute. The study also concludes that the willingness of the government to support JKCI is high, budget allocation, government set enough budget for experts recruitment and provision of sponsorship to health professionals, however the budget allocated was found not to be enough.

5.3 Recommendations

5.3.1 General Recommendations

Based on the findings the following recommendations were drawn. Regarding the influence of health professionals on efficiency of Jakaya Kikwete Cardiac Institute, the study conclude that there is positive and significant relationship between health professionals and efficiency in terms of as mortality and morbidity has been reduced, also pool of specialists established, also other health centers have been capacitated to assist the institute as there is enough cardiologists, per fusionist and nurses but inadequate number of cardiovascular surgeons and anesthesiologists. Hence the study recommends the government to employ more cardiovascular surgeons and cardiovascular anesthesiologists.

On the influence of cost effective medication on the efficiency of JKCI, the study findings recommended that review of the cost of some medicine as the government could subsidize since majority of Tanzanians are poor so they fail to pay for these medicines. Furthermore on the influence of medical equipment on efficiency of JKCI the study recommends the government to increase budget so that the number of cath lab machine and modern intra aortic balloons pump to be added.

5.3.2 Limitations and Areas for Further Studies

The researcher experienced a number of limitations to include; respondents were preoccupied with other responsibilities during the data collection phase thus, the researcher had to reschedule appointments severally to accrue data. Also, the study was limited on only four determinants of efficiency of JKCI to include; availability of health professionals, cost effective medication, medical equipment and

government support and other drivers were beyond the scope of this study. Moreover, the time assigned for the completion of this research project was limited thus; the researcher was compelled to improvise by working on weekends. Furthermore, this study was cross sectional study; hence future study could be longitudinal and conducted in other health-based organizations as the limit of the study was in cardiac institute.

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APPENDICES

OPEN UNIVERSITY OF TANZANIA

APPENDIX 1: QUESTIONNAIRE FOR JKCI EMPLOYEES

I am Maulid Mohamed Kikondo a student of Open University of Tanzania undertaking Masters of Arts in Monitoring and Evaluation. As part of the fulfillment of this study, Iam conducting a research titled **Determinants of Efficiency of Jakaya Kikwete Cardiac Institute (JKCI) in Tanzania.** Therefore these questionnaires are intended to collect information about the subject matter. Information being gathered will be confidential and used solely for academic purposes and not otherwise. Please respond correctly to enable the researcher attain the intended objectives. If you have any questions about the research, or any information and data concerning my research do not hesitate to contact the researcher through his mobile phone, 0684 346518 email.mkikondo@yahoo.com

Thank you for your cooperation to complete this questionnaire.

SECTION A: GENERAL INFORMATION

Please select the answer by placing a tick (V) in the blank box with appropriate options in the following questions

1) Which is your sex ( )Male ( ) Female
2) Which of the following categories describes your age in years? ( )20 – 24 ( )25 – 29 ( )30 – 34 ( )35 – 39 ( )40 – 44 ( )45 – 49 ( )50 +
3) What is your marital status? ( ) Single ( )Married ( )Divorce ( )Separated
4) What is your highest level of education?( )Not attended ( )Primary education ( )Secondary education ( )Technical education ( )University education
6) For how long have you worked with the current employer ( )0-5 ( )6-10 ( )11-15 ( ) Above 15 years

SECTION B: HEALTH PROFESSIONALS

This section seeks to examine the influence of available health professionals in enhancing efficiency of Jakaya Kikwete Cardiac Institute? Read every statement carefully and indicate your level of agreement or disagreement to each. For convenience, five numerical answers are given besides each statement to include; (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree and (5) Strongly Agree. Encircle the serial number of the answer which is most suitable in your opinion. There is no right or wrong statement. Your answer to each statement is necessary.

	Statement	SD	D	N	A	SA
1	In this institute we have enough Cardiovascular surgeon	1	2	3	4	5
2	At JKCI there is enough cardiologists	1	2	3	4	5
3	At JKCI there is cardiac anesthesiologists	1	2	3	4	5
4	The number of Perfusionist in the hospital meet the client's needs	1	2	3	4	5
5	At JKCI there is enough nurses	1	2	3	4	5

SECTION C: COST EFFECTIVE MEDICATION

This section seeks to examine the influence of cost effective medication in improving efficiency of Jakaya Kikwete Cardiac Institute? Read every statement carefully and indicate your level of agreement or disagreement to each. For convenience, five numerical answers are given besides each statement to include; (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree and (5) strongly Agree. Encircle the serial number of the answer which is most suitable in your opinion. There is no right or wrong statement. Your answer to each statement is necessary.

	Statement	SD	D	N	A	SA
1	The consultation fee charge is affordable for most of the clients	1	2	3	4	5
2	The laboratory tests are very affordable compared to other institutes	1	2	3	4	5
3	The medicine is at the rate which can be accessed by majority	1	2	3	4	5
4	Surgical procedures offered at JKCI are very affordable compared to other institutes	1	2	3	4	5
5	At JKCI there is affordable diagnostic cardiac procedures	1	2	3	4	5

SECTION D: MEDICAL EQUIPMENT

This section seeks examine the influence of availability of medical equipment in improving efficiency of Jakaya Kikwete Cardiac Institute? Read every statement carefully and indicate your level of agreement or disagreement to each. For convenience, five numerical answers are given besides each statement to include; (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree and (5) strongly Agree. Encircle the serial number of the answer which is most suitable in your opinion. There is no right or wrong statement. Your answer to each statement is necessary.

	Statement	SD	D	N	A	SA
1	There is state of arts cathlab machine at JKCI	1	2	3	4	5
2	There is enough heart lung machines	1	2	3	4	5
3	There is enough modern intra aortic balloons pump at JKCI	1	2	3	4	5
4	The institute owns ventilation machines	1	2	3	4	5
5	We have enough advance lab equipment	1	2	3	4	5

SECTION E: GOVERNMENT SUPPORT

Read every statement carefully and indicate your level of agreement or disagreement to each. For convenience, five numerical answers are given besides each statement to include; (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4)

Agree and (5) Strongly Agree. Encircle the serial number of the answer which is most suitable in your opinion. There is no right or wrong statement. Your answer to each statement is necessary

	Statement	SD	D	N	A	SA
1	The government is willing to support JKCI	1	2	3	4	5
2	The government has allocate enough budgets for running the hospital	1	2	3	4	5
3	The government set enough budget for experts recruitment	1	2	3	4	5
4	The government provides sponsorship health professions who go for further studies	1	2	3	4	5

SECTION F: EFFICIENY

Read every statement carefully and indicate your level of agreement or disagreement to each. For convenience, five numerical answers are given besides each statement to include; (1) Strongly Disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree and (5) Strongly Agree. Encircle the serial number of the answer which is most suitable in your opinion. There is no right or wrong statement. Your answer to each statement is necessary

	Statement	SD	D	N	A	SA
1	Services provided at JKCI are on time	1	2	3	4	5
2	Survival rate of clients is increasing	1	2	3	4	5
3	Reasonable emergency response time	1	2	3	4	5
4	The number of operations conducted increased	1	2	3	4	5
5	The number of successful operations increased every years	1	2	3	4	5
6	The number of clients served by institute keep increasing	1	2	3	4	5

Thank you for your time

INTERVIEW GUIDE FOR PATIENTS

i. How do you rate services provided by Jakaya Kikwete Cardiac Institute?

ii. Do you get the services on time? How about the cost of medication charged by the hospital?

iii. Do you think this hospital has enough staff for serving you?

iv. What challenge do you face when you attend clinic at this hospital?

v. What suggestions do you have to improve service at Jakaya Kikwete Cardiac Institute?

INTERVIEW GUIDE FOR EXECUTIVE DIRECTOR AT JKCI

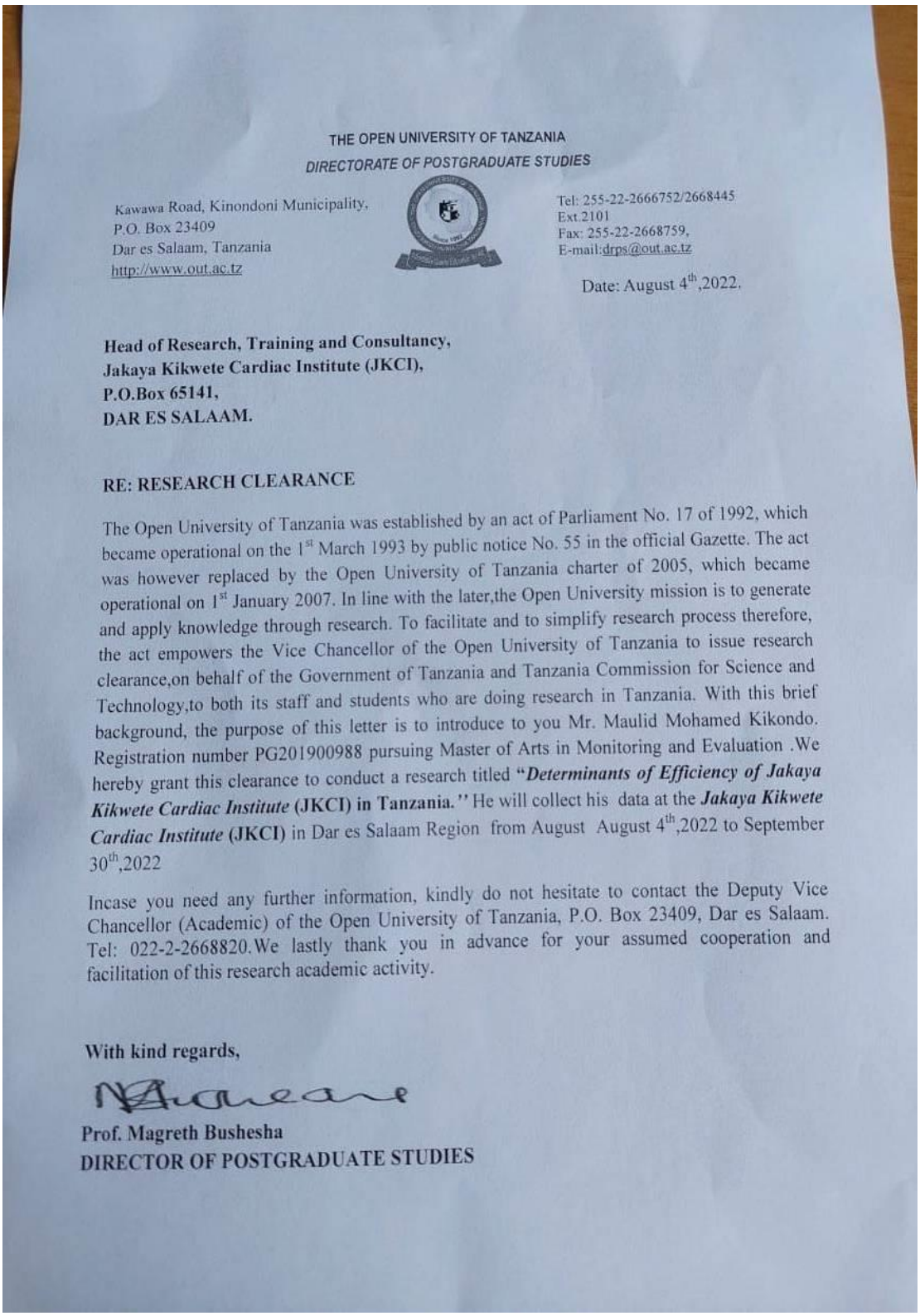
1. How do you see JKCI of now as compared to few years back?

2. What kind of support do you need from the government and other stakeholders who will increase efficiency of this institute?

3. Which challenges do you face in the course of offering services to patients?

4. Which suggestions do you have on the government so that efficiency will be enhanced?

APPENDIX II: CLEARANCE LETTERS



THE OPEN UNIVERSITY OF TANZANIA
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Date: August 4th,2022.

Head of Research, Training and Consultancy,
Jakaya Kikwete Cardiac Institute (JKCI),
P.O.Box 65141,
DAR ES SALAAM.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No. 55 in the official Gazette. The act was however replaced by the Open University of Tanzania charter of 2005, which became operational on 1st January 2007. In line with the later,the Open University mission is to generate and apply knowledge through research. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance,on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology,to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you Mr. Maulid Mohamed Kikondo. Registration number PG201900988 pursuing Master of Arts in Monitoring and Evaluation .We hereby grant this clearance to conduct a research titled **"*Determinants of Efficiency of Jakaya Kikwete Cardiac Institute* (JKCI) in Tanzania."** He will collect his data at the ***Jakaya Kikwete Cardiac Institute*** **(JKCI)** in Dar es Salaam Region from August August 4th,2022 to September 30th,2022

Incase you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O. Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

With kind regards,

Prof. Magreth Bushesha
DIRECTOR OF POSTGRADUATE STUDIES

UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

JAKAYA KIKWETE CARDIAC INSTITUTE (JKCI)

JAKAYA KIKWETE CARDIAC INSTITUTE

In reply please quote; **Ref No: AB.123/307/01H/57** **Date:** 10/08/2022

Maulid Mohamed Kikondo
Reg. No 201900988
Masters of Arts in Monitoring and Evaluation - OUT

RE: PERMISSION TO CONDUCT RESEARCH AT JKCI

Reference is made to your letter request to do research study entitled **"Determinant of Efficiency of Jakaya Kikwete Cardiac Institute Dar es Salaam, Tanzania"** here at JKCI.

This letter serves as an official document that permits you to do the above-mentioned task as per your institution requirement from 04th August to 30th September, 2022 as mentioned on your ethical clearance letter.

It is our sincere hope that you will abide to the rules and regulations of good clinical *practice. We wish you the very best and hope that your stay at JKCI will be fruitful.*

Best Regards,

JAKAYA KIKWETE CARDIAC INSTITUTE P.O.Box 65141 Dar es Salaam JKCI

Dr. Peter Kisenge
Ag: Head of Research, Training and consultancy.