

**QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG PATIENT
WITH CORONARY ARTERY DISEASE WHO UNDERWENT
CORONARY REVASCULARIZATION INTERVENTIONS AT JAKAYA
KIKWETE CARDIAC INSTITUTE**

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**MMed (Internal Medicine) Dissertation
Muhimbili University of Health and Allied Sciences
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**Muhimbili University of Health and Allied Sciences
School of Medicine**



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By

Edith Shose Mlay

**A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of
Masters of Medicine in Internal medicine at**

Muhimbili University of Health and Allied Sciences

October, 2021

CERTIFICATION

The undersigned certifies that they have read and hereby recommend for examination by Muhimbili University of Health and Allied Sciences a dissertation entitled: *“quality of life and associated factors among patients with coronary artery disease who underwent coronary revascularization intervention at Jakaya Kikwete Cardiac Institute”* in partial fulfillment of requirement for the degree of Master of Medicine in Internal Medicine Muhimbili University of Health and Allied Sciences.

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(Co-supervisor)

Date: _____

DECLARATION AND COPYRIGHT

I, **Dr. Edith Shose Mlay**, declare that this, dissertation is my own original work, and has not been accepted for the similar degree award in any University

Signature:.....

Date:.....

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DEDICATION

I dedicate this work to my parents Mr. Didas Mlay and Mrs. Mary Mlay, my son Bryan, my daughter Belinda and the whole family. I am extremely grateful for their moral support and prayers during the entire research period and throughout my studies.

ABSTRACT

Background: Both percutaneous coronary interventions (PCI) and coronary artery bypass graft (CABG) have shown to improve health related quality of life (HRQOL) in terms of physical, emotional, and social functions. This is probably related to reduction of angina symptoms and ischemic complications in patients with coronary artery disease (CAD). To our knowledge, the nature of HRQOL among this group of patients remains unknown in Tanzania.

Objective: We aimed at assessing the quality of life and associated factors following PCI and CABG amongst patients with CAD who attended Jakaya Kikwete Cardiac Institute (JKCI).

Methodology: We conducted a descriptive cross-sectional study amongst patients who underwent PCI and CABG from January 2018 to December 2019 at JKCI. The HRQOL was assessed by using the MacNew heart disease HRQOL questionnaire. The tool has 27 questions, each question has maximum of 7 scores with a total of 189 scores measured as continuous data. The tool assesses each individual in terms of 3 domains. Physical functioning 13 elements, social functioning 13 elements, emotional functioning 14 elements and 5 elements for angina symptoms. One question out of 27 can have more than 2 elements. We used the following mean scoring algorithm: low (≤ 4.9), moderate (5 - 6), high (>6) for the global scale and for physical, emotional and social subscale scores. HRQOL before and after procedure was not assessed, we assessed patients six months to twenty months after the procedure. Clinical data include BMI, RBG, type of procedure, number of vessels involved, comorbidities example; hypertension, diabetes, stroke, heart failure and others were obtained from the patients and the hospital medical records.

Data were analyzed using SPSS version 23. Summary statistics was reported as means with standard deviation for continuous data, inferential statistics and frequency for categorical data. ANOVA and T-Test were used to compare different means of continuous variables. Multiple linear regression model was used to determine factors related to the quality of life in patients underwent coronary interventions.

Results: This study found that, among 424 coronary artery disease patients who attended JKCI between January 2018 and December 2019, 181 patients underwent CABG and PCI. 162(89.5) patients with complete clinical data were included in this study. The mean (SD) age was 66 ± 9 . Male patients were 114(70.4%), 89(54.9%) were residing in Dar es salaam, 105(64.8%) had history of cigarette smoking, 159(98.1%) had health insurance coverage, 128(79%) had body mass index $> 25\text{kg/m}^2$, (138(85%) had diabetes mellitus, and 65(41%) had single vessel involvement, 47(29%) had double vessels involvement, 48(30%) had triple vessels disease.

The internal consistency for the three domains in the MacNew questionnaire (Cronbach's alpha coefficient) was 0.94. An overall HRQOL mean (SD) score was 5.51(0.92). The mean (SD) scores were statistically significant higher in the emotional 5.84(0.68) than social 5.5(0.93) and physical domains 5.01(1.34) { $p < 0.001$ }. CABG has better mean (SD) score as compared to PCI in terms of all domains i.e., emotional 6.12(0.63) vs 5.76(0.67) than social 5.84(0.88) vs 5.40(0.93) and physical domains 5.37(1.46) vs 4.90(1.29) Multiple linear regression analysis revealed that being a resident of Dar es Salaam ($p=0.047$), having a secondary and college education ($p=0.003$ and $p=0.024$ respectively), absence of history of taking alcohol ($p=0.002$), absence of history of cigarette smoking ($p=0.002$), and single vessels involved ($p= 0.003$) were determinants of better quality of life

Conclusion and recommendation

This study showed improvement in QOL with an overall moderate HRQOL scores among patients who underwent PCI and CABG at JKCI. The independent predictors for the better HRQOL were being residing in Dar es Salaam, higher level of education, absence of history of alcohol intake, absence of history of cigarette smoking, and single vessel disease. These factors should be addressed by health care providers while planning for PCI and CABG interventions by providing health education on how to address the modifiable risk factors. Patients who undergoing cardiac interventions should be routinely screened for HRQOL since MacNew was shown to be reliable in our study.

TABLE OF CONTENTS

CERTIFICATION	i
DECLARATION AND COPYRIGHT.....	ii
ACKNOWLEDGEMENTS	iii
DEDICATION.....	iv
ABSTRACT	v
LIST OF TABLES.....	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
OPERATIONAL DEFINITION OF KEY TERMS	xii
CHAPTER ONE.....	1
1.0 INTRODUCTION	1
1.1 Background	1
1.2. Literature Review.....	3
1.2.1 Proportion of patients with CAD undergoing PCI and CABG	3
1.2.2 QOL among patient undergoing PCI and CABG.....	3
1.2.3 Factors Associated with Quality of Life among Patient Undergoing PCI	4
CHAPTER TWO.....	6
2.1. Problem Statement	6
2.2. Conceptual Framework.....	7
2.3. Rationale of the Study.....	8
2.4. Research Question	8
2.5. Objectives	9
2.5.1 Broad objective.	9
2.5.2 Specific Objectives.....	9
CHAPTER THREE	10
3.0 METHODOLOGY	10
3.1 Study design	10
3.2 Study area	10
3.3 Study duration	10
3.4 Study population	10

3.5 Inclusion criteria.....	10
3.6 Exclusion criteria.....	10
3.7 Sample size estimation	10
3.8. Study Variable.....	11
3.8.1 Dependent Variables.....	11
3.8.2 Independent Variables	11
3.9 Sampling Technique and Study Procedure	12
3.10 Data Collecting Tool	12
3.10.1 Patient Interview	12
3.11 Data management and data analysis.....	14
3.12. Ethical Consideration	15
CHAPTER FOUR	16
4.0 RESULTS	16
CHAPTER FIVE	28
5.0. DISCUSSION	28
5.1. Strength of the study	30
5.2. Limitation of the study	30
CHAPTER SIX.....	31
6.0. CONCLUSION AND RECOMMENDATIONS	31
REFERENCES	32
APPENDIX	39
Appendix I: Questionnaire.....	39
Appendix II: Fomu Ya Ridhaa Kwa Kiswahili.....	49
Appendix:III: Informed Consent Form- English Version.....	52

LIST OF TABLES

Table 1: Socio-demographic characteristics of the study participants N=162	17
Table 2: Clinical characteristics of the participants.....	18
Table 3: Mean score and their SD for each domain of quality of life	20
Table 4: Quality-of-life scores among participants	21
Table 5: Comparison of scores in Domains of quality-of-life scale among participants with different clinical characteristics	22
Table 6: Relationship between socio-demographic characteristics of patients and their Quality-of-life scores (Global).....	23
Table 7: Relationship between clinical characteristics of patients and their Quality-of-life scores (Global).....	25
Table 8: Estimated regression coefficients from the multiple linear regression models to predict quality of life from related factors	26

LIST OF FIGURES

Figure 1: Conceptual framework	7
Figure 2: Showing recommended MacNew tool scoring system.	13
Figure 3: Flow chart to show the recruitment of participants.....	16
Figure 4: Domains of quality-of-life scale for patient undergoing PCI and CABG;	19
Figure 5: Comparison between PCI and CABG quality of life score in 3 domains;.....	27

LIST OF ABBREVIATIONS

ACT	Activated Clotting Time
ACS	Acute Coronary Syndrome
BMS	Bare Metal Stent
GBD	Global Burden of Disease
CABG	Coronary artery bypass Graft
CAD	Coronary artery disease
CCS	Chronic Coronary Syndrome
CTO	Chronic Total Occlusion
CVDs	Cardiovascular diseases
DES	Drug Eluting Stent
IMA	Internal Mammary Artery
JKCI	Jakaya Kikwete Cardiac Institute
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and allied Sciences
NYHA	New York Heart Association
PCI	Per cutaneous intervention
POBA	Plain Old Balloon Angioplasty
QOL	Quality of life
RCT	Randomized control trial
SVG	Saphenous Venous Graft

OPERATIONAL DEFINITION OF KEY TERMS

Coronary artery disease (CAD): Is a pathological process characterized by atherosclerotic plaque accumulation in the epicardial arteries, whether obstructive or non-obstructive. Can be categorized as either Chronic Coronary Syndrome (CCS) or Acute Coronary Syndrome (ACS).

Acute coronary syndrome (ACS): Is a constellation of syndromes ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI) or unstable angina. It is associated with rupture of an atherosclerotic plaque and partial or complete thrombosis.

Chronic coronary syndrome (CCS) comprises of six clinical scenarios; 1. Suspected CAD and 'stable' angina, and/or dyspnea, 2. New onset of HF or LV dysfunction and 3. Suspected CAD, 4. Patients with stabilized symptoms 1 year after initial diagnosis or revascularization, 5. Angina and suspected vasospastic or microvascular disease, 6. CAD is detected at screening in asymptomatic patient.

Percutaneous coronary intervention (PCI): Is a minimally invasive procedures used to reestablish blood flow by opening and (stenting) a blocked coronary artery

Coronary Artery Bypass Graft (CABG): Is a surgical procedure to reestablish blood flow by bypassing a blocked coronary artery

Quality of life (QOL): WHO defines quality of life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Cardiovascular diseases (CVD) are number one cause of death globally. WHO estimated 17.9 million deaths (31%) of all death yearly in 2016 were due to CVD. Coronary artery disease (CAD) was the leading cause of all deaths globally, there were an estimated 7.29 million acute myocardial infarctions and 110.55 million prevalent cases of CAD in 2015. Prevalent cases of CAD contribute for a large proportion of prevalent cases of CVD, CAD accounted for almost one-half of all CVD cases in Central Asia and Eastern Europe, but a smaller proportion in Central Europe, where other cardiovascular and circulatory diseases made up a larger proportion of total cases (1,2) The global burden of CAD was 154 million cases in 2016 representing 32.7% of global burden of cardiovascular disease and 2.2% of overall diseases.(3) CAD was previously considered rare in sub-Saharan Africa(SSA) but now ranks 8th among the leading causes of death in the region(4). The incidence of myocardial infarction is rising in SSA, efforts needs to be done to reduce mortality, interventions for timely reperfusion by PCI and CABG is more important, studies revealed South Africa has 62 health facilities which performs PCI but still it is not accessible to many South Africans (5). A study done by Alice Kaijage et al in Tanzania revealed that among all cardiac patients attended at JKCI 45% are affected by CAD.

Quality of life in patient with coronary artery diseases is impaired and patients with chest pain are underdiagnosed and untreated, smoking and hypercholesterolemia worsens the angina symptoms. Several studies were conducted globally on patients with CAD revealed worse QOL as compared to health individuals(6). Treatment of coronary artery diseases including; medication therapy, Percutaneous Transluminal Coronary Angioplast (PTCA), CABG and PCI, study done by Lukkaren et al “treatment of CAD improves HRQOL in long term” revealed immediate effects of CABG was reduction of chest pain due to restenosis of vascular grafty. CABG improves HRQOL significantly in the first year after the intervention. Better life was experienced after PTCA as compared to before the interventions. The study shows no

significant improvement on the use of medication alone (7). Improvements in chest pain, physical function and emotional elements was observed in several studies including, study on impact of age on improvement in HRQOL 5 years after CABG also in a randomized control trial comparing CABG and PCI (8,9)

Elderly patients have long-term improvement in quality of life comparable with younger patients after PCI. The study done in Wales Hospital in Hong Kong and their research finding suggest that age per se should not deter against revascularization because of sustained benefit in HRQOL(10). A study done in The Netherlands revealed octogenarians have a high mortality risk following PCI, QOL after one year is acceptable with a better mental than physical score. PCI in octogenarians has a positive effect on health perception, with less symptoms of angina pectoris (11). There is an evidence on the significance of one's general health status quality of life [QOL] as a predictor of postoperative outcomes(12).

A study done in Iran showed that patients who underwent PCI experienced higher HRQOL in 6 months after revascularization but over 24 months follow-up no difference was observed between PCI and CABG(13)

It is importance to address the whole aspects of HRQOL. Studies were therefore analyses the overall QOL following PCI and CABG and possible differences of HRQOL by demographic characteristics and cardiac risk factors. Research has identified beneficial physical effects of PCI that may contribute towards a better HRQOL over time (14). A study done by Weintraub et al and Norris et al revealed Improvement in HRQOL after PCI has been identified after 3 months and 1 year respectively(15).

1.2. Literature Review

1.2.1 Proportion of patients with CAD undergoing PCI and CABG

A study done in the United States (US) by Alkhoul et al revealed that out of 12,062,081 patients with CAD admitted in the hospitals between 2003 and 2016, 8,687,338(72.0%) underwent PCI (16). Few studies have been reported on the proportion of patients undergoing PCI in other parts of the world including Sub- Saharan Africa (SSA)(5).

1.2.2 QOL among patient undergoing PCI and CABG

Both CABG and PCI had been shown to improve HRQOL for patient with stable angina with a single vessel or multi vessels coronary artery disease(15). CABG shown improvement after 6 months. At 48 months improvement in HRQOL had been observed for both PCI and CABG interventions(17). Improvement was also observed in diabetic patients with multi vessel disease who underwent revascularization surgery for ACS showed improvement in all three domains of HRQOL. Greater benefits with CABG were observed compared with PCI (15). PCI may present with restenosis and repeated interventions which necessitates delay improvement in HRQOL. However the same QOL levels were experienced by patients who did not develop restenosis(18)

Poor HRQOL after coronary interventions was significantly associated with number of coronary vessels and co-morbidities patients presents with, this was revealed in the 10 years follow up study done by Perrotti et al. similarly Rumsfeld et al reported patient with co-morbidities such as vascular diseases, COPD, hypertension and heart failure had poor HRQOL after the interventions.(19,20)

A randomized, non-blinded, multicenter trial that took place in 50 centers in the United States and Canada involved 2287 patients with stable coronary artery disease on optimum medical therapy alone, or PCI plus optimal medical therapy. Angina-specific health status was assessed using the Seattle Angina Questionnaire. Scores ranged from 0 to 100, with highest scores indicating better health status.

The RAND 36-Item Health Survey was used to assess overall physical and mental function, the study was concluded in patients with stable angina, those treated with PCI and optimal medical management, and those treated with optimal medical management, both groups had marked improvement in HRQOL during follow-up. Initially, those treated with PCI have small incremental benefit vs those treated with medical management alone. After 36 months there was no difference in health status between the two groups(21).

An observation study on predictors of HRQOL benefit after coronary interventions involved 1518 patient with non-acute myocardial infraction using a disease-specific Seattle Angina Questionnaire (SAQ) to quantify the impact of patient's coronary artery disease on their quality of life, revealed PCI conferred substantial benefit to the population of patients who underwent the procedures. (22)

A meta-analysis of 14 randomized, controlled trials of PCI versus medical therapy in 7,818 patients enrolled from 1987–2005 showed that complete angina relief was superior with PCI (odds ratio: 1.69, 95% confidence interval: 1.24–2.30) (23).

1.2.3 Factors Associated with Quality of Life among Patient Undergoing PCI

A study done in Iran on factors associated with quality of life in patient who underwent Coronary angioplasty from 2015-2016 among patients who were beyond 3 months post procedure, results revealed multiple vessels involved and number of other comorbidities were the mostly releant factors associated with low HRQOL after the interventions. A self-structured questionnaire that includes factors associated with HRQOL the MacNew questionnaire was used to assess those patients. The study concluded that health workers should educate patients on the outcome regarding lifestyle modification on the particular associated factors(13,24).

The study done in Rasht, Iran well defines the factors associated with HRQOL and a number of risk incidence have been developed for the prediction of QOL(23), Low QOL had been observed in female as compared to men, women's perceptions of the symptoms has been considered for the difference, the similar study revealed higher the level of education is

associated with good QOL(24). There was no association between marital status and QOL had been observed, similar study revealed people who were unemployed had lower quality of life after the intervention(24).

There was a relationship between smoking and poor quality of life. Smoking increases the risk of myocardial infarction and mortality in patients with CAD, especially after coronary interventions as it limits vascular reconstruction and the maintenance of coronary blood flow by creating microvascular endothelial dysfunction, it is also lower patient's ability to exercise after angioplasty. Thus, the study concludes that smoking can reduce QOL of patients after coronary interventions similar study revealed patients with single vessel involvement had higher QOL than those with multiple vessels involvement. Other comorbidities like heart failure, diabetes, hypertension and dyslipidemias had worsens the prognosis(20,24).

A study done by Nazila et al and Abdulhusein et al in Nasht Iran Revealed that the most effective treatment of MI is primary PCI, The PCI results in a reduction of reinfarction rate, shorter hospitalization, and decreased mortality. Nevertheless, the progress and high success rate of the treatment is influenced by many factors such as age, renal function, left ventricular function, and anatomical complexity of coronary artery disease(25). Patients' experiences play a significant role in the successful outcomes of angioplasty. In addition to raising physical problems, diagnosis of acute MI leads to a significant disorder in the patients' psychological condition including anxiety, depression, and uncertainty about the future. In addition, as an invasive procedure, angioplasty causes stress and anxiety in patients (9, 10).

A study done in Kano Nigeria revealed that (63.7%) of the subjects who underwent coronary interventions between 61-80 years, 47.5% had no education, other factors like hypertensive disorders, depressive disorders and history of cigarette smoking were the major contributing factors to poor HRQOL. The study concluded that there is reduced QOL n patient with CAD(26).

CHAPTER TWO

2.1. Problem Statement

Worldwide there is an increased burden of CAD and increase in number of patients undergoing PCI and CABG. In recent years the prevalence of CAD in SSA has increased greatly and is stated to have doubled by the year 2020(27). PCI and CABG have shown to reduce mortality. However, 42% of patients with CAD in Africa receive reperfusion therapy (5). Despite this, and to our knowledge studies in our setting on HRQOL and associated factors following PCI and CABG have not extensively investigated.

The effects of PCI and CABG on functional status and HRQOL are important factor for doctors to plan for interventions and patients decisions, especially when both treatments options are available for patients with single or multiple-vessel CAD undergoing revascularization intervention (17).

2.2. Conceptual Framework

Self-constructed conceptual frame work showing the quality of life improvements among patients receiving PCI and CABG at JKCI(24)(20).

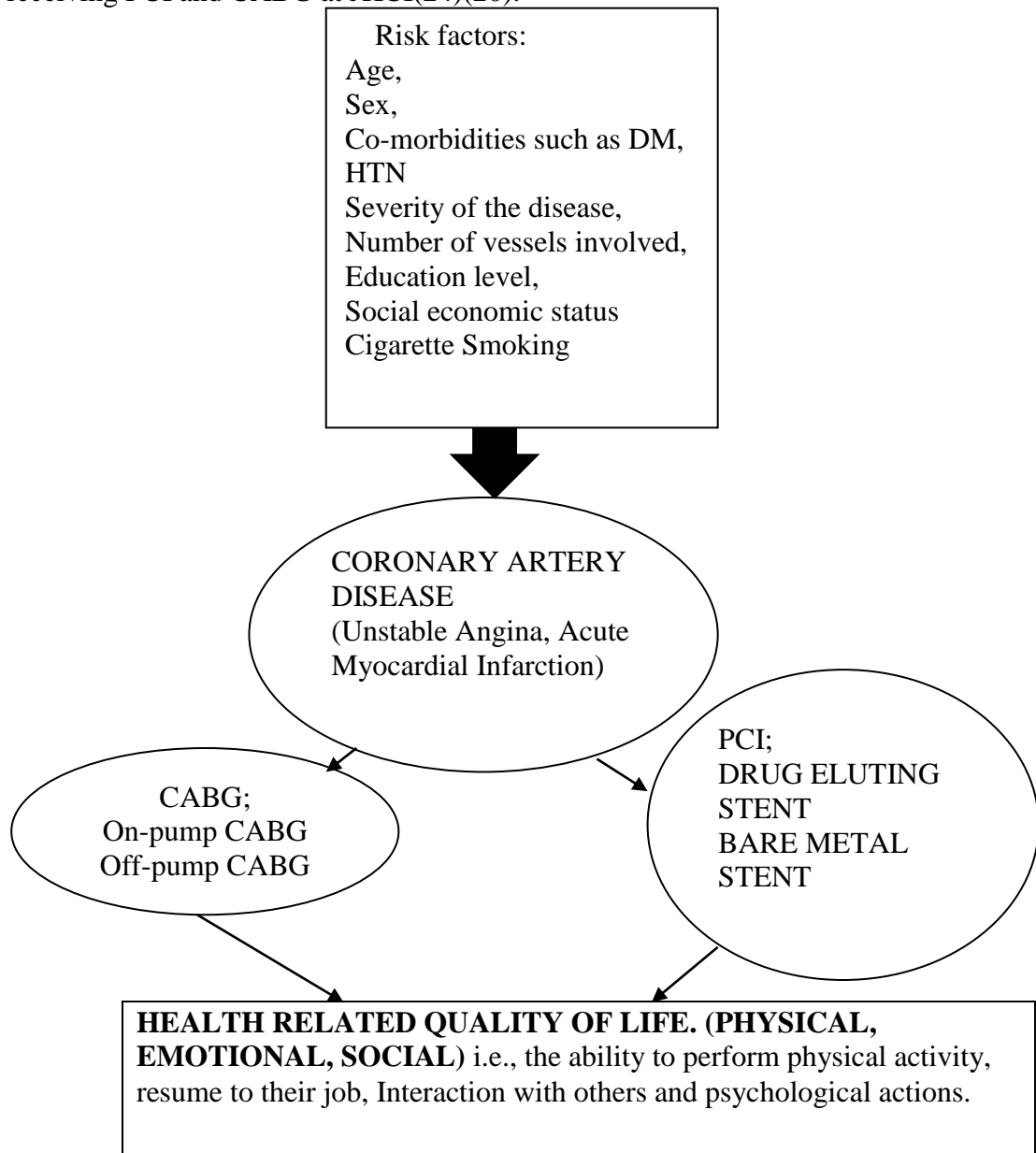


Figure 1: Conceptual framework

The conceptual framework model (figure 1) defined the overall risk-process-structure-outcomes relationship. In this model, the dimensions of patient-related risk factors for cardiac interventions included severity of cardiac disease, co-morbidity, general health status, and demographic/socioeconomic factors. HRQOL as a broad concept with subjective and objective components. Subjective component is referred to as well-being, the objective component is represented by functional status. The dimensions of the patient's preoperative status included severity of CAD, comorbidities, general health status and demographic/socioeconomic factors. The dimensions of the intervention outcomes for CABG and PCI includes QOL (well-being and functional status in three domains that is Physical, Emotional and Social) in terms of physical activities, psychological actions and interaction with others(28).

2.3. Rationale of the Study

Evaluation of HRQOL post PCI and CABG and factors associated with HRQOL improvement will enable health workers to understand process of recovery and develop strategies for patient management. This study serves to evaluate the HRQOL and its associated factors among patient who underwent PCI and CABG at JKCI. It provides reliable information concerning the HRQOL and its associated factors, effectiveness of the procedure, the challenges and expectations to the patients were revealed, hence an influence on modality of patient care post procedure are anticipated. HRQOL and its associated factors has not been extensively investigated in Tanzania among CAD patients post PCI and CABG. This study will shed light on improving HRQOL in CAD patients post PCI and CABG in Tanzania.

2.4. Research Question

- i. What is the HRQOL of patients who underwent PCI and CABG at JKCI
- ii. What are the associated factors that influence the HRQOL after PCI and CABG at JKCI

2.5. Objectives

2.5.1 Broad objective.

Assessment of quality of life and associated factors following percutaneous coronary intervention and coronary bypass graft at JKCI Institute.

2.5.2 Specific Objectives

1. To determine the proportion of patients who underwent percutaneous coronary intervention and coronary artery bypass graft among patients with CAD at JKCI from January 2018 to December 2019.
2. To assess quality of life following PCI and CABG procedures done at JKCI from January 2018 to December 2019
3. To determine factors influencing QOL among patients following PCI and CABG done at JKCI from January 2018 to December 2019

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

Descriptive cross-sectional study

3.2 Study area

The study was conducted at Jakaya Kikwete Cardiac Institute (JKCI). The facility is located in Muhimbili national hospital Dar-es-salaam Tanzania. JKCI is a National Specialized and University Teaching Hospital offering cardiovascular care, training and research services. JKCI conducts an average of 10 to 12 PCI procedures monthly and 1 or 0 procedure of CABG.

3.3 Study duration

The study took a period of 6 month from July 2020 to December 2020.

3.4 Study population

All patients with Coronary artery disease who underwent PCI and CABG procedures

3.5 Inclusion criteria

Age ≥ 35 years

3.6 Exclusion criteria

Cognitive impairment.

3.7 Sample size estimation

$$n = Z^2 \frac{\sigma^2}{\xi^2}$$

$$\xi^2$$

Where

Z = level of confidence (1.96 for 95% CI)

σ = standard deviation in the population

ε = margin of error = 3

σ from previous study =15.99

(This standard deviation was obtained from a similar study done in Iran (24))

$$n = \frac{1.96^2 \times 15.99^2}{3^2}$$

$$3^2$$

$n = 109$.

The minimum sample size was 110 to achieve more accuracy and reliable results.

3.8. Study Variable

3.8.1 Dependent Variables

The dependent variable in this study is HRQOL as assessed by the use of MACNEW Questionnaire, which comprises of three domains: physical functioning (ability to perform Physical exercise), emotional functioning (example is the patient feels depressed?) and social functioning (is the patient able to interact with friends?)

3.8.2 Independent Variables

These includes demographic factors; age, sex, level of education, occupation, social economic status, residency, marital status, living condition, family support, number of atherosclerotic-vessels involved, comorbidities i.e., diabetes, hypertension, higher BMI, family history of the diseases heart diseases and mental disorders, hospitalization after PCI, Life style, cigarette smoking and alcohol intake.

3.9 Sampling Technique and Study Procedure

This cross-sectional study was conducted to patients who underwent PCI and CABG at JKCI between Jan 2018 and Dec 2019, patients were interviewed 6 to 24 months after the procedure as they came to their routine clinic visits or a telephone interview was conducted for those who were not able to come. Data was filled in a MACNEW questionnaire, using patients' medical records and statements, information on the factors related to the disease was obtained, contact were obtained from JKCI database medical records system. After obtaining ethical approval and a written informed consent or in words for those who could not read and by voice recording for those who were not in Dar es salaam, the participants were asked questions from the questionnaire, and information pertaining to the factors related to their illness was obtained.

All patients who had been treated with PCI and CABG procedure from January 2018 to December 2019 and who met the inclusion criteria and consented to participate in the study were included.

3.10 Data Collecting Tool

3.10.1 Patient Interview

MACNEW TOOL: The MacNew tool is a modification of the “quality of life after myocardial infarction questionnaire” it is well documented, validated and tested for reliability and used to assess the HRQOL for patients with angina pectoris, myocardial infarction, arrhythmia, heart failure as well as for several cardiology interventions like PCI, CABG, pacemaker implants, and heart valve surgeries(28). This tool has been validated and translated in about 20 languages. The questions were translated to Kiswahili at the University of Dar es salaam, department of Kiswahili studies. A pilot study was conducted in a sample of 16 patients to ascertain the applicability of this tool in Kiswahili language and the response were satisfactory. MacNew has 27 items to be tested and scored from 1(poor HRQOL) to 7(high HRQOL) it has three domains; physical functioning-13 items, emotional function-14 items and social function-13 items, 5 questions on the physical functioning subscale evaluate the

angina symptom (one question can assess more than 2 domains). Overall score ranges from 27 to 189 therefore QOL was measured in terms of continuous variable. Patients were assessed for HRQOL in terms of each domain separately, and later on the global finding were calculated, in each domain patient cannot score mean value of more than 7. HRQOL was categorized as low (mean score <4.9) moderate (mean score between 5 and 6) and high (mean score >6)



Recommended Scoring System

Item	Emotional	Physical	Social
1. Frustrated	✓		
2. Worthless	✓		
3. Confident	✓		✓
4. Down in the dumps	✓		
5. Relaxed	✓		
6. Worn Out	✓	✓	
7. Happy with Personal Life	✓		
8. Restless	✓		
9. Short of Breath		✓	
10. Tearful	✓		
11. More Dependent			✓
12. Social Activities	✓	✓	✓
13. Others/less Confidence in you	✓		✓
14. Chest Pain		✓	✓
15. Lack Self-Confidence	✓		✓
16. Aching Legs		✓	
17. Sports/Exercise Limited		✓	✓
18. Frightened	✓		
19. Dizzy/Lightheaded		✓	
20. Restricted or Limited		✓	✓
21. Unsure about Exercise		✓	✓
22. Overprotective Family			✓
23. Burden on Others	✓		✓
24. Excluded		✓	✓
25. Unable to Socialise		✓	✓
26. Physically Restricted		✓	✓
27. Sexual Intercourse		✓	✓

1. Ticks show domains to which the items contribute.
2. The maximum possible score in any domain is 7 and the minimum is 1.
3. The Emotional Score is calculated as the average of the 14 item responses which contribute to the Emotional domain shown in the above table, the Physical Score is the average of 13 responses and the Social Score is the average of 13 responses.
4. Missing responses do not contribute to the Score. For example, if only 10 of the 14 Emotional items are answered, the Emotional Score is the average of 10 responses. At least 50% of items must have a score for a domain score to be calculated.
5. If desired, a Global Score can be calculated as the average over all items.
6. Item 27, 'Sexual intercourse', may be excluded in the Physical domain.

Figure 2: Showing recommended MacNew tool scoring system.

3.11 Data management and data analysis

Each study participant was administered in a MacNew questionnaire

The questionnaire was reviewed for its clarity/completeness and appropriate coding prior to data entry through SPSS version 23, the scores from the questionnaire were continuous variable data.

Data was analyzed using the SPSS statistical software version 23. Summary statistics was reported as means with standard deviation for continuous data, inferential statistics and frequencies with percentages for categorical data. Association between type of procedures and QOL was done in comparing mean scores and independent T-test, ANOVA, Pearson's correlation coefficient and multiple linear regression model to determine factors associated with quality of life and p -value less than 0.05 were considered statistically significant. The data obtained from the questionnaires was entered electronically in statistical package of social sciences SPSS version 23 for data analysis. Cross checking of filled questionnaires for quality control of data was done.

Quantitative variables in the study include; age, duration of time prior to PCI and CABG were presented by frequency distribution tables. Qualitative variables, sex, residency, level of education, occupation, number of vessels involved were presented by frequency distribution tables. Factors associated with disease were selected through the literature review. After collecting data, the descriptive (mean, standard deviation, and frequency distribution table) and inferential statistics (T -test, ANOVA, Pearson's correlation coefficient, and multiple linear regression model) were used to determine factors related to the quality of life in patients undergoing coronary interventions.

Bar charts were used to present results. Comparison of categorical variables between groups was performed using fisher exact T-test. Analysis of variance (ANOVA) was used for the comparison of means between multiple groups. Multiple linear regression analysis was used to determine association between quality of life and binary variables. The level of significance used was $p=0.05$.

3.12. Ethical Consideration

Ethical clearance was obtained from MUHAS research ethical committee and JKCI. Informed consent obtained from all participants before data collection. Patients who agreed to participate through their informed consent were enrolled in the study.

Enrolled study subjects had the right to decline answering any questions and withdraw from the study at any point and their decisions were respected, level of confidentiality was maintained throughout the study.

CHAPTER FOUR

4.0 RESULTS

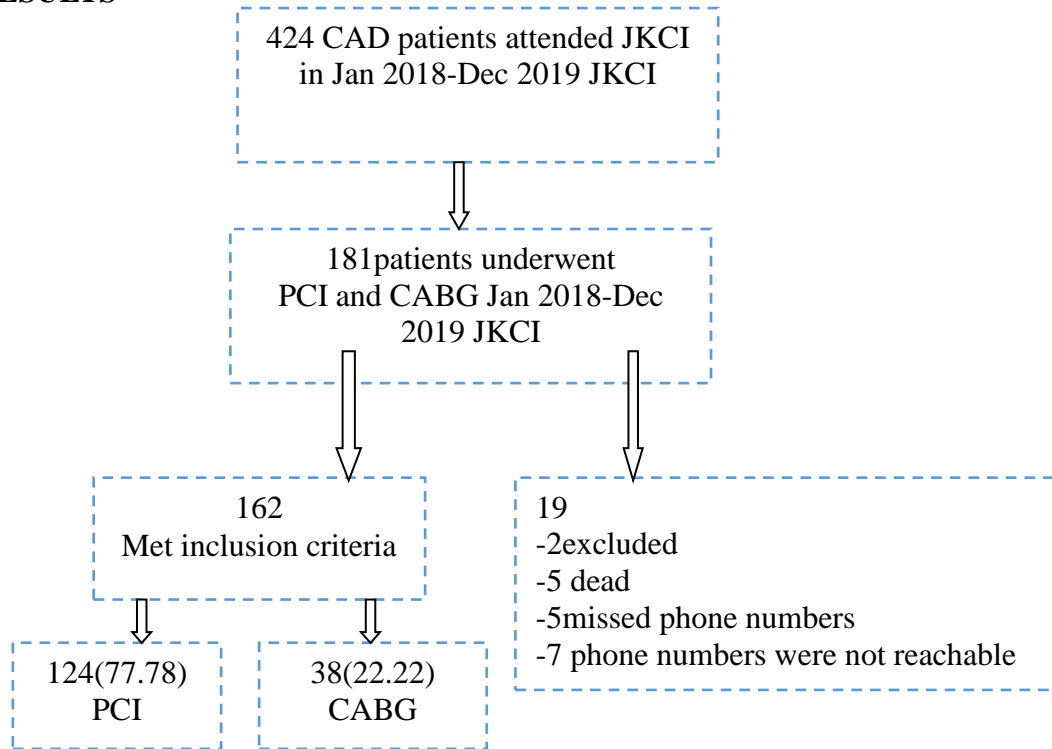


Figure 3: Flow chart to show the recruitment of participants.

Validity and reliability of the tool

Reliability was tested to assess the health-related quality of life (HRQOL) by assessing a pilot study done to 16 patients and Cronbach's Alpha coefficient was 0.940.

From January 2018 to December 2019 a total of 424 CAD patients were attended 181 patients undergone interventions, 162(89.5%) met inclusion criteria, among them 124(77.78%) undergone PCI and 38(22.22%) underwent CABG. The mean (SD) age was 66 ± 9 years, majority of patients were male (70.4%), Half of patients who underwent the interventions lives in Dar-es salaam (54.9%), two third of participants had history of cigarette smoking (64.8%), almost all participants were covered by health insurance (98.1%) and only one third of participants have college or university level of education (34.0%) (Table 1).

Table 1: Socio-demographic characteristics of the study participants N=162

Variables	Category	Frequency (n)	Percent (%)
Age group (years)	≤ 60	52	32.1
	>60	110	67.9
Mean age ± Standard deviation (SD) (years)		66 ± 9	
Sex	Male	114	70.4
	Female	48	29.6
Residence	Dar es salaam	89	54.9
	Outside Dar es salaam	73	45.1
Education level	No formal education	3	1.9
	Primary	55	34.0
	Secondary	49	30.2
	College or University	55	34.0
Occupation	Not employed	42	25.9
	Self employed	54	33.3
	Public employment	55	34.0
	Private sector employment	11	6.8
Marital status	Single	12	7.4
	Married	150	92.6
Monthly income	< 100,000	36	22.2
	100,000 – 299,999	53	32.7
	300,000 – 699,999	35	21.6
	700,000 – 1,000,000	23	14.2
	>1,000,000	15	9.3
Payment for medical treatment	Private	3	1.9
	Insurance	159	98.1
Heavy alcohol intake	Yes	60	37.0
	No	102	63.0
History of Cigarette smoking	Yes	105	64.8
	No	57	35.2

One hundred and twenty-eight (79%) of the study participants had BMI ≥ 25 , 65(41%) had single vessel involvement, 47 (29.4%) had double vessels involvement, 48 (30%) had triple vessels involved, 10 (6%) had stroke, 138 (85%) had diabetes and 149 (92%) had Hypertension (Table 2).

Table 2 : Clinical characteristics of the participants

Variable	Category	Frequency (n)
Median pulse rate \pm(IQR)	72 \pm 38	
Median DBP \pm (IQR)mmHg	79 \pm 72	
Median SBP \pm (IQR)mmHg	130 \pm 80	
BMI (kg/m²)	\leq 24.9	34(21)
	\geq 25	128(79)
Number of vessels	One	65(40.6)
	Two	47(29.4)
	Three	48(30.0)
Stroke / TIA	Yes	10(6.2)
	No	152(93.8)
Diabetic mellitus	Yes	138(85.2)
	No	24(14.8)
Hypertension	Yes	149(92.0)
	No	13(8.0)
CKD	Yes	6(3.7)
	No	156(96.3)
Anemia	Yes	6(3.7)
	No	156(96.3)
COPD & Asthma	Yes	3(1.9)
	No	159(98.1)

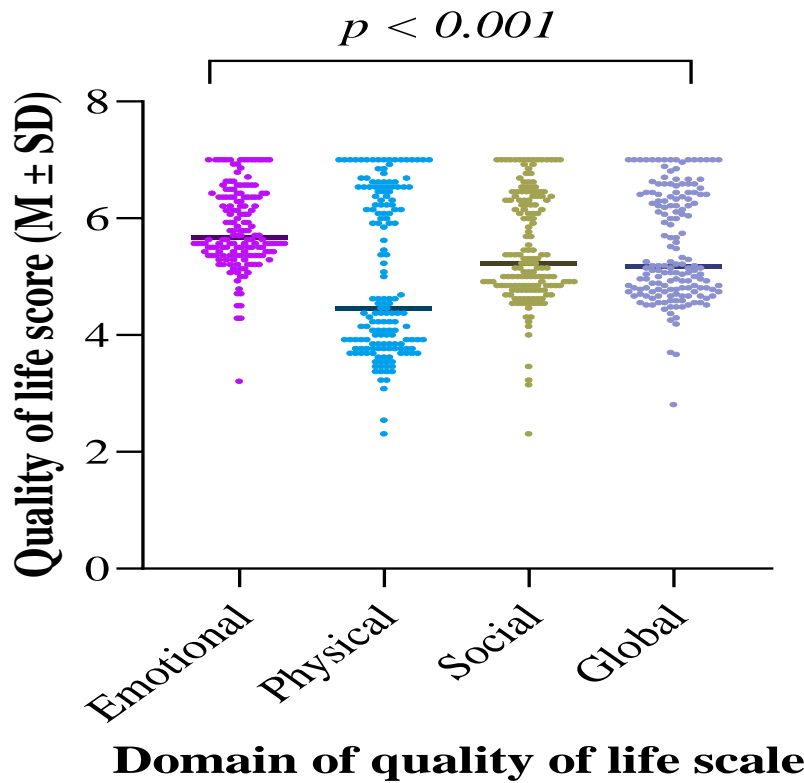


Figure 4: Domains of quality-of-life scale for patient undergoing PCI and CABG;

Overall Quality of life among patients who underwent PCI and CABG at JKCI from January 2018 to December 20 19 was moderate with global score of 5.51(0.92), emotional, social and physical domains both had moderate scores of 5.84(0.68), 5.5(0.93), and 5.01(1.34) respectively. Emotional score was higher as compared to social and physical domains. Figure

Table 3: Mean score and their SD for each domain of quality of life

DOMAIN	MEAN	SD
Emotional	5.84	0.68
Physical	5.01	1.34
Social	5.50	0.93

Patients aged ≤ 60 years of age had presented with better HRQOL across all the three domains of QOL than patients aged >60 years. The mean (SD) scores being 6.03(0.65) VS 5.75(0.68) for emotional domain, 5.35 (1.40) VS 4.85(1.29) for physical domain and 5.75(0.92) VS 5.83 (0.92) for social domain, ($p<0.001$) for all three domains respectively.

The HRQOL was comparable in both sexes, Residents of Dar es salaam had a better quality of life than non-residents mean (SD) scores being 5.97(0.71) VS 5.68(0.60) for emotional domain, 5.27(1.41) VS 4.68(1.18) for physical domain and 5.69(0.97) VS 5.26(0.83) for social domain. Patients who do not take alcohol had better QOL than those who had history of heavy alcohol intake the mean scores are 6.00(0.73) VS 5.58(0.48) for emotional domain, 5.45(1.35) VS 4.25(0.93) for physical domain and 5.73(1.00) VS 5.10(0.65) respectively. Patients with no history of cigarette smoking had better HRQOL than those who had history of cigarette smoking mean (SD) being 6.09(0.78) VS 5.71(0.85) for emotional domain, 5.81(1.19) VS 4.57(1.22) for physical domain and 5.86(1.07) VS 5.30(0.79) for social domain. All with ($p<0.05$) (table 4)

Table 4: Quality-of-life scores among participants

Variables	Emotional		Physical		Social	
	Mean (SD)	P-value	Mean (SD)	P - value	Mean (SD)	P - value
Age group (years)						
≤ 60	6.03 (0.65)	0.014	5.35 (1.40)	0.032	5.75 (0.92)	0.016
>60	5.75 (0.68)		4.85 (1.29)		5.38 (0.92)	
Sex						
Male	5.89 (0.70)	0.144	5.05 (1.35)	0.567	5.55 (0.96)	0.300
Female	5.72 (0.61)		4.92 (1.33)		5.38 (0.87)	
Residence						
Dar es salaam	5.97 (0.71)	0.006	5.27 (1.41)	0.004	5.69 (0.97)	0.003
Outside Dar	5.68 (0.60)		4.68 (1.18)		5.26 (0.83)	
Education						
No to primary	5.58 (0.66)	0.001	4.50 (1.19)	< 0.001	5.11 (0.91)	<0.001
Secondary	6.06 (0.76)		5.55 (1.35)		5.86 (0.98)	
College/University	5.92 (0.53)		5.06 (1.30)		5.59 (0.77)	
Occupation						
Not employed	5.65 (0.79)	0.108	4.58 (1.35)	0.026	5.22 (1.02)	0.097
Self employed	5.86 (0.64)		5.11 (1.35)		5.57 (0.94)	
Public employment	5.99 (0.61)		5.33 (1.25)		5.68 (0.84)	
Private employment	5.74 (0.59)		4.53 (1.36)		5.37 (0.89)	
Marital status						
Married	5.86 (0.69)	0.275	5.05 (1.35)	0.155	5.53 (0.95)	0.40
Not married	5.64 (0.57)		4.54 (1.09)		5.12 (0.66)	
Income (Tsh.)						
<100,000	5.62 (0.67)	0.236	4.66 (1.25)	0.410	5.18 (0.88)	0.199
100,000 - 299,999	5.95 (0.78)		5.23 (1.42)		5.66 (1.05)	
300,000 – 699,999	5.88 (0.56)		4.98 (1.30)		5.54 (0.84)	
700,000 – 1,000,000	5.84 (0.60)		4.99 (1.33)		5.48 (0.90)	
>1,000,000	5.95 (0.60)		5.12 (1.36)		5.63 (0.81)	
Heavy alcohol						
Yes	5.58 (0.48)	< 0.001	4.25 (0.93)	< 0.001	5.10 (0.65)	< 0.001
No	6.00 (0.73)		5.45 (1.35)		5.73 (1.00)	
History of Cigarette smoking						
Yes	5.71 (0.58)	< 0.001	4.57 (1.22)	< 0.001	5.30 (0.79)	0.001
No	6.09 (0.78)		5.81 (1.19)		5.86 (1.07)	

Low mean (SD) score = ≤4.9, Moderate mean (SD)= 5-6, High mean (SD)= >6

Non-diabetic patients had significantly higher HRQOL score than diabetic patients, the scores in emotional domain 6.19(0.62) VS 5.78 (0.67), for physical domain 6.02(0.85) VS 4.83(1.33) and 6.00(0.80) 5.41 (0.93) for social domain respectively. Patients with single vessel disease had high emotional HRQOL scores compared to double and triple vessels diseases, the scores include 6.10(0.70) VS 5.67(0.59) for double vessels and 5.69(0.56) for triple vessels diseases, high score for physical domain was observed and that was 5.31(1.46) VS 4.66(1.25) for double vessels and 4.99(1.18) for triple vessels respectively, High HRQOL score was observed for single vessel involvement compared to multiple vessels disease in social domain 5.82(0.95) VS 5.23(0.88) for double vessels and 5.31(0.87) for ripple vessel respectively), $p < 0.05$. Comparison of HRQOL scores in each domain with clinical characteristics as shown in Table 5

Table 5: Comparison of scores in Domains of quality-of-life scale among participants with different clinical characteristics

Variables	Emotional		Physical		Social	
	Mean (SD)	P-value	Mean (SD)	P - value	Mean (SD)	P – value
BMI (Kg/m ²)						
≥ 25	5.61 (0.41)	0.003	4.42 (1.00)	0.001	5.14 (0.58)	0.001
≤ 24.9	5.90 (0.72)		5.16 (1.38)		5.59 (0.99)	
Number of vessels						
One	6.10 (0.70)	0.001	5.31 (1.46)	0.040	5.82 (0.95)	0.001
Two	5.67 (0.59)		4.66 (1.25)		5.23 (0.88)	
Three	5.69 (0.65)		4.99 (1.18)		5.31 (0.87)	
Stroke						
Yes	5.74 (0.76)	0.606	4.78 (1.34)	0.575	5.16 (1.10)	0.240
No	5.85 (0.68)		5.02 (1.34)		5.52 (0.92)	
Diabetic mellitus						
Yes	5.78 (0.67)	0.006	4.83 (1.33)	< 0.001	5.41 (0.93)	0.004
No	6.19 (0.62)		6.02 (0.85)		6.00 (0.80)	
Hypertension						
Yes	5.86 (0.69)	0.371	5.02 (1.35)	0.787	5.51 (0.95)	0.613
No	5.68 (0.55)		4.91 (1.22)		5.37 (0.76)	

Low mean (SD) score = ≤4.9, Low mean (SD) score = ≤4.9, Moderate mean (SD)= 5-6, High mean (SD)= >6

Patients aged ≤ 60 years had higher HRQOL global scores than patients with >60 years with mean (SD) score of 5.77(0.93) and 5.39 (0.89), respectively with ($p=0.013$, $DF=160$). Similarly, residents of Dar es salaam had higher HRQOL global scores than those from outside Dar es salaam with mean score of 5.69 (0.97) and 5.28 (0.80) respectively ($p=0.004$, $DF=160$). Patients with no history of alcohol use scored higher HRQOL than patients who had history of alcohol use with a global score of 5.78 (0.64) and 5.04 (0.64) respectively ($p<0.001$ and $DF=160$). This study also found patients who are non-smokers had high HRQOL score than those who had history of smoking with mean (SD) of 5.97 (0.93) and 5.26 (0.81) respectively ($p<0.001$ and $DF=160$) (Table6)

Table 6: Relationship between socio-demographic characteristics of patients and their Quality-of-life scores (Global)

Demographic factors	Quality of life		P - value	Test
	Mean \pm SD			
Age group (years)				
≤ 60	5.77 (0.93)		0.013	T-test (DF = 160) T = 2.516
>60	5.39 (0.89)			
Sex				
Male	5.56 (0.94)		0.291	T-test (DF = 160) T = 1.060
Female	5.39 (0.87)			
Residence				
Dar es salaam	5.69 (0.97)		0.004	T-test (DF = 159.894) T = 2.910
Outside Dar es salaam	5.28 (0.80)			
Education levels				
No to primary education	5.14 (0.84)		< 0.001	ANOVA (DF = 161) F = 9.357
Secondary education	5.87 (0.96)			
College or University	5.57 (0.82)			
Occupation				
Not employed	5.22 (0.98)		0.046	ANOVA (DF = 161) F = 2.727
Self employed	5.56 (0.91)			
Public employment	5.72 (0.84)			
Private sector employment	5.26 (0.90)			
Marital status				
Married	5.54 (0.93)		0.099	T-test (DF = 14.659) T = -1.761
Not married	5.17 (0.67)			

Monthly income (Tsh/=)			
< 100,000	5.23 (0.85)	0.294	ANOVA (DF = 161)
100,000 – 299,999	5.66 (1.03)		F = 1.246
300,000 – 699,999	5.52 (0.85)		
700,000 – 1,000,000	5.49 (0.85)		
>1,000,000	5.63 (0.89)		
History of heavy alcohol intake			
Yes	5.04 (0.64)	< 0.001	T-test (DF = 156.774)
No	5.78 (0.95)		T = 5.891
History of cigarette smoking			
Yes	5.26 (0.81)	< 0.001	T-test (DF = 160)
No	5.97 (0.93)		T = 5.104

Key: SD: Standard Deviation, Low mean (SD) score = ≤ 4.9 , Moderate mean (SD)= 5-6, High mean (SD)= >6

The study revealed both patients with BMI ≤ 24.9 had higher scores than those with BMI > 25 with HRQOL global score of 5.61(0.96) and 5.41 (0.61) respectively, $p=0.001$, DF=81.48. Patients with Single vessel disease had higher HRQOL scores as compared to those with multiple vessels diseases, however both patients with single, double and triple vessels involvement had moderate HRQOL global score with means (SD) of 5.97(0.98), 5.27 (0.84) and 5.39 (0.83) respectively p -value 0.006, DF 159. Non diabetes patients had scored higher HRQOL as compared to diabetes patients, although both diabetes and non-diabetes patients had moderate mean (SD) HRQOL global scores of 5.40(0.92) and 6.12 (0.67) respectively $p<0.001$, DF=39.82. (Table 7

Table 7: Relationship between clinical characteristics of patients and their Quality-of-life scores (Global)

Clinical factors	Quality of life		
	Mean \pm SD	P - value	Test
Body Mass Index (BMI) (Kg/m ²)			
>25	5.14 (0.61)	0.001	T-test (DF = 81.476)
\leq 24.9	5.61 (0.96)		T = -3.443
Number of vessels			
One	5.79 (0.98)	0.006	ANOVA (DF = 159)
Two	5.27 (0.84)		F = 5.202
Three	5.39 (0.83)		
Stroke			
Yes	5.33 (0.95)	0.519	T-test (DF = 160)
No	5.52 (0.92)		T = 0.647
Diabetic mellitus			
Yes	5.40 (0.92)	< 0.001	T-test (DF = 39.816)
No	6.12 (0.67)		T = 4.531
Hypertension			
Yes	5.52 (0.93)	0.639	T-test (DF = 160)
No	5.39 (0.80)		T = -0.470

Key: SD: Standard Deviation, Low mean (SD) score = \leq 4.9, Moderate mean (SD)= 5-6, High mean (SD)= $>$ 6

Multiple linear regression model was performed to determine factors which were independently associated or related to HRQOL among patients who underwent PCI and CABG. This study found residents of Dar es salaam had 0.248 increase in HRQOL score (95% CI 0.003 to 0.494, $p=0.047$). Patients with secondary education level had 0.476 increased value in HRQOL score (95% CI 0.05 to 0.66 $p=0.003$). The study also found that for every increase in one unit of alcohol intake in patients with history of alcohol taking they had 0.435 decrease in HRQOL score (95% CI -0.71 to -0.16). The study found for every increase in one number of pack years in patients with history of cigarette smoking had 0.444 decrease in HRQOL score (95%CI -0.72 to -0.17, $p=0.002$). There was significant relationship in every increase in number of vessels involved, there is 0.225 decrease HRQOL score (95% CI-0.37 to -0.08, $p= 0.003$). Residence, heavy alcohol intake, history of cigarette smoking and number of vessels involved, were determinants of HRQOL (Table 8)

Table 8: Estimated regression coefficients from the multiple linear regression models to predict quality of life from related factors

Variables	Unstandardized Coefficients		Standardized Coefficient β	t	95.0% CI		p-value
	B	Standard error			Lower	Upper	
Age \leq 60	0.207	0.133	0.105	1.556	-0.06	0.47	0.122
Sex (Male)	0.131	0.136	0.065	0.969	-0.14	0.40	0.334
Residence (Dar)	0.248	0.124	0.134	2.000	0.003	0.494	0.047
Secondary Education	0.476	0.155	0.239	3.068	0.17	0.78	0.003
College Education	0.353	0.154	0.182	2.287	0.05	0.66	0.024
Self employed	0.050	0.140	0.026	0.357	-0.23	0.33	0.721
Private employment	-0.213	0.260	-0.056	-0.818	-0.73	0.30	0.415
Married	0.192	0.241	0.053	0.798	-0.28	0.67	0.426
Alcohol intake	-0.435	0.141	-0.227	-3.09	-0.71	-0.16	0.002
Cigarette smoking	-0.444	0.139	-0.232	-3.188	-0.72	-0.17	0.002
BMI (\leq 24.9kg/m ²)	-0.202	0.157	-0.089	-1.288	-0.51	0.11	0.200
Multiple vessels	-0.225	0.075	-0.204	-3.004	-0.37	-0.08	0.003
DM	-0.341	0.180	-0.133	-1.891	-0.70	0.02	0.061

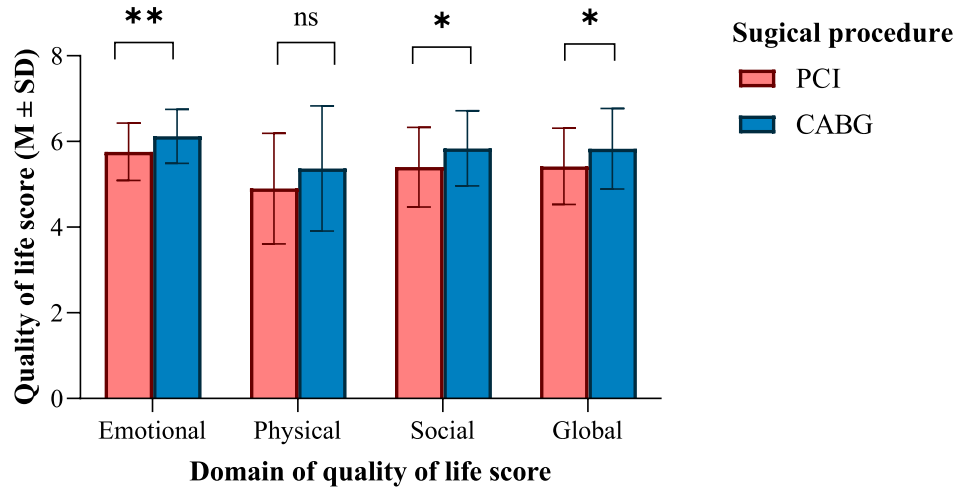


Figure 5: Comparison between PCI and CABG quality of life score in 3 domains;

ns= not statistically significant $p > 0.05$, $*=p \leq 0.05$, $ = p \leq 0.01$, $***= p \leq 0.001$**

Both procedures PCI and CABG had moderate HRQOL score 5.42 (0.89) and 5.83 (0.94) respectively. Patients who underwent CABG had higher HRQOL scores as compared to PCI in all three domains.

CHAPTER FIVE

5.0. DISCUSSION

In our study, a total of 162 patients who underwent PCI and CABG between January 2018 and December 2019, were assessed for health-related quality of life and associated factors. Among which 124(77.8%) underwent PCI while 38(22.2) underwent CABG.

The overall global HRQOL was of moderate for the entire study population, so was emotional, social and physical functioning. This is consistent with findings from a meta-analysis done by Takousi et al on HRQOL after coronary revascularization in 2016, in a total of 34 studies they concluded that PCI and CABG had moderate effects on improving HRQOL(30). Another study done by Mcgrath BM et al in diabetic patients who underwent revascularization surgery, improvement in QOL was observed in all three domains(15). Similarly, Anastasios et al found a postoperative (CABG) improvement in all domains one year after surgery with 45 (80.4%) patients experiencing improvement in HRQOL(24). Moreover, emotional and social domains had higher scores as compared to physical domain, similarly to our findings, Lukkarinen H et al showed a higher HRQoL scores in emotional and social domains followed by physical functioning improvement later on. (31).

Regarding the age of our participants the global HRQOL was found to be moderate in both ≤ 60 years and >60 years, in all three domains, however better QOL was seen in patients with ≤ 60 years as compared to those with >60 years. This finding is consistent with the study done by Pfisterer et al that revealed older patients more than 75 years had low improvement in HRQOL score as compared to younger patients(32), reason being elderly patients have higher prevalence of multiple co-morbidities(33), all of which complicate patient management and their HRQOL improvement(34).

In relation to gender our study revealed that both male's and female's scores were on moderate in all three domains but better QOL were observed in males than female. Similarly a randomized control trial done on effects of PCI on QOL revealed lower QOL scores in females as compared to males(35). Another similar study done by Stefan H et al on cardiac

rehabilitation, long term health related quality of life outcomes; males showed higher improvement as compared to females (36). Blankenship et al on his study, effects of PCI on quality of life he also found males had higher QOL than females(37). In contrast to the study done in Tampere hospital in Finland which revealed similar improvement in quality of life for both male and female patients(38). The difference between males and female can be explained by CABG surgery being associated with incomplete revascularization and high graft occlusion rates in women compared to men; this might not result into symptom relief and lower physical functioning after CABG (39). Also, sex differences in self-reporting of health-related quality of life might also play a role. Women consistently report worse health than men do(40). Probably because of cultural and social aspects associated with sex.

The QOL in non-smokers was found to be higher as compared to past smokers in the current study. Study done by Darvishpour and Welke et al both revealed similar effects with poor HRQOL outcome for cigarette smokers as compared to those who never smoke(24,41).Also a study done in Shanghai-China revealed low scores of persistent smokers as compared to those who never smokers(42).This can be explained by the fact that the effect of tobacco persists up to 5 years after cessation of smoking, in return it increases the risk of atherosclerosis which has effects even after the surgical interventions and reconstruction of the vessels hence poor healing process(24,43).

In this study non diabetic patients were found to score higher compared to diabetic patients in all three domains. This finding is compatible with a veterans randomised controlled trial which revealed diabetes is a predictor of poor outcome in HRQOL(44). A study done by Rumsfeld et al also found diabetes was a predictor of poor HRQOL(44). Also study done by Otso J et al, diabetic patients had low HRQOL as compared to non-diabetic during the first one year after CABG(45).

This study revealed that patients with single-vessel coronary artery disease (CAD) had higher HRQOL score in all three domains as compared to double and triple vessels involvement. This finding was similar to study by Darvishpour et al, which found that patients with single vessels had higher HRQOL than others, another study by Miranda et al, revealed multiple vessel involvement increases procedure complexity especially when the vessels are totally occluded and calcified and these will have implication in healing process and in return affects health related quality of life to these patients (24,46).

The present study findings revealed that elementary to primary education level patients, had low HRQOL scores as compared to those who had secondary to college/university level of education in all three domains. Several studies have similar results; study done by Yazdani et al on comparison of HRQOL after percutaneous coronary intervention and coronary artery bypass surgery found that people with no education/low level of education had poor quality of life after the interventions. Taghadosi et al reported similar findings(13,47). Education level changes peoples' attitude to health which can improve health-related quality of life.

This study revealed that patients who underwent CABG had higher HRQOL scores as compared to those who underwent PCI. Similar results had been observed in a study done by Borkon et al; a study which compared recovery of a health status after PCI and CABG(18). Another study done by Mcrgrath et al, observed that CABG patients had significant improvement in HQOL one year after procedure as compared to PCI patients(15).

5.1. Strength of the study

This is the first study to be conducted in Tanzania, MacNew tool is a disease specific tool it includes questions on specific health problems hence making it more sensitive.

5.2. Limitation of the study

There was no documentation of HRQOL of patients with CAD before and after procedure (baseline HRQOL score). Assessment of HRQOL before CABG and PCI would have assisted us in comparing quality of life before and after procedure.

CHAPTER SIX

6.0. CONCLUSION AND RECOMMENDATIONS

This study showed an overall moderate HRQOL scores among patients who underwent PCI and CABG at JKCI. The independent predictors for the better HRQOL were being residing in Dar es Salaam, higher level of education, no history of alcohol intake, no history of cigarette smoking, and single vessel disease. Health care providers should create awareness to the patients focussing on modifiable factors including proper management of co-morbidities like diabetes and hypertension and lifestyle modification. Given the reliability of the MacNew HRQOL questionnaire shown from this study, we recommend it for routine use in our clinical settings.

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APPENDIX

Appendix I: Questionnaire

Zana za ziada: Nakala ya dodoso la (Utafiti wa) MacNew kama ilivyotafsiriwa na Institute of Kiswahili Studies (TATAKI) at the University of Dar es Salaam

Zana inayohusisha Ubora wa maisha na Afya

Sasa tungependa kukuuliza maswali kadhaa kuhusu jinsi ulivyokuwa ukijihisi katika kipindi cha wiki 2 zilizopita. Tafadhali jaza kisanduku (weka alama katika kisanduku) kinachooana na jibu lako.

1. Kwa ujumla, ni kwa muda gani katika wiki 2 zilizopita ulihisi kuwa na msongo, kukosa uvumilivu au hasira?

- Mara zote
- Mara nyingi sana
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

2. Ni mara ngapi katika kipindi cha wiki 2 zilizopita ulihisi kukosa thamani na kutoridhika?

- Mara zote
- Mara nyingi sana
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

3. Katika wiki 2 zilizopita, ni kwa muda gani ulihisi kujiamini na kuwa na uhakika wa kushughulika na tatizo lako la moyo?

- Hakuna
- Mara chache
- Mara kadhaa
- Mara nyingi
- Mara nyingi sana
- Karibu mara zote
- Mara zote

4. Kwa ujumla, ni kwa muda gani katika kipindi cha wiki 2 zilizopita ulihisi kuvunjwa moyo au kukata tamaai?

- Mara zote
- Mara nyingi sana
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

5. Ni kwa muda gani katika kipindi cha wiki 2 zilizopita ulihisi kuwa na amani na huru bila msongo?

- Hakuna
- Mara chache
- Mara kadhaa
- Mara nyingi
- Mara nyingi sana
- Karibu mara zote
- Mara zote

6. Ni mara ngapi katika kipindi cha wiki 2 zilizopita ulihisi kuchoka na kukosa nguvu?

- Mara zote
- Mara nyingi sana
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

7. Ni kwa kiasi gani katika kipindi cha wiki 2 zilizopita ulihisi maisha yako binafsi kuwa ya furaha, yenye kuridhika?

- Yasiyoridhisha kabisa, na yasiyofurahisha mara nyimbi zaidi
- Yasiyoridhisha, na yasiyofurahisha kwa ujumla
- Yasiyoridhisha, na yasiyofurahisha mara kadhaa
- Yanayoridhisha, na kupendeza kwa ujumla
- Yanayofurahisha mara nyingi
- Yanayofurahisha sana mara nyingi zaidi
- Yanayofurahisha kupita kiasi, lakini hayakuweza kuwa ya kuridhisha au kupendeza

8. Kwa ujumla ni mara ngapi katika kipindi cha wiki 2 zilizopita ulihisi kuhangaika, au kama vile huwezi kutulia?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

9. Ni kwa kiasi gani katika kipindi cha wiki 2 zilizopita ulijisikia kuishiwa na pumzi wakati ukifanya kazi zako za kila siku?

- Niliishiwa na pumzi kwa muda mrefu sana
- Niliishiwa na pumzi kwa muda mfupi sana
- Niliishiwa pumzi kwa muda mfupi
- Niliishiwa na pumzi kwa muda wa wastani
- Niliishiwa na pumzi mara kadhaa
- Niliishiwa na pumzi mara chache
- Hakuna

10. Ni mara ngapi katika wiki 2 zilizopita ulihisi kutokwa machozi, au kulia?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

11. Ni kwa mara ngapi katika kipindi cha wiki 2 zilizopita umejihisi kuwa tegemezi zaidi kuliko hapo awali kabla ya kuwa na tatizo la moyo?

-Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

12. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kuwa huwezi kufanya shughuli za kawaida katika jamii au kufanya shughuli za kijamii na familia yako?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
-Mara chache sana
- Hakuna

13. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kuwa watu wengine hawakuamini kama ilivyokuwa hapo awali kabla ya kupata tatizo la moyo?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

14. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi maumivu ya kifua wakati wa kufanya shughuli za kila siku?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

15. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kutokujiamini mwenyewe?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

16. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umesumbuliwa na maumivu au kuchoka miguu?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

17. Katika kipindi cha wiki 2 zilizopita, ni kwa kiasi gani umeshindwa kufanya michezo au mazoezi ya mwili kutokana na matatizo yako ya moyo?

- Kushindwa kupita kiasi
- Kushindwa sana
- Kushindwa mara nyingi
- Kushindwa kwa wastani
- Kushindwa mara kadhaa
- Kushindwa mara chache
- Hakuna

18. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi hofu au mashaka?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

19. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kizunguzungu?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

20. Kwa ujumla, katika kipindi cha wiki 2 zilizopita ni mara ngapi umezuiwa au kushindwa kama matokeo ya tatizo lako la moyo?

- Kushindwa kupita kiasi
- Kushindwa sana
- Kushindwa mara nyingi
- Kushindwa kwa wastani
- Kushindwa mara kadhaa
- Kushindwa mara chache
- Hakuna

21. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kutokuwa na uhakika wa kiasi cha mazoezi au shughuli za kimwili unazotakiwa kufanya?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

22. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kwamba familia yako imekuwa ikikulinda kwa uangalifu kupita kiasi?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

23. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kuwa mzigo kwa wengine?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

24. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kuondolewa katika kufanya shughuli na watu wengine kutokana na tatizo lako ya moyo?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

25. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi kushindwa kujumuika na wengine kutokana na tatizo lako ya moyo?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna

26. Kwa ujumla, katika kipindi cha wiki 2 zilizopita ni kwa kiasi gani haukuwa sawa kimwili na hata kushindwa kama matokeo ya tatizo lako la moyo?

- Kushindwa kupita kiasi
- Kushindwa sana
- Kushindwa mara nyingi
- Kushindwa kwa wastani
- Kushindwa mara kadhaa
- Kushindwa mara chache
- Hakuna

27. Ni mara ngapi katika kipindi cha wiki 2 zilizopita umehisi tatizo lako la moyo kuingilia au kuwa kikwazo katika kujamiiana na mwenzi wako?

- Mara zote
- Mara nyingi zaidi
- Mara nyingi
- Mara kadhaa
- Mara chache
- Mara chache sana
- Hakuna
- Haihusiani

Appendix II: Fomu Ya Ridhaa Kwa Kiswahili

Ridhaa ya kushiriki katika utafiti wa kuchunguza ubora wa maisha ya wagonjwa waliofanyiwa urekebishaji wa mirija ya damu ya moyo katika hospitali ya JKCI kuanzia Januari 2018 hadi Disemba 2019

Kwa bwana/bibi.....

Tafadhali jina langu ni **Dr EDITH SHOSE MLAY**, mwananfunzi wa udaktari bingwa kutoka idara ya magonjwa ya ndani ya chuo kikuu cha afya na sayansi shirikishi cha Muhimbili. Ninafanya utafiti wa kuchunguza ubora wa maisha ya wagonjwa waliofanyiwa urekebishaji wa mirija yad amu ya moyo katika hospitali ya JKCI kuanzia Januari 2018 hadi Disemba 2019.

Namna ya kushiriki:

Kwa wagonjwa watakaoridhia kushiriki katika utafiti huu watajaza na kusaini fomu ya ridhaa na pia habari zingine kutoka kwenye mafaili yao yaliyopo hospitali ya JKCI

USIRI

Taarifa zote zitakazopatikana kutoka kwako zitatunzwa kwa usiri wa hali ya juu na zitatumika kwa ajili ya utafiti huu na pia kuboresha hali ya kutoa huduma kwa wagonjwa

GHARAMA:

Kutakua hakuna gharama yoyote katika kushiriki kwenye utafiti huu.

Hiyari ya kushiriki na kujitoa

Ushiriki katika utafiti huu ni wa hiyari na pia ni haki yako kujitoa katika utafiti huu muda wowote unapohisi kufanya hivyo. Maamuzi yako ya kuamua kutoshiriki au kujitoa katika utafiti huu hayataathiri haki yako ya kupata huduma na matibabu.

Madhara ya kushiriki utafiti:

Hakuna madhara yeyote yatakayompata mshiriki wa utafiti huu.

Manufaa ya kushiriki utafiti:

Ushiriki wako katika utafiti huu utakuwa na faida kwako kwa kuweza kujua kuhusu ubora wa maisha kwa wagonjwa waliofanyiwa urekebishaji wa mirija yad amu katika moyo

Pia, matokeo ya utafiti huu utakuwa yatasaidia kushauri katika matibabu sahihi kwa wagonjwa waliofanyiwa urekebihsaji wa mirija yad amu katika moyo. Nitashukuru sana kama kwa hiyari yako utaamua kushiriki katika utafiti huu.

Kauli ya Mtafiti:

Mimi mtafiti, nakiri nimemueleweshwa mshiriki wa utafiti huu kuhusu huu utafiti.

Sahihi.....

Tarehe.....

Mawasiliano kwa wahusika:

Kwa maswali au maoni kuhusian na utafiti huu tafadhali wasiliana na wafuatao:

Dr EDITH SHOSE MLAY

Mtafiti mkuu

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AU

Kwa mawasiliano zaidi kuhusiana na haki zako kwenye utafiti huu kama mshiriki, tafadhali wasiliana na:

Mwenyekiti wa tume ya tafiti na uchapishaji wa tafiti

Chuo kikuu cha afya na tiba shirikishi Muhimbila

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Kauli ya Mshiriki

Natoa idhini mwenyewe bila aina yeyote ya kushurutiwa au kulazimishwa kushiriki katika utafiti uliotajwa hapa kuhusu utafiiti wa ubora wa maisha baina ya wagonjwa waliofanyiwa urekebishaji wa mirija yad amu katika moyo katika hospitali ya JKCI. Nafanya hivi baada ya kuelewa taarifa zote nilizoelezwa na Dr EDITH SHOSE MLAY na pia amenijibu na kunieleweshwa zaidi maswali niliyomuuliza.

Nimeelewa kikamilifu kuhusu madhumuni ya hali yake na naelewa kuwa nitaulizwa maswali.

Pia naelewa kujiondoa wakati wowote iwapo nitabadilisha mawazo.

Sahihi ya mshiriki

Saini ya mshiriki

Tarehe

Appendix: III: Informed Consent Form- English Version

Consent to participate to assess the quality of life for patients who underwent percutaneous coronary interventions and coronary artery bypass graft at JKCI from 2018 to 2019.

Dear Sir/Madam

My name is DR EDITH SHOSE MLAY a resident doctor in the department of internal medicine at Muhimbili University of health and allied sciences (MUHAS), I am conducting a research study on the quality of life for patients who underwent percutaneous coronary interventions and coronary artery bypass graft at JKCI from 2018 to 2019.

I hereby request your participation.

Purpose of the study: The aim of this study is to assess the quality of life for patients who underwent percutaneous coronary intervention and coronary artery bypass graft cardiac at JKCI from July to November 2020.

How to participate: Patients who are willing to participate in this study will have to sign a consent form. Short interview will be done and information will be obtained from their files and database at JKCI.

Confidentiality: Information obtained from you will be kept confidential and shall be very helpful in this study as well as promoting better health of patients who underwent percutaneous coronary intervention and coronary artery bypass graft.

Cost: You will not be required to pay any fund in order to participation in this study.

Voluntary participation and the right to withdraw from the study:

Your participation is voluntary and you have the right to withdraw from participating in this study at any time. Whatever your decision may be, it will have no effect in any way to your rights to care and treatment.

Risks: There are no risks involved.

Benefits: Your participation in this study will help you know about the quality of life of patients with cardiac devices and enable health providers to improve their treatment modalities.

I hope that the information from this research will be useful in contributing to improve the quality of your care at JKCI

Contact person:

If you have any inquiries about this study, please do not hesitate to contact:

Dr EDITH SHOSE MLAY

Principal investigator

Muhimbili University of health and Allied Sciences (MUHAS)

Department of Internal medicine

P.O.BOX 65001 Dar-es-salaam

TEL: 0714 258313

OR

DR REUBEN MUTTA

Supervisor of this research

Muhimbili University of Health and Allied Sciences (MUHAS)

Department of Internal medicine

P.O BOX 65001 Dar-es-salaam

Tel.0717 921555

OR

Dr PETER KISENGE

CO-supervisor of this research

Jakaya Kikwete Cardiac Institute

P.O BOX 65001 Dar-es-salaam

Tel.0713 236502

OR

In case of any information about your rights as a participant in this study please contact

The chairperson of Research and Ethical Committee

Muhimbili university of Health and Allied Sciences (MUHAS)

P.O BOX 65001 Dar-es-salaam

Tel.022-2152489

I will be grateful if you willingly agree to participate in this study.

I have understood the above information and my questions have been answered by the investigator to my satisfaction. I willingly agree to take part in this research.

Name of the participant

Signature of the participant Date

.....

Signature of investigator Date