ADHERENCE TO DIETARY PLAN AND ASSOCIATED FACTORS AMONG PATIENTS UNDERGOING MECHANICAL VALVE REPLACEMENT AT JAKAYA KIKWETE CARDIAC INSTITUTE

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ADHERENCE TO DIETARY PLAN AND ASSOCIATED FACTORS AMONG PATIENTS UNDERGOING MECHANICAL VALVE REPLACEMENT AT JAKAYA KIKWETE CARDIAC INSTITUTE.

By

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A Dissertation Submitted in (Partial) Fulfillment of the Requirement for the Degree of Master of Science in Cardiovascular Nursing of

Muhimbili University of Health and Allied Sciences
October, 2024

DECLARATION

The undersigned certifies that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences for the dissertation titled **"Adherence to dietary plan and associated factors among patients undergoing mechanical valve replacement at Jakaya Kikwete Cardiac Institute**", in (partial) fulfillment of the requirements for the degree of Master of science in Cardiovascular Nursing of Muhimbili University of Health and Allied sciences.

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Date

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Co-Supervisor

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Date

DECLARATION AND COPYRIGHT

I, **Ecklia Mazengo**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for similar or any other degree award.

Signature…….Date…….

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DEDICATION

I dedicate this dissertation to my lovely husband, Dr. Pathan M Pathan, for his unwavering support, understanding, and tolerance of my busy academic schedule throughout the course of my master's studies his constant support and encouragement have made this dissertation a success. I extend a special dedication to my beloved father, John Mazengo, and my mother, Rosemary Lucas, whose care and support provided me with a solid educational foundation that has brought me to this level.

ABSTRACT

Background: Dietary plan adherence to patient with mechanical valve replacement remains an integral part of the proper functioning of the new valves and the maintenance of patient's hemodynamics in general. Several factors including patient-level factors, disease factors, and sociodemographic factors are linked with patient's adherence to the dietary plan. Complications associated with non-compliance to the dietary recommendations post heart-valves replacement can be severe and life threatening.

Objectives: This study aimed to determine the level and factors associated with adherence to dietary plan among patients who underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute Dar es Salaam, Tanzania.

Methodology: Cross-sectional study design with quantitative approach was used in this study. The study involved 334 patients with heart-valves replacement in the surgical ward and outpatient clinic at JKCI. Patients were selected by using systematic random sampling technique. Every study participant was interviewed by using interviewer-administered questionnaire to obtain data. Measures such as mean, standard deviation, proportions and regression analysis were used to analyze the data.

Results: About 120 (35.9%) of the respondent were middle-aged (24–44 years old). Two third of the respondents were female 194(58.1%) and 145(43.4%) had primary school education. Furthermore,198 (59.3%) of the respondents were married and the mean weight of the respondents were 66 kg. The majority of the respondents had high adherence to the recommended dietary plan 267 (79.9%) and high awareness of vitamin K rich food and fruits 256 (77.5%). The presence of chronic illness and the unavailability of suitable dietary needs for patients with mechanical valves around the hospital were main challenges facing respondents in following dietary plan as prescribed, 149(50.3%) and 148(50.0%) respectively. Marital status and having insurance were the predictors of the level of adherence to the dietary plan with 95%CI: 1.414-4.213, P=0.001 and 95%CI:4.54-15.79, P=0.001 respectively. Additionally, Knowledge on vitamin K rich food and fruits and who they received the

counselling from had association with adherence to the dietary plan, 95%CI 0.005-0.030, P=0.001 and 95%CI 0.001-0.017, P=0.001 respectively.

Conclusions and recommendations: Study found that patients' adherence to the recommended dietary plan was high. Marital status, having health insurance, knowledge on vitamin K rich food and fruits and health care provider who counsel the patients were significantly associated with level of adherence. Institutional policy advocacy is essential to help availability of suitable diet for in-patients, and multidisciplinary approach in planning individualized dietary plan is needed. Further research, particularly longitudinal studies, can provide deeper insights in monitoring changes in dietary adherence over a period of time and better understanding of causative factors.

Keywords: Adherence, Anticoagulants, Dietary plan, Factors, Mechanical valves.

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LIST OF ABBREVIATIONS

AOR	Adjusted odds ratio
aPTT	Activated Partial Thromboplastin Time
CVDs	Cardiovascular Diseases
ECHO	Electrocardiogram
HIV	Human immunodeficiency virus
INR	International normalized ratio
JKCI	Jakaya Kikwete Cardiac Institute
MNH	Muhimbili national hospital
MOH	Ministry of Health
MUHAS	Muhimbili University of Health and Allied Science
PT	Prothrombin time
PT-INR	Partial Prothrombin- International normalized ratio
RHD	Rheumatic heart disease
SPSS	Statistical Package for the Social Sciences
TTR	Target therapeutic range
VHD	Valvular heart disease
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Adherence: The degree to which an individual's actions align with the predetermined advice from the medical professional (1)

Anticoagulants: A group of medications that decrease the blood ability to clot(2)

Factors: Refer to variables, conditions, or elements that can influence the outcome or results of a study(3)

Mechanical valve: Is a prosthetic device made of durable materials like titanium or carbon(4)

Biological valves: Is a type of prosthetic heart valve made from biological tissues, often sourced from animals like pigs or cows(4)

Valve replacement: Is the medical procedure where a damaged valve is replaced with artificial or biological valve(2)

Dietary plan: Is a structured approach to one’s food intake, outlining the types and amounts of food consumed to meet specific health or fitness goal(5)

CHAPTER ONE: INTRODUCTION

1.1. Background

Cardiovascular diseases (CVDs) are the leading cause of death worldwide, accounting for nearly 18 million deaths per year. (6). The burden of CVDs is even higher with Valvular Heart Diseases (VHDs) with the major manifestation being Rheumatic Heart Disease (RHD) which affects approximately 41 million people worldwide (7). In sub-Saharan Africa, the overall prevalence of VHDs that are caused by RHDs accounts for 5.7 per 1000 individuals (8). One study conducted in Tanzania at a cardiac referral hospital revealed that between 2017 and 2018 all cardiac surgeries, 29.5% and 32.9% of the surgeries respectively were done to correct valvular dysfunction related to RHD (9).

Valvular replacement surgery has emerged as one of the treatment options for patients with valvular disorders and accounts for approximately 2.5 million surgeries yearly. (7). A dietary plan adherence greatly determines the prognosis of a patient's post-surgery health condition. Recommended dietary plan for patients with mechanical heart valves includes foods with low salt, low cholesterol, and adequate protein(10). Also foods with vitamin K are recommended to be maintained in order to prevent coagulation and allow proper functioning of the new valves (5,11,12). The dietary restrictions are communicated to patients and families by healthcare providers during hospitalization, and follow-up is done initially every two to three weeks at outpatient clinics.(5).

Together with diet restrictions clients with mechanical heart valves should adhere to a lifelong anticoagulant(warfarin) therapy to maintain the therapeutic level of International Normalized Ratio (INR) of 2.5- 3.5 (13). Knowledge of dietary intake following the surgery is important. Higher knowledge of the implementation of a dietary plan following heart valve replacement is linked to a lower risk of complications of anticoagulants, reduced hospital stays, reduced readmissions, and proper maintenance of INR levels (2), altogether they lead to improved quality of life among patients (14).

Furthermore, some factors influence adherence to recommended dietary plan among patient who undergone surgery mechanical valve replacement surgery. Some of the factors include cultural background, individual food preferences, level of education, social support, and the need to comply with the lifelong anticoagulant medication(15).

In the context of Tanzania and to the best of my literature search, little is known about what factors influence adherence to dietary plan among patients with mechanical valve replacement, few studies conducted were based on the burden and adherence on oral anticoagulant medications post mechanical valves replacement (9,16), Hence there is need to assess the level of adherence to dietary plan and its associated factors among patients with mechanical valve replacement.

1.2. Problem statement

The major goal after heart valve replacement surgery is to maintain the International Normalized Ratio (INR) within the therapeutic range of 2.5- 3.5 for proper function of the new valves(17). INR is a standardized measure of blood clotting time, often used to monitor effectiveness of oral anticoagulant medications(2). Patients are advised to adhere to the lifelong usage of oral anticoagulant (warfarin) that goes hand in hand with a dietary plan of low sodium, low cholesterol and medium protein but most importantly to maintain regular intake of vitamin K diet as it has direct interference with anticoagulant therapy resulting in a potential adverse effect caused by warfarin toxicity (12).

Studies indicate that there are still significant prevalence of complications due to non-adherence to the dietary plan such as bleeding, valve failure, heart failure, thromboembolism, reoperation and death(15). Knowledge of dietary plan, support system, food preferences, and patients' motivations is important in ensuring effective adherence to the prescribed dietary plan. A study was carried out at Muhimbili National Hospital showed that 20.5% of participants with mechanical valves who are on oral anticoagulant with the recommended dietary plan developed complications such as bleeding and valve failure(16)

Unpublished hospital records from a study conducted at JKCI in 2021 showed that (23%) 45 patients out of 196 who had undergone mechanical valve replacement developed complications that require hospital readmission for close monitoring of INR levels and patient's condition generally with one of the main reasons for the complications being inadequate compliance with the dietary plan (18). However, little has been investigated about the cause of poor adherence. Thus, this study aims to examine factors influencing adherence to dietary plan, among patients who underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute in Dar es Salaam Tanzania.

1.3. Research questions

1. What is the level of adherence to recommended dietary plan among patients with mechanical valve replacement at JKCI?

2. What are the factors associated with adherence to the recommended dietary plan among post-heart valve replacement patients at JKCI?

3. What are the factors hindering adherence to the recommended dietary plan among post-heart valve replacement patients at JKCI?

1.4. Rationale

Information obtained from this research offered an in-depth awareness of the level of adherence to dietary plan and factors that influence adherence to dietary plan recommended to patients with mechanical valve replacement. The information helped to draft recommendations to healthcare providers to improve health education on adherence to the dietary plan provided during discharge and follow-up visits. Additionally, it helped to address barriers that hinder adherence to dietary plan and may help to reduce the risks of warfarin toxicity such as fluctuating INR levels and bleeding tendencies among patients.

Furthermore, findings from this study was aiding to identify and understand factors associated with the adherence to the dietary plan at JKCI and add knowledge to the body of science as well as forming a basis knowledge for future studies.

1.5. Broad objectives

To determine the level of adherence to the recommended dietary plan and factors associated with adherence to dietary plan among patients who underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute Dar es Salaam, Tanzania

1.5.1. Specific objectives

1. To assess the level of adherence to the recommended dietary plan among -post-heart valve replacement patients at JKCI hospital.
2. To assess factors associated with adherence to the recommended dietary plan among post-heart valve replacement patients at JKCI hospital.
3. To assess factors hindering adherence to the recommended dietary plan among post heart valve replacement at JKCI hospital

1.6. Conceptual framework

This conceptual framework was adapted from (19) and formulated through thorough literatures reading. Factors affecting level of adherence to the dietary plan to patients with mechanical valves in this framework refer to all three factors including patient-level factors, disease factors and socio-demographic factors that may affect the level of adherence to the dietary plan.

This conceptual framework showed patient-level factors that were associated with adherence to the dietary plan to patients with valve replacement. These factors included age, gender, occupation, marital status and socio-economic status of patients post mechanical valves replacement. For instance, being young or old, male or female, employed or unemployed, being married or single, influence high or low adherence to the dietary plan among patients with mechanical valve replacement (3,4,19). Patients from low socioeconomic status and young age seemed to be interrelated with patient-level factors and resulted in poor adherence to the plan. Also, personal food preferences, cultural influences and social support were characterized as patient level factors that greatly affected the adherence to the dietary plan.

Also, the framework showed disease factors and how they impact level of adherence to the dietary plan to patients with mechanical valves. These includes all comorbidities that a patient

has in conjunction with the mechanical valves. Presence of comorbidity such as diabetes mellitus, other CVDs, and HIV limits patients on a variety of food choices hence lower adherence level to the dietary plan(20)

Furthermore, adherence to the dietary plan, among patient who have mechanical valve replacement who are on the use of anticoagulants can be improved when factors such as patient-level factors, presence of comorbidity, and sociodemographic are taken into account during the dietary plan formulation. Therefore, these three factors (socio-demographic factors, disease factors and patient-level factors) for this conceptual framework were stated as independent variables, while adherence to dietary plan was denoted as a dependent variable.

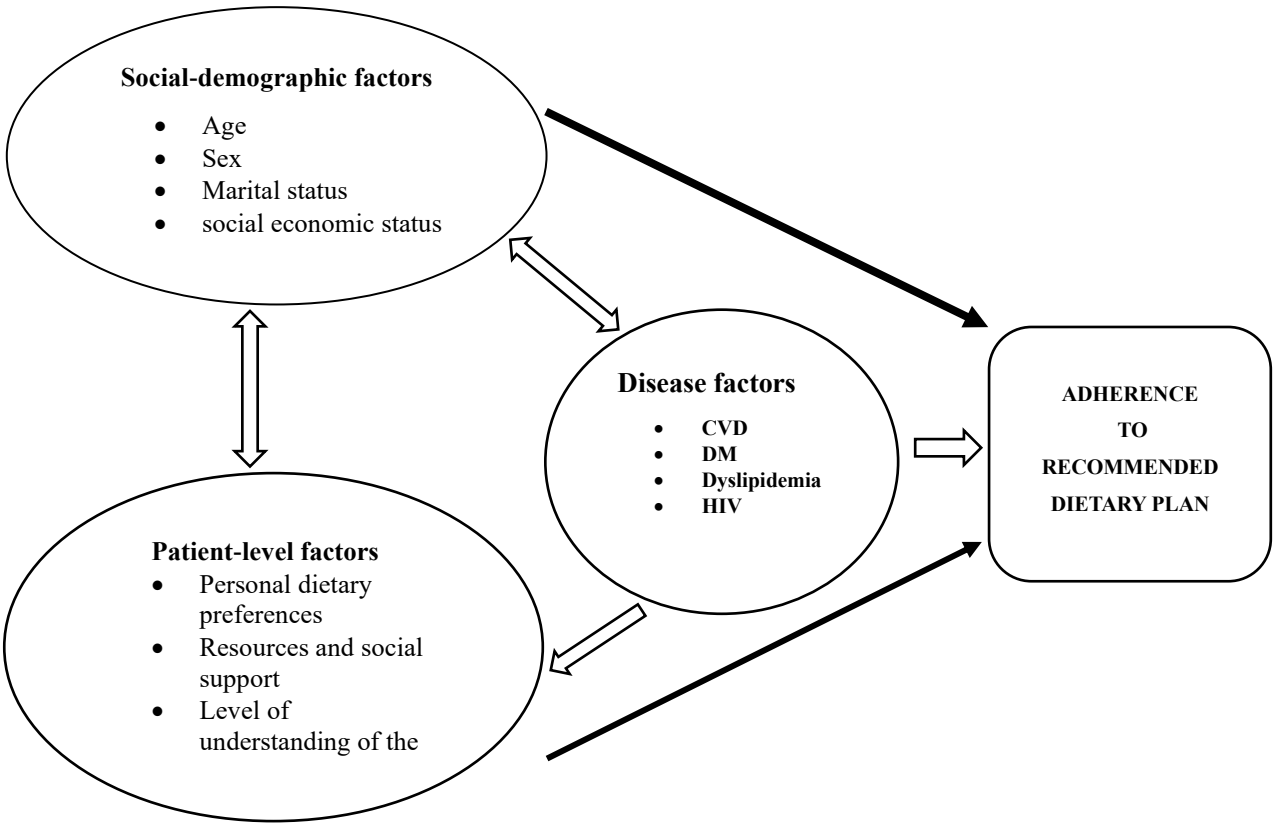


Figure 1: Conceptual framework showing factors affecting adherence to dietary plan.

CHAPTER TWO: LITERATURE REVIEW

2.1. General Overview

Heart valve replacement surgery has been the most chosen treatment option for patients with valvular heart disorders (7). Medications and dietary adherence post-heart valve replacement surgery greatly determine the prognosis of patients. Various benefits of adhering to the dietary recommendations after surgery have been put forward and linked to a good prognosis among patients. (3,21,22).

2.2. Patient level of adherence to recommended dietary plan post mechanical valve replacement surgery

Globally there is still inadequate knowledge in society on the concomitant use of anticoagulants with the proper dietary recommendations after heart valve replacement despite healthcare providers prioritizing health education for patients with heart valve replacement (5). The provision of continuous health education on dietary plans seemed to increase adherence to patients post-valve replacement(12,23).

Patient's level of education, and support system such as family, socioeconomic status, age, and patient food preferences, have a potential implication on the patient's prognosis after surgery. Dieticians together with nurses and doctors must understand the patient's level of understanding and how they perceive the dietary recommendation that is planned for them to adhere to after heart valve replacement(5,12,21).

A study in Belgium was conducted to explore patient outcomes after mechanical heart valve replacement revealed that, there was insufficient awareness among patients on drug-to-food interactions, which led them to adhere poorly to the dietary plan and hence put them at the greatest risk of serious complications such as bleeding thromboembolic events and failure of the replaced valves (1).

In an observational study done in Netherlands, it was observed that low implementation of the dietary plans was associated with inadequate knowledge of various food types that interaction

with anticoagulant therapy which leads, to fluctuating INR levels and bleeding tendencies (23). In Tanzania, dietary health education post valvular surgery is barely explored, a study conducted at MNH revealed that an increase in early mortality rate in patient with replaced valves is associated with complications such as bleeding due to warfarin toxicity which is greatly affected by dietary intake(16).

2.3. Factors enabling adherence to recommended dietary plan post heart valve replacement.

A study done in France about satisfaction and treatment therapy to patient with heart valve disorder showed that high adherence to the dietary plan post valvular surgery was associated with early initiation of therapy, patient involvement in the planning of the diet suitable for them, patient relationship with health care providers and commitment on follow up visits.(15).Hence health education was advised to be individualized and patient-centered(19).

The recommended amount of vitamin K dietary intake for proper valve functioning is 250-500ug/day. Amounts less than the requirement put a patient at risk of bleeding, and excessive intake may cause thromboembolic events (24). Patients of older age, who are married and have regular follow-up visits were reported to experience low complications following mechanical valve replacement (14,25).

A randomized and observational study was conducted to explore the role of dietary vitamin K oral intake with long-term use of warfarin, revealing that the level of knowledge about dietary restriction was associated with adherence to the dietary plan (26). The increase in dietary consumption of vitamin K was linked to a decline in the coagulability of blood since vitamin K has a vital role in activating the coagulation cascade factors and protein (13,26).

Foods rich in vitamin K were advised to be taken in adequacy and consistently to maintain the therapeutic INR level. The amount of food rich in vitamin K such as yellow and green leafy vegetables, spices, avocados in case of fruits were mentioned to be the ones greatly affecting the prothrombin time which in turn determines the functioning of the mechanical valves (11,26).

Patients adhering to the appropriate dietary vitamin K intake were not only observed to maintain the therapeutic INR levels but also had fast wound healing since vitamin K is associated with the activation of protein for bone formation, and vascular restoration and prevents the risk of atherosclerosis (11). Factors such as age, sex, kind of residence, level of education, and the tendency of follow-up visit were highly contributed to the adherence to therapy (14)

2.4. Factors that hinder adherence to recommended dietary plan post heart valve replacement surgery

A study done in the Netherlands showed a high adherence to the dietary recommendations which goes hand in hand with oral anticoagulation medication to patient with replaced heart valve but highlights few indicators associated with nonadherence which were factors such as age, where people of young age and those with poor follow up to their practitioners had poor adherence to the dietary recommendations(21).

Poor dietary follow-up seems to cause deranged levels of coagulation studies and greatly affects the functioning of mechanical valves (27). Postoperatively dietary recommendations together with anticoagulant adherence were mentioned to be of most important and integral part after mechanical valve replacement to reduce the mortality rate after surgery and maintain proper valve functioning (16).

In Japan, a study showed a 14% prevalence of nonadherence to the dietary recommendations planned after valvular replacement surgery was associated with low knowledge level and frequency of daily intake of anticoagulation dosing (22). A recent study done in Egypt reveals emotional state to greater life changes specifically anxiety had a greater impact on nonadherence to the prescribed dietary plan after valvular surgery (3).

Nonadherence to the dietary plan results in prolonged stay in the hospital, readmission to the hospital due to warfarin toxicity, worsening standard of living, and burden of therapy costs. High adherence to the medications, and behavioral lifestyle changes in patients with chronic illness shows reduced rate of hospitalization and health costs (19).

Currently, there aren't many published studies in Tanzania on factors affecting adherence to dietary plans for patients with mechanical valves, Therefore, this study will be conducted to assess various factors associated with adherence to dietary plans and come up with detailed information on the factors influencing adherence and non-adherence to the dietary plan.

CHAPTER THREE: MATERIALS AND METHODS

3.1. Study design

This was a hospital-based descriptive cross-sectional study design to determine level of adherence to dietary plan and the extent to which various factors influence adherence to the dietary plan to patients with mechanical valves. A cross-sectional study design was chosen because of the constraints of limited time provided for data collection, as this type of research design can capture information at a single point in time (28). A quantitative approach was used to address research questions and ensure a large sample size is used to facilitate the generalization of the results.

3.2. Study setting

The study was conducted at Jakaya Kikwete Cardiac Institute which is a public national specialized cardiovascular teaching and research hospital located in the Upanga ward of Ilala district in Dar es Salaam Region of Tanzania. JKCI is still the only referral hospital for cardiovascular diseases in Tanzania, with 157 beds, serving over 1800 outpatients and 100 inpatients weekly (29). The hospital performs a variety of cardiac surgeries including heart valve replacement with approximately 5-10 valve replacement surgeries per week and over 50 patients attending follow visits weekly at outpatient clinic. JKCI being the only public cardiac institute doing various cardiac surgeries currently in Tanzania, made it a perfect choice to conduct this study.

3.3. Study population

Patients admitted with mechanical valve replacement in the surgical unit and those who attend follow-up appointments in the outpatient clinic at JKCI were involved in the study.This population selection was enough to facilitate getting information required to fullfil the objectives of this study. The chosen population is unique since it requires following strict dietary recommendations to effectively manage the functioning of the replaced valves(27).

3.3.1. Inclusion criteria

The study included individuals who were:

- All patients who are at least 18 years old with replaced mechanical heart valves, who receive treatment with oral anticoagulants in the surgical ward and outpatient clinic at JKCI
- Also patients with cormobidities such as other CVDs, DM that contributes more on valvular dysfunction were included in this study
- Patients who are willing and consent to participate in the study

3.3.2. Exclusion criteria

This research did not include patients with the following characteristics

- Patients with severe valvular dysfunction who are critically ill and can not respond to questions asked by the researcher.
- Patients who are too old and can not express themselves.
- Patients who had significant vitamin K food allergies that necessitate a different dietary approach from the one recommended routinely to patients with mechanical valves.

3.4. Sample size

The method of estimating the sample size used was the sample size formula for infinite population

$S= Z^2P(1-P) / M^2$

Where

S= sample size for infinite population

Z= Z score which is 1.96 for confidence interval of 95%

P= Percentage of the target population for infinite population was assumed to be 50% or 0.5

Since there was no published data with prevalence of adherence to dietary plan to patient with mechanical heart valves.

M= Margin of error

Therefore

S=1.96^2X0.5X (1-0.5)/0.05^2 =384.

Therefore, the overall sample size, which was taken into account the 10% non response rate was 422 respondents.

3.5. Sampling method and technique

The study participants were obtained through systematic random sampling, where by it included all eligible patients using oral anticoagulants in conjunction with mechanical valve replacement. Patients were explained the aim of the study and their importance in participation. Patients asked first if they have mechanical valves and if they are on anticoagulant therapy that guided the researcher to point out the intended participants. Number of patients done mechanical valve replacement at JKCI from 2018 is over 1200 according to the hospital data base. 1200 (Number of patients with mechanical valves at JKCI) was divided by 388 (Estimated sample size) and n was obtained to be 3. So, the first participant was randomly picked, then after every 3 patients next was choosen to meet the required sample size.The technique was used in outpatients and inpatient depending on the number of patients available in a day which is approximately 50 patients. After having the number of patients required a standardized interviewer administered questionnaire was introduced after participants consenting to take part in research.

3.6. Data collection tool and procedure

The data collection tool was interviewer-administered questions where the respondent answered questions poses to them from the researcher in a language that a patient can understand better, either English or Swahili. The tool was adapted through extensive literature review of other sources, and modifications were only to meet the requirement of dietary needs available in the local context(3,25,30,31).The questionnaire comprised of about 30 questions with three sections, which are sociodemographic characteristics questions, questions on factors enabling adherance to the dietary plan, and questions on factors hindering adherance to the dietary plan which comprises close-ended questions, open-ended questions, and Likert scale questions. Patients' adherence to the dietary plan was measured by using a 5-point Likert scale, which included

different practice questions with responses, 1 Completely agree 2 Partially agree 3 Neither agree nor disagree, 4 Partially disagree, 5 Completely disagree. Also, a dichotomous scale, 1 Yes, 2 No was used to determine the awareness of vitamin K rich food and fruits. Scores were summed for all questions, and the high score indicated a high dietary plan practice.

3.6.1. Outcome measures

Variables were evaluated throughout this study to observe the effect that a certain exposure had on the dietary habits to a specific study group(15,19). In this study, the independent variables were socio-demographic characteristics, patient-level factors and disease factors. The most important variable that addressed the study question was the primary outcome, Adherence to the recommended dietary plan. The level of adherence was obtained depending to the score an individual got while answering questions on dietary intake of food and fruits that are rich in vitamin k since they have direct effects on mechanical valves functioning. Measurements of weight (in kilograms) and height (in meters) to obtain BMI(Kg/m^2) were taken directly from patient's bedside medical sheets as continuous data. A weight scale called Measuretek was used to measure the respondent's weight and height in each visit for outpatient category and all results were incorporated in patient report. Measuring equipment is validated every after two months, and the last counter-check was done on March 2024 by biomedical department at JKCI in order to reduce instrumental errors.

3.6.2. Validity and reliability

Validity is an extent to which a concept is accurately measured in a quantitative study (30). The validity of the tool can be measured by doing a pre-test before conducting the main study. Therefore, to measure the validity of this study, pre-test was done for 10 respondents where questionnaires was administered to them as recommended (32), who were found in the outpatient clinic at JKCI. This sample size was enough to test the clarity, relevance, and accuracy of the questionnaire and helped a researcher to determine the time a participant use to respond to questions and if the questions were clear. Items which were not clear in the questionnaire were removed, and modifications were made in close consultation with research supervisors and clinicians such as expert dieticians in the institute to ensure consistent understanding among the

participants. Participants used in the pilot study were not included in the main study and analysis.

The degree to which the evaluation tool yields consistent results is known as reliability. This is the stability of measures given to the same individuals at different periods, or using the same standard or comparable sets of questions from the same test, were assessed using reliability estimates (consistency) (30). Cronbach's Alpha tool was used to assess the reliability of the questionnaire. The evaluation was done through the application of the Statistical Package for the Social Sciences (SPSS) during pre-test. Reliability coefficient of this study (Cronbach's alpha) was r=0.74 that showed the tool was consistent, acceptable and relatively free from errors in order to yield a trustworthiness results of the study. It should be noted that the Cronbach's alpha value that is acceptable lies between 0.7 and 0.9 (33).

3.7. Data management and analysis

The data gathered for this study was analyzed Statistical Package for Social Science (SPSS) Version 27. Descriptive results were presented using frequency distribution tables and graphs, which included percentages, frequencies, and averages. Level of adherence to dietary plan was categorized as low and high depending on the score individual respondent get (3) and analyzed used each independent variable found in all three sections of the questionnaire. The association of level of adherence were according to independent variables such as socio-demographic factors, disease factors and patient-level factors.

Binary logistic regression was performed to measure the degree of association between two variables, and then p-value and crude odds ratios at a confidence interval of 95% with a significance level of 5% were reported. In bivariate analysis all variables with p-value <0.02 were considered statistically significant and were then taken to multivariate logistic regression. Multivariate logistic regression analysis was performed where associations between more than two variables to control potential confounding variables and adjusted odds ratio at a confidence level of 95% and significance level of 5% were reported where a p-value of < 0.05 was considered statistically significant.

3.8. Ethical considerations

The ethical approval for this study was obtained from Muhimbili University of Health and Allied Science (MUHAS) Research and Publication ethical committee. Approval was given from MUHAS Institution review board with Reference No: DA.282/298/01.C/2153.Research permission was requested from JKCI Executive Director in charge. Before collecting data, a researcher explained the goals of the study, purpose, benefits, right to participation and freedom to withdraw from participation at any time during data collection without facing consequences or any risk such as declining health services access, or altering relationships with other staff members.

Following the description by the researcher, respondents were informed in advance about maximization of benefits and reduction of risks that may be involved in the study. Respondents were explained the benefits of participating in this study may result in the improvement of knowledge and development of research-based practices that could improve interventions for patients with mechanical valves.

Additionally, respondents who were willing to participate in the study were given written informed consent to sign. Privacy and confidentiality of respondent's information were highly observed by assigning coded numbers their names were not used in the questionnaires for anonymity. Furthermore, by making sure that only the principal investigator received completed questionnaires, confidentiality was observed. Finally, electronic papers were stored in email that only the principal investigator could access with a password, and hard copies of the questionnaire were stored in a secure location and digital copies were stored on a password-protected on personal laptop.

CHAPTER FOUR: RESULTS

4.1 Socio-demographic characteristics of participants

Data was collected from 334 respondents out of the estimated sample size of 422 respondents with a response rate of 80%, 120 (35.9%) were middle-aged (24–44 years old). About two third of the respondents were female 194(58.1%) and 145(43.4%) had primary school education. Furthermore,198 (59.3%) of the respondents were married and the mean weight of the respondents were 66 kg. Only 23 respondents (6.9%) were underweight, with a BMI of less than 18.5 kg/m2. Furthermore, 210 (62.9%) of the respondents reported having health insurance, and 264 (71.0%) reported being financially dependent on family members.

(Table 1).

Table 1: Socio-demographic characteristics of participants

Variable		Mean	Standard deviation	Frequency	Percentage (%)
Age of the participant		44	16		
Age category	0-24 years			51	15.3
	25-44 years			120	35.9
	45-60 years			96	28.7
	61-71years			67	20.1
Gender	Female			194	58.1
	Male			140	41.9
Marital status	Single			136	40.7
	Married			198	59.3
Education status	Never go to school			43	12.9
	Primary education			145	43.4
	Secondary education			100	29.9
	College/University			46	13.8
BMI		24	4		
BMI Category	0-18.5 kg/m^2			23	6.9
	18.6-24.9 kg/m^2			191	57.5

	25.0-29.9 kg/m^2	99	29.8
	30.0kg/$m^2$and above	19	5.7
Income activity	Employed	73	21.9
	Entrepreneur	119	35.6
	Agriculture	26	7.8
	Pensioner	12	3.6
	Unemployed	104	31.1
Insurance category	No insurance	124	37.1
	Having insurance	210	62.9
Other mode of payments	Cash	35	28.2
	Public	83	66.9
	Cost sharing	6	4.8
Breadwinner	Yourself	108	32.4
	Your partner	34	10.2
	Both	112	33.6
	Family members	79	23.7
Having dependent	Yes	264	79.0
	No	70	21.0

4.2. Patient's level of adherence to the recommended dietary plan post-heart valve replacement

Level of adherence to the recommended dietary plan was assessed by using ten (10) Likert scale questions. Respondents They were scored as completely agree, partially agree, neither agree nor disagree, partially disagree, and completely disagree, for a total of 50 marks. Respondents who scored 40(80%) and more were graded to have high adherence to dietary plan, whereas respondents who scored below 40(80%) were regarded to have low adherence to the recommended dietary plan. Based on these classifications, the study found that 269 (80.5%) of study participants had high adherence, while only 65 (19.5%) participants reported having low adherence. The item that scored the lowest was eating green vegetables daily (4.28 out of 5) (Table 2).

Table 2: Level of adherence to the recommended dietary plan percentage scores

Items	SCORE	Score percentage (%)
1.I don't eat green leafy vegetables daily as I want	4.28	85.6
2.I don't exclude green leafy vegetables completely from my daily diet.	4.64	92.8
3.I eat Greenleaf vegetables at the same quantity daily	4.54	90.8
4.Eating too much Greenleaf vegetables resulted to INR variability	4.64	92.8
5.Eating inconsistency amount of legumes foods resulted in variability of my INR	4.58	91.6
6.I don't eat all fruits daily as I want	4.58	91.6
7.I don't eat berry fruits on daily as I want	4.59	91.8
8.I don't eat citrus fruits such as melon, pear, apricot daily as I want	4.59	91.8
9.Eating meat daily resulted in variability of my INR	4.59	91.8
10.Drinking alcohol resulted in variability of my INR	4.59	91.8

4.3. Factors enabling adherence to the recommended dietary plan

Awareness of vitamin K rich food and fruits was assessed using 5 dichotomous questions as one of the factors enabling adherence level. Respondents were supposed to respond to dichotomous questions by choosing either yes or no to all questions which had a total of 5 points. Respondents who scored 4.1 and above (above 80%) were graded as having high awareness to vitamin K foods and those who scored 3-4(60-80%) were graded to have moderate awareness and those who scored below 3(below 60%) were graded to have low awareness. When awareness of vitamin K food was categorized, about half of patients had high awareness (51.5%, n = 171), less than a third had moderate awareness (23.4%, n = 78), and the rest (25.1%, n = 84) had low

awareness of food and fruits rich in vitamin K. Majority of the patient were aware of green leafy vegetables being rich in vitamin K 259 (77.5%), (Table 3).

Table 3: Patient's awareness of vitamin K rich food and fruits

Variable	**Patient aware on vitamin k foods (n (%))**	**Patient not aware on vitamin k foods (n (%)**
Ever heard of the dietary plan	266 (79.6)	68(20.4)
Greenleaf vegetables are rich in vitamin K	259(77.5)	75(22.5)
Citrus fruits are rich in vitamin K	229(68.6)	105(31.4)
Avocado is rich in vitamin K	266(79.6)	68(20.4)
Cranberries are rich in vitamin K	180(53.9)	154(46.1)
Spicy foods are rich in vitamin K	250(74.9)	84(25.1)

4.4. Association between Patients level of adherence to the recommended dietary plan with socio-demographic variables and awareness level

To determine the strength and direction of the relationship between socio-demographic characteristics and awareness level of the respondents with level of adherence, logistic regression was performed. The analysis showed that; marital status had a direct association with level of adherence. The odds of adherence of respondents who were married were 2.441 times more likely to adhere to the recommended dietary plan compared to those who were single (AOR=2.441, 95%CI:1.414-4.213, P=0.001). Respondents who had payment category by insurance were 8.47times more likely to adhere to the recommended dietary plan compared to those with no insurance (AOR=8.47,95%CI:4.544-15.79, P=0.001). Respondents with income amount between 100000Tsh to 500000Tsh were 0.24 times more likely to adhere to dietary plan compared to other income categories (AOR=0.245,95%CI:0.611-0.98 P=0.003). Table 4 below summarizes this information.

Table 4: Association between socio demographic characteristics and level of adherence to dietary plan

Variable	Category	bivariate analysis			Multivariate analysis		
		Cor	**95% CI**	**P-value**	**aOR**	**95% CI**	**P value**
Marital status	Single	Ref					
	Married	0.410	0.237-0.707	0.001	2.441	1.414-4.213	0.001
Education level	Never go to school	Ref					
	Primary Education	0.203	0.052-0.788	0.021	53.32	0.466-6.107	0.081
	Secondary Education	0.305	0.88-1.057	0.061	4.42	0.108-18.14	0.432
	College/University	0.199	0.57-0.695	0.11	5.21	0.241-11.27	0.293
Income Level	0-100000						
	100001-500000TSH	0.374	0.144-0.968	0.043	0.245	0.611-0.983	0.003
	500001TSH and above	0.245	0.098-0.611	0.003	0.656	0.36-1.180	0.159
Insurance category	No insurance	Ref					
	Having insurance	0.480	0.016-14.31	0.006	8.47	4.544-15.79	0.001

4.5. Association between awareness of food and fruits rich in vitamin k with level of adherence to the dietary plan

This study done an association between level of adherence and awareness of the respondents on food and fruits rich in vitamin K and it has revealed that, respondents who had moderate awareness level were 0.49 times less likely to have high adherence to the dietary plan compared to those with higher level of awareness (AOR=0.29, 95%CI 0.015-5.45, P=0.049).Respondents who haven't heard about the dietary plan were 30.9 times less likely to adhere to the recommended dietary plan (AOR=30.9, 95%CI=2.13-4.488,P=0.001). Additionally respondents who have heard about the dietary plan from doctors were 8.6 times more likely to have low adherence compared to those who have heard it from dietician (AOR=8.6, 95%CI=5.20-11.00, P=0.001)Also, respondents with moderate awareness level were 0.29times less likely to have low adherence to the dietary plan compared to those with high awareness on food and fruits rich in vitamin K,(AOR=0.014,95%CI 0.004-0.050,P=0.001). This information is summarized in the table 5 below

Table 5: Association between awareness of vitamin k rich foods and fruits with level of adherence

Variable	Category		bivariate analysis			Multivariate analysis	
		cOR	95%CI	P Value	aOR	95%CI	P value
Awareness level	High	Ref					
	Moderate	0.294	0.48-1.797	0.185	0.29	0.015-5.45	0.049
	Low	0.004	0.001-0.18	0.001	0.49	0.38-6.304	0.493
Ever heard of dietary plan	Yes	Ref					
	No	0.001	0.00-0.003	0.001	30.9	2.13-44.88	0.001
From who	Dietician	Ref					
	Doctors	4.3380.002	0.385-50.0	0.234	8.60	5.2-11.00	0.001
	None	0.002	0.01-0.017	0.001	3.23	3.2-10.00	0.291

4.6. Barriers hindering adherence to the recommended dietary plan

Barriers on adherence to the recommended dietary plan was assessed by using multiple response questions, and this study has shown that out of 334 respondents, 262(78.4%) were facing challenges on adherence to the dietary plan**.** More than half of the respondents mentioned presence of chronic illness as the major challenge 149(50.3%), following with unavailability of suitable diet to admitted patient around the hospital 148(50.0), Furthermore nearly half of the respondents had financial constraints regarding paying dietician fee for dietary counselling 130 (43.9%) (Table 6).

Table 6: Barriers hindering adherence to the recommended dietary plan

Variable	Frequency(N)	Percentage (%)
Challenges on following dietary plan	262	78.4
Unavailability of suitable diet to admitted patients around the hospital	148	50.0
Dietician fee	130	43.9
Cost of travels for follow up visit	67	22.6
Chronic illness	149	50.3
Food preferences	50	16.9
Lack of family support	102	34.5
Cultural beliefs	9	3.0

4.7. Factors hindering adherence to the recommended dietary plan.

The presence of other chronic illness was mentioned as one of the barriers hindering adherence to the dietary plan. It was assessed by using a multiple response question, respondents were to choose if they had other comorbidities despite having valvular diseases. This study found that about half of the patients responded to the question had hypertensive heart disease 88(43.1%), followed by Rheumatic heart disease 47(23.0%). **(Table 7).**

Table 7: Chronic illness distribution among respondents

Chronic illness	Frequency(N)	Percentage (%)
Diabetes mellitus	33	16.2
High cholesterol	31	15.2
RHD	47	23.0
HTN	88	43.1
HIV	5	2.5

CHAPTER FIVE

5.0. DISCUSSION

This study aimed to assess the adherence to dietary plan and associated factors among patients underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute. It included 334 respondents from surgical ward and outpatient clinic. The main findings of the study included high adherence to the dietary plan 269(80.5%), high awareness to food and fruits rich in vitamin k 171(51.5%), significant association between some of socio demographic characteristics such as marital status, having insurance, level of income, having heard of the dietary plan, knowing vitamin k rich foods and fruits with level of adherence. Furthermore, three main barriers hindering following the recommended dietary plan were predominant namely presence of chronic illness, unavailability of suitable diet for patient with mechanical valves around the hospital and financial constraints for paying dietician fee for dietary counselling.

According to this survey, over 50% of the respondents adhered to the recommended dietary plan. This may be the result of increased knowledge of foods and fruits high in vitamin K. The results were comparable to an Egyptian study (19), which found that over two thirds of the patients had a satisfactory level of knowledge about the diet and other aspects of the treatment regimen following the replacement of mechanical valves. This knowledge was associated with high adherence to the diet and oral anticoagulant medication.

Regarding factors enabling adherence to the recommended dietary plan, this study showed that Awareness about the dietary plan had a positive association to high level of adherence. The majority of participants answered all questions about foods and fruits high in vitamin K accurately. Dieticians were the primary providers of dietary health education, whereas nurses claimed to never have given their patients nutritional health education. This may have been because of time constraints and the demanding nature of their work. These results were comparable to those of (3), which indicated inadequate nursing education regarding dietary intake and demonstrated a significant relationship between awareness of a dietary plan and adherence.

Other variables, including age, having a family to support, having a chronic condition, and cultural attitudes, did not significantly correlate with the degree of diet plan adherence in this study. This result conflicted with those of (3,11), who discovered a relationship between adherence level and factors such as age, comorbidities, and family financial dependence.

The current study's results regarding sociodemographic characteristics revealed that almost two thirds of the respondents were between the ages of 22 and 44. This finding may be related to the progressive degenerative valvular diseases that result from rheumatic heart disease, which primarily affects young people. This result was consistent with (8), which stated that young individuals from low socioeconomic backgrounds were more likely to have RHD.

In terms of gender and marital status, this study revealed that over half of the respondents were female. This finding may be explained by the fact that women are more likely than men to develop valvular disorders as a result of hormonal variables, longevity, RHD, and diagnostic awareness. This result contradicted the assertion made by (19) that males were primarily affected by VHDs. Additionally, the majority of respondents in this survey were married, a finding that is corroborated by a study conducted in China (2). In terms of education, the majority of respondents in this study had only completed their primary school, which had no correlation with adherence levels. This was in contrast to the findings of study (19), where over half of the patients had completed their secondary education, which had a favorable correlation with adherence levels.

Regarding relation between socio-demographic characteristics of the respondents with their level of adherence. The current study revealed that, marital status, income level, having insurance and receiving dietary counselling contributed to high adherence to dietary plan. These findings were in disagreement with (3) who mentioned that, there were statistical difference between total adherence level of the studied patients and their age, educational level, gender and receiving knowledge. Additionally, the results of the current study showed that the adherence level of patients did not differ statistically significantly based on their age, gender, or occupation. These

results were corroborated by (3), who discovered that there were no statistically significant variations between the patients' gender, age, and occupation and their overall adherence level.

In this context, more than half of the respondents stated that they had difficulty adhering to the recommended dietary plan. Presence of other chronic illnesses was most of the challenge facing respondent, since they reported to be overburdened by dietary restrictions, together with this, unavailability of the recommended dietary requirements especially for inpatient respondents was as a great barrier for them to follow dietary plan, this could be due to food spices added by local vendors when preparing foods which are mainly available for inpatient respondents. Other factors such as dietician fee, cost of travels, food preferences and lack of family support were least mentioned by the respondents. This result conflicts with that of (2,23), who demonstrated that the sole issue facing people with mechanical heart valves was treatment expenses, which were linked to poor adherence to the recommended dietary regimen and oral anticoagulant medication.

5.1. Study limitation and mitigation

5.1.1. Limitation

This was a cross-sectional study, it only identified the association of various factors and adherence to the recommended dietary plan but couldn’t establish the causation. This limitation can be mitigated by doing a qualitative study on factors associated to the recommended dietary plan such as marital status, socio-economic status, having health insurance in order to gain a deeper comprehension of the contributing components to the adherence of the dietary plan**.**

Another limitation was a recall bias, some respondents had trouble recalling precisely and reporting their daily dietary intake and related factors affecting adherence, this was mitigated by the use of a validated questionnaires and tools for data collection in dietary assessment and self-reported data was considered.

Social desirability bias, where respondents exaggerate their adherence to dietary recommendations or underreporting deviations from the dietary plan leading to skewed results by

making seem as there is effective dietary plan than it is and incomplete understanding of the challenges to adherence respectively. This was lessened by using a validated tool, making sure the respondents' anonymity was respected, and developing a positive relationship with them throughout the interview to make them feel more at ease in a nonjudgmental environment.

Variability in dietary recommendations where different healthcare providers give different or partial information of the dietary plan which lead to inconsistence in adherence measurements this was mitigated by the use of standardized dietary guidelines by JKCI which guaranteed that all respondents who received counseling from any healthcare provider received the same information. This prevented inconsistent adherence measurements.

CHAPTER SIX:

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Using an interviewer-guided questionnaire, this study evaluated the level of adherence to the recommended dietary plan and its associated factors among patients underwent mechanical valve replacement. It was discovered that patients had a high degree of adherence to the dietary plan and a high level of awareness of foods and fruits high in vitamin K. Knowledge of vitamin k rich food and fruits significantly affect level of adherence to the recommended dietary plan. This implies that improved INR control from anticoagulant medication is a result of nutritional education for patients with mechanical heart valves on warfarin, with knowledge assessed using a validated tool.

Patient's marital status, income activity, receiving dietary counselling contribute to patient's adherence to the prescribe dietary plan. Finally, the majority of the issues that prevented the respondents from following the recommended dietary plan were the existence of a chronic condition and the lack of appropriate food requirements in the hospital, particularly for patients who had been admitted.

6.2 Recommendations

To clinicians, to form a multidisciplinary team approach, that will include nurses, cardiologists, cardiothoracic-surgeons and dieticians in order to develop an individualized dietary plan that take into account all chronic illnesses the patient has. Also, to emphasize on nursing educational programs focusing on the interaction between multiple chronic conditions and dietary requirements, ensuring patients understand how their diet can impact all their health conditions. This will also benefit patients who cannot afford to pay a dietician's charge for dietary counseling.

To JKCI, to consider providing hospital meal planning by collaborating with hospital food services to include a range of suitable diet options that cater to the specific needs of post-

mechanical valve replacement patients. Furthermore, to develop partnership with local restaurants and food vendors to provide suitable meal options, for patients with mechanical heart valves, since inpatient respondents had it difficult to find suitable meals for them around the hospital

To National health insurance fund, since majority of patients use NHIF for their treatment, it would be helpful for them to incorporate dietician counselling costs in their packages so that patients can easily receive assistance from dieticians without a need to pay additional fee as it is currently.

Finally, to researchers, a cohort study can best assess adherence of dietary recommendations, best practices for dietary management to post-mechanical valve replacement patients, particularly those with multiple chronic illnesses.

APPENDICES

Appendix I: Questionnaire (English Version)

A. Social demographic characteristics of respondent.

Complete sentences or circle the correct response.

1. What is your age in years……?

2. Your gender
   1) Female
   2) Male
3. Your body weight in (kg)……
4. Your height in (cm)…
5. Your education status
   1) Never go to school
   2) Primary education
   3) Secondary education
   4) College/University
6. Your marital status
   1) Single
   2) Married
   3) Cohabiting
   4) Divorced
   5) Widowed
7. What activity brings you income?
   1) Employed
   2) Entrepreneur
   3) Agriculture
   4) Pensioner
   4) Unemployed

8. What is your level of income per month in Tshs.
   1) Below 100000
   2)100000 to 500000
   3)500000 to 1000000
   4)1000000 to 2000000
   5)Above 2000000
9. Do you have health insurance? If yes go to question 10, If no, go to question 11.
   1)Yes
   2) No
10. Mention the health insurance category you're using……
11. Mention mode of treatment payment you're using…….
12. Who is the breadwinner in your family?
    1) Yourself
    2) Your partner
    3) Both
    4) Other, Mention……
13. Do you have any family member who depends on you financially?
    1) Yes
    2) No
14. If yes, how many?.....
15. Do you get treatment support from your family
    1) Yes
    2) No
16. Who prepare your meals at home?
    1) Yourself
    2) Wife
    3) Husband
    4) Mother
    5) Other, Mention……

B. Factors altering adherence to the recommended dietary plan

1.Have you ever heard about the dietary plan to patients with mechanical valves?

1)Yes

2)No

2.Where did you hear to it from?

1)Nurses

2)Doctors

3)Dietician

4)Other

3. Do you know examples of food and fruits rich in vitamin K? If, no go to question 20

1) Yes

2) No

4. Mention some food and fruits that are rich in Vitamin K……...

5. Are there any foods or fruits that you particularly enjoy or find it easy to include in your diet? If, no go to question 22

1)Yes

2)No

6.List those foods……

7.Are there specific aspects of the dietary plan that you find confusing or difficult to follow?

1)Yes

2)No

8.If yes mention the challenges ……

9.Are there any personal beliefs or cultural factors that impact your willingness to adhere to the prescribed dietary restrictions?

1)Yes

2)No

10.Have you been diagnosed with following diseases?

1)Diabetes mellitus

2)High cholesterol

3)HIV

4)Hypertension 5) Other, Mention……

D: TOOL FOR ASSESSING LEVEL OF ADHERENCE TO RECOMMENDED DIETARY PLAN TO PATIENTS UNDERGOING MECHANICAL VALVE REPLACEMENT

Please, carefully read each statement and respond by rounding the exact statement to which you agree

QN.	Completely agree	Partially agree	Neither agree nor disagree	Partially disagree	Completely disagree
1.I don't eat Greenleaf vegetables daily as I want	1	2	3	4	5
2.I don't exclude vegetables in my diet on daily basis	1	2	3	4	5
3.I eat Greenleaf vegetables at the same quantity daily	1	2	3	4	5
4.Eating too much vegetables resulted to INR variability	1	2	3	4	5

5.Eating inconsistency amount of legumes foods resulted in variability in INR	1	2	3	4	5
6. I don't eat all fruits daily as I want	1	2	3	4	5
7. I don't eat berry fruits daily as I want	1	2	3	4	5
8.I don't eat citrus fruit such as melon, pear, apricot daily as I want	1	2	3	4	5
9.Eating meat daily resulted to variability in my INR	1	2	3	4	5
10.Drinking alcohol resulted to variability in my INR	1	2	3	4	5

Appendix II: Dodoso la kukusanya taarifa (Toleo la Kiswahili)

A: Taarifa Binafsi za Mgonjwa

Sehemu hii ina maswali ya kuchagua jibu sahihi na maswali ya kujaza nafasi wazi. Zungushia duara kwenye jibu sahihi kwa maswali ya kuchagua na jaza nafasi wazi kwa maswali ya kujaza nafasi wazi

1.Umri wako ni miaka…….....

2. Jinsia ya mgonjwa

1) Mwanamke
2) Mwanaume

3. Uzito wako katika kilogram……

4. Urefu wako katika sentimita…….

6. Hali ya Elimu

1) Hujasoma kabisa
2) Nimemaliza Shule ya msingi
3) Nimemaliza elimu ya Sekondari
4) Chuo cha kati/ chuo kikuu
5) Nyingine taja (Nimeishia darasa la…… au kidato cha……)

7. Hali yako ya ndoa

1) Single (Mseja)
2) Umeoa/ Umeolewa
3) Umetaliki/ Umetalikiwa
4) Unakaa nae tu/Kuishi kinyumba
5) Mjane au mgane

8. Shughuli gani inakuingizia kipato?

1) Muajiriwa
2) Mjasiriamali
3) Mkulima
4) Mstaafu (Pansheni)
5) Huna kazi

9. Kiwango cha kipato kwa mwezi (Hela za kitanzania)

1) Chini ya 100000

2)100,000 mpaka 500,000

3) 500,000 mpaka 1,000,000

4) 1,000,000 mpaka 2,000,000

5) Zaidi ya 2,000,000

10. Je, unayo bima ya afya? Kama ndio nenda swali la 11, kama hapana nenda swali la 12

1) Ndio

2) Hapana

11. Taja aina ya bima unayotumia……

12. Taja njia ya malipo unayotumia…….

13. Nani ni tegemeo katika uchumi/kifedha katika familia?

1) Wewe mwenyewe

2) Mwenza wako

3) Wengineo, Taja…….

14. Unapata msaada wa matibabu kutoka katika familia au ndugu wengine?

1) Ndio

2) Hapana

14.1 Kama ndio taja wanao kusaidia……

15. Nani huandaa chakula chako nyumbani?

1) Wewe mwenyewe

2) Mke

3) Mume

4) Mama

5) Wengineo, Taja……

B: Sababu zinazochangia katika ufuasi wa lishe elekezi kwa mgonjwa aliyebadilishiwa vali bandia, za moyo.

1. Umewahi kusikia kuhusu lishe elekezi kwa mgonjwa mwenye vali bandia za moyo?
   1) Ndio
   2) Hapana
2. Ulisikia kutoka kwa nani?
   1) Muuguzi
   2) Daktari
   3) Afisa lishe
   4) Wengineo, Taja…….
3. Unajua mifano ya chakula na matunda yenye vitamini K kwa wingi?,
   1) Ndio
   2) Hapana

Kama ndio nenda swali la 4, kama hapana nenda swali la tano

4.Taja vyakula na matunda yenye vitamini K kwa wingi…….

5. Je, kuna aina yoyote ya chakula ambayo inakufurahisha au inakupa urahisi kuitumia katika kuandaa mlo elekezi? Kama hapana nenda swali la 7
   1) Ndio
   2) Hapana

6.Taja vyakula hivyo……..

7. Je umekutana na changamoto yoyote katika kufuata mpango wa lishe kama ulivyopendekezwa na wataalamu wa afya na lishe? Kama hapana nenda swali la 9
   1) Ndio
   2) Hapana

8. Taja changamoto hizo…….....

9. Je, unazo Imani binafsi au tamaduni zinazokufanya kushindwa kufuatilia mpango wa lishe kama unavyopendekezwa na wataalamu wa afya na lishe?

1) Ndio
2) Hapana

Kama ndio, Imani/mila hizo ni zipi?.....

10. Je umewahi kugundulika na magonjwa yafuatayo?

1) Kisukari
2) Cholesterol/Lehemu ya juu
3) Ukimwi
4) Shinikizo la damu
5) Mengineyo, Taja……

SEHEMU D: DODOSO LA KUTATHMINI MAMBO YANAYO ATHIRI UFUASI WA MPANGO WA LISHE ELEKEZI KWA WAGONJWA WENYE VALI BANDIA ZA MOYO

Tafadhali soma kwa makini, na zungushia kauli unayokubaliana nayo kwenye Jedwali kwa kuzingatia ni kiasi gani unakubalian nayo

SWALI	Nakubaliana kabisa	Nakubaliana kiasi	Sikubaliani wala sikatai	Nakataa kiasi	Nakataa kabisa
1. Inaruhusiwa kula mboga za majani jinsi unavyotaka mwenyewe	1	2	3	4	5
2.Tunatakiwa kuondoa kabisa mboga za majani katika mlo	1	2	3	4	5

3.Katika kila wiki mboga za majani za kijani kama spinachi, kabichi, brokoli zinatakiwa kuliwa katika kiwango sawa	1	2	3	4	5
4.Mboga za majani za kijani zina athiri INR	1	2	3	4	5
5.Mbogamboga jamii ya mikunde kama vile, maharagwe, mbaazi, njegere, maharagwe ya kijani yanaathiri INR	1	2	3	4	5
6. Inaruhusiwa kula aina zote za matunda kama unavyojisikia kwa kuwa haiathiri INR	1	2	3	4	5
7.Matunda ya beri kama vile zabibu, tende, strawberry yanaathiri INR	1	2	3	4	**5**
8.Kuongeza ulaji					

wa matunda kama vile malimao, peasi, parachichi inapunguza INR	1	2	3	4	5
9.Nyama haina athari katika INR	1	2	3	4	5
10.Pombe haina athari yoyote katika INR	1	2	3	4	5

Appendix III: Informed Consent (English Version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

SCHOOL OF NURSING

ID NO…….

Greetings,

My name is Ecklia John Mazengo, a postgraduate student in Cardiovascular Nursing. I'm carrying out a study on factors associated with adherence to dietary plan. This form provides you with important information, when you understand the details in this form and agree to take part, please sign the following form at the bottom.

Study Title: Adherence to dietary plan and associated factors among patients underwent mechanical valve replacement at JKCI

Researcher: Ecklia John Mazengo,

Purpose of the study: To assess the level of adherence of the dietary plan and its associated factors among patient with mechanical valves at JKCI in Dar es salaam, Tanzania

Who can take part in this study?

All individuals having mechanical cardiac valve replacement in surgical ward and outpatient clinic at JKCI

What will happen in this study?

When you consent to take part in this research, you will receive a questionnaire to complete and it will be collected after you have completed filling it.

Confidentiality

The study's data will be used exclusively for research, and it will be kept private and secure, accessible to only approved people. To protect the participants' confidentiality, identification numbers rather than names will be utilized.

Duration

It will take about 20 minutes on average to complete the study.

Risks

Prior to, during, and/or following participation in this study, there should be no risk.

Rights to Withdraw

Participation in this study is entirely voluntary. It is entirely up to you whether or not to take part in this study. Even if you have previously provided consent, you are free to withdraw from this study at any time. You will not be penalized or lose any advantages to which you would otherwise be entitled if you choose not to participate in the study or if you withdraw from it.

Benefits

There are no immediate benefits to participating in this study, however the data gathered will be utilized to pinpoint areas and opportunities for improving the dietary plan provided to JKCI patients who have mechanical valves.

Compensation

There won't be any form of reimbursement for taking part in this study.

Whom to contact:

Please do not hesitate to contact me if you have any questions concerning this study, Ecklia Mazengo, Phone:0653124327 or via email at eckliamazengo@gmail.com or you might speak with my supervisor Dr. Menti Ndile (0714 890 015) and co-supervisor Mr Rashid Heri (0754 272080)

Consent

I ……..... Having read or had the contents of this form read to me, I have comprehended it, and my queries have received sufficient attention. I consent to taking part in this research.

Signature of Participant .....

Date of signed consent…….

Kiambatisho IV: Fomu ya Ridhaa (Toleo la Kiswahili)

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

Fomu namba: …….

Salamu,

Naitwa Ecklia John Mazengo, mwanafunzi wa uzamili katika uuguzi wa wagonjwa wenye magonjwa ya moyo na mishipa ya damu. Ninafanya utafiti juu ya Ufuasi na sababu zinazoathiri katika kufuata mpango wa chakula kwa wagonjwa wenye vali za bandia.

Fomu hii ina maelezo muhimu kuhusu utafiti hu una mara tu utakapoelewa habari zilizopo katika fomu hii na kuridhia kushiriki, tafadhali saini chini ya fomu.

Kichwa cha utafiti

Ufuasi na sababu zinazoathiri, katika kufuata mpango cha chakula kwa wagonjwa wenye Vali za bandia katika taasisi ya moyo Jakaya Kikwete.

Mtafiti: Ecklia John Mazengo**,** Afisa muuguzi

Umuhimu wa utafiti huu

Lengo kuu ni kuchunguza sababu mbalimbali zinazoathiri wagonjwa wenye vali za bandia katika kufuata mpango wa chakula katika taasisi ya moyo Jakaya Kikwete, Dar es salaam.

Ni nani anayeweza kushiriki katika utafiti huu?

Wagonjwa wote wenye vali za bandia walioko wodi ya upasuaji na kliniki za moyo

Ni nini kitatokea katika utafiti huu?

Utakapokubali kushiriki katika utafiti huu, utapewa dodoso la kujaza litakalokusanywa baada ya kujaza.

Usiri

Majibu yote yatakusanywa kutoka katika eneo la utafiti na yatahifadhiwa sehemu maalum ambapo wahusika tu ndio wataruhusiwa kuzipata taarifa hizo na zitatumika kwaajiri ya utafiti tu. Pia majina hayatatumika badala yake tutatumia namba ya utambulisho tu.

Muda

Muda wa kushiriki katika utafiti ni wastani wa dakika ishirini.

Madhara

Hatutegemei madhara yeyote kukutokea ukiwa na/ama baada ya kushiriki katika utafiti huu.

Haki ya kushiriki au kusitisha kushiriki na mbadala

Kushiriki katika utafiti huu ni chaguo lako, na una uhuru wa kukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kusitisha ushiriki wako katika utafiti huu muda wowote utakapojisikia hatakama umeshakubali kushiriki. Kukataa kushiriki au kusitisha kushiriki katika utafiti huu hakutakufanya upoteze haki zako za msingi au kupata adhabu yoyote

Faida

Ukikubali kushiriki katika utafiti huu hakuna faida ya moja kwa moja utakayopata lakini tunaamini ushirikiano utakao utoa utasaidia katika kusaidia kuongeza juhudi kuepuka magonjwa ya kuto kuambukiza kama shinikizo ya damu

Fidia

Hakuna fidia yoyote zinazotolewa katika utafiti huu.

Nani wa kuwasiliana naye

Kama utakuwa na swali lolote kuhusu utafiti huu unaweza kuwasiliana na mkuu wa utafiti huu Ecklia Mazengo, Phone:0653124327 au kupitia barua pepe eckliamazengo@gmail.com na pia

usisite kuwasiliana na wasimamizi wangu Dr. Menti Ndile (0714 890 015) na Mr Rashid Heri (0754 272080)

Idhini

Mimi ……nimesoma au nimesomewa yaliyomo katika fomu hii na kuyaelewa, maswali yangu yamejibiwa vya kutosha. Ninakubali kushiriki katika utafiti huu

Sahihi ya mshiriki ……

Tarehe ……

Appendix V: Approval for ethical clearance

UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATION

Ref. No.DA.282/298/01.C/2153 Date: 09/04/2024

MUHAS-REC-04-2024-2153
ECKLIA JOHN MAZENGO
SCHOOL OF NURSING
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: ADHERANCE TO DIETARY PLAN AND ASSOCIATED FACTORS AMONG PATIENTS UNDERWENT MECHANICAL VALVE REPLACEMENT AT JAKAYA KIKWETE CARDIAC INSTITUTE

Reference is made to the above heading,

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 09/04/2024
EXPIRATION DATE OF APPROVAL: 09/04/2025

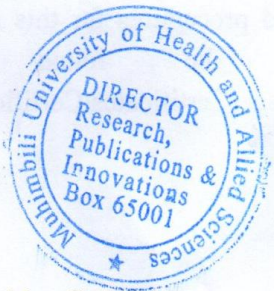
STUDY DESCRIPTION:
Purpose:

The purpose of this observational cross section study is to determine the level of adherence to the recommended dietary plan and it's associated factors among patients who underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute Dar es Salaam, Tanzania

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2015363.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.



Dr. Nahya Salim Masoud,

Chairperson, MUHAS Research and Ethics Committee

Appendix VI: Introduction letter for data collection

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;
Ref. No. HD/MUH/T.515/2022

15th April, 2024

THE EXECUTIVE DIRECTOR,
JAKAYA KIKWETE CARDIAC INSTITUTE,
P.O.BOX 65141,
DAR ES SALAAM.

RE: INTRODUCTION LETTER OF ECKLIA JOHN MAZENGO

We would like to inform you that the carrier of this letter is Ecklia John Mazengo with registration number HD/MUH/T.515/2022 a student in the School of Public Health and Social Sciences at Muhimbili University of Health and Allied Science (MUHAS), pursuing MSc. Cardiovascular Nursing.

As part of her studies, she will be doing an elective research titled **"Adherence to Dietary Plan and Assoicated Factors Among Patients Underwent Mechanical Valve Replacement at Jakaya Kikwete Cardiac Institute".** She is being supervised by Dr. Menti Ndile from MUHAS and Salma Ugonela from JKCI.

The Ethical Clearance for doing the said research has been given by the University.

Kindly request your assistance and cooperation to our student.

Yours Sincerely,

Mr. Sebe Mohamed
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Ecklia John Mazengo

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 101
Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz

Appendix VII: Permission letter for data collection from JKCI

UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH

JAKAYA KIKWETE CARDIAC INSTITUTE (JKCI)

JAKAYA KIKWETE CARDIAC INSTITUTE

In reply please quote;
Ref No: AB.123/307/01K/30 23/04/2024

Ecklia John Mazengo
Reg. HD/MUH/T.515/2022
MSc. Cardiovascular Nursing - MUHAS

RE: PERMISSION TO CONDUCT RESEARCH AT JKCI

Reference is made to your letter requesting to do a research study entitled **"Adherence to Dietary plan and associated factors among patients underwent mechanical valve replacement at Jakaya Kikwete Cardiac Institute"** here at JKCI.

This letter serves as an official document that permits you to do the above-mentioned task as requested. However, in accordance with your request, your designated JKCI co-supervisor will be **Salma Ugonela**.

It is our sincere hope that you will adhere strictly to the rules and regulations governing good clinical practice. Your compliance with these standards will ensure the integrity and ethical conduct of your study.

Best Regards,

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

Dr. Pedro Pallangyo
Head of Research, Training and Consultancy.
CC: ALL DIRECTORATES & Head of Units; Salma Ugonela

Jakaya Kikwete Cardiac Institute (JKCI); Upanga East Plot No. 1048, Kalenga Street, Malik Road, P. O. Box 65141 - Dar es Salaam; Telephone Number + 255 -22- 2152392Email:info@jkci.or.tz, Website: ww.jkci.or.tz.

Appendix VIII: Antiplagiarism receipt

turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Ecklia Mazengo
Assignment title:	dissertations
Submission title:	ADHERENCE TO DIETARY PLAN AND ASSOCIATED FACTORS A...
File name:	ECKLIA_S_REPORT._CVN.docx
File size:	3.74M
Page count:	67
Word count:	11,102
Character count:	63,417
Submission date:	18-Jul-2024 02:06PM (UTC+0300)
Submission ID:	2418647245



ADHERENCE TO DIETARY PLAN AND ASSOCIATED FACTORS AMONG PATIENTS UNDERWENT MECHANICAL VALVE REPLACEMENT AT JAKAYA KIKWETE CARDIAC INSTITUTE

By

Ecklia John Mazengo

MSc (Cardiovascular Nursing) Dissertation

Muhimbili University of Health and Allied Sciences

July 2024

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Appendix IX: Antiplagiarism report

ADHERENCE TO DIETARY PLAN AND ASSOCIATED FACTORS AMONG PATIENTS UNDERWENT MECHANICAL VALVE REPLACEMENT AT JAKAYA KIKWETE CARDIAC INSTITUTE

ORIGINALITY REPORT

19%	17%	6%	10%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	dspace.muhas.ac.tz:8080 Internet Source	6%
2	Submitted to Muhimbili University of Health and Allied Sciences Student Paper	3%
3	www.ncbi.nlm.nih.gov Internet Source	1%
4	Samar Mohamed Etiwa, Amany Mohamed Safwat, Asmaa Mohamed Khorais. "Factors Affecting Adherence to Therapeutic Regimens among Patients with cardiac valve Replacement", Egyptian Journal of Health Care, 2022 Publication	1%
5	Submitted to Mount Kenya University Student Paper	<1%
6	ihi.eprints.org Internet Source	<1%

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