PREVALENCE OF MALNUTRITION AND ASSOCIATED FACTORS AMONG PATIENTS UNDERGOING HEMODIALYSIS AT MNAZI MMOJA HOSPITAL – ZANZIBAR, TANZANIA

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Department of Clinical Nursing

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By

Asya Salum Abdalla

A Dissertation Submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Science (Nursing Nephrology) of

Muhimbili University of Health and Allied Sciences
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CERTIFICATION

The undersigned certifies that they have read and recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled **‘‘Prevalence of malnutrition and associated factors among patients undergoing hemodialysis at Mnazi Mmoja Hospital – Zanzibar, Tanzania’’,** in (partial) fulfillment of the requirements for the degree of Master Science (Nursing Nephrology) of Muhimbili University of Health and Allied Sciences.

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Main supervisor

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Date

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Mr. Pius Temba

Co-supervisor

_____

Date

DECLARATION AND COPYRIGHT

I, **Asya Salum Abdalla**, hereby declare that this **dissertation** is wholly original with no intention of being submitted to another university for consideration for a degree of this kind or any other.

Signature……. **Date**……...

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DEDICATION

I offer this dissertation to the divine Creator, my unwavering support and wellspring of inspiration, wisdom, knowledge, and insight. To my beloved children, Maryam Slim and Rayyan Slim, I express gratitude for their constant care and encouragement throughout my academic journey. It is with heartfelt intention that I dedicate this scholarly work to my family and parents, acknowledging their invaluable role in nurturing me with a solid foundation of upbringing and education that has propelled me to this stage. May the Almighty continue to shower them with abundant blessings and grant them a long, healthy life. Amen.

ABSTRACT

Background: Malnutrition is common among patients undergoing maintenance hemodialysis. It is associated with increased hospitalization, cardiovascular complications, and reduced quality of life. Therefore, it is important to diagnose malnutrition earlier to enhance timely and adequate nutritional support, and intervention, and help maintain the health and wellness of the patient. The study was conducted to evaluate the nutritional status and associated factors among patients undergoing hemodialysis at Mnazi Mmoja Hospital in Zanzibar.

Methodology: This was a cross-sectional study employing a quantitative approach to examine the nutritional status of 136 Chronic Kidney Disease (CKD) dialysis patients. The participants were recruited using a convenient sampling method, and data were collected using a researcher-administered semi-structured questionnaire. To assess nutritional status, BMI-WHO categories and the Subjective Global Assessment (SGA) tool were employed. The data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 26. Clinical characteristics and nutritional status were presented using statistical tables and figures. Factors associated with nutritional status were assessed using a Chi-square test with a P-value set at 0.05

Result: A total of 136 hemodialysis patients in the study. The mean age of all participants was 45 ± 12 years. Most of the participants were males n=69 (50.7%), married n=94 (69.1%), about n=67 (49.3%) had secondary education, and n=84 (61.8%) resided in the urban area. Nearly half n=59 (43.4%) of participants were diagnosed with CKD in less than a year whereby, n=68, (50%) of participants had been on hemodialysis for less than 12 months, and the majority n=131 (96.3%) were doing hemodialysis twice a week. According to WHO- BMI categories, 28(20.6%) [95%CI (47-63.9)] of the participants were underweight, 34(25%)[95%CI(34-56)] were overweight and14(10.3%)[95%CI(11-29)]were obese. Using SGA, malnutrition was present that overall malnutrition was n=82(60.3%) [95%CI (58.9-68.1)], where n=67 (81.7%) [95% CI (71.9- 88.6)] had moderate malnutrition and n=15 (18.3 %) [95/% CI (11.4-28.0)]-had severe malnutrition. On univariate logistic regression analysis, dialysis access, duration of dialysis, and duration of CKD were associated with malnutrition.

Conclusion and recommendation: Malnutrition was prevalent in over two-thirds of the participants included in the study. Based on these findings, it is recommended to conduct regular nutritional screenings for malnutrition among hemodialysis patients and provide timely dietary education and support to enhance their nutritional status. Additionally, a comprehensive study should be conducted to assess patients' adherence to nutritional guidelines and identify challenges faced by healthcare providers in meeting the nutritional needs of their clients.

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ABBREVIATIONS

AKI	Acute Kidney Disease
BMI	Body Mass Index
CKD	Chronic Kidney Disease
ESKD	End Stage Kidney Disease
GFR	Glomerular Filtration Rate
HD	Hemodialysis
HIC	High-Income Countries
KDIGO	Kidney Disease Improving Global Outcome
LMIC	Low- and Middle-Income Countries (LMIC)
MMH	Mnazi Mmoja Hospital
MNH	Mnazi National Hospital
MUHAS	Muhimbili University of Health and Allied Sciences
RPEC	Research and Publication Ethical Committee
RRT	Renal Replacement Therapy
SGA	Subjective Global Assessment
ZNZ	Zanzibar

DEFINITIONS OF TERMS

Malnutrition is a polyhydric condition whose etiology lies in the failure of the individual to meet the nutritional requirements, reduced or excessive food intake, or an unspecified alteration of the nutritional status from ailments or medications.(1)

Chronic Kidney Disease is defined as the Gradual and irreversible impairment of kidney function or structure as evidenced by glomerular filtration rate (GFR <60ml/min per 1.73m2) or persistent albumin-to-creatinine ratio >30 mg/g (ACR) for more than 3 month(1)

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Malnutrition is a common problem among patients with chronic kidney disease (CKD) and End Stage Kidney Disease (ESKD). Malnutrition affects 42.7% of patients with CKD worldwide(2). The prevalence of malnutrition is higher in low- and middle-income nations (LMIC) compared to nations with higher incomes (HIC). In Sub-Sahara Africa (SSA) for example, Malnutrition is estimated to affect 30–75% of patients with End Stage Of Kidney Disease(ESKD)(3).A significant percentage of hemodialysis patients (20–61.8%) are malnourished. In Tanzania, malnutrition affects about 61.2% of the patients undergoing maintenance hemodialysis.(4)

Malnutrition in patients with hemodialysis occurs as a result of three mechanisms. The first mechanism is inadequate dietary intake due to excessive restriction or existing gastrointestinal disturbances from uremic complications**.** CKD is known to have a significant economic burden on patients due to the chronic demands of their chronic illness. It affects patients' ability to work through symptom burden which impairs their cognitive, physical, and psychological capacity to work and time lost in dialysis(5). Second is the high-cost treatment of the disease through dialysis and management of the associated complications(6).This deprives the patient's capacity to afford treatments and basic needs including accessing the recommended diet to sustain their nourishment. The inability to meet their demands has effects on their psychology and results in stress, feelings of depression, and low self-esteem. Poor dietary intakes in CKD make the patients prone to weakened body immunity and chronic fatigue, body weakness fatigue is also explained by uremia, a complication of advanced CKD.(7). The mechanism is the reduction in appetite resulting from raised cytokines, tissue necrotic factor alpha, uremia from inadequate dialysis. The third factor is associated with the hemodialysis treatment resulting in Severe depletion of essential nutrients such as proteins, minerals, vitamins, and amino acids (9)

The two explained mechanisms, lead to reduced intake of nutritious food and increased loss of nutrients leading to under nutrition. Under nutrition in patients with ESKD is associated with an increased incidence of complications. The complications include delayed wound healing, decreased resistance to infection, electrolyte imbalance, prolonged hospitalization, muscle wasting, cardiovascular diseases, and reduced functional capacity of the patients(10). All these complications result in increased treatment costs, reduced patients' quality of life, and increased morbidity and mortality. (3)

The detection of malnutrition is important and involves several assessment techniques. These techniques include anthropometry measurements, biochemical tests, clinical assessment, diet, and physical function. Several tools have been developed and validated worldwide to ease screening and early detection of malnutrition. For example, the Malnutrition Universal Screening Tool is used to measure anthropometry (weight, weight change) and diet(11). The Subjective Global Assessment tool is more comprehensive and incorporates anthropometry, clinical, diet, and exercise/activity(12). Other tools include The Malnutrition Inflammation Score and Mini Nutritional Assessment. These tools evaluate multiple aspects of nutrition, including weight loss, muscle wasting, and dietary intake(3).

Investigating nutritional status and the associated factors among patients undergoing hemodialysis treatment is crucial. It facilitates effective planning and execution of targeted interventions for the prevention and management of malnutrition. Until recently, there are few studies that have assessed nutritional status among hemodialysis patients in our country(13**).**

Zanzibar Island though is part of Tanzania has a quite different environment and food culture. Therefore, in the current study, we aim to ascertain the prevalence of malnutrition and the associated factors among hemodialysis patients on the Island of Zanzibar.

1.2 Problem Statement

The magnitude of malnutrition in hemodialysis patients remains a major challenge nationally and internationally. Worldwide, Malnutrition affects 42.7% of patients with ESKD with LMICs hosting a disproportionately large number of malnutrition cases. For example, studies have shown that in LMICs, Malnutrition affects 73.7% of patients with ESKD while in HICs malnutrition affects 18.3%of patients with ESKD(14). In Tanzania more than 60% of patients with ESKD are malnourished (4)

Malnutrition is caused by the interplay of several factors that lead to either inadequate dietary intake, reduced appetite, or increased loss of nutrients(15). If left undiagnosed and untreated, malnutrition can lead to serious complications which may result in increased hospitalization, reduced quality of life, and premature death(4). Nutritional assessment is important in detecting and treating malnutrition in HD patients ultimately lead to improved nutritional status, enhanced quality of life, and better overall outcomes for HD patients. Currently in our dialysis unit there is no dietitian to guide patients on renal friendly diet.

Understanding the nutritional status of hemodialysis patients in Zanzibar is vital to prevent possible complications and poor outcomes. The results of this study may then be used to develop nutritional guidelines for dialysis patients in Zanzibar and underscoring of the need for a dietitian to be part of care providers in the dialysis unit.

1.3 Conceptual Framework

This study developed a conceptual framework that shows the relationship between independent variables and dependent variables. The independent Variables include socio demographic factors, clinical characteristics, and chronic kidney disease interventions. Also, the dependent variables consist of changes in nutrition status

Socio-demographic Factors

Age: Older patients may experience changes in metabolism, and reduced appetite, and may be associated with other health conditions that can affect their dietary intake. Gender: Men and women may have different nutritional needs, and hormonal variation can influence body

composition. Sociocultural norms may affect dietary habits differently for men and women, which impacts nutritional status.

Marital status may contribute to social support and encouragement for proper dietary adherence.

Occupation: An individual with a physically demanding job may have higher energy requirements, and their dietary habits may depend on the type of occupation they have while sedentary occupations have the risk of weight gain which may result in cardiovascular, hypertension, and diabetic disease. Also, patients with permanent occupation have a high possibility of getting a variety of foods recommended by health professionals and enhancing good nutrition status. Occupational stress and time constraints can impact meal planning and eating planning, which can affect the nutritional well-being of CKD patients.

Clinical characteristics

Comorbidities such as diabetes, hypertension, and cancer can lead to food restrictions and inflammation, which may hinder the absorption of food.

CKD Intervention

Dialysis results in the removal of some electrolytes and proteins, which leads to malnutrition, and medication affects appetite and nutritional absorption, impacting overall nutritional intake.

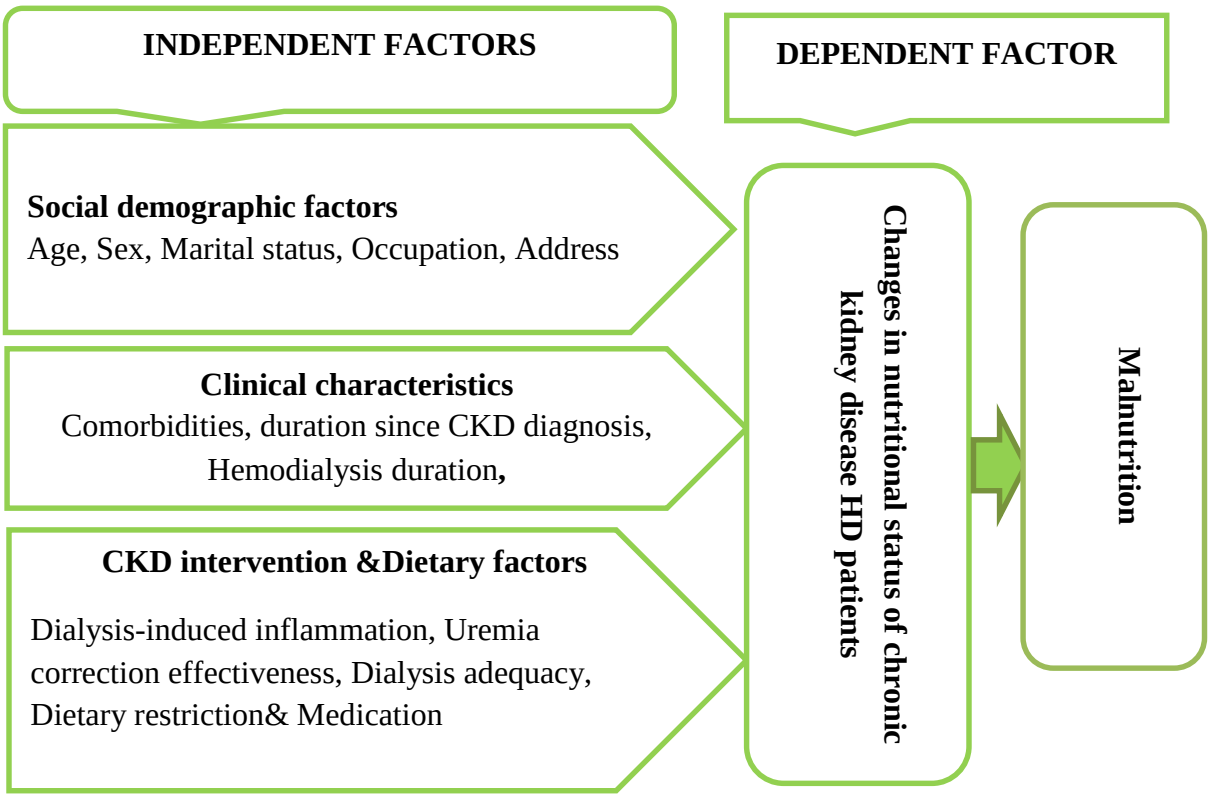


Figure 1: A conceptual framework showing the interplay between socio demographic, clinical characteristics, Dialysis, and malnutrition

1.4 Rationale of the study

The outcomes of the study provided valuable insights to hemodialysis staff on the nutritional status of the patients. This will help to inform the need for regular nutritional screening and provide timely and appropriate intervention to manage clients' nutritional status. In addition, the study findings will inform the management of MMH to initiate efforts to provide comprehensive nutritional services to patients undergoing hemodialysis treatment. The findings will also be used as a source of data and provide baseline information for further studies.

1.5 Research Questions

1.5.1 General Research Question

What are the prevalence of malnutrition and the associated factors among patients undergoing hemodialysis treatment at Mnazi Mmoja Hospital, Zanzibar?

1.5.2 Specific Research Question

1. What were the clinical characteristics of patients undergoing hemodialysis (MMH)?
2. What was the prevalence of malnutrition among patient undergoing hemodialysis at MMH?
3. What were the factors linked to malnutrition among patients undergoing hemodialysis at MMH?

1.6 Research objective

1.6.1 Main objective

Determine the prevalence of malnutrition the nutritional status and the associated factors among patients undergoing hemodialysis treatment at Mnazi Mmoja Hospital, Zanzibar?

1.6.2 Specific Objectives

1. To describe the clinical characteristics of patients undergoing hemodialysis at Mnazi Mmoja Hospital
2. To examine the prevalence of malnutrition among patients undergoing hemodialysis at Mnazi Mmoja Hospital
3. To determine Factors Associated with Malnutrition among patients undergoing hemodialysis at Mnazi Mmoja Hospital

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

Malnutrition is an imbalance of need and supply of energy, protein and micronutrients leading to growth and development defects(16),Malnutrition can be caused by different factors such as Diet restriction, prolonged periods on hemodialysis, induced nutrient loss, multiple dialyzes reuse, dialysis-induced inflammation, the efficacy of uremia, correction of metabolic acidosis, adequacy dialysis, frequency, and duration(7). Malnutrition can lead the complications such; as reduced quality of life, increased risk of infection, increased risk of diseases, and impaired wound healing. It also results in poor rehabilitation, fatigue, lethargy, as well as increased hospitalization and mortality in these patients(17).

Malnutrition in dialysis patients can be effectively managed through various strategies, including regular consultations with experienced dietitians, early initiation of a dialysis-specific diet, provision of socioeconomic support, psychological counseling, administration of appetite stimulants and anti-inflammatory drugs, ensuring adequate dialysis duration and sessions, and considering intradialytic parenteral nutrition. These measures are recommended for both the prevention and treatment of malnutrition in individuals undergoing dialysis(18). The researcher of this study covered three objectives namely, clinical characteristics, prevalence of malnutrition, and factors affecting nutrition status among patients undergoing' hemodialysis at Mnazi Mmoja Hospital.

2.2 Clinical characteristics of patients attending maintenance hemodialysis

Hemodialysis patients are faced with several clinical issues that may be either due to CKD failure or complications related to treatment modality. The risk of malnutrition was elevated in nearly 60% of diabetics compared to nearly 40% of non-diabetics.(19). Many studies reported that Hypertension, Diabetes Mellitus, and Cardiovascular diseases are common for these patients, Other symptoms like fever, fatigue, and Anorexia were also reported and this is due to hesitation during dialysis procedure that consumes around four hours per day (20)

(Mali N,Ge J,2022) say that hemodialysis patients with diabetes have a greater risk of developing malnutrition as evidenced by low album level, presence of c-reactive protein, and low level of hemoglobin(16). These markers such as albumin level, low hemoglobin, and c-reactive protein may indicate inadequate nutritional status of hemodialysis patients(16).

Hypertension in kidney failure patients is often caused by fluid retention, leading to increased blood volume and pressure. Hormonal imbalance, renin and angiotensin also play a significant role and also sympathetic nervous system activation and vascular resistance can contribute to elevated blood pressure. (19).

2.3 Prevalence of malnutrition among CKD Patients Attending Dialysis

Malnutrition in patients treated with dialysis procedures is one of the causes of mortality in these patients, this wakes up the researchers to make a continual assessment of the nutritional status of these patients as a preventive and interventional approach(21). A study conducted at Muhimbili National Hospital 2021 reported that the Majority of the CKD HD were Malnourished which count about 61.2%, of severe malnutrition and underweight 1.9% and 16.9% respectively(13). Also, the nutritional status of HD reported in different studies mainly varied based on the assessing methods of Nutrition. A Sharmila at el. used a World Health Organization body mass index classification and mid-upper arm circumference methods as an assessing method and the reported malnutrition was 24.52% and 52% respectively,(22). Furthermore, a cross-sectional study conducted by Badrasawi et al. at Hebron Governmental Hospital in Palestine showed that 45.4% of hemodialysis patients had a high frequency of malnutrition. (23).

Despite techniques being used in measuring nutritional status CKD HD patients mostly faced with malnutrition problems that is mostly due to dietary prescriptions that restrict them from using a well-balanced diet as well as medication that imposes a wide physiological change including nausea and anorexia, vomiting, and diarrhea(24)

2.4 Factors associated with malnutrition in **hemodialysis patients:**

Dietary factors

Living healthily with renal illness requires careful attention to diet and nutrition. Because of this, chronic kidney disease is linked to several changes that might cause a catabolic state and poor nutritional status, both of which encourage the loss of energy and protein storage in the body. Poor nutritional status in CKD patients is even thought to be the main factor contributing to poor clinical outcomes, death, and poor quality of life(5).

Nutrient losses in hemodialysis patients are very common mainly caused by dialysis procedures, especially amino acids and protein. Each dialysis session results in the loss of around 6–12 g of amino acids and 7–8 g of protein (25)

Protein needs are increased due to the dialysis process, some patients may restrict their protein intake due to dietary guidelines ,leading to deficiency, Fluid restrictions may hinder the consumption of adequate calories and nutrients affecting overall nutrition status, many patients also struggle to eat their caloric needs, especially if they experience appetite loss or other dietary limitations, strict managing of electrolyte like potassium, phosphorous ,and sodium can further restrict food choices resulting in imbalances and nutrient deficiencies (25)

Uremia Correction's Effectiveness: Eliminating uremic waste products is a primary goal of dialysis treatment. When patients get inadequate dialysis, it may lead to the accumulation of uremic solute, which may cause a buildup and inhibit enzyme transamination, which affects amino acid and protein metabolism and reduces nutritional intake(26)

Duration of hemodialysis: The longer duration of the CKD patients to be in hemodialysis procedure was found to be the causative agent of Malnutrition, and the only reason reported was the nature of the disease itself as well as the form of the replacement therapy. Chronic dialysis can lead to fatigue and a reduced quality of life, often causing patients to engage in less physical activity. Reduced physical activity can contribute to muscle wasting and exacerbate malnutrition over time.(13).The reported prospective cross-sectional study that was done on ESRD patients observed that with the increased number of years on Maintenance Hemodialysis among CKD

patients, malnutrition increases, these may affect psychological and emotional for long-term treatment that can have psychological impacts on patients, including depression and anxiety. These factors can reduce motivation to eat well and maintain a balanced diet, leading to malnutrition, especially over an extended period of treatment. (27).

Employment status: Lack of a job that provides income to some of the HD patients was found to the one among the causative agents of Malnutrition in many studies, this is because they can't afford even their basic required per day and further, they lack to adhere in a diet which lead to poor food intake as well as medication prescriptions (28).) Employment can contribute to malnutrition due to factors like time constraints, reliance on fast foods, and inadequate access to nutritious meals during work. Long hours, irregular schedules, or physically demanding jobs can lead to irregular eating habits and nutrient deficiencies, Low-wage jobs may limit financial access to healthy foods, while high-stress environments can lead to poor eating choices, such as emotional eating linked to undernourishment (28), Additionally a high risk of malnutrition was considerably linked to unemployment(23).

Age of the patient: Older patients can have reduced appetite, may have altered tested perception, and usually take different medications which may reduce appetite and hence impact their nutritional status. This was reported in a contradictory way between studies. Some of them reported that older HD patients were more subjected to severe malnutrition than other age categories (31) while other studies showed that the younger age (19-29 years) category was affected more by malnutrition than others (30). Omari et al (2019) also reported that Malnutrition among hemodialysis patients was positively correlated with age, having multiple comorbid conditions, taking several chronic drugs, and having a lengthy dialysis history (32).Another study carried out in Jeddah with 71 HD patients found that the following factors increased the risk of malnutrition in hemodialysis patients: age, underweight, living alone, longer dialysis duration, chronic disease(s), and medication intake, low educational attainment, unemployment, and history of transplantation. (28).

Marital status: Marriage can have a positive or negative effect on nutritional status, on the positive side a married patient may receive emotional support and encouragement in managing dietary restrictions and improving nutritional status(14). On the other hand, challenges may arise if the spouse is not supportive of the patient which may impact the nutritional status. This also was reported in a contradictory way. Some had shown that being single and divorced were more subjected to Malnutrition than other (4), while others had reported that married were more malnourished than other (31). Another study found that severely malnourished hemodialysis patients were older, married or divorced, unemployed, and lived in large families compared with other groups (P value < 0.05) while also reported that illiterate people were at greater risk for malnutrition 95%(22).Furthermore, hemodialysis patients living with their families were reported to have a negative association with malnutrition 95% (32).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This research adopted a cross-sectional descriptive study design with a quantitative approach to examine the nutritional status and associated factors among patients undergoing hemodialysis treatment at Mnazi Mmoja Hospital. Data was gathered using a semi-structured interviewer-administered questionnaire.

3.2 Study Area

The research was carried out at Mnazi Mmoja Hospital (MMH). MMH is a government and National Referral and Teaching Hospital located in the urban west region of Zanzibar Island. MH has 630 beds on the main campus in Stone Town, 36 beds at Mwembeladu Maternity Home, and 110 beds at Kidongo Chekundu Mental Hospital; it can accommodate a total of 776 beds throughout its three campuses. Both the maternity and mental hospitals are located within the city limits of Stone Town but outside of the downtown area. While it provides specialty care to all of Zanzibar, MMH chiefly operates as a primary and secondary level hospital for the island of Unguja, especially the North B, West, Urban, and Central populations all of which lack adequate access to cottage or district hospitals. The hospital is a referral roughly 95% of all outpatients is self-referred, and only about 1/3 come from the Urban District. On average, the hospital sees 27,185 inpatients and 74, 975 out patients. MMH is the only government hospital in Zanzibar that offers hemodialysis services. It has the largest number of hemodialysis patients in the region receiving patients from different areas of Zanzibar. The dialysis unit has 10 dialysis beds and performs 120 sessions per week and 360 sessions per month. Hemodialysis services are offered at free cost to all Zanzibarians.

3.3 Study Population

The study involved patients with End Stage Kidney Disease undergoing hemodialysis treatment at MMH. CKD

3.3.1 Inclusion criteria

- Patients undergoing hemodialysis treatment aged 18 years and above.
- Patients undergoing hemodialysis treatment for at least three months.

3.3.2 Exclusion criteria

- Severely /Critically ill patients
    - Patient who could not comprehend or communicate to provide consent due to being very sick eg patients on oxygen therapy
- Patient on dialysis due to acute kidney injury

3.4 Sample Size and Selection

A total of 136 HD patients participated in the study. A Kish Leslie formula was used to calculate the expected participants of this research.

$$n = \frac{Z^2 P (100-P)}{d^2}$$

$$n = \frac{(1.96)^2 \times 9.8 \times (100-9.8)}{5^2}$$

$$n = 3.842 \frac{\times 9.8 \times 90.2}{25}$$

n=136

$n = 1.96^2 \times 9.8 (100-9.8) / 5^2 = 111+25$ for non-respond patient=136

Where: **Z** = 1.96, **P** = Previous published prevalence of under-nutrition in Hemodialysis patients which was 9.8% (4). **d =**Precision and was 5%

The sample size is approximately 136 participants.

3.5 Study variables

3.5.1 Dependent variable

Nutritional status

3.5.2 Independent variables

The independent variables in this study encompassed the factors that are likely to influence malnutrition in hemodialysis patients with chronic kidney disease (CKD). These factors included:

- Socio-demographic factors such as age, gender, marital status, education level, occupation, and economic status
- Clinical characteristics such as the presence of co-morbidities such as diabetes mellitus, hypertension, and cancer
- CKD intervention such as dialysis procedure, dietary restriction, and medication.

3.6 Sampling Techniques

A convenient sampling method was used where all patients with ESKD undergoing hemodialysis treatment and who met the criteria were allowed to participate in the study until the required sample size was achieved. The participant was taken one by one when they came to their normal routine dialysis procedure.

3.7 Data Collection Tools

The structured questionnaire was used to collect data in this study. The first part of the questionnaire was developed by the researcher in consultation with the supervisors while the second part adopted the subjective global assessment tool. The questionnaire was categorized into two main parts the first one was for capturing demographic data and patients' clinical characteristics and the second one was for assessing the nutritional status of the participants using the SGA score. SGA is a validated tool for assessing the nutritional status of patients undergoing hemodialysis; it includes information such as the patient’s history, and physical examination and uses structural clinical parameters to diagnose malnutrition. Anthropometric measurements such as weight in kg, height in cm, and BMI were calculated using the WHO nutritional score. A WHO BMI score of less than 18.4 was considered underweight, 18 .5 to

24.9 was considered normal weight, 25 – 29.9 was considered overweight and a BMI of 30 and above was considered obese.

Subjective global assessment (SGA) dialysis malnutrition score:

It refers to the overall evaluation of a patient's history and physical examination and uses structured clinical parameters to diagnose malnutrition. It has seven characteristics: changes in weight, food intake, gastrointestinal problems, functional ability, co-morbidity, subcutaneous fat, and indications of muscular atrophy. Every element is rated on a scale of 1 (average) to 5 (very severe). The total of the seven components that make up the malnutrition score ranges from 7 (normal) to 35 (severely malnourished). A score less than 10 was regarded as good nutrition status, 10 up to 17 moderate Malnutrition, and greater than 17 as Severe Malnutrition(33,34).

Translation of SGA: An inclination toward a normal nutritional condition is indicated by a lower score. A higher score indicates that protein-energy malnutrition is present. The scoring sheet has two sections, each with seven elements, as was previously described. In each patient evaluation, a questionnaire addressing the initial five components, of the patient's medical history, was acquired to facilitate a comprehensive assessment.

a. Regarding "weight change," the evaluation was concentrated on how the post-dialysis dry weight has changed generally during the previous six months. If the patient gained weight or there was no change in weight, a score of 1 was given. A score of 2 to 5 indicates a little loss of weight (less than 5%), a loss of 5 to 10%, a loss of 10 to 15%, and any loss of weight more than 15% over the previous six months.
b. In terms of 'dietary intake,' as reported by the participant during the interview, If there have been no recent changes to the quantity or quality of meals consumed, a regular (traditional) solid intake was given a score of 1 (normal). A score of two indicates a subpar solid diet; three indicates a full liquid diet or any moderate general illness; four indicates a hypo caloric liquid diet; and five indicates starvation.

c. Regarding 'gastrointestinal symptoms,' a score of 1 was assigned if there are no symptoms, 2 for nausea, 3 for vomiting or any moderate gastrointestinal symptoms, 4 for diarrhea, and 5 for severe anorexia.
d. d. For "functional capacity," a score of 1 was assigned for both normal functional capacity and any appreciable reduction in the degree of prior functional impairment. Any mild to moderate difficulty walking received a score of 2, any trouble with normal activity received a score of 3, being limited to just light activity received a score of 4, and a persistent bed or chair-ridden state received a score of 5.
e. The patient obtained a score of 1 for “co-morbidity” if they have been having hemodialysis for less than a year and is otherwise healthy and free of any other medical conditions. A patient who has been dialyzed for one to two years or who has modest co-morbidity was receiving a score of 2. For mild co-morbidity or if the patient is older than 75, a score of 3 was given. If the patient has been on dialyzed for more than 4 years, or if there is serious co-morbidity, they have received a score of 4. If there are numerous, extremely severe co-morbidities, a score of five was given. The physical examination comprises two sections: subcutaneous fat and muscle wasting. Scoring based on subcutaneous fat deposition in four body areas the eyes, triceps, biceps, and chest area used to assess "body fat stores" (subcutaneous fat).Seven areas are quickly examined to look for signs of muscle wasting: the knee, quadriceps, ribs, scapula, temple, and interosseous muscles.

Patients were divided into three categories after completing their physical examinations: well-nourished, mild to moderately malnourished, and severely malnourished.

Validity

In an early study on nutritional status assessment, Baker et al. showed good agreement between their evaluators (Kappa=0.72), as well as Detsky et al. when they standardized the clinical method, creating a subjective nutritional assessment questionnaire (Kappa=0.78).

- The SGA includes a variety of indicators, such as weight change, dietary intake, gastrointestinal symptoms, and physical assessment, to provide a holistic picture of

nutritional status. Research indicates that these components together construct an accurate assessment of a patient's nutritional health, supporting the tool's construct validity(36)

- The use of the **WHO BMI** classification it allows comparison of my participants' BMI with established global standards for nutritional status(37)(33)**.**

Reliability

- For anthropometric measures such as height, weight, and BMI, these tools are accurate because different researchers or clinicians measuring the same patients arrive at similar results(38)(37).

3.8 Data quality management

The computer was password-protected so that only the researcher could access it. For backup, a copy was kept on a flash disc. All data storage devices remain private and are only available to the research team. After the study was over, all copies were destroyed. The research was very well at managing data collection, entry or digitalization, and checking. The data was pretested in the first two days to ensure its quality.

3.9 Data Analysis

The collected data were coded and entered into a Statistical Package for Social Sciences (SPSS) version 26.Before analysis data cleaning to identify any missing data was done. Social demographic data, clinical characteristics, and BMI were analyzed using descriptive statistics i.e. mean, standard deviation, and proportion. The data was summarized in statistical tables and figures. A Chi-square and Fisher's exact test were used to estimate the association between factors and Malnutrition of the Hemodialysis patients. A statistically significant association was considered when a P value of less than 0.05 was found. After obtaining statistically significant variables with p-value < 0.05, multiple logistic regression analysis was carried out to see the independent factors of malnutrition among hemodialysis patients on univariate logistic regression analysis

3.10 Ethical Issues

Permission to perform this study was sought from the Institutional Review Board of the Muhimbili University of Health and Allied Sciences (MUHAS), Ref.No.DA.282/298/01.C/2136 and Zanzibar Health Research Institute Ref: No. ZAHREC/02/ST/APR/2024/80.In addition, permission to carry out the research was sought from the executive director and the chief of the internal medicine and nephrology departments in Zanzibar hospitals. Participants were given a Swahili formal written informed consent form and were asked to sign it. Furthermore, the study's purpose and the right to withdraw from the interview were thoroughly explained to the respondents. To uphold confidentiality, patients' names were concealed, and identification was based on their checklist numbers. Participation in the study was limited to eligible participants.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of the study participants

A total of 136 hemodialysis patients participated in the study. The mean age of the study participants was 45 ± 12 years; the youngest was 18 and the oldest was 73 years old. About half (n = 69, 50.7%) of the participants were male and the majority (n = 94, 69.1%) of the participants were married. compared to other levels of education, the majority of patients 67 (49.3%) had a secondary level of education, less than half of the participants were self-employed (n = 49, 36%), and more than half (n=84, 61.8%) resided in an urban area. The summary of the social demographic characteristics of the participants is presented in Table 1.

Table 1: Socio-demographic characteristics of the study participants (N = 136)

Variables	Values	Frequency (N=136)	Percent (%)
Age	18-28 years	15	11.0
	29-39 years	25	18.4
	40-50 years	54	39.7
	51-61 years	31	22.8
	62-73 years	11	8.1
Sex	Female	67	49.3
Marital Status	Single/widow/divorced	42	30.9
	Married	94	69.1
Education level	Informal education	12	8.8
	Primary education	45	33.1
	Secondary education	67	49.3
	College and university	12	8.8
Occupation	Un employed	121	89.0
	Employed	15	11.0
Participants residents	Town	84	61.8
	Rural	52	38.2

4.2 Clinical characteristics of the patients undergoing hemodialysis at Mnazi Mmoja Hospital

Most of the participants (n =59, 43.4%) were diagnosed with CKD in less than 12 months and about half (n=59, 43.4%), (n = 68, 50%) were in their first year of hemodialysis. The majority of the participants (n=131, 96%) were doing hemodialysis twice a week and about half of all participants (n=69, 50.7%) were using AVF as Vascular access for hemodialysis. Regarding comorbidities, more than half of the participants (n = 88, 64.7%) suffered from hypertension, and, Anti-hypertension drug use was reported by more than half (n=86, 63.2%) of the study participants. The summary of the clinical characteristics of the participants is presented in Table 2.

Table 2: Clinical characteristics of the of the study participants (N = 136)

Variables	Category	Frequency (N = 136)	Percent (%)
Duration of CKD	Less than 12 months	59	43.4
	12 -24 months	47	34.6
	24 - 48 months	13	9.6
	More than 48 months	17	12.5
Duration of Dialysis	< 12 months	68	50
	12 -24 month	48	35.3
	24 - 48 month	11	8.1
	more than 48 months	9	6.6
Dialysis frequency per week	Once	5	3.7
	Twice	131	96.3
Dialysis access type	CVC	67	49.3
	AVF	69	50.7
Comorbidities	HTN	88	64.7
	DM	2	1.5
	CHF	5	3.7
	HTN&DM	34	25
	OTHERS	7	5.1
Medication used	Antihypertensive	86	63.2
	Hypoglycaemic agent	5	3.7
	Antihypertensive &Hypoglycaemic agent	35	25.7
	Other drugs	10	7.4
Smoking status	No	122	89.7
	Yes	14	10.3
Alcohol Consumption status	No	127	93.4
	Yes	9	6.6

4.3 Nutritional Status of Patients undergoing Hemodialysis therapy at Mnazi Mmoja Hospital

Nutrition status According to BMI – WHO categories

According to BMI-WHO categories, more than half of the participants n = 76, (55.9%) [95% CI (47-63.9)] had abnormal BMI, with n =28, (20.6%) [95%CI (47-63.9)], n =34, (25%) [95%CI (34-56)] and n=14, (10.3%) [95%CI (11-29)] being underweight, overweight and obese respectively.

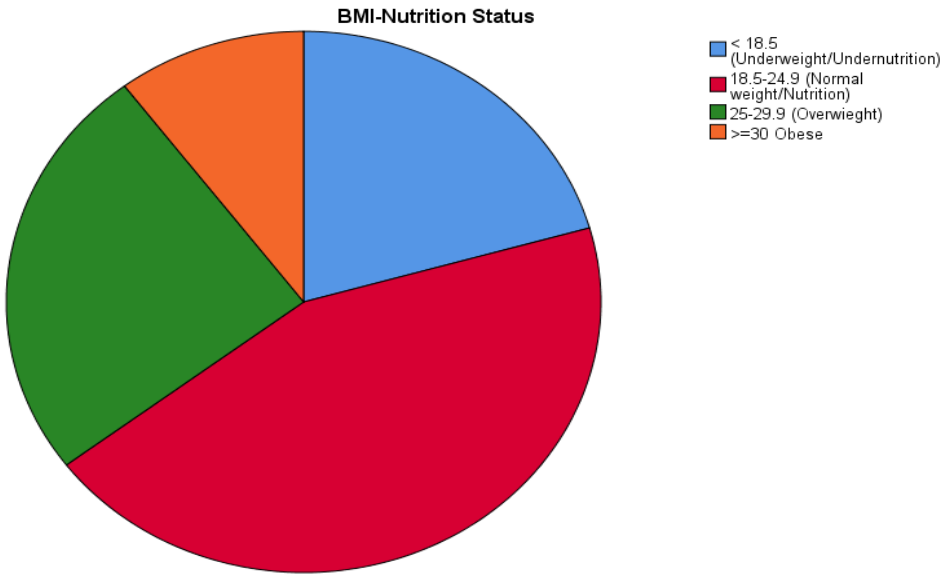


Figure 2: Pie chart showing BMI – WHO categories of the study participants

Nutrition status According to SGA-(PEM):

The mean score of malnutrition in the Subjective Global Assessment tool (SGA) was 12.18±4.2. The prevalence of overall malnutrition was n=82(60.3%) [95%CI (58.9-68.1)], where n=67 (81.7%) [95% CI (71.9-88.6)] had moderate malnutrition and n=15 (18.3 %) [95/% CI (11.4-28.0)]-had severe malnutrition.

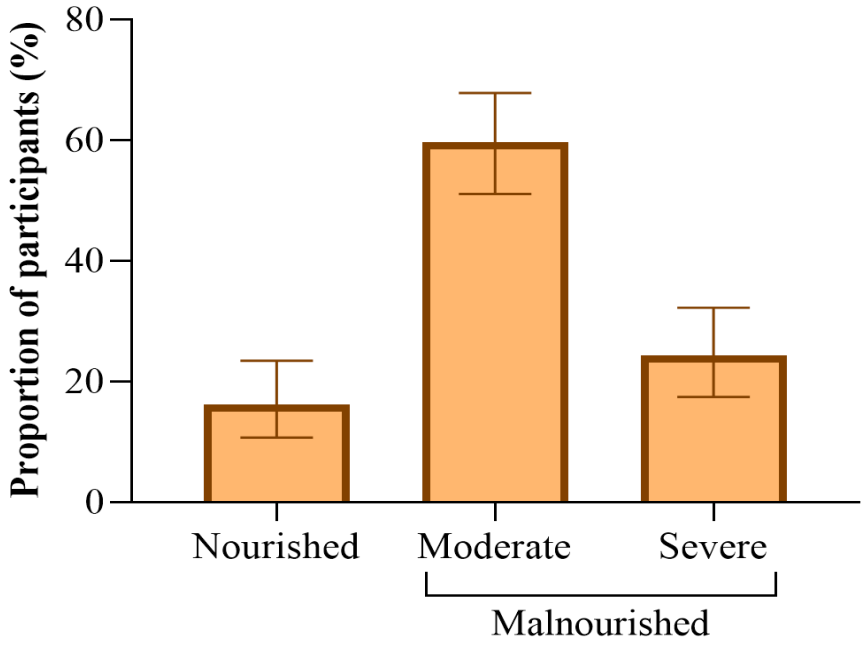


Figure 3: Bar chart showing the nutrition status of patients undergoing hemodialysis treatment at MMH

4.4 Factors Associated with Malnutrition among Patients Undergoing Hemodialysis at Mnazi Mmoja Hospital

A chi-square test and Fisher exact test were executed to examine the association between socio-demographic and clinical characteristics of the study participants with the nutritional status. Malnutrition was found to be associated with the duration of CKD since diagnosis (p = 0.007), duration of hemodialysis (P = 0.008), and dialysis access type (p = 0.01).

Table 3: Factors associated with malnutrition among patients attending hemodialysis treatment at MMH

Variables	Values	Well-Nourished (%)	Malnourished (%)	P - Value
Marital status	Not Married	17 (40.5)	25(59.5)	1.0
	Married	37 (39.4)	57 (60.6)	
Age	18-28 years	7 (46.6)	8 (53.3)	0.72
	29-39 years	11 (44)	14 (57)	
	40-50 years	23 (42.6)	31 (57.4)	
	51-61 years	10 (32.3)	21 (67.7)	
	62-73 years	3 (27.3)	8 (72.7)	
Sex	Male	30 (43.5)	39 (56.5)	0.082
	Female	24 (35.8)	43 (64.2)	
Education level	Informal education	3(12)	9(75)	0.416
	Primary education	18(40)	27(60)	
	Secondary education	26(38.8)	41(61.2)	
	College/university	7(58.3)	5(41.7)	
Occupation	Civil servant	51 (42.2)	70 (57.8)	0.16
	Merchant	3 (20)	12 (80)	
Participants residents	Town	38(45.2)	46(54.7)	0.094
	Rural	16(30.7)	36(69.2)	
Duration of CKD	Less than 12 months	30(50.8)	29(49.2)	0.007
	12 -24 months	20(42.6)	27(57.4)	
	24 - 48 months	2(15)	11(84.6)	
	More than 48 months	2(11.8)	15(88.2)	
Duration of Dialysis	< 12 months	36(52.9)	32(47.1)	0.008
	12 -24 month	15(31.9)	33(68.8)	
	24 - 48 month	1(9)	10(90.9)	
	more than 48 months	2(22.2)	7(77.8)	
Dialysis access type	CVC	34(50.8)	33(49.2)	0.01
	AVF	20(29)	49(71)	

Factors Associated with Malnutrition among Hemodialysis Patients

We used a logistic regression model to identify factors associated with malnutrition among Hemodialysis patients. On univariate logistic regression analysis, dialysis access, duration of dialysis, and duration of CKD were associated with malnutrition. After obtaining statistically significant variables with p-value< 0.05, multiple logistic regression analysis was carried out to see the independent factors of malnutrition among hemodialysis patients. As a result, no variables in the multivariable logistic regression analysis were determined as independent predictors as their p values were not < 0.05.

Table 4: Univariable and multivariable analysis of the factors associated with malnutrition

		Univariable analysis			Multivariable analysis		
Variable	**Category**	**cOR**	**95% CI**	**p-value**	**aOR**	**95% CI**	**p-value**
Age (years)	≥ 60	3.09	0.75 – 12.72	0.118	1.34	0.25 – 7.07	0.730
	39 – 59	1.09	0.51 – 2.36	0.825	0.75	0.30 – 1.86	0.537
	18 – 38	Ref					
Sex	Female	1.38	0.69 – 2.75	0.362			
	Male	Ref					
Education	No formal education	4.20	0.74 – 23.91	0.106	2.81	0.39 – 20.32	0.307
	Primary	2.10	0.58 – 7.65	0.261	1.79	0.42 – 7.62	0.432
	Secondary	2.21	0.63 – 7.69	0.214	1.88	0.47 – 7.55	0.373
	College & university	Ref					
Dialysis access	AVF	2.52	1.25 – 5.12	0.010	1.89	0.84 – 4.26	0.125
	CVC	Ref					
Duration of dialysis	>48 months	2.48	1.14 – 5.37	0.022	2.62	0.45 – 15.33	0.286
	24 – 48 months	11.25	1.36 – 92.76	0.025	7.09	0.78 – 64.53	0.082
	12 – 24 months	3.94	0.76 – 20.34	0.102	2.00	0.85 – 4.71	0.113
	< 12 months	Ref					
Duration of CKD	>48 months	7.76	1.63 – 36.97	0.010			
	24 – 48 months	5.69	1.16 – 27.92	0.032			
	12 – 24 months	1.40	0.65 – 3.02	0.396			
	< 12 months	Ref					
Hypertension	Yes	0.38	0.10 – 1.43	0.152	0.38	0.10 – 1.43	0.152
	No	Ref					

Key: cOR: crude Odds Ratio, aOR: adjusted Odds Ratio, Ref: Reference category

CHAPTERFIVE

5.0 DISCUSSION

Chronic Kidney Disease patients are continuously subjected to the need to adhere to dietary restrictions to prevent accumulation of the fluids and toxins in their bodies. Different guidelines are available worldwide for both dialysis and non-dialysis patients and for those who have received kidney transplantation. For patients on hemodialysis, the procedure itself involves the removal of nutrients, reduced appetite, and dietary restriction that may predispose a patient with already a restricted diet into danger of malnutrition. Other factors contributing to the nutritional derangements in these patients may include pre-existing comorbidities, illiteracy, socio-economic factors, and many others. The current study was conducted at Mnazi Mmoja Referral Hospital in Zanzibar to assess the nutritional status of CKD patients on maintenance hemodialysis therapy.

In this study we studied CKD patients on maintenance hemodialysis, there was a slight preponderance of male patients on hemodialysis, this is similar to other studies in sub-Saharan Africa(4). Most of the patients were diagnosed with CKD within 12monthsand almost 50% of patients were in their first year of hemodialysis. This is consistent with studies reporting that, in resource-limited countries, the majority of the patients are diagnosed late in their stage of the disease and require immediate renal replacement therapy(39)Hypertension was recorded as the most common complication among the CKD participants. These findings were in line with the other study conducted at Muhimbili (4).Decreased renal blood flow or low sodium levels trigger vasoconstriction, elevating blood pressure. This response also prompts sodium and water retention, increasing blood volume. Together, these mechanisms contribute to hypertension by raising vascular resistance and expanding blood volume causing kidney damage(40).According to my results patients having diabetes shown that low prevalence compared to other studies done in Tanzania(41).

The nearly equal use of arteriovenous fistula (50.7%) and central venous catheter (49.3%) for vascular access. AVF showed that high prevalence compared with another study that common access for hemodialysis is a central venous catheter(42). This is because, in January this year, there was a program in Zanzibar for arterial-venous catheter procedures so most of the patients had AVF.The current study also observed that AVF catheter was observed as a slightly statically significant predictor for severe malnutrition than CVC. The reason behind this finding is still not clear since many studies including Maguire et al. (2022 reported that CVCs are associated with fewer difficulties than AVF but did not explain its association with malnutrition (43).

The longer duration of hemodialysis the more risk of malnutrition. This finding is similar study done in Indonesia(44). Long-term dialysis can increase the risk of cardiovascular diseases, including hypertension, congestive heart failure, and arrhythmias, due to constant changes in fluid and electrolyte balance, and also protein-energy wasting, loss of water-soluble vitamins, and restrictions on diet that can lead to malnutrition. The common duration for hemodialysis sessions typically ranges from 3 to 5 hours, and it usually occurs three times per week for most patients with end-stage renal disease (ESRD). In Zanzibar, all hemodialysis patients are provided two times per week according to the Zanzibar protocol because the services are free this can be more associated factors for malnutrition because not enough can cause gastrointestinal disturbance and fluid overload

The present study observed a high prevalence of malnutrition among patients. The finding was similar to other studies conducted in different parts of the world (45,46). At the same time, we found that most of the participants were moderately malnourished followed by severe findings that were different from another study where most of the reported HD patients were well nourished while only a minor proportion were malnourished(13). The difference between BMI-WHO and SGA is that the SGA Nutrition assessment goes beyond which also contains a package of weight change in the past 6 months while BMI-WHO assesses only via the present weight and height of the individual (47).

5.1 Strengths and Limitations

Strength

This study revealed a high prevalence of malnutrition. It provides a picture that can assist hospital management, medical professionals, nurses, and other stakeholders in the healthcare system in improving the current guidelines and strategies for greater attention to malnutrition in Hemodialysis patients. Methods for nutritional assessment, including BMI and Subjective Global Assessment (SGA), were used, providing a nuanced understanding of patient health. The study also analyzed relevant clinical variables, such as the duration of CKD and dialysis, adding depth to the findings.

Limitation

The results of this study may be faced with limitations due to the cross-sectional design limiting the ability to establish causality between variables and malnutrition, the nature of sampling i.e. convenient sampling technique which introduces bias due to the small sample size. And also conducting the study at a single hospital may limit the generalizability of the findings to other settings or regions.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

The general prevalence of malnutrition among Hemodialysis patients was very high; however, most of them were moderately malnourished according to Subjective global assessment tools. Most of the patients were in dialysis procedures for more than one year while Hypertension was observed as the main cause of chronic kidney disease. To be in dialysis procedure for more than two years, AVF catheter accesses, and sometimes were associated with severe malnutrition among Hemodialysis patients.

6.2 Recommendation

Knowledge about factors affecting the nutrition status of CKD-HD patients to the healthcare workers dealing with these patients must be provided to make continuous minor assessments to see the change over time and to be aware of preventing the patients from exposing to those risk factors.

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APPENDICES

Appendix I: Consent Form

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

MUHAS Directorate of Research and Publication

Informed Consent Form

Consent to participate in the Study: Entitled Assessment of nutritional status among patients attending maintenance hemodialysis (HD) at Mnazi Mmoja Hospital-Zanzibar

Purpose of the study:

The purpose of this study is to know the nutritional status of the patient on hemodialysis to provide knowledge to the patients and caregivers to improve the quality of life and to give quality care to the patients.

How to participate:

If you consent to participate in the study, you will undergo an interview to respond to a series of questions that was asked by the researcher from the prepared questionnaire, you are being asked in this study of assessment of nutritional status among patients attending maintenance hemodialysis (HD) at Mnazi Mmoja Hospital-Zanzibar.

Confidentiality

The interview questionnaire was kept in a secure location and handled with confidentiality. This data will be accessible to and used by authorized people, and only for the study's objectives.

Identifier numbers were assigned to each participant in place of names throughout the interview. If you're willing to take part, if you agree to participate, I was giving you a thorough explanation of the study and ask for your signature on a consent form.

Potential Risks for Study Participants

As a participant, you will not be exposed to any risks in this study.

Right to Decline

Your participation is entirely voluntary; you have the freedom to withdraw from the study at any point without facing any discrimination. Before completing the consent form and throughout the treatment, you are welcome to ask any questions you may have. Your signature on the consent form would be greatly appreciated if you choose to participate. Many thanks.

Benefit:

By agreeing to participate in this study, you had the opportunity to learn about your Body Mass Index (BMI) and nutritional status among hemodialysis patients.

Compensation

No form of compensation is provided for participating in this study.

Whom to Contact

Throughout the study, feel free to get in touch with the following if you have any queries:

Principal Investigator: Asya SalumAbdalla
The Muhimbili University of Health and Allied Sciences (MUHAS)
Department of Clinical Nursing
P.O.BOX 65001, Dar-es-salaam
Mobile: 0777333070

Alternatively, for inquiries during the study, you can contact:

Supervisor: Dr. Jacqueline Shoo, Co-Supervisor: Mr. Pius Temba

Muhimbili University of Health and Allied Sciences (MUHAS) Department of Clinical Nursing
P.O BOX 65001, Dar-es-salaam

Dr. Jacqueline Shoo Mobile: 0716 505241

Mr. Pius Temba's Mobile: 0623 234365

I, ……, consent to participate in the study assessing the nutritional status among patients undergoing maintenance hemodialysis (HD) at Mnazi Mmoja Hospital-Zanzibar. I do so with an understanding of the study's objectives and procedures. Asya Salum Abdalla has provided a clear explanation of the study's purpose. I am also aware that I have the right to withdraw from the study without any impact on my benefits or the quality of my medical care.

Participant's Signature: _____ Date: _____

Witness's Signature: _____ Date: _____

For any ethical concerns, please contact:
The Director of Research and Publication-MUHAS
P.O BOX 65001, Dar-es-salaam
Tel. +255-022-2152489

Appendix II: Maelezo ya ridhaa ya kushirik iwa utafiti

Ridhaa ya kushiriki katika utafiti wa hali ya lishe kati ya wagonjwa wa uchujaji wadamu (dialylisis)ya wagonjwa wa Ugonjwa wa Figo (CKD) wanaohudhuria MMH Zanzibar

Dhumuni la utafiti:

Utafiti huu utasaidia kuchunguza afya ya lishe kwa wagonjwa wanachuja damu ili kuweza kupata elimu kwa wagonjwa na watoa huduma ili kuboresha na kutoa huduma stahiki kwa wagonjwa wa figo wanaochuja damu katika hospitali ya Mnazi Mmoja, Zanzibar

Jinsi ya kushiriki:

Ikiwa unakubaliana kushiriki katika utafiti, utahojiwa ili kutoa majibu kwa mfululizo wa maswali ambayo yataulizwa na mtafiti kutumia orodha ya maswali iliyotayarishwa. Utaulizwa katika utafiti huu wa tathmini ya hali ya lishe kati ya wagonjwa wanaopokea huduma ya uchujaji wad amu (hemodialysis) katika Hospitali ya Mnazi Mmoja-Zanzibar**.**

Usiri wa taarifa

Majibu ya maswali yatakayotolewa wakati wa mahojiano yatahifadhiwa kwa usiri katika eneo salama. Watu wenye mamlaka pekee ndio watakaokuwa na idhini ya kufikia na kutumia habari hii, kwa kuzingatia kikamilifu malengo ya utafiti.

Majina ya washiriki hayatakuwa yanatumika wakati wa mahojiano; badala yake, namba za utambulisho zitatolewa kwa kila mshiriki. Ikiwa utakubaliana kushiriki, nitatoa maelezo ya kina kuhusu utafiti na kukusihi uisaini fomu ya ridhaa.

Ikiwa kuna majeraha

Hatutarajii madhara yoyote kwako wala kwa jamaa zako kama matokeo ya kushiriki katika utafiti huu. Hata hivyo, ikiwa kuna majeraha ya kimwili yanayotokana na kushiriki katika utafiti huu, tutakupatia wewe au jamaa zako matibabu ya kitabibu kulingana na viwango vya huduma

vinavyotumika kwa sasa nchini Tanzania. Hakutakuwa na fidia ya ziada kwa ajili yako au jamaa zako.

Faida:

Utafiti huu utatoa fursa ya kujua hali ya lishe katikati ya mizunguko ya dialysis kwa wagonjwa na, pia kwa watowa huduma juu ya lishe stahiki kwa wagonjwa wa figo ili kutowa huduma bora kwa wagonjwa wa figo.

Fidia

Hakuna fidia ya namna yeyote katika ushiriki wako kwenye utafiti huu.

Haki ya kukataa:

Haki ya Kukataa

Ushiriki wako ni wa ridhaa kabisa; una uhuru wa kujitoa kutoka kwenye utafiti wakati wowote bila kukumbana na ubaguzi wowote. Unashauriwa kuuliza maswali yoyote kabla ya kusaini fomu ya ridhaa na wakati wa ukiendelea na huduma. Ikiwa utachagua kushiriki, saini yako kwenye fomu ya ridhaa itathaminiwa. Asante.

Mimi, ……, naunga mkono ushiriki wangu katika utafiti wa kuchunguza hali ya lishe kati ya wagonjwa wanaopokea huduma ya kusafishwa damu (hemodialysis) katika Hospitali ya Mnazi Mmoja-Zanzibar. Nafanya hivyo nikiwa na uelewa wa malengo na taratibu za utafiti huu. Asya Salum Abdalla amenielezea kwa wazi lengo la utafiti. Pia,

ninatambua kwamba nina haki ya kujiondoa kutoka kwenye utafiti bila kuathiri faida zangu au ubora wa huduma yangu ya matibabu.

Saini ya Mshiriki: _____ Tarehe: _____

Saini ya Shahidi: _____ Tarehe: _____

Ikiwa una maswali yoyote wakati wa utafiti, unaweza kuwasiliana na wafuatao.

Asya Salum Abdalla: Mtafiti Mkuu,

Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili (MUHAS)

Idara ya Fiziolojia: P.O.BOX 65001 Dar-es-salaam,

Simu: 0777333070

AU

Dk. JACQUELINE SHOO: Msimamizi wa utafiti huu,
Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili

(MUHAS)Idara ya Fiziolojia: P.O BOX 65001, Dar-es-salaam:

Simu ya Mkononi 0716 505241

Ikiwa kuna wasiwasi wowote wa kimaadili tafadhali wasiliana

Mkurugenzi wa Utafiti na Uchapishaji-

MUHAS, P.O BOX 65001

Dar-es-salaam, Simu. + 255-022-2152489

Appendix III: Evaluation Tools

Form number..... Date.....

PART A

DEMOGRAPHIC SURVEY AND ANTHROPOMETRIC MEASUREMENTS

1. Your age …….
2. Your gender …….
3. Marital status
   a. Single
   b. Married
   c. Separate/divorced
   d. Widow
4. Level of education
   a. Never gone to school
   b. Primary education
   c. Secondary education
   d. College and university education
5. What is your Occupation
   a. Civil servant
   b. Merchant
   c. House wife
   d. Self-employee
   e. Daily laborer
   f. Student
   g. Others (…….)

6. Resident area
   a. Town
   b. Village

PART B: CLINICAL CHARACTERISTICS

7. Duration since diagnosis of CKD ……..(months)
8. How long have been on dialysis treatment ……. (months)
9. Weekly hemodialysis sessions ……..
10. What dialysis access are you using; CVC…….. AVF…….. AVG……..
11. Are you suffering from any of the following diseases?
    a. High blood pressure
    b. Low blood pressure
    c. Diabetes Mellitus
    d. Others ……..
12. What medication are you currently using?
    a. Antihypertensive
    b. Hypoglycemic agents
    c. Others ……..
13. Do you smoke?
    a. Yes
    b. No
14. Do you consume alcohol?
    a. Yes
    b. No
15. Weight in Kilograms.....
16. Height in Centimeters.....
17. BMI kilograms in meters squires (Kg/M2).....

PART C: DIETARY INTAKE SECTIONS

18. Has your healthcare practitioner given you any advice on dietary intake?
    a. Yes
    b. No
19. What are the dietary advices has you received from health care providers?
    a. Limiting fluid intake
    b. Reducing food rich in potassium e.g. banana, oranges, coconut water
    c. Reducing phosphorus such as egg York, Dairy products, cola drinks
    d. Reduction in salts including salt added processed food
    e. Limiting consumption high protein diet such as red meat, eggs,
    f. Leaching vegetables preparation
    g. Reducing fat food eg. avocado, nuts, butter, cheese, dark chocolate
20. How many meals do you typically have in a day?
    a. < 3 meals
    b. 3 meals
    c. More than 3
21. How often do you adhere to the following?

SN	ITEM	Not at all	Sometimes	Very often	Always
A	Reducing food rich in potassium e.g. banana, oranges, coconut water				
B	Reducing phosphorus such as egg York, Dairy products, cola drinks				
C	Reduction in salts including salt added processed food				
D	Limiting fluid intake				
F	Leaching vegetables preparation				
G	Reducing fat food				

PART B: SGS

Current body weight …… (Kg)

Weight in the past six months…….. (Kg)

SUBJECTIVE GLOBAL ASSESSMENTMALNUTRITION SCORING CHART ‘’A” Please circle the correct answer				
1.Weight change (overall change in the past 6 months)				
1	2	3	4	5
1. No weight change or gain-0%	Minor weight loss (<5%)-(1—4)	Weight loss to 5 to <10% (5----9)	Weight loss 10 to <15% (10---14)	Weight loss >15%
2.Dietary intake				
1 No change Decrease	2 Sub-optimal solid diet	3 Full liquid or moderate overall	4 Hypo caloric liquid	5 Starvation
3.Gastrointestinal symptoms				
1 No symptoms GI symptoms	2 Nausea	3 Vomiting or moderate	4 Diarrhea	5 Severe anorexia
4.Functional capacity (nutritionally related functional impairment)				
1 None (improved) Normal activity	2 Difficult with no/little activity	3 Difficult with With ambulation	4 Light activity ridden	5 Bed/Chair
5.Co-morbidity				
1 MDH<12 month	2	3 MDH2-4yrs or age >75 or	4	5

And healthy Otherwise	MDH1-2yrs or mild co-morbidity	moderate co-morbidity	MDH>4yrs or severe co-morbidity	Very severe multiple co-morbidity
Physical examination: 6.Decreased fat stores or loss of subcutaneous fat (below eyes, triceps, biceps, chest)				
1 None (no change)	2 Mild	3 moderate	4 Moderately severe	5 Severe
7.Signs of muscle wasting (temple, clavicle, scapula, ribs, quadriceps, knee, intercoseous)				
1 None (no change)	2 Mild	3 Moderate	4 Moderately severe	5 Severe

Plan for SGA analysis: Either**SGA (<10 Good Nutr, 10-17- Moderate Malntr, > 17 Severe Malntr)**

1. Well nourished-10 <Score
2. Moderate Malnourished-10--17
3. Severe Malnourished- > 17

SGA has 7 components:

Ranges: 1 score (Normal) to 5 scores (Severe) per component

Total ranges: 7 scores (Normal) to 35 (severely Malnourished) for all 7 components

Type of Malnutrition assessed by SGA: PEM (Protein Energy Malnutrition)

Figure 4: Subjective Global Assessment-Dialysis Malnutrition Scoring

Appendix IV: Swahili Version of the Questionnaire

A. MAELEZO YA AWALI

1. Miaka ya muhojiwa …….

2. Jinsia ya anayehojiwa

   a) Mwanaume
   b) Mwanamke

3. Hali yako ya ndoa sasa hivi

   a) Nina ndoa/Tunaishi pamoja
   b) Sijaolewa/sijaoa
   c) Mtalakiwa/ Tumetengana
   d) Mjane

4. Kiwango cha juu cha elimu?

   a) Sijasoma
   b) Msingi
   c) Sekondari
   d) Vyuo vya kati/chuo kikuu

5. Kipato unachopata kwa mwezi?

   a) Kidogo sana
   b) Wastani
   c) Kikubwa

6. Unafanya shughuli gani kwa ajili ya kipato na kujikimu?

   a) Mtumishi wa umma
   b) Mfanya biashara
   c) Mkulima
   d) Mama wa nyumbani

e) Nimejiajiri mwenyewe
f) Mfanyakazi wa kila siku wa shughuli ndogo ndogo
g) Mwanafunzi
h) Mengineyo

7. Makazi
   a) Mjini
   b) Shamba

8. Una mda gani tokea uanze kusafishwa figo?

   ……

9. Unasafisha figo mara ngapi kwa wiki?

   …….

10. Una tatizo lolote kati ya haya yafuatayo?
   a) Shindikizo la damu kuwa juu
   b) Shindikizo la damu kuwa chini
   c) Kisukari
   d) Sina tatizo kati ya hayo

11. Kama una shindikizo la juu la damu je ulikuwa nalo kabla hujapata tatizo la figo
   a) Ndio nilikuwa na shindikizo ladamu la juu kabla ya tatizo la figo
   b) Hapa limeanza Pamoja au baada ya kupata tatizo la figo

12. Ulipata ushauri wowote kutoka kwa muhudumu wa afya kuhusu unywajuwa wa vimiminika?
   a) Mda wote uapata ushauri
   b) Napata mara chache

c) Napata mara chache sana

d) Sijawahi kupata

13. Ulifata ushauri uliopewa na wahudumu wako wa afya?

a) Mda wote naufata

b) Mara chache naufata

c) Mara chache sana naufata

d) Siufati kabisa

14. Nani anakuhudumia nyumbani?

a) Wanafamilia

b) Marafiki

c) Hakuna mtu anaenihudumia

15. Je, unajua kuhusu vizuizi vya lishe vinavyohusiana na matibabu yako ya usafishaji wa damu (hemodialysis?)

a) Ndiyo

b) Kwa kiasi

c) Hapana

16. Unakula milo mingapi kwa siku?

a) Chini ya milo 3

b) Milo 3

c) Zaidi ya milo 3

17. Je, unatambua na kufuata vizuizi vya maji vilivyopendekezwa kwa hali yako?

a) Ndiyo

b) Wastani

c) Hapana

18. Je, unazingatia vipimo vilivyopendekezwa vya kiasi cha protini?
    a) Ndiyo
    b) Kwa kiasi
    c) Hapana
19. Je, unavuta sigara?
    a) Ndiyo
    b) Hapana
20. Je, unatumia pombe?
    a) Ndiy
    b) Hapana
21. Kwa mara ngapi unachukua dawa zako kama ilivyoelekezwa?
    a) Mara zote
    b) Mara chache
    c) Kamwe

SEHEMU B

PART C: VIASHIRIA VYA ANTHROPOMETRIC

22. Uzito wa mwili (KG).....
23. Urefu wa mwili (SM).....
24. BMI kilogramu katika mita za mraba (Kg/M2).....

Appendix V: Approval for ethical clearence

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/2136 Date: 02/04/2024

MUHAS-REC-04-2024-2136

ASYA SALUM ABDALLA
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: ASSESSMENT OF NUTRITIONAL STATUS AMONG PATIENTS ATTENDING HEMODIALYSIS AT MNAZI MMOJA HOSPITAL - ZANZIBAR

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: 02/04/2024
EXPIRATION DATE OF APPROVAL: 02/04/2025

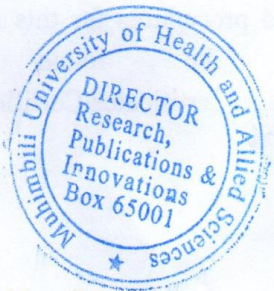
STUDY DESCRIPTION:
Purpose:

The purpose of this descriptive cross sectional study design is to assess the nutritional status of patients receiving hemodialysis at MMH and identify the factors associated with it.

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-%2014554.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

REVOLUTIONARY GOVERNMENT OF ZANZIBAR

Ministry of Health,
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Zanzibar Health Research Institute,
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Website: www.zahri.go.tz
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Street: Binguni – Zanzibar
Tel: +255(0) 776 264 880
Email: zahrec@zahri.go.tz

Ref: NO. ZAHREC/02/ST/APR/2024/80 15th April, 2024

Asya Salum Abdalla,
Student Researcher,
MUHAS.

RE: ETHICAL CLEARANCE FOR CONDUCTING HEALTH RESEARCH IN ZANZIBAR

This is to certify that the research protocol titled **"Assessment of Nutritional Status among Patients Attending Haemodialysis at Mnazi Mmoja Hospital - Zanzibar."** was received and reviewed on the 11th of March, 2024.

We would like to inform you that your proposal has been **"Approved"** for implementation.

Sites of Research: Mnazi Mmoja Hospital.

The Principal Investigator has to:

i. Submit your progress report and a final report upon completion of Research.
ii. Seek permission for Publication of results from ZAHREC.
iii. Submit Copies of the final Publications to ZAHREC.
iv. Seek approval for any changes made to the approved protocol prior to their implementation

Any researcher who deviates or fails to comply with these conditions shall be guilty of an offense and shall be liable **Six months: 15/04/2024 - 14/10/2024**

Thanks in advance

ZANZIBAR HEALTH RESEARCH INSTITUTE
23 APR 2024
P.O. Box 236, ZANZIBAR

Bernard P. Mhuta,
ACTING CHAIR- HRCC,
ZANZIBAR HEALTH RESEARCH INSTITUTE,
BINGUNI,
ZANZIBAR.

Amour S. Mohamed,
DIRECTOR GENERAL,
MINISTRY OF HEALTH,
ZANZIBAR.

Appendix VI: Introduction letter

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.465/2022 04th April, 2024

The Medical Officer In-Charge,
Mnazi Mmoja Hospital,
P.O. Box 672,
ZANZIBAR

Re: INTRODUCTION LETTER OF ASYA SALUM ABDALLA

The bearer of this letter is Asya Salum Abdalla (HD/MUH/T.465/2022), a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Nursing Nephrology.

As part of her studies She intends to do a study titled: **"Assessment of Nutritional Status Among Patients Attending Hemodialyisis at Mnazi Mmoja Hospital - ZANZIBAR."**

The research has been approved by the Chairman of University Senate.

Kindly provide her the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.

Mr. Seba Mohamed
For: DIRECTOR, POSTGRADUATE STUDIES

c.c. Asya Salum Abdalla

9 United Nations Road, Upanga West, P.O. Box 65001, Dar Es Salaam. Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line: +255-22-2151378,Telefax:+255-22-2150465,E-mail:dpgs@muhas.ac.tz;Web https://www.muhas.ac.tz

Appendix VII: Digital 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:	ASYA SALUM
Assignment title:	dissertations
Submission title:	ASSESSMENT OF NUTRITIONAL STATUS AMONG PATIENTS AT...
File name:	ASYA_REPORT_FINAL_Jumatano.docx
File size:	848.35K
Page count:	59
Word count:	11,237
Character count:	64,443
Submission date:	18-Jul-2024 06:24PM (UTC+0300)
Submission ID:	2418715729



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Appendix VIII: Plagiarism Report

ASSESSMENT OF NUTRITIONAL STATUS AMONG PATIENTS ATTENDING HEMODIALYSIS AT MNAZI MMOJA HOSPITAL – ZANZIBAR, TANZANIA

ORIGINALITY REPORT

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