

**NUTRITION KNOWLEDGE, ATTITUDES AND PRACTICES AMONG
HEALTHCARE WORKERS IN MANAGEMENT OF CHRONIC
KIDNEY DISEASES IN SELECTED HOSPITALS IN DAR ES SALAAM,
TANZANIA**

**MUNUO, ADELINE ELIUD (BSc. HE& HN)
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DECLARATION

“This thesis is my original work and has not been presented for a degree in any other University.”

Signature

Date

Name: Munuo, Adeline Eliud - H60EA/12996/2009

Supervisors: This thesis has been submitted for review with our approval as
University supervisors:

1. Signature.....

Date.....

Beatrice Mugendi (PhD)

Department of Food Science and Technology

Dedan Kimathi University of Technology

2. Signature

Date.....

Onesmo A. Kisanga (MD,MMed, MSc. Nephrology)

Department of Internal Medicine

Muhimbili National Hospital

DEDICATION

This thesis is dedicated to my husband Douglas Charles and our children, Comfort and Blessing for their continued encouragement and unending support.

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LIST OF ACRONYMS AND ABBREVIATIONS

AMSA	American Medical student Association
Bwt	body weight
CME	continuous medical education
CKD	Chronic Kidney Disease
CVD	Cardiovascular diseases
CSA	Council on Scientific Affairs
ESPEN	European society for parenteral and enteral nutrition
ESRD	End-stage Renal Disease
GoT	Government of Tanzania
HBV	High Biological Value
ICU	Intensive care unit
KNH	Kenyatta National Hospital
LMICs	Lower-Middle Income Countries
MoH	Ministry of Health
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and Allied Sciences
NGT	Nasogastric tube
NKF	National Kidney Foundation
RMC	Regency Medical Centre
RRT	Renal replacement therapy
SGA	Subjective global assessment
SSA	Sub-Saharan Africa
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Healthcare workers: Clinical and other staffs; including those in primary care, who have regular, clinical contact with patients. In this study, meant doctors, nurses and nutritionists working in renal units.

Chronic Kidney Disease (CKD): Conditions in which an individual has suffered from kidney problems for 3 months or more and is being attended at the renal unit.

Nutrition management of CKD: Activities carried out in hospitals (renal clinics and wards) to diagnose and manage nutritional related problems as a result of CKD progression. They include patient nutrition assessment; dietary counselling, dietary prescription and patient follow ups.

Nutrition knowledge: Having concept on nutrition matters and ability to apply it to patient's need.

Attitude: Talking positively or negatively about nutrition management of patients with chronic kidney diseases in the hospital.

ABSTRACT

Chronic kidney disease (CKD) is a permanent and progressive loss of kidney function, resulting in deterioration of renal function. The overall management of CKD focuses on medication, dialysis, transplant and nutrition. The importance of nutritional evaluation and diet therapy in the overall management of the patients with CKD is very important; its application is limited by lack of knowledge regarding the requirement for certain nutrients in health and the way in which these requirements are modified by chronic diseases. There is limited information on the nutrition knowledge on management of CKD and the factors affecting it among healthcare workers in the Dar es Salaam Tanzania. This study aimed to assess nutrition knowledge, attitudes and current practices of healthcare workers in management of patients with CKD in selected hospitals. A cross sectional descriptive study design was conducted amongst 133 healthcare workers in renal units at Muhimbili national hospital, Regency medical centre and the Aga Khan Hospitals. Hospitals were purposively selected based on the availability of renal care services in the facility. Study subjects were conveniently selected from the three hospitals. Nutrition knowledge was assessed using a standardized questionnaire. Data were analysed using SPSS computer software version 17. Descriptive statistics were used to summarize data. Chi-square was used to test the relationship between categorical variables. Results showed that the mean nutrition knowledge score was 9.8 (SD 3.12) with 18.8 % of respondents having good knowledge. There was a significant difference in the nutrition knowledge among different carders ($p \leq 0.001$). It was also found that medical specialists had a higher mean score of nutrition knowledge (13.75) compared to medical doctors and nurses with mean score 12.05. Others (lab technicians, pharmacists, nutritionists and radiographers) had lower mean score of 8.65. Most of respondents (94%) had positive attitudes on the role of nutrition in preventing and treating diseases. However, their belief contradicted their practices. Most of respondents 92 % (n=122) did not use any nutrition guidelines. Nutrition management was discussed occasionally during ward rounds. Significant relationships between nutrition care practices and some demographic variables. Occupation ($\chi^2= 12.9$; $df= 4$; $p= 0.014$), work experience ($\chi^2= 15.8$; $df= 3$; $p= 0.001$). Nutrition knowledge among study participants was poor; though their attitude was positive they failed to practice due to poor knowledge. Inadequate nutrition training in medical school, lack of resources and motivation were identified as factors that influence nutrition management of CKD in the study area. Review of medical curriculum to incorporate clinical nutrition topics, continuous nutrition education programs for in-service healthcare workers and hiring dieticians in each hospital department would improve nutrition management of CKD patients in hospitals.

CHAPTER ONE: INTRODUCTION

1.0 Background information

Chronic kidney disease (CKD) is a permanent and progressive loss of kidney function, which results in deterioration of renal function or end-stage renal disease (ESRD). ESRD represents the end of the continuum of CKD. It is a devastating medical, social and economic problem for the patients, their families, and the country as a whole (Olugbenga *et al*, 2010). CKD is an important component of chronic non-communicable disease (NCDs) that are now of pandemic proportions and are the major cause of morbidity and mortality worldwide (Thorp, 2006). The incidence and prevalence of CKD has increased in recent years in both developed and developing countries including sub Saharan Africa (SSA) (Hosseinpanah, 2009; Arogundade, 2008). In SSA, CKD affects mainly young adults in their productive years and is a significant cause of death. In Tanzania the prevalence of ESRD is estimated to be 75 patients per million populations. Studies follow-up of 26 patients, Maro and Ammur,(2002) found that the main primary cause of ESRD were hypertension (30.8%) chronic glomerulonephritis (23.8%), nephritic syndrome(15.4 %), obstructive uropathy (7.7%), ischaemic nephrosclerosis (3.9%), polycystic kidney (3.9%) and underdetermined (15.4%). Early diagnosis and treatment of the underlying cause and of secondary preventive measures is imperative in patients with chronic kidney disease, as it may delay, or possibly halt progression (Sumaili *et al.*, 2009).

Management of the nutritional aspects presents a number of challenges. Patients with CKD frequently have risk factors for atherosclerosis hypertension, insulin resistance, and dyslipidaemia, which can be controlled by a fat, sodium, and sugar-restricted but high-fibre diet (Merck Manual, 2012). But these patients also commonly present with MN, which calls for a less restricted meal plan (Shoji and Nishizawa, 2005). According to Bergstrom (1993),

end-stage renal failure requires calorie, protein and micronutrient intake alterations which may contribute to the high incidence of protein-energy malnutrition (PEM). PEM has been shown to be one of the most important risk factors for increased morbidity and mortality in end stage renal disease, while ingestion of excessive potassium, phosphorus, sodium and fluid may have adverse effects on fluid balance and result in other complications induced by electrolyte disturbances (Zeier, 2002). Early nutrition intervention is thought to play a major role in the maintenance of renal function and overall well-being in the renal patient (Moore *et al.*, 2003). Consultation with a renal dietician to establish an appropriate diet can help to reduce cardiovascular risk factors and mortality risk (Caglar and Ikizler, 2002). Such a diet will also help to prevent MN and metastatic calcification of previously undamaged tissue (Albaaj and Hutchison, 2003) and may slow the progression of renal disease (Zarazaga *et al.*, 2001).

Historically, physicians were not prepared to assess and treat nutrition problems in their patients. People became more aware of nutrition demanding reliable sources of nutrition information. The public has formed negative image towards the knowledge and experience of their physicians toward nutrition. This attitude encourages people to seek nutrition information from potentially unreliable sources (CSA, 1990).

Survey studies revealed that physicians are hesitant to provide nutrition information to patients due to low levels of confidence resulting from a lack of education and knowledge in this field (US report, 2000). Interest has emerged in nutrition education and many medical schools integrated nutrition in bedside and case based teaching has none (ADA, 1994). Primary care physicians have the potential to decrease morbidity and mortality if they provide effective nutrition counselling and advice. Nutrition knowledge changes with new scientific evidence. Physicians must be aware of reliable sources of continuing education and information appropriate for their practice and patient care (Kushner, 1995). Nutritional

information from health workers has also shown to be positively and significantly correlated with adoption of dietary behaviour and reduced risk of nutrition related chronic disease (Fox *et al.*, 2006).

1.1 Problem statement and justification

The importance of nutritional evaluation and diet therapy in the overall management of the patients with chronic renal disease is unquestioned, as it is thought to play a major role in the preservation of renal function and overall well-being in the renal patients (Moore *et al.*, 2003). Its application is limited by a lack of knowledge regarding the requirement for certain nutrients in health as well as the way in which these requirements are modified by chronic disease. Health workers who have direct interactions with patients during hospitalization are in a good position to inform those who are at risk of these diseases and counsel them on scientific and practical dietary therapies. However, ability of healthcare workers to provide quality accurate, practical and consistent dietary advice appropriate to the needs of patients is limited (Hasse, 2006). There is limited information on the nutrition knowledge of healthcare workers in the management of CKD in Tanzania. Recently, there has been increasing number of unauthorised practitioners providing misleading information regarding nutrition to the society. In view of this discrepancy, the present study was conducted.

1.2 Purpose of the study

The purpose of this study was to determine nutrition knowledge attitudes and practices of healthcare workers in the management of patients with CKD in selected hospitals, together with factors influencing them.

1.3 Research objectives

The specific objectives of this study were to;

1. Assess the nutrition knowledge of the healthcare workers in the management of patients with CKD.
2. Assess the attitudes of healthcare workers in the management of patients with CKD.
3. Assess the existing practices of healthcare workers on management of patient with CKD.
4. Determine factors influencing nutrition management of patient with CKD among study participants.

1.4 Hypotheses of the study

This study tested the following hypothesis;

H₀₁: There is no significant relationship between the nutrition knowledge and practices in management of patients with CKD.

H₀₂: There is no significant relationship between the nutrition knowledge and attitudes among healthcare workers in the management of patients with CKD.

H₀₃: There is no significant relationship between attitudes and practices of healthcare workers in the management of patients with CKD.

1.5 Significance and anticipated output

The findings of the study can be used by Ministry of Health and Social Welfare (MoHSW) as well as to hospital administrators to improve the overall nutrition management among CKD patients. The study has also contributed to knowledge on nutrition management of CKD patients and factors related to it in selected hospitals in the region and other area with similar characteristics. Further, findings have generated new ideas to research on the use of

nutritional supplements among CKD patients and nutrition care for patients with other diet related non communicable diseases.

1.6 Limitations of the study

Comprehensive assessment of the knowledge attitudes and practices of healthcare workers was not possible because of the time that would have been required and was unlikely to have been given by healthcare workers as they already complained that the questionnaire used was too long. Funds were limited and this forced the researcher to survey only three hospitals in the city. The study would have been more beneficial if it covered not only MNH but other regional hospitals countrywide.

1.7 Conceptual Framework

To address the various components of this study the aspect of healthcare workers nutrition knowledge, attitudes and practices and other factors such as motivation and incentives that might influence nutritional management of patients with CKD were examined. In this regard, the conceptual framework in Figure 1.1 was considered for the study.

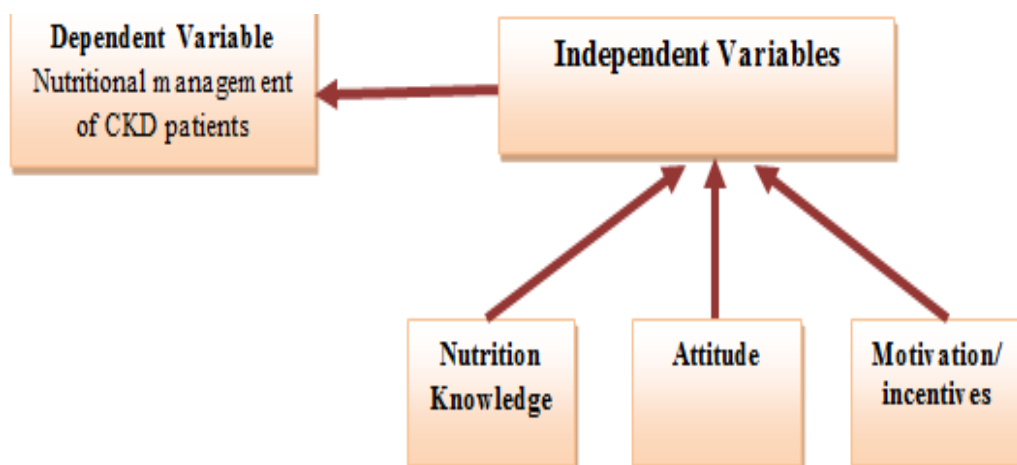


Figure 1.1: Relationship between nutrition management of CKD and other variables

(Source: Adopted from Oso and Onen, 2009).

In the conceptual framework depicted in Figure 1.1, nutrition knowledge, attitude and factors such as incentives and motivation were hypothesized to influence the nutrition management of patients with CKD of the healthcare workers. The framework assumes that nutrition knowledge, attitude and factors such as motivation and incentives affect nutritional management of patients with CKD among healthcare workers.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

Every individual with kidney disease is unique, and treatment is very individualized based on the cause, stage of progression, other coexisting health conditions, and medications. Some individuals in earlier stages of kidney disease can manage their condition with diet, exercise, and medications (Wendy, 2001). Dietary modification is essential in individuals with kidney diseases and the nutritional recommendations vary depending on each patient's stage of progression, cause of disease and other treatment methods (Dertenois, 2003). This study sought to give information on nutrition knowledge, attitudes and practices among healthcare workers in the management of CKD patients.

2.1 Nutritional management of CKD

Nutrition plays an important role in the treatment of many chronic diseases, but uniquely to CKD. Nutritional therapy allows good control of several consequences of the disease and has therefore the same clinical relevance as other types of medical therapies (Toigo, 2000). The risk of malnutrition (MN) increases as CKD progresses and often, many patients are malnourished by the time they start dialysis. Studies have shown that as many as 78% of dialysis patients do not comply with the diet restrictions, though such adherence has demonstrated a decreased risk of symptoms and medical complications and increase in quality of life (Sussman, 2001). Further, studies have shown that MN rates are between 28-48% in predialysis patients or those at CKD stage 1-4 (Symes, 2009) and as many as 50% of patients with ESRD may be malnourished (McKnight *et al.*, 2010). MN may be caused in part by inadequate nutritional management of patients during pre-dialysis phase. Treatment goals require that the best possible nutritional status be established and maintained, and that a nutritional plan, which the patient can accept and adhere to be created.

The flow chart in figure 2.1 outlines the practical considerations involved in the diagnosis and treatment of MN. Patient screening to assess nutritional status is the starting point in a stepped approach to care that addresses the specific needs of CKD patient.

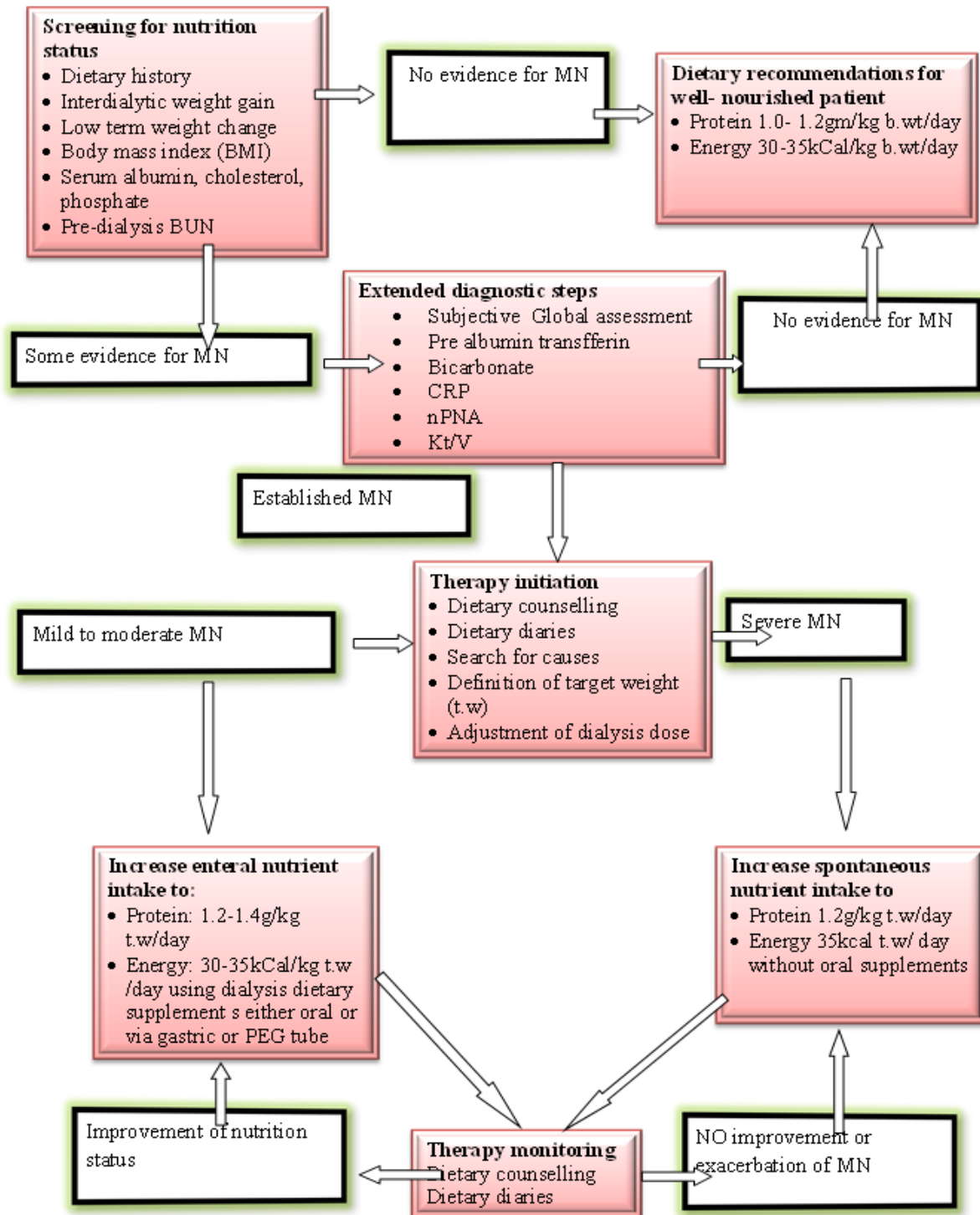


Figure 2.1: Flow chart for diagnosis and treatment of MN in CKD patients

(Source: Kuhlman, 2007).

2.2 Renal diet

A renal diet is one intended for individuals who have kidney problems, known as CKD. Adequate nutrition is managed through dietary regulations. A well planned diet helps to maximize the remaining ability of the kidneys to filter and excrete toxins in the blood, without straining them too much. However, when the kidneys lose over 85-90% of their function, treatment options become very specific and the renal diet becomes even more tightly controlled (Joshi, 2010). The nutrition needs of CKD patient changes as the stages of the disease progresses. This affects the way in which the patient metabolizes protein water, salt potassium, phosphorous and carbohydrate substrates (Thomas *et al.*, 2008).

Protein requirement are based on body weight and degree of renal failure. The requirement of proteins is 0.6g/kg body weight (b.wt) for adults. However, higher amounts up to 0.8gm/kg b.wt can be prescribed earlier in chronic renal failure when creatinine levels are still below 500mmol/litre(K/DOQI NKF, 2002). A 40gm protein diet may be used where the weight of an adult is unknown. 65-75% of the total dietary protein should be of high biological value (HBV) such as eggs, meat, poultry, milk and fish. Proteins of HBV are essential because total protein intake is restricted. Adequate protein levels helps in maintenance of fluid balance, healing and maintenance of skin integrity, and finally maintenance of immune function (NKF, 2006). Intake of protein rich foods is controlled to avoid excessive production of nitrogenous waste products while at the same time maintaining the positive nitrogen balance (K/DOQI NKF, 2002).

The diet should provide adequate calories to maintain optimal nutritional status and a source of energy. Reducing the amount of protein will reduce the amount of calories that is ingested. Thus, other foods will be necessary to compensate for the proteins. Sufficient carbohydrate and fats are used to increase the caloric intake of the diet and spare the breakdown of body

protein. It is recommended that for patients aged < 60 years they should take 35 kcal/kg/day while those aged \geq 60 years or obese should take 30-35 kcal/kg/day (K/DOQI NKF, 2002).

Fluid consumption should be controlled to avoid congestive heart failure, pulmonary oedema, hypertension, and swelling of the legs and feet. Fluid allowances are 1,000 -1,500 millilitres per day based on urine output and type of dialysis (K/DOQI NKF K/DOQI, 2002).

Kidney failure causes high levels of phosphorus to build up in the blood and disrupts calcium/phosphorus balance. Elevated phosphorus levels can lead to metastatic calcification (soft tissue calcification), secondary hyperparathyroidism, and renal osteodystrophy. Recommended intakes usually range from 800-1,000 milligrams per day with haemodialysis and less than 1,200 milligrams per day with peritoneal dialysis (NKF K/DOQI, 2003). Although phosphorus depletes calcium from bones, it is not advisable to consume foods rich in calcium. This is because the foods that are generally rich in calcium also have high amounts of phosphorus. Thus, medication is recommended in such situations (Braham *et.al.*, 2004).

Potassium restrictions depend on serum potassium levels, the type of dialysis, medications, and residual renal function. Patients on haemodialysis are usually restricted to 2000-3000 milligrams per day to prevent hyperkalaemia between treatments. Patients on peritoneal dialysis may follow a more liberal dietary potassium intake, as potassium is lost in the dialysate solution during daily exchanges (Byham and Wiesen, 2004). Potassium can be reduced by reducing the intake of all fruits and vegetable to one or two servings. Boiling vegetable and potatoes in large volume of water for about half an hour and then using them after discarding the water, can achieve further reduction in potassium (Braham *et al.*, 2004). Potassium is found in most foods to some extent, so it can be very challenging to control.

Therefore, patient should be advised to avoid foods that are high in potassium like dried fruits, bananas, honeydew, beans, artichokes, bran products, chocolate, coffee, ice cream, nuts and many other items (Joshi, 2010).

Sodium intake must be modified to prevent hypertension, congestive heart failure, and pulmonary oedema. Limiting intake will help avoid thirst and maintain acceptable fluid balance. The recommended intake of sodium ranges from 1,000–3,000 milligrams per day for patients who undergo haemodialysis. The intake range of 2,000 – 4,000 milligrams per day is recommended for patients undergoing peritoneal dialysis (K/DOQI, 2007). To be able to control sodium intake a patient is advised to read labels of food packages provided carefully. Table salt has high amounts of sodium. Foods with high amounts of sodium include processed foods like cheese, soups and snacks. Generally, sodium is found in many foods but higher amount in table salt and foods that have salt added in them like processed cheese, soups and snacks. Some canned foods, fast foods and brine pickled foods (sauerkraut, olives, and prepared foods); cured and smoked foods such as luncheon meats, ham and bacon are also high in sodium (Braham *et. al.*, 2004).

Dialysis patient require supplementation with the B-complex group of vitamins and vitamin C since several of them are lost due to prolonged cooking method (to remove potassium). B-complex vitamins, vitamin C and folic acid are generally prescribed. Vitamin A is a high molecular weight protein and not dialyzable; hence no vitamin A supplementation is required. Iron supplementation may be given to make –up for blood loses during haemodialysis. Vitamin D supplementation may also be done. Usually, vitamin and mineral supplementation will correspond to the levels of those nutrients lost during dialysis (Joshi 2010).

2.3 Importance of nutrition knowledge among healthcare workers

Nutritional care is based on ethical principles, scientific knowledge and proven experience (Beauchamp and Childress, 2001). Together with co-workers, nurses are responsible for the delivery of nutritional support and regular diet. Besides assessing the patient's needs and problems, the nurses must ensure that the right food and fluid is served to the right patient in a pleasant and appetizing manner and that patients receive necessary assistance when eating. Co-operation between different health care professionals, instructions and planning ahead of transfer, as well as positive attitudes, are all factors contributing to good nutritional care(ADA, 2007). The recommendation for the nutrients of specific needs for the patient on dialysis are summarised in table 2.1.

2.3.1 Nutritional knowledge

Nutritional knowledge is the ability to produce facts or principles related to nutrition from memory (Cowie, 1999). In other words, nutrition is defined as a science, which narrates the relationship between the health and diet. In the same way, nutritionists or dieticians are health professionals who specialize in this area. The main purpose of studying or knowing nutrition is to explain the physiological and metabolic response of the body to the diet consumed. Nutritional support is required to improve or prevent deterioration in nutritional status. Nursing staff play a key role in identifying patients and referring patients to the dietician for further nutritional intervention and management. This can only be done by a nurse who is knowledgeable in nutrition related matters. Several studies however, have found nutrition knowledge is lacking among healthcare workers. Nightingale and Reeves (1999), indicated that it is well known that nutrition education and knowledge amongst health care professionals is poor. Medical and nursing staff's documentation of questions, measurements, notes or information on nutritional status is inadequate.

Table 2.1: Nutrient recommendations for patient on dialysis

Nutrient	Recommendation	Rationale
Energy/ calories	<60 years: 35kcal/kg/day ≥60 years or obese: 30- 35kcal/kg/day	Energy expenditure of patient undergoing maintenance haemodialysis or continuous ambulatory peritoneal dialysis is similar to that of normal, healthy active individuals. Because individuals more than 60 years of age tend to be more sedentary, a total energy of 30-35kcal/kg is acceptable.
Protein	1.2/kg/day. At least 50% as HBV protein	Protein requirements are higher during dialysis because of loss of protein and amino acids
Sodium Fluid	Must be strictly controlled	Sodium and fluid will help to control weight gain and blood pressure
Potassium	Vary according to patient's urine output	Potassium retention occurs as CKD progress
Phosphorus	800-1000mg/day	Should be restricted to avoid hyperphosphatemia. Recommend foods high in protein with the least amount of phosphorus.
Calcium	≤ 2gm/day	Total intake should be limited to reduce risk of hypocalcaemia and soft tissue calcification

(Source: Brown *et al.*, 2010)

2.3.2 Nutrition training and development

The importance of nutrition education and training for healthcare professionals must not be overlooked. This is because the lack of nutrition knowledge has been reported as the most common cause for inadequate nutritional care (Mowe *et al.*, 2008). Increasing the nutritional knowledge of healthcare professionals has also been demonstrated to improve the management of malnourished patients (Kennelly *et al.*, 2010). The fact that, nutrition information provided by medical and health-related workers is held in high regard by the general public, suggest that sound and safe nutrition advices to the public and patients is important (Jackson, 2001). Since healthcare workers are to apply nutrition in clinical practice and in prevention of disease, then nutrition should be an essential component of medical professional curriculum.

Training provides a series of planned learning experiences for individuals and builds technical skills and competencies. Training also helps to improve efficiency and can motivate employees to do well. This helps to make positive changes to the way in which they work and make decisions. Development helps individuals use the training to meet their individual needs and ambitions. Career development determines the nature and quality of individuals' lives, and the social and economic contribution they make. Opportunities to develop afford individuals the prospect of further enhancing themselves and growing within the ranks of their career (Kato and Morishima, 1995).

Evidence indicates that good-quality continuing professional development is a positive incentive and helps to retain staff members (Jinadu *et al.*, 2002). Limited funds, lack of technical skills, low motivation, and poor support networks have been cited to make it difficult (Kurowski *et al.*, 2003). Likewise, the quality of basic training of health

professionals varies widely in lower-middle income countries, (LMICs) the provision of continuing education and development is almost universally inadequate.

2.4 Attitudes of healthcare workers

Mugenda and Mugenda (1999), defines attitude as away one perceives or feels about an issue. In this study healthcare worker's attitudes are critical because they are likely to affect their practices in the nutritional management of patients with CKD. Some studies have showed that the knowledge and attitudes of both the community and healthcare workers changes immediately and significantly, sometime after the training program (Chinnayya *et al.*, 1990). In 1980s, WHO performed a collaborative study to evaluate these outcomes in seven countries, with the same design, results showed a positive effect on the attitudes and knowledge of the community and personnel 18 to 24 months after the intervention (Ignacio *et al.*, 1989). This has also been documented in the study by Marjolein, *et al.*, (2001),in Northern Vietnam. The Vietnam study found that positive attitudes of healthcare personnel resulted in good performance in delivery of health services.

2.5 Nutrition practices of healthcare workers

Nutritional care services in patients with CKD depend both on the frequency and type of renal support therapy the patient is under, (dialysis, transplant or medication). Adequate nutrition for patients with CKD is managed through dietary modification depending on length of the disease, degree of impaired renal function and individual clinical symptoms. Most patients are sensitive to excess fluid loads. Therefore, care is required with electrolyte administration, particularly potassium, magnesium and phosphate (Williams, 2001). Efforts to adopt new behaviours may fail due to inadequate knowledge; lack of motivation; poor

problem-solving skills; limited emotional, financial, and/or social resources (Zarcadoolas *et al.*, 2005).

Individual perceptions of dietary restrictions, particularly feelings of deprivation, are difficult for patients and healthcare professionals to address (Mensing *et al.*, 2004). Thus, a primary issue is whether staff have the required knowledge or not. Understanding the level of knowledge is of interest for deciding what nutrition intervention might be effective. Unfortunately, effective and sustainable implementation of knowledge into practice is not a trivial task, and only a few studies have evaluated strategies for knowledge translation in low-income countries (Haines *et al.*, 2004).

2.5.1 Nutrition assessment

Nutritional assessment is the evaluation of nutrition status to obtain adequate information in order to identify nutrition related problems (ADA, 2000). Gibson (2004) defines nutritional assessment as a systematic process of obtaining, verifying and interpreting data in order to make decisions about the nature and the cause of a nutrition related problem. Nutritional assessment is an important element in the nutritional care of patients with CKD. Mensing *et al.*, (2004), suggested that, it is important for each patient to have an individualized nutritional assessment, educational plan, and periodic reassessment pertaining to nutritional needs.

Nutritional assessment should be used to determine the nutritional requirements for all patients taking into account their nutritional and metabolic status. It should be done so as to monitor the patient's progress and any alteration in requirements. Several screening and assessment tools are available; of these subjective global assessment (SGA) has been found to be reliable and valid assessment method (*de Mutsert*, 2009). SGA scores nutrition status in

a standardised way and capture various aspects of patient's nutritional status during single examination. It uses the components of medical history (like weight change, dietary intake and gastrointestinal symptoms) and components of brief physical examination to assess nutrition status. Because of the complexity of the nutritional management of CKD patients, registered dieticians should be consulted, especially for nutritional counselling of the patients. Physicians and other clinical personnel should also strongly encourage dietary compliance of the patients because dietary adherence can determine outcomes in CKD (Kopple, 2001).

2.5.2 Nutritional supplementation

Improving the nutritional status of a malnourished dialysis patient may be achieved by introducing supplemental nutritional products that help them to replenish protein and energy stores. A study by Calgar (2002), demonstrated that oral nutritional supplementation over a period of 6 months significantly increases serum albumin, pre-albumin concentrations and subjective global assessment (SGA) scores.

2.6 Factors influencing nutrition management of CKD patients

2.6.1: Nutrition Knowledge

In recent years there has been a concern about lack of nutritional knowledge among nurses (MacDiarmid and Gatenby, 1997), their study on an assessment of nutrition knowledge and undergraduate training of community pharmacists found that nutrition knowledge was lacking amongst pharmacists. Hopper (1995) also recognized that nutrition education in the medical curricular has been haphazard, ambivalent and far from adequate. It is also well known that nutrition training and knowledge among health care professionals is poor (Nightingale and Reeves, 1999).

A study done in Lebowa South Africa showed that nutrition knowledge of clinical nurses was inadequate (Kgaphala *et al.*, 1997). Without good nutrition knowledge nurses cannot provide appropriate nutritional care. It is apparent that there has been too little emphasis on clinical nutrition during nursing training in hospitals in the past (Waitberg *et al.*, 2001). Nutrition therefore needs to be an essential component of nursing training if nurses are to apply nutrition in clinical practices in the prevention of diseases (Leonard *et al.*, 1995).

Although nurses consider nutrition care to be important, many may have difficulty in raising its priority above other activities due to time constraint and multitasking issues (Kowonko *et al.*, 1999). Information relating to nursing activities has tended to focus on the development and implementation of individual assessment protocols. Nurses are unlikely to give high priority to feeding patients and monitoring their nutritional status without a better understanding of the importance of good nutrition in relation to health and disease. There is a growing interest on changes in disease pattern in relation to foods and nutrition. Confusion about nutrition matters abounds and people are easily drawn into believing distorted messages, which encourage expenditure on worthless dietary products, books and supplements (Short, 1994). Doctors and nurses are perceived to be the most reliable sources of nutrition information. However, few of them have time, knowledge and skills to give sound nutritional advice or to recognize nutrition related problems (ADA, 1994). In addition, there is little published information about healthcare workers' perception on their role in nutrition care and their knowledge of nutritional principles as well as practices (Kowonko *et al.*, 1999).

2.6.2: Resources for CKD management

It is increasingly clear that most SSA governments are facing an acute shortage of skilled public sector healthcare workers and that this is getting worse, not better. The manifestations are obvious: vacant posts; unstaffed facilities; long waiting times; and a rapidly growing

private sector. Doctor to population ratios is illustrative: for (SSA) these range from 1:5000 to as few as 1:30000. In other developing countries; the ratios average 1:1400 and in the developed world, 1:300. In some countries the crisis is worse than others (WHO/WB, 2004). The World Health Organization estimates that more than 4 million more health workers are needed worldwide to improve health systems and achieve international health and development goals. The gap is felt keenly in Africa, which carries 25% of the global disease burden yet has only 3 per cent of the world's health workers and 1% of its economic resources (WHO, 2002). According to the 2005 proposed national staffing levels for the health sector, Tanzania should have 125,924 health workers but only 35,202 were available representing a deficit of over 72% (MoH, 2008).

2.6.3 Motivation and incentives

Motivation is defined as the willingness to exert and maintain effort towards attaining organizational goals. A survey of ministries of health in 29 countries showed that low motivation was seen as the second most important health workforce problem after staff shortages (Mathauer *et al.*, 2006). The motivation of workers is influenced by several factors. Financial resources in terms of salary and other fringe benefits is just one of the elements (Van Lerberghe *et al.*, 2002; Chenet. *al.*, 2004). Leshabari *et al.*, (2008), in the study on "Motivation of health care workers in Tanzania": a case study of Muhimbili national hospital (MNH) found that: almost half of both doctors and nurses were not satisfied with their jobs. Amongst the contributing factors reported were low salary levels and unavailability of necessary equipment to ensure proper patient care. Evidence indicates that good-quality continuing professional development is a positive incentive and helps to retain staff members (Jinadu *et al.*, 2002). However, limited funds, lack of technical skills, low motivation, and poor support networks has made it difficult (Kurowski *et al.*, 2003).

2.6.4 Staff relations

Healthy employee relations in an organization are a pre-requisite for organizational success. Strong employee relations are required for high productivity and human satisfaction. Such relations depend upon healthy and safe work environment, involvement and commitment of all employees, incentives for employee motivation, and effective communication system in the organization (Kato and Morishima, 1995). Numerous studies conducted among healthcare professionals point to the importance of interpersonal relationships in job satisfaction, and show that they lead to increased patient safety, improved quality of care and greater patient satisfaction (Wenzel *et al.*, 2008). Highly functioning teams have also been shown to offer great support to inexperienced staff. Specifically within healthcare, there has been a growing need to improve teamwork. Introducing team-building activities has resulted in stronger interpersonal; relationships, improved staff communication, understanding and clarity of roles as well as greater job performance (Wenzel *et al.*, 2006).

2.7 Summary of literature review

Management of the nutritional aspects of CKD presents a number of challenges. Understanding level of nutrition knowledge, attitudes and practices as well as factors that may adversely affect nutrition management of patients with CKD is critical in the preservation of renal function and overall well-being in the renal patient. Lack of nutrition knowledge has been reported as the most common cause for inadequate nutritional care. Low motivation, inadequate resources and staff relations has shown to negatively influence healthcare workers performance. The study therefore determined the nutrition knowledge, attitudes, current practices and factors affecting nutrition management of CKD patients in selected hospitals in Dar es salaam, Tanzania.

CHAPTER THREE: METHODOLOGY

3.1 Study design

The study used cross sectional descriptive design (Katzenellenbogen *et al.*, 2002). This methodology was chosen as it would show the level of nutrition knowledge, attitude and current practices and factors affecting it at a point in time.

3.2 Study variables

The dependent variable was nutrition management of CKD. Independent variables included: nutrition knowledge score, attitudes and factors such as motivations and incentives.

3.3 Study area

Dar es Salaam is the largest city in Tanzania with 4 million people, with a population rate increase of 4.39% annually (URT, 2012). Administratively, Dar-es Salaam is divided into three municipals namely: Ilala, Kinondoni and Temeke. The city hosts the Muhimbili National Hospital, three district hospitals, one in each municipality, health centres and several private health facilities. The Muhimbili University College of Health and Allied sciences where most of the healthcare workers are trained is also found in the city. The study was conducted in three sites namely: MNH, Regency Medical Centre (RMC) and the Aga Khan hospital (AGK) (Appendix I). These hospitals were purposely selected based on the provision of renal care services within the hospital.

3.4 Study population

The target population was the healthcare workers managing patients with CKD in 3 selected hospitals in Dar-es Salaam. Participants involved in the present study were healthcare workers who have worked in the renal unit not less than six months and those who were found on duty on the day of data collection. Healthcare workers who were on annual or maternity leave and newly employed were excluded in this study.

3.5 Sample and sampling procedures

The sample size consisted of a total 140 healthcare workers at renal units and wards admitting patients with CKD. From the selected hospitals, list of healthcare workers working at renal units were taken to get the subject. A total of 95, 25 and 20 subjects were obtained from MNH, RMC and Aga Khan respectively. The researcher used contact details on the list to arrange appointments and request the selected participants to participate in this study. This was done after the researcher was officially introduced to the respective study sites. Seven respondents did not return the questionnaire because of their multitasking issues including managerial. The number of respondents who returned the questionnaire was 133 and this was used for analysis.

3.6 Research instruments

A questionnaire, focus group discussion guide and observation checklist were the main tools for data collection. The selection of these tools was guided by the nature of data to be collected, the time available as well as by the objectives of the study.

3.6.1 Questionnaire

The questionnaire was self-administered and completed at participant's place of work under supervision. The questionnaire sought information on demographics, nutrition-related knowledge, attitude and practices (Appendix II). The nutrition knowledge component of the questionnaire included questions relating to: source of nutrition knowledge, nutrient and their sources, diet related risk factors for CKD, and CKD nutrition management.

The participants were asked ten questions to assess their attitudes on nutrition management of CKD patients. The questions sought to draw their thoughts about nutrition practices at workplace, professional responsibility of nutrition assessment, importance of nutrition assessment in management of CKD, healthcare workers nutrition knowledge.

They were also asked to respond to ten questions to assess their opinions on the factors that might have affected nutrition management of CKD patients. Such factors included their thoughts about the motivations, resources and staff relations. The respondents answered on a range of scales namely strongly disagree, disagree, disagree nor agree, agree, and strongly agree.

3.6.2 Focus group discussion guide

In this study, a focus group discussion guide (Appendix III) was used to collect information on nutrition knowledge and challenges. Three groups were made each comprised of 10 participants who were leaders and section leaders selected from each hospital. During FGD participants gathered around a table and the questions were posed to them. The responses were tape recorded and notes were taken.

3.6.3 Observation checklist

The list was used to check for inconsistencies and discrepancies that may have been occurred due to forgetting, or incomplete responses from the questionnaire (Appendix IV). This was used to establish whether the responses were a reflection of what respondents said and what they did. The checklist indicated the nature of events to be observed. These were taking anthropometric measurements and how nutrition counselling was done in the selected hospitals.

3.7 Pre-testing the instruments

Two research assistants were trained to collect data at the hospitals. Two days were used for training as well as pre testing of the questionnaire. The questionnaire was pre-tested for accuracy and clarity at TMJ hospital the area with similar characteristics as the target

population, at 10% of targeted sample. Fourteen (14) respondents were therefore interviewed. The procedures used in pre-testing were similar to those used during the actual study. After pre-testing the instruments, questions and instructions which were not clear to the respondents were modified and reconstructed. This enhanced clarity of the questions to the respondents, as well as validity of data collected (Fisher *et al.*, 1983).

3.8 Data collection procedures

Ethical clearance was sought from Research and Publication Committee of Muhimbili University of Health and Allied Sciences (MUHAS) (Appendix V). After permission was granted; a letter asking the hospitals to allow the research to be conducted was written to the respective hospitals (Appendix VI). Research assistants were requested to go to the hospitals with the letter of introduction. The hospital administrators allowed the research assistants to collect the information required. Upon consenting to the study (Appendix VII), healthcare workers were given the questionnaire to complete in the presence of researcher or the assistant.

A focus group discussion guide was used to collect information that could not be collected using the questionnaire such as “challenges encountered in nutrition management of CKD patients, perceptions and attitudes about nutrition training in medical /nursing school, and measures that can be taken to improve nutrition management of CKD patients. A total of 30 healthcare workers participated in the focus group discussion. One session of group discussion at each of the hospitals was conducted at the renal units as shown in Table 3.1.

Table 3:1 Composition of FGD Participants.

Group	Facility	Number of people	Composition	Session date
1	MNH	10	2 Doctors 7 Nurse officers 1 Nutritionist	12th February 2012
2	RMC	10	2 Doctors 7 Nurse officers 1 Nutritionist	19th February 2012
3	AKH	10	7 Nurse officers 1 Nutritionist	25th February 2012

The researcher and the assistants made several observations during the study. A prepared checklist with a total of 13 points covering all the areas of interest of the study was used. At the end the research assistant had to count the points and score out of 13, which was converted into percentages. Brief comments were also given in the last column which was later recorded and brief notes were made. Observations were made specifically in the area of anthropometric -measurements, nutrition counselling and nutrition education.

3. 9 Data analysis and presentation

Completed questionnaires were checked on a daily basis for accuracy and completeness in recoding of responses. Editing and coding was done before data entry. Data were entered and analysed using SPSS version 17. For nutrition knowledge; correct answers were scored as per

questionnaire sections, correct answers were labelled “1” and the incorrect were labelled “0”. New variables were then created which carried the knowledge score by summing up all the variables. The knowledge score were determined by taking the number of correct responses by each respondent out of 25 knowledge questions asked expressed as percentage. The percentage scores were graded (table 3.2) to determine whether healthcare workers knowledge levels were poor, average or adequate. The grading table was designed by the researcher as there was no standard scoring table available in the literature.

Table 3.2: The grading system used to classify the respondent’s nutritional knowledge level

Score	Level
> 61	Adequate
41-60	Average
1-40	Poor

Descriptive statistics was used to analyse demographic information. The Chi square was used to find the relationship between demographic characteristics of the respondents and other variables.

In analysing information from the group discussion, a unique identifier (code) for focus group participants was created such as “R1” representing the first respondents was used to identify who said what and when, without revealing the identity of the participant. The tapes were listened to carefully; to pick up on the tone and intensity of participant’s identity the transcript was read through, highlighting major issues and identifying emerging themes. The

audio tape of the focus group was listened to at least twice, and followed along with the transcript to ensure that all of the information was captured accurately. The notes taken by the note taker and observer were read to enhance the data from the tapes, especially if the note taker documented any non-verbal communication that is not reviewable on the audio tapes. The responses were assembled according to each research question in the topic guide. Key points that emerged were highlighted, these included things the participants seemed most interested in talking about or the main focus of the conversation.

The level of nutritional attitude was rated using Likert scale as: 1= strongly disagree, 2= disagree, 3=uncertain 4= agree and 5 strongly agree. 1 and 2 were pulled together labelled as “Negative Attitude” 3remained Neutral attitude where 4 and 5 were labelled “Positive Attitude”. This was researcher own criteria devised for this particular study.

Frequencies and percentages were used to organise, summarise and to describe data. Chi-square test was used to test the relationship between categorical variables level of significant was set as ($p \leq 0.05$).Practices were assessed using a questionnaire; the right practice was scored “1” while the wrong one was sore “0”. Basing on the mean, the scores below the mean were regarded as poor practices while the ones above the mean were regarded as good practices.

3.10 Logistical and ethical considerations

The study was approved by the graduate school of the Kenyatta University (Appendix VIII), ethical clearance and research permit was obtained from the Research and Publication Committee of MUHAS. Permission from respective hospital administrations was also sought. Consent for participation was sought prior the administration of study instruments. A total of 140 healthcare workers from the 3 selected hospitals consented to the study and were

recruited anonymously. Only their title/profession was reflected on the questionnaire for demographic analysis purposes.

The researcher and the assistants introduced themselves. The researcher explained the aim of the discussion and that the discussion would be recorded including their comments. Participants were assured that their comments were confidential and no one but the researchers would listen to the recording. The participant's consent was sought before the discussion. The researcher insisted:

“We want to hear everything you say, so I’ll ask you to speak one at a time, and loud enough for the recorder. I’m going to ask you a few questions, to which there are no “right” or “wrong” answers – anything you want to say is ok, and we want to hear the positive as well as the negative. Let’s begin with our first question...”

The first question was the easiest to answer, and its main purpose was to get each participant involved. Participants were asked to answer the first question sequentially, clock-wise or counter-clock wise, to make sure each person speaks. The remainder of the questions were answered more spontaneously, where every participant was given the opportunity to answer. Research assistant recorded the proceeding of discussion while the principal researcher facilitated the discussion. A recorder was also used to capture the proceedings of the focus group. The focus group discussion was conducted in English the language known by all health personnel. The discussions took place until saturation was reached (no new information was discussed).

At the end of discussion, the researcher said a word of thanks and concluded by promising that their ideas and comments would be summarized in a report for use in improve nutrition management of CKD. The Researcher provided transport cost to the respondents especially

those who were off duty. They were asked if they had any questions, to be answered by the researcher.

Table 3.3 summarises the methodology of this study indicating objectives, variables that were measured, sources of data and the type of analysis done.

Table 3.3 Methodology summary

Objective		Variables	Sources of Data	Type of analysis
1.	To assess nutrition knowledge of the healthcare workers managing patients with CKD in Dar es Salaam hospitals, Tanzania;	Socio-demographic: Age, sex, marital status education level professional qualification, work experience Nutrition knowledge: pre service training , in-service training, nutrition seminars/workshop	Questionnaire Focus group discussion	Descriptive: Frequency, percentages Inferential: Chi-square ANOVA
2.	To explore the attitudes of healthcare workers on nutrition management of patient with CKD in Dar es Salaam hospitals, Tanzania;	Talking positively or negatively on their own knowledge, responsibilities	Questionnaire/	Descriptive: Frequency, percentages
3.	To assess healthcare workers' practices on nutrition management of patients with CKD in Dar es Salaam hospitals, Tanzania;	Correct anthropometric measurements, availability and use of guideline	Questionnaire, Field Observation checklist	Descriptive: percentages & frequencies Inferential: Chi-square
4.	To determine factors influencing nutrition management of patient CKD in Dar es Salaam hospitals, Tanzania.	Motivation & incentives Staff relations	Questionnaire Focus group discussion	Descriptive: Percentages and frequencies

CHAPTER FOUR: RESULTS

4.0 Introduction

Presented in this chapter are the study findings as per the objectives: Demographic characteristics of the study population comprising healthcare workers managing patients with CKD in selected hospitals, their nutrition knowledge; attitudes, current practices and factors were influencing nutritional management of patients. Data were presented in tables and figures.

4.1 Nutrition and dietary context existing in the study area

According to the hospital spokesperson, some of CKD patients receive the same food as other patients from hospital kitchen. There is no special food for them, since the food is prepared such that everybody can take. Most of patients receive foods prepared from their homes. Sometimes the nutritionists discuss with the patient's relatives on how to make food choices and preparation of it. Regarding severely ill patients and those in intensive care unit (ICU) they are given porridge and milk using nasogastric tubes (NGT). There is no special/commercial formulas exist in the hospitals.

4.2 Demographic characteristics

Figure 4.1 shows the categories of respondents. Among the respondents majority were nurses (57.9%). The total number and categories of the participants (Figure 4.1) were the basis for determining the relationship between some variables that have been calculated.

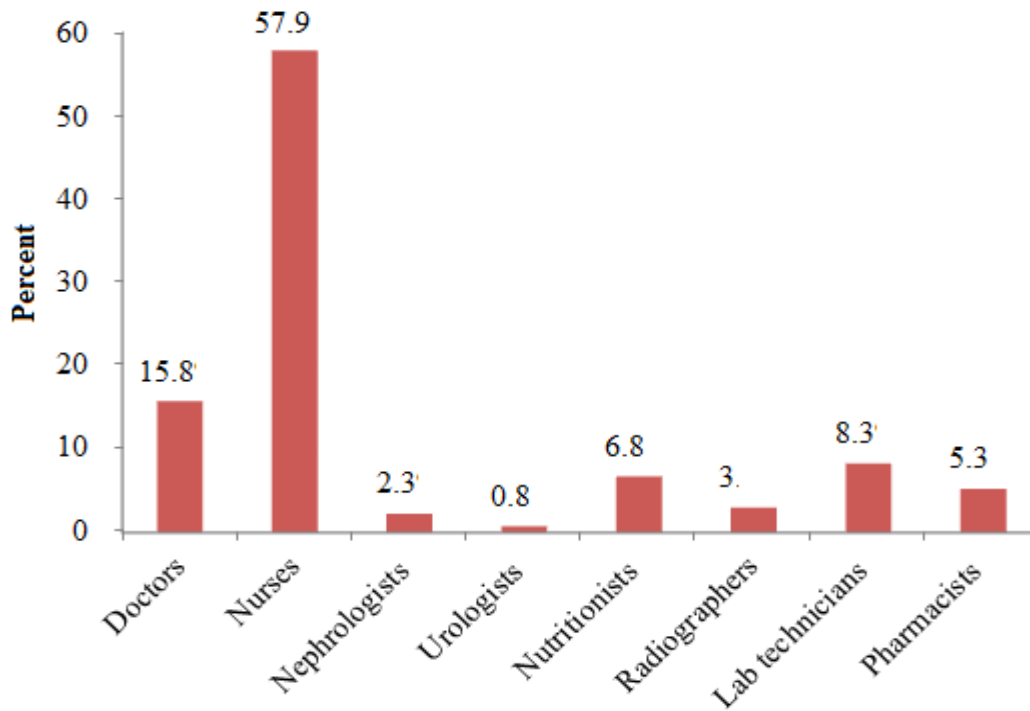


Figure 4.1: Categories of respondents

4.2.1 Age groups of respondents

Age was collected in terms of age groups. In this study majority of respondents (40.6%) aged between 40 and 50 years. Few of them were below 28 years (11.3%) and above 51 years (14.3%) respectively. The distribution of age groups are summarised in table 4.1.

Table 4.1: Age groups of respondents

Age group	Frequency(n)	Percentage
Below 28	15	11.3
29-39	45	33.8
40-50	54	40.6
Above 51	19	14.3
Total	133	100.0

4.2.2 Sex

Figure 4.2 shows the distribution of the study participants according to sex. Majority of respondents were female (71 %).

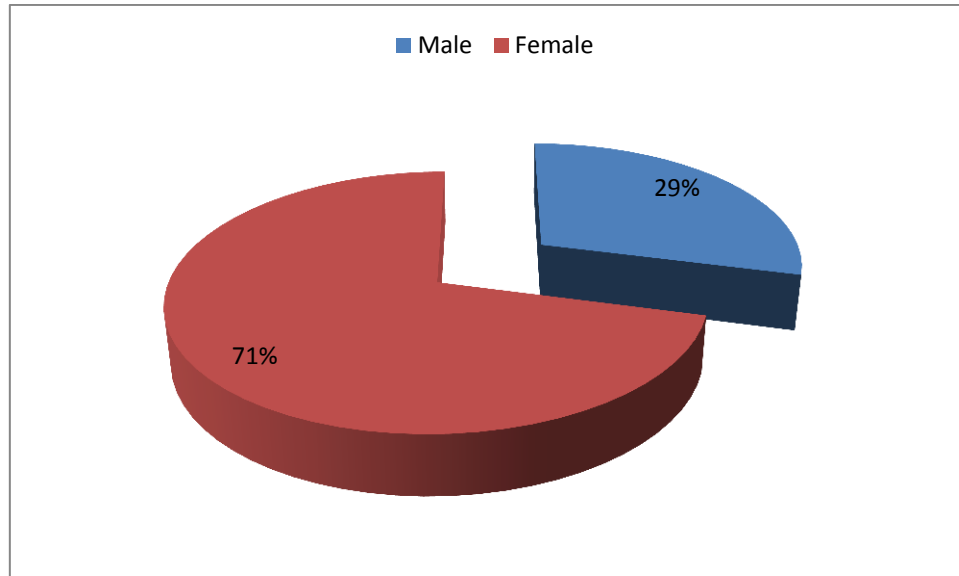


Figure 4.2: Sex distribution of respondents

4.2.3 Marital Status of the Respondents

Majority of the respondents were married 60 %, and 30% were single. The respondents that were separated and those that are widowed were 3 % (Table 4.2).

Table 4.2: Marital status

Status	Frequency (n)	Percentage
Single	40	30.1
Married	80	60.2
Widow/er	8	6.0
Separated	5	3.8
Total	133	100

4.2.4 Duration of service in present position (in years)

Data on length of service in the present position (table 4.3) were collected in order to determine if knowledge, attitude and practices on nutrition management of patients with CKD was related to length of service in the present position. Majority of respondents (42.9%) had worked in this unit between 2-5 years.

Table 4.3: Length of service of health workers in present position

Duration of service in present position (in years)	Frequency (n)	%
Less than 1 year	31	23.3
2-5 years	57	42.9
6-10 years	23	17.3
More than 10years	22	16.5
Total	133	100

4.2 Nutrition Knowledge

Participants were asked to react to several statements intended to describe the level of nutritional knowledge in terms of: sources of the knowledge, knowledge on nutrients that are important to CKD management with their sources and CKD nutrition related knowledge. .

4.2.1 Sources of nutrition Knowledge

The most commonly cited source of nutrition information was professional training 88%. Apart from professional training only 39.1% reported to have formal nutrition training. Other sources reported were, textbooks 34.6%, internet (21.8%), seminars 23.3% self-education and work-related experience (9.8%). Figure 4.3 shows the nutrition topics covered during

professional training. Only 11% of respondents did some topics on clinical nutrition. Majority (54%) did basic nutrition.

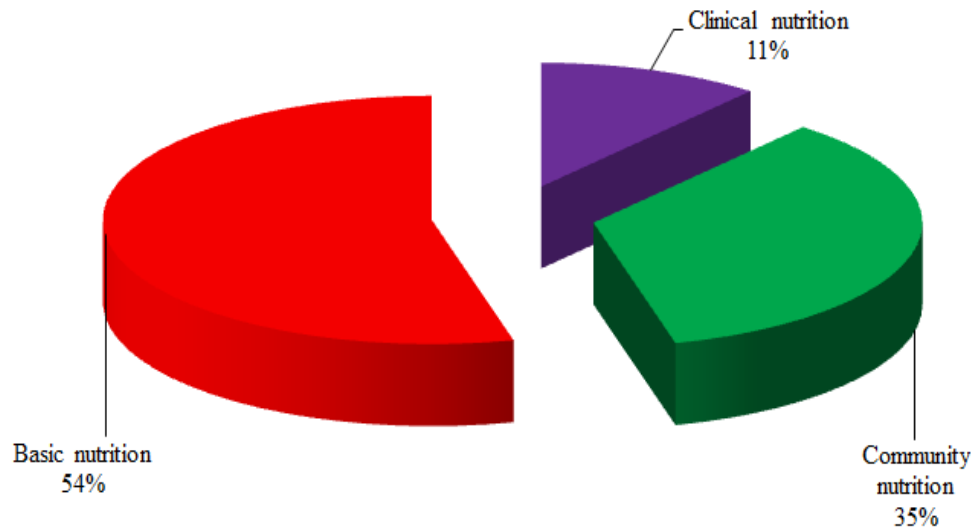


Figure4.3: Nutrition topics covered during professional training

4.2.2 Knowledge on nutrients with their sources and risk factors for CKD

There was a maximum score of 5 in this section. The respondents were best able to identify foods with high biological value proteins 61.7 % function of carbohydrate in CKD patient 65.4% and rich sources of potassium 66.9 %. More than half of respondents 54 % were less able to identify vitamins which may accumulate in the body to dangerous levels if large doses are taken. Most respondents 78.2% were familiar with diet related risk factors for CKD.

4.2.3 CKD- related nutritional knowledge

Out of maximum of 15 points, the mean score for this section addressing the CKD-related knowledge was 7.11 (SD= 2.66). The higher correct rate was obtained for questions regarding signs of patients with fluid overloads (65.1%), recommendation to increase carbohydrate to patients (60.2%). Most of respondents were knowledgeable on the functions of protein in general 63.2 %. However, only 11.5% were able to explain of importance of protein of high biological value and only 19.5% could explain why protein is restricted to

CKD patients respectively. Less than half of respondents 36.1% correctly identified the goals of nutritional management in CKD patients. A number of specific questions about nutrients restrictions and recommendations were also poorly answered (Table 4.4). Seventy per cent of respondents could not identify the nutrient that is central to management of CKD mineral and bone disorders (CKD-BMD). Three quarters were unable to identify vitamin supplement which a dialysis patient does not require. Most of respondent 72% acknowledged that nutrition requirement increases following chronic disease. Majority of them 76.7 % also acknowledged that adherence to dietary regimens can have large impact on lifestyle and is often one of the most difficult aspects of management.

Table 4.4 Proportion of respondents who provided the correct answers on CKD-related nutrition knowledge

No	Question	Correct answer	n(%)
1.	Goals of nutritional management of chronic kidney disease	*Maintain good nutritional status, slow down disease progression and treat complications	48(36.1)
2.	Signs of a patient with fluid overload	*Oedema, shortness of breath, hypertension	87(65.4)
3.	Functions of protein	*Repair tissue, making hormones antibodies and enzymes, balance acid-base, fluid and electrolytes	84(63.2)
4.	Foods with large amount of sodium patient with CKD should avoid	Canned and processed foods such as bacon, sausage, popcorn	30(22.6)
5.	Why is protein restricted for a renal patient?	*To slow progression and minimize accumulation of uremic toxins	26(19.5)
6.	Importance of protein of high biological value for CKD patient	*To provide the essential amino acids without resulting in excessive urea production	15(11.5)
7.	Why is it recommended to increase carbohydrate intake for a renal patient?	*Provide energy and spare protein	80(60.2)
8.	Why are fluids restricted for a renal patient?	*Reduce risks of hypertension	71(53.4)
9.	Why are minerals restricted for a renal patient?	*To avoid accumulation leading to bone diseases	42(31.6)

n= number of respondents, * correct answer

4.2.5 Nutrition knowledge score

The mean score for both sections was 9.8(SD= 3.12) the higher score reflects a higher/adequate knowledge level. Table 4.6 summarises the knowledge levels of respondents per carder.

Table 4.5: Nutrition Knowledge level of the respondents per carder

	Knowledge level n (%)			Total
	Low	Moderate	High	
Doctors	4 (19.0%)	6(28.6%)	11(52.6%)	21
Nurses	25 (%)	43(%)	9(2.6%)	77
Nephrologists	0(0%)	1(33.3%)	2(66.7%)	3
Urologists	0(0%)	(0 %)	1(100%)	1
Nutritionists	0(0%)	7(77.8%)	2(22.2%)	9
Radiographers	3(75%)	1(25%)	0(0%)	4
Lab technicians	8(72.7%)	3(27.3%)	0(%)	11
Pharmacists	5(71.4%)	2(28.6 %)	0(0%)	7
Total	45 (33.8%)	63(47.4%)	25(18.8%)	133

When ANOVA post hoc tests were done, significant differences among the carders/professional were noted in the mean knowledge scores (ANOVA, $p < 0.001$) (Table 4.6). Medical specialists and doctors had a higher mean scores compared to other carders.

Table 4.6: Comparison of nutrition knowledge score across carders

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	216.315	3	72.105	8.231	.000
Within Groups	1130.046	129	8.760		
Total	1346.361	132			

Waller-Duncan occupation	Subset for alpha = 0.05			
	N	Mean scores	Mean scores	Mean scores
Others	31	8.65		
Nurse officers	77	9.51	9.51	
Medical doctors	21		12.05	12.05
Specialists	4			13.75

4.2.6 Relationship between nutrition knowledge and demographic characteristics of respondents

The demographic characteristics of the respondents surveyed are shown in Table 4.7. nutrition knowledge on management of CKD higher among those aged between 29 -39 and 40 - 50 years compared with younger respondents > 28 year and those aged 51 years but this was not statically significant. Occupation which reflects the higher education level was significantly associated with good nutrition knowledge ($\chi^2=32.428$; $df=8$; $p>0.001$)

Table 4.7: Demographic characteristics of respondents with good nutrition knowledge (N=133)

Variable	Good knowledge n (%)	Average knowledge n (%)	Poor knowledge	χ^2	df	p- value
Age :<28yrs	2(13.3)	6(40.0)	7(46.7)			
29-39yrs	10(22.2)	24(53.3)	11(24.4)			
40-50yrs	10(18.5)	24(44.4)	20(37.0)	3.424 ^a	6	0.754NS
>50yrs	3(15.8)	10(52.6)	6(31.6)			
Sex: Male	12(30.8)	15(38.5)	12(30.8)			
Female	13(13.8)	45(52.1)	32(34.0)	5.367 ^a	2	0.068NS
Occupation						
Medical doctors	11 (52.4)	6(28.6)	4(19.0)			
Nurse officers	9(11.7)	43(55.8)	25(32.5)	32.423 ^a	8	<0.005
Nephrologists	2(66.7)	1 (33.3)	-			
Urologists	1(100)	-	-			
Others	2(6.5)	14(45.2)	15(48.4)			
Work experiences:						
< 1yr	4(12.9)	14(45.2)	13(41.9)			
2-5yrs	14(24.6)	28(49.1)	15(26.3)	5.441 ^a	6	0.489NS
6-10yrs	4 (17.4)	13(56.5)	6(26.1)			
>10yrs	3(13.6)	9 (40.9)	10(45.5)			

NS=not significant

df= degrees of freedom

n = total number of health care workers interviewed

Group discussion further revealed that, inadequate knowledge of healthcare workers was due to inadequate training in medical/ nursing school as one participant commented:

“...: Nutrition education that we had in nursing school was just an introduction to enable us as nurses to identify patients with common nutrition deficiencies and help us to give health education to patients on how to overcome such deficiency. It was too general. It was not specific to diseases such as CKD, diabetes, or hypertension. So we really need nutrition knowledge on specific diseases because for example patients with CKD encounter so many nutrition complications such that with my little knowledge in nutrition we are not sure on what to tell the patients. Sometimes I tend to shy away from patient because they are more knowledgeable than we are, so I feel that if I mess up they will no longer trust me!”

(Respondent)

The group reported that, it is important to empower all nurses with nutrition knowledge, it was also insisted this knowledge should be included in the nursing curriculum as expressed by one of the participant.

“... It is important to empower all nurses with nutrition knowledge for each specific unit for example dialysis and renal unit, diabetes nurses every unit should have specific training in their areas. Again nurses curriculum need to be reviewed so that it cover all disease so that by the time they finish the course they are competent.”

(Respondent)

4.3 Attitudes of participants on nutrition management of CKD

Participants responded to several statements intended to describe their attitude on nutrition management of patients with CKD in terms of responsibility, practices at workplace and importance of nutrition in CKD management.

4.3.1 Responsibility for nutrition status assessment

“It is the nurse’s responsibility to assess nutrition status of patients”. The aim of this statement was to determine the attitudes of respondents towards nurse’s responsibility in nutrition status assessment. Majority of respondents 76.7 % agreed with this statement (figure 4.4)

The significance of the statement *“It is the nutritionist’s responsibility to assess nutrition status of patient”* was to determine respondent’s opinion on nutritionist’s responsibility in the nutrition assessment of patients. Most of respondents 88.7% (figure 4.4).

The statement *“It is the doctor’s responsibility to assess nutrition status of patient”* was to determine respondent’s opinion on doctor’s responsibility in the nutrition assessment of patients. Most of respondents 66.2 % agreed that nutrition status assessment was indeed the responsibility of doctors (figure 4.4)

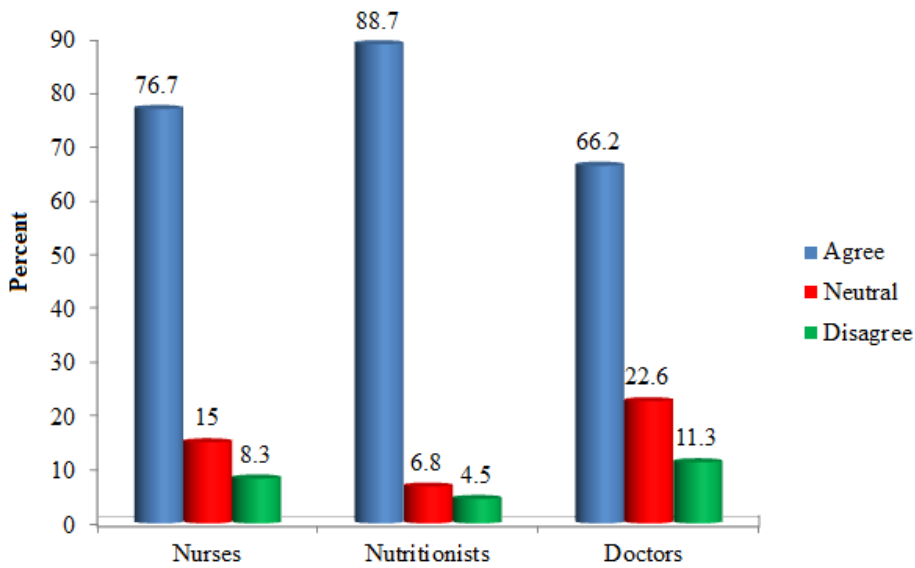


Figure 4.4: Respondents opinion on the professional responsible for assessing nutrition status

4.3.2 Nutrition education

This statement “*Nutrition education is not the responsibility of the healthcare worker*” aimed at determining the respondent’s attitudes to their role as nutrition educators. Few respondents 16.5 % agreed that nutrition education was not their responsibility, 16.5% were uncertain while majority 66.9 % disagreed with the statement meaning that they agree that nutrition education is their responsibility.

4.3.3 Nutrition support

The intention of this statement “*Appropriate and adequate nutrition support is normally provided at the renal unit*” was to determine healthcare workers opinion on nutrition support to CKD patients. 75.9 % disagreed with this statement, 18.8 % were uncertain while only 5.3% agreed.

4.3.4 Assessment on admission

This statement “*It is important to assess nutrition status of every patient admitted to the ward*” was to determine respondent’s attitude to the nutrition status assessment of patient on admission. . Majority 87.2 % agreed, 9 % were uncertain while only 3.8 % disagreed.

The significance of the statement “*It is important to weigh every patient every visit*” was to determine if basic nutrition status assessment like measuring the weight of the patient should be done on every visit. Results showed that majority 89.5 % agreed, 4.5 % were uncertain while only 6% disagreed.

4.3.5 Role of nutrition in the prevention and treatment of diseases

The significance of the statement “*Nutrition has an important role in preventing diseases*” was to determine healthcare workers opinions regarding the benefits of nutrition in preventing diseases. 89.5 % agreed, 5.3 % were uncertain while only 5.3 % disagreed.

The significance of the statement “*Nutrition plays a key role in prevention, progression and adverse outcomes of CKD along with other medical and other lifestyle treatments.*” was to determine healthcare workers opinions on nutrition therapy in the management of diseases and deficiencies. Most of respondents 94% agreed, while 4.5 % and 1.5% were uncertain and disagreed respectively.

4.3.6 Healthcare workers knowledge on nutrition

The statement “*Healthcare workers are very knowledgeable in nutrition related matters.*” was to determine how respondents rated their knowledge when it comes to nutrition related issues. Surprisingly, 61.7 % disagreed, 26.3 % were uncertain and only 12% agreed that they were knowledgeable on nutrition matters.

Most of participants felt that, what they had in their professional training was too general and basic such that they were unable to deliver accurate information to patients as one of them explained:

“...to me, nutrition knowledge that I had in professional training was too basic such that when it comes to application to patients with CKD ...mmh! It does not match at all! We mainly focused on nutrition deficiencies such as vitamin A, iodine, iron and protein energy deficiencies. There was nothing specific like nutrition in kidney diseases. So I can say there is no association between what I learnt in medical school and what I usually do” (Respondent)

4.4 Healthcare worker’s practices on nutrition management of CKD

Respondents answered some questions intended to describe their practices in terms of use of guidelines, discussion of nutrition status and dietary management of CKD patients during ward round, uses of anthropometric equipment and nutrition sessions conducted per week.

4.4.1 Availability and use of nutritional guidelines

The significance of the statement *“Do u use guidelines when discussing nutrition plan for patient with CKD.”* was to determine healthcare workers practices on nutrition management of patients. Most of respondents 92 % did not use any guidelines, instead they use some information from patients those were from other hospitals. This was expressed during group discussion.

“....For patients who have been dialysed out of Muhimbili, they are given some guide on what to eat and what not to eat, so before the patient asks me a question I start asking him/her do you have a book which tells you what to eat? Ok, make sure you adhere to that. Iam afraid if they start asking me questions especially the amount

supposed to take, I will be in trouble because I don't know. I usually avoid explaining anything in deep because I may fail to defend myself.

(Respondent)

The minority 8% (n=11) who used the guidelines, had guidelines adopted from other hospitals.

4.4.2 Ward rounds

The purpose of the question “*Do you always discuss patient’s nutrition status and nutritional management during ward round?*” Was to find out if nutrition therapy was a factor considered during ward rounds. Majority 53% of respondents indicated that nutrition management was discussed occasionally. It was reported that “*doctors are always in hurry and we have no nutritionist in the unit who joins the ward round*”. Some said it was due to negligence, while one respondent in particular felt that there was no time for such discussion as nutrition matters should be referred to the dieticians/nutritionists.

4.4.3 Uses of anthropometric equipment

The statement “*What tools do you use when assessing nutrition status of patients in this unit?*” was to identify the tools commonly used to assess nutrition status of patients. Majority 60 % were more familiar with the anthropometric measurements and mainly used weight scale. Five per cent noted that they used stadiometer for assessment while the rest 13% used other anthropometric tools which they did not specify.

It was also observed that there was a shortage of anthropometric equipment as one of respondent reported during group discussion:

“...There are no facilities like food models which will help us demonstrate to patients what we tell them; there are no weighing scales like here you can see only one! If you go to the ward there is none if you need to use it you really have look for it”

(Respondent)

4.4.4 Nutrition education sessions

The aim of the statement *“How often do you conduct nutrition education session to patient with CKD”* was to determine the frequency at which nutrition education sessions conducted per week at the renal unit. It was found that nutrition education was irregularly done (Table 4.8)

Table 4: 8Frequency of nutrition sessions to CKD patients in the study area(N=133)

Nutrition session per week	n	%
0	65	48.9
1-2	38	28.6
Others*	30	22.6
Total	133	100

* Not scheduled

Cross tabulations were done, to find the proportion of healthcare workers good practices (table 4.4). Chi square test showed significant relationships between practices and some demographic variables. Occupation ($\chi^2= 12.9$; $df= 4$; $p= 0.014$), work experience ($\chi^2= 15.8$; $df= 3$; $p= 0.001$) (table 4.9).

Table 4.9: The relationship between practices and demographic characteristics of respondents

Variable	Good practice n (%)	Poor practice n (%)	Total	χ^2	df	p- value
Age :<28yrs	9(13.4)	6(9.2)	15			
29-39yrs	21(31.3)	24(36.9)	46			
40-50yrs	31(46.3)	22(33.8)	54	3.424 ^a	6	0.754
>50yrs		13(20.0)				
Sex: Male	15(22.4)	24(36.9)	39			
Female	41(63.1)	52(77.6)	93	3.348 ^a	1	0.067
Occupation /carder:						
Medical doctors	4 (6.0)	16(24.6)	20			
Nurses	47(70.1)	30(46.2)	77			
Nephrologists	1(1.5)	2 (3.1)	3	12.594 ^a	4	0.014
Urologists	-	1 (1.5)	1			
Others	14(20.9)	17(26.2)	31			
Work experiences:						
< 1yr	14(20.9)	16(24.6)	30			
2-5yrs	33(49.3)	24(39.4)	57	15.856 ^a	3	0.001
6-10yrs	4 (6)	19(29.2)	23			
>10yrs	16(23.9)	6 (9.2)	22			

df= degrees of freedom

NS= not significant

4.5 Factors influencing nutrition management of patient with CKD

Respondents reacted to several attitudinal statements intended to find out some of the factors that might influence nutrition management of CKD patients.

4.5.1 Motivation and incentives

During group discussion session, participants mentioned unavailability of supplies and resources. They reported inadequacies in clinical facilities and supplies that are needed to meet the standard nutrition management of CKD. There were also comments about inadequacies in nutrition educational materials, reference books, and internet facilities.

4.5.2 Inadequate resources

The participants expressed their misery about the ratio of workers to patients within the facility:

“....If you look the number of patients and workers are not proportional, we receive patients from all over Muhimbili and others from upcountry so we have no time for nutrition counselling and follow-ups.”

(Respondent)

Participants reported lack of clinical nutritionist in the renal unit as one of the major obstacle in providing nutrition services to CKD patients. They felt that the nutritionist they have just did not satisfy the requirement of this unit:

“....We are worried with the nutritionists we have in this hospital, we have never seen them coming for counselling or diet prescription in this unit. Administration should know what kind of staff to hire, look... we need someone good in clinical nutrition but the hospital hired community nutritionists!”(Respondent)

Another participant added:

“...If you need to use it you really have to look for it “Laboratory is also a problem, if you request an investigation you may get the result two- three days later, something that is needed urgently.”

(Respondent)

During group discussion, respondents raised different issues which are thought to influence nutrition management of CKD at their working places. Such concerns are summarised in table 4.10

Table 4.10: Themes and findings emerged from focus group discussion

	Theme	Findings
1.	Knowledge on nutrition management of CKD patients	<ul style="list-style-type: none"> • Inadequate training in medical schools • Lack of reference materials (books, internet ,) • Lack of nutrition guidelines
2.	Attitude on nutrition training in medical school	<ul style="list-style-type: none"> • Training was too general and not specific on management of CKD • Training based on nutrient deficiencies • More attention given to under-five children and pregnant women
3.	Application of nutrition knowledge (practices)	<ul style="list-style-type: none"> • Lack of nutrition guidelines • Lack of reference materials
4.	Challenges on nutrition management of CKD patients	<ul style="list-style-type: none"> • Lack of nutrition expert • Labour shortage • Lack of facilities • Lack of motivation
5.	What is to be done to improve nutrition management of CKD patients	<ul style="list-style-type: none"> • Improve working conditions • Hire nutrition expert • Regular nutrition trainings

CHAPTER FIVE: DISCUSSION

5.0 Introduction

The overall aim of this study was to gain a deeper understanding of nutrition management in selected hospitals, with special focus on patients with CKD. This section discusses the interpretation of the findings. The presentation of the discussion follows the sequence of the study objectives.

5.1 Nutrition knowledge

The results of the present study provide the insight into the level of understanding of nutrition management of CKD patients among healthcare workers in selected hospitals in Dar es Salaam –Tanzania. Most of the respondents 88% had nutrition trainings in their medical/nursing schools. However, they reported what they learned in their professional training was not sufficient to provide proper information to patients with CKD. This is of particular significant as it has been shown that nurses are a trusted source of health information as noted in the similar study by Harrison (2002).Therefore, it is important that information provided by health professionals is accurate.

The findings of this study are similar to those of several studies in the United States Canada and Asia that have indicated a lack of nutrition knowledge among physicians (Kushner, 1995; Krusae and Fox, 1977) .One national study was carried out in Riyadh among primary care physician in 4 governmental hospitals not belonging to ministry of health (MOH) in 2004. The response rate was 52% and the mean mark for correctly answered questions was 51.7%. Seventy five percent of physicians described their knowledge of nutrition as” poor”

Apart from medical/ nursing schools, some of the respondents reported had nutrition knowledge from seminars, books and internet. No one mentioned he/she had continuous medical education in nutrition (CME). It is important therefore to equip healthcare workers with facilities that will enable them to improve their knowledge.

The lack of knowledge about nutrient (minerals, protein, and carbohydrate) adjustment is of particular concern, as these health professionals sometimes provide information about nutrition to their patients. It is also a lost opportunity as there are many more nurses than nutritionists in Tanzania, and thus they have the potential to disseminate such information widely. However, interventions are required to ensure that the information they pass on to their patients is accurate and current.

The low nutritional knowledge scores were noticeable for questions related to the role of HBV protein and why should protein be restricted. The healthcare workers demonstrated limited knowledge regarding the role of HBV protein and why total protein is restricted to patient. This could reflect the belief that this topic is more the domain of specialists such as nutritionists and dieticians, or that this information is available in more specialist sources that the respondents may not be in contact with. The findings are similar to the observations of Nightingale and Reeves (1999), Kgaphala *et al.*, (1997) and Rajaa and Raddad (2009), who also expressed the same findings.

The low effectiveness of nutrition training courses that was mentioned by healthcare workers in this study as one participant expressed:

“ To me, nutrition knowledge that I had in professional training was too basic such that when it comes to application to patients with CKD ...mmh! It does not match at

all! We mainly focused on nutrition deficiencies such as vitamin A, iodine, iron and protein energy deficiencies. There was nothing specific like nutrition in kidney diseases. So I can say there is no association between what I learnt in medical school and what I usually do”

(Respondent)

The criticism of the medical college curriculum was also supported by Musaiger (1990), who indicated that the curriculum of the medical college in the Aga Khan University (AGU) did not include relevant and adequate information on nutrition and dietary management of diseases. The same deficiencies in the medical curriculum have been found in other countries (Guagnano *et al.*, 2001; Taren *et al.*, 2001).

5.2 Attitude among health workers

In this study, most of healthcare workers agreed that nutrition plays an important role in prevention and treatment of disease. They also admitted that they are responsible for undertaking nutrition assessment of patients. However, their positive attitude seemed to contradict their practices, this was revealed when majority disagreed with the statement “appropriate nutrition support is provided at the renal unit”

Furthermore, results indicated that 76.7% had negative attitude regarding their own nutritional knowledge. This was revealed when they were asked to rate themselves on nutrition related matters. This could be due to less emphasis given to nutrition programs in medical/nursing schools and as part in-service trainings in patient care. Such negative attitudes were expressed during group discussion when they were asked to give opinion on nutrition knowledge in their professional training.

Marjolein *et al.*,(2001), in a study on attitudes and motivation of health staff in the Northern Vietnam, found that positive attitudes of health personnel resulted in good performance in delivery of health services. Other studies done by Chinnayya *et al.*, (1990); Ignacio *et al.*,(1989) had shown a positive effect on the attitude and knowledge of the community and personnel 18 to 24 months after the intervention. Doctors however may not have adequate knowledge and skills as their knowledge on nutrition has been shown to be poor (MacDiarmid and Gatenby, 1997). In these cases, therefore most patients nutritional care tend to be overlooked as it has long been recognized that nutrition training in medical curricular has been haphazard, ambivalent and far from adequate (Hopper and Barker, 1995). It has been found that nutritional issues have been given low priority among health care professionals (Xia and McCutcheon, 2006).Another study found that the attitude of the staff towards nutritional nursing care was overall positive, mainly regarding the importance of food (Christenson *et al.*, 2003).

Nutritional care is complex and coincides partly with other health care professionals. Therefore, a multi-professional working team is fundamental in nutritional care. Having a patient-centred approach, using evidence-based care, procedures and protocols, paying attention to records, monitoring progress and outcomes, communication, ability to maximise the individual attributes of each team member, having a collaborative approach, creativity, and supportive culture are some factors mentioned as important in the European Society for Parenteral and Enteral Nutrition (ESPEN) guidelines (Howard *et al.*, 2006).

5.3 Practices among health workers

In this study, assessment of a patient's nutritional condition was not always discussed during ward round. Instead, the patient's condition, diagnosis, treatment and age were taken into consideration as reasons for assessment. A low performance of nutritional assessment was also found recently among nurses in Amsterdam (29.9%) (Bavelaar *et al.*, 2008) and in Denmark (40%) (Lindorff-Larsen *et al.*, 2007). One reason for the limited use of assessment tools, confirmed by other studies (Alfengard and Klevsgard, 2005), could be that they maybe not so easy to use (Söderhamn, 2006) and that there is a lack of instructions and guidelines (Kondrup *et al.*, 2002). Another reason could be that the doctors simply trust their clinical judgement and therefore abandon the tools. The reasons might be found in inadequate knowledge and skill, or perceived lack of resources, such as assessment tools and guidelines. In addition, nurses might think that nutritional assessment is not part of their role, something which has been discussed recently (Adams *et al.*, 2008). Regarding nutrition education to patients with CKD, 48.9% of these participants did not provide such information while 28.6% and 22.6% did it once to twice per week and whenever they had time to do so respectively. It has been suggested that for improvement of nutrition care, multidisciplinary care must be implemented. Once a patient is identified nutritionally vulnerable management strategies should be planned and implemented by a nurse in partnership with nutritionist, doctors and other health professionals (Dhoot *et al.*, 1996

5.4 Factors influencing nutrition management of patients

In this study, lack of resources was mentioned as the major cause of inadequate nutrition care for CKD patients. This was revealed during discussion as the participants expressed their dissatisfaction about the patients/health care workers ratio as one of the respondents expressed:

“R2: If you look the number of patients and workers are not proportional, we receive patients from all over Muhimbili and others from upcountry so we have no time for nutrition counselling and follow-ups.”

Respondent.

The present study findings concur with that of WHO/WB (2004), and other development report that that most sub-Saharan governments are facing an acute shortage of skilled public sector health workers, and that this is getting worse, not better. Furthermore, the ministry of health in Tanzania acknowledged that there is a deficit of more than 72% of healthcare worker with the sector (MoH, 2008). This implies that, healthcare workers may consider nutrition care to be important to patients, but many have difficulty in raising its priority above the nursing activities due to time constraints, and multitasking issues as a result of labor shortage.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter presents study conclusions and recommendations. These recommendations are based on the objectives of the study, focusing on policy and practice as well as further research.

6.1 Conclusions

Nutrition knowledge was found to be low /poor among healthcare workers, though they had positive attitude, they failed to practice. Inadequate nutrition training in medical school, lack of resources and motivation were identified as factors that influence nutrition management of CKD in the study area. Nutrition knowledge strongly influences practices of healthcare workers managing patients with CKD. Participants with higher level of education tended to practice better compare to those with low education level.

6. 2.Recommendations

6.2.1 Recommendations for policy

In order to achieve proper nutritional diagnosis, counseling, safe and sound dietary advices, the Ministry of Health and Social Welfare and universities should review the medical curriculum to ensure that clinical nutrition becomes a part of training in medical schools.

6.2.2 Recommendations for practice

Regular nutrition updates (in-services) by dietitians or person trained in clinical nutrition at the work place so as to ensure that health workers particularly nurse who are close to patients have current and accurate nutrition information. Dietitians could also write short, but regular segments for nursing journals or newsletters. This written material may be most useful if written in lay terms to enable nursing staff to use it directly with their patients, rather than needing to translate the information for the general public.

6.2.3 Suggestions for further research

There is need for further investigation on the use of nutrition supplement among CKD patients and their effect on the disease outcome. Further research on the nutrition management for patients with other diet related non communicable diseases such as diabetes, cardiovascular diseases cancer should be conducted in hospitals to ensure that patients get good nutrition therapy together with the medical therapy.

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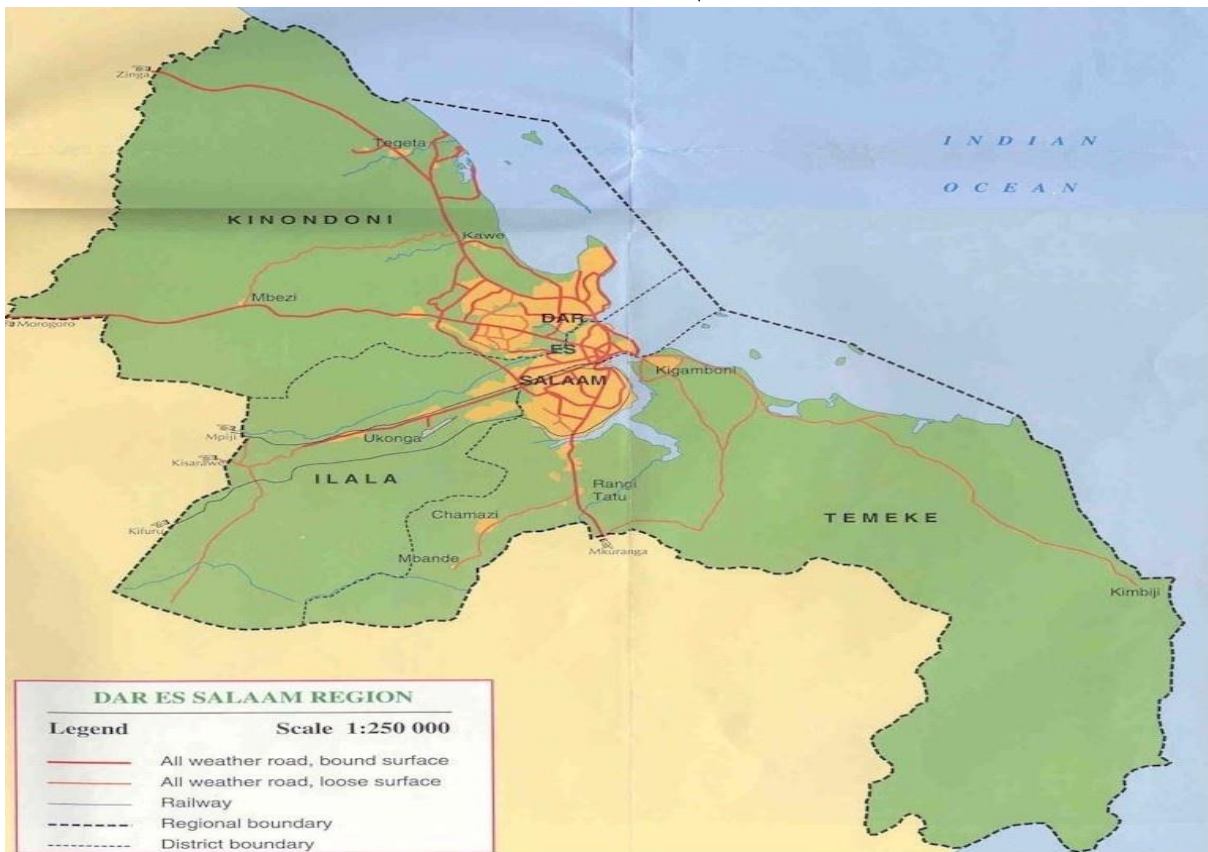
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Appendix I: Study area location



Appendix II: Questionnaire

Questionnaire on nutritional knowledge attitude and practices among healthcare workers managing patients with chronic kidney disease in Dar es Salaam hospitals, Tanzania

Administrative details

Q/ NO..... Name of the interviewer.....

Date of interview.....

Instructions

- 1 Answer ALL questions as directed
- 2 Do not write your name on any paper of this questionnaire
- 3 All answers will be kept confidential
- 4 Put a tick (√) on the respective box provided of your response

SECTION A: Socio-demographic

Below are some questions about you

1. Sex

1. Male
2. Female

2. Age in years:

1. Below 28
2. 29-39
3. 40-50
4. Above 51

3. Marital status

1. Single
2. Married
3. Widow
4. Others (specify).....

4. Education level.....

1. Primary school
2. Secondary school
3. Advanced secondary school
4. College
5. University
6. Others (specify).....

5. Professional/ technical qualification

1. Certificate
2. Diploma
3. Advanced Diploma
4. Bachelor degree
5. Master's degree
6. PhD

7. Other (specify).....

6. Occupation /professional title (**you can tick more than one**).....

1. Medical Doctor
2. Nurse Officer
3. Nephrologist
4. Urologist
5. Other (specify).....

7. How long have you worked in caring patients with chronic kidney diseases?

1. Less than 1 year
2. 2 to 5 years
3. 6-10 years
4. More than 10 years

SECTION B: Questionnaire on nutrition knowledge.

Below are questions about your knowledge on managing patients with chronic kidney diseases.

Part one: Sources of Knowledge in nutritional management of CKDS

1. Was nutrition part of your training in medical/nursing school? _____
 1. Yes
 2. No

2. If your answer to Qn1 is yes, please specify the areas you concentrated on _____
 1. Clinical nutrition
 2. Community nutrition
 3. Basic nutrition.
 4. Both clinical and community nutrition.

3. Apart from medical/ nursing school training, have you had any formal nutrition training?
 1. Yes
 2. No

4. Have you ever had any information about medical nutrition therapy? _____
 1. Yes (if yes, go to question 10)
 2. No (skip question 10)

5. Where did you get the information from? _____
 1. Books
 2. Seminars/ workshops
 3. Internet
 4. Others (please specify)

Part two: Knowledge on nutrients and their sources that is important in the management of CKDS

Circle the most correct answer

1. Some vitamins may accumulate in the body to dangerous levels if large doses of vitamin supplements are frequently taken. Examples of this would be?
 - A) Vitamin B6, Bland C
 - B) VitaminA, E and D
 - C) Vitamin B2, Niacin and C
 - D) Vitamin Bland B12

2. Carbohydrates are needed by the body for the following reasons except?
 - A) Glycogen stores and to spare protein for tissue synthesis
 - B) To insulate the body.
 - C) To help body fight infections.
 - D) As a source of energy.

3. Which groups of food listed below are high biological value proteins?
 - A) Red beans, Milk, green grams.
 - B) Milk, chicken, fish.
 - C) Meat, lettuce, peas.
 - D) Bread, beef, spinach.

4. Which of the following food is not a rich source of potassium?
 - A) Rice
 - B) Banana
 - C) Spinach
 - D) Sweet potatoes

- 5 The following are diet related risk factors for chronic kidney disease
 - A) Diabetes, hypertension
 - B) HIV, cardiovascular disease
 - C) Typhoid, malaria
 - D) Cancer, cholesterol

6. Which of the following is central to management of Chronic Kidney Disease Mineral and Bone Disorder (CKD-MBD)?
- A) Dietary calcium
 - B) Dietary phosphorous
 - C) Dietary sodium
 - D) Dietary potassium
7. Dialysis patients do NOT require supplementation of which vitamin:
- A) Vitamin A
 - B) Vitamin B
 - C) Vitamin C
 - D) Folic acid
8. "A person's nutrition requirements increase following chronic disease"
- A) True
 - B) False
9. "Unless renal failure develops, or there is diminished urine output (oliguria) protein is NOT restricted"
- A) True.
 - B) False
10. "Haemodialysis does mimic a functioning kidney therefore; dietary modifications are a crucial part of treatment"
- A) True
 - B) False
11. "Adherence to dietary regimens can have a large impact on lifestyle and is often one of the most difficult aspects of management"
- A) True
 - B) False
12. Mention three goals of nutritional management of chronic kidney disease
- A)
 - B)
 - C)

13. List 3 signs of a patient with fluid overload

- A)
- B)
- C)

14. List 3 functions of protein

- A)
- B)
- C)

15. Mention three foods that contain large amount of sodium which a patient with CKD should avoid

- A)
- B)
- C)

16. Why is protein restricted for a renal patient?

17. Why is protein of high biological value recommended for a renal patient?

18. Why is it recommended to increase carbohydrate intake for a renal patient?

19. Why are fluids restricted for a renal patient?

20. Why are minerals restricted for a renal patient?

Part three: Knowledge on practice in the management of CKDS

10. Do you use nutritional guideline when discussing nutrition plan for patient with chronic kidney disease?

1. Yes (which one do you use?)
2. No

11. Which tools do you use when assessing patients with chronic kidney nutrition status in this unit?(Mention them)

12. How often do you give nutrition education session to patients with chronic kidney disease in a week?

1. 0
2. 1-2
3. Others (please specify)

14. Do you always discuss patients nutrition status and nutrition management during ward round?

1. Yes
2. No (give reasons)

15. Do you usually give individual nutrition education to patients with chronic kidney diseases?

1. Yes
2. No

SECTION C: Questionnaire on attitude

Below are statements concerning your attitudes on nutrition management of chronic kidney disease? Please circle your response to each statement using the following scale of 1 (strongly disagree) through 5 (strongly agree).

No	Statement	strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1.	It is the nurses' responsibility to assess nutritional status of patients					
2.	It is the nutritionist's responsibility to assess nutritional status of patients					
3.	It is the doctor's responsibility to assess nutritional status of patients					
4.	Appropriate and adequate nutritional support is normally provided in the Renal Unit					
5.	It is important to assess the nutritional status of every patient who comes to the clinic and those admitted in the ward.					
6.	It is important to weigh every patient upon every visit					
7.	Nutritional education is not the responsibility of the nurse.					
8.	Nutrition has an important role in preventing diseases.					
9.	Health workers are very knowledgeable in nutritional matters					
10.	Nutrition plays a key role in the prevention, progression, and adverse outcomes of CKD along with medical and other lifestyle treatments					

SECTION D: questionnaire on motivation and incentives.

Below are questions about your motivation and incentives on managing patients with chronic kidney diseases.

No.	Statement	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1	I have sufficient opportunity to develop in my work					
2	The variation in my work is satisfactory					
3	My work is mentally stimulating					
4	I experience frustration in my work due to limited resources					
5	I find my work routine non stimulating					
6	Too much is expected from me at work					
7	I receive recognition for tasks well done					
8	I am entrusted with great responsibility in my work					
9	The patients appreciate what I do for them					
10	My patients co-operate because they understand my working conditions					
11.	I have a good working relationship with my colleagues					
12.	There is an atmosphere of co-operation between staff & management					
13.	There is a clear channel of communication at my workplace					
14.	My manager is concerned about my well being					
15.	Management does involve staff in decision making					
16.	I am happy with the management style in my department					

Appendix III: Focus Group Discussion Guide

1. From your understanding, what are the goals of nutrition therapy in chronic kidney disease management?
2. What is your opinion on nutrition knowledge that you received in your professional training?
3. How do you apply nutrition knowledge that you received in your professional training in managing patients with chronic kidney disease?
4. What are some of challenges do you face in your day to day activities in nutrition management of patients with chronic kidney disease?
5. What do you think should be done in order to improve quality nutritional care to patients with chronic kidney diseases?

Thank you for your cooperation

Appendix IV: Observation Checklist

Name of the hospital.....

Date

	Nutrition assessment	Yes	No	Remarks
1	Patient anthropometric measurement taken correctly			
2	Presence of a functioning weighing scale			
3	Nutrition therapy discussed in ward round			
4	Availability of a well-equipped laboratory			
	Nutrition counseling			
6	Availability of space/ room for nutrition /health education session			
7	Availability of education materials			
8	Use of education materials (booklets, brochures, posters)			
9	Uses of notes			
10	Space / privacy available			
11	Availability of counseling card			
12	Availability of food models, pictures or sample			
13	Use of counseling card			

Appendix V: Ethical clearance

Appendix G: Ethical Clearance

DIRECTORATE OF RESEARCH AND PUBLICATIONS

P. O. Box 65001
DAR-ES-SALAAM

TANZANIA
Telefax: 2152489
Telegrams: UNIVMED



E-Mail drp@muhas.ac.tz
TEL: (255-022)-2150302-6 Ext
207
Direct line: 2152489

Ref.No.MU/RP/AEC/Vol.XIII/

23rd November 2011

Adeline Munuo
c/o Dr Onesmo Kisanga
Elective Student
MUHAS.

Re: Nutrition Knowledge, Attitudes and Practices among Healthcare workers in Management of Chronic Kidney Diseases in selected hospitals in Dar es Salaam, Tanzania

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the Senate, approved ethical clearance of the above mentioned study, on recommendation of Expedited Review Sub committee of the Senate Research and publications committee meeting held on 10th November 2011.

The validity of this ethical clearance is effective from 10th November 2011 to 9th November 2012. You will be required to apply for extension of ethical clearance if the study will not be completed at the end of this clearance. You are also required to submit a final project report upon completion of your study.

Permission to publish your study findings should be sought from the appropriate authorities at MUHAS and MNH, local supervisor be involved in the study implementation and also be a co-author in all publications to acknowledge his contribution in the study.

Prof. M. Aboud

CHAIRPERSON, SENATE RESEARCH & PUBLICATIONS COMMITTEE

- c.c Vice Cancellor - Your letter ref. no. MU/01/1022/122/188
- c.c Deputy Vice Chancellor, Academics, Research & Consultancy (MUHAS)
- c.c Dr. Onesmo Kisanga - Local Supervisor (Muhimbili Notional Hospital)

Appendix VI: Permission request

MUHIMBILI NATIONAL HOSPITAL

Cables: "MUHIMBILI"
 Telephones: 255-22-2151599
 255-22-2151369
 FAX: 255-22-2150234
 Email: ceo@mnh.or.tz
 Web: www.mnh.or.tz



Postal Address:
 P.O. Box 65000
 Muhimbili
 DAR ES SALAAM
 Tanzania

In reply please quote

Tuesday, 29 November 2011

The Hospital Administrator,
 The Aga Khan Hospital
 P.O Box 2289
 Dar es Salaam
 Tanzania

Dear Sir/Madame,

Re: Permission for Ms. Munuo Adeline Eliud –H60EA/12996/2009 to Conduct Research at Your Institution

The above named is a student of Kenyatta University's school of Human Applied Sciences pursuing masters of science in Foods, Nutrition and Dietetics. She is hereby wishing to apply for permission to conduct a study among your staff members, in partial fulfilment for the above mentioned programme. This research work is under Dr. O. A. Kisanga supervision.

Her topic is entitled "Nutrition Knowledge, Attitudes and Practices among Healthcare Workers in Management of Chronic Kidney Diseases in selected hospitals in Dar Es Salaam, Tanzania."

A proposal study has been submitted to Muhimbili University of Health and Allied Sciences for ethical and research committee for approval.

A copy of ethical committee's approval for the study and the questionnaire are attached.

Yours faithfully,

.....

Dr . Onesmo A. Kisanga

Consultant Physician/ Nephrologist

*Department of Internal Medicine
 Muhimbili National Hospital
 P. O. Box 65000
 Dar es Salaam*

Appendix VII: Consent and Explanation Form

Hello, I am Adeline Munuo, a student at Kenyatta University –Nairobi, Kenya. Currently, I am perusing Master’s degree in Foods, Nutrition and Dietetics. The aim of this study is to assess nutritional knowledge among healthcare workers managing patients with chronic kidney diseases in Dar es Salaam hospitals, Tanzania. You have been identified as a key participant in this study. You will be required to respond to questions in a given questionnaire. Before you participate it is very important that you understand the following principles that apply to all participants.

Participation through the filling in the questionnaire is entirely voluntary. Your confidentiality will be safeguarded through: identity and records relating to your participation will remain confidential; no names of any participant will appear in the final reports or publications resulting from this study. There are no risks by participating in this study; your professional reputation will not be affected. There will be no allowances by participating.

In case of any problem or concern, you may either contact the supervisor of this study at the department of Internal medicine-Muhimbili National Hospital on the following numbers: **+255 784 782 948.**

If you choose to participate in the study please sign below.

I chose to participate in the study.

Signature: _____ Date: _____

Thank you very much.

Appendix VIII Authorization letter



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: kubps@yahoo.com
dean-graduate@ku.ac.ke
 Website: www.ku.ac.ke

P.O. Box 43844, 00100
 NAIROBI, KENYA
 Tel. 8710901 Ext. 57530

Our Ref: H60EA/12996/2009

Date: 4th October, 2011

The Permanent Secretary,
 Ministry of Higher Education, Science & Technology,
 P.O. Box 30040,
NAIROBI

Dear Sir / Madam,


**RE: RESEARCH AUTHORIZATION FOR MUNUO ADELINE ELIUD
 REG.NO H60EA/12996/2009**

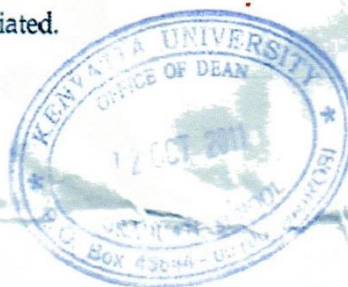
I write to introduce Munuo Adeline Eliud who is a postgraduate Student of this University. She is registered for a M.Sc degree programme in the Department of Foods, Nutrition and Dietetics in the School of Applied Human Sciences.

Ms. Eliud intends to conduct research for a Thesis entailed “**Nutrition Knowledge, Attitudes and Practices among Healthcare workers in Management of Chronic Kidney Diseases in selected Hospitals in Dar es Salaam, Tanzania**”

Any assistance given will be highly appreciated.

Yours faithfully,


JOHN M. ODONGI
FOR: DEAN, GRADUATE SCHOOL



JMO/rwm