PSYCHO-DIETARY ADAPTATION AMONG END STAGE RENAL DISEASE CLIENTS ON HEMODIALYSIS AT KENYATTA NATIONAL HOSPITAL

BY

VIOLA KIPTURGO

H56/75914/2014

A Dissertation Submitted in partial Fulfilment of the Requirements for the Award of Master of Science Degree in Medical Surgical Nursing of the University of Nairobi

August 2016.

DECLARATION

I, Viola J. Kipturgo, the undersigned, declare that this thesis is my original work and has not been submitted for any award to any other college, institution or university other than the University of Nairobi for an academic in award.

Signed.....

Date .....

CERTIFICATE OF APPROVAL

We, the undersigned certify that this research thesis has been submitted for the award of the degree of Master of Science in Nursing (medical surgical Nursing) of the University of Nairobi with our approval as internal supervisors.

Dr .Samuel T. Kimani .
BScN, MSC, PhD.
Senior Lecturer, School of Nursing sciences
University of Nairobi.

Signature.....Date.....

Mrs. Angeline C Kirui.
BScN, MSC
Lecturer School of Nursing Sciences
University of Nairobi

Signature.....Date.....

DEDICATION

I dedicate this work to Almighty God Jesus Christ and to all clients with chronic kidney disease on Hemodialysis in the renal unit, and to my husband Daniel Chebet, son Brian Ruto and Niece Wanda Chepchumba for their love, and encouragement. It is also dedicated to all family members and friends and for their support and love.

ACKNOWLEDGEMENT

I would like to express my sincere appreciation to the following people who assisted and guided me until now. My supervisors DR .Kimani and Mrs Kirui for their guidance support and follow up of my research thesis.

The University of Nairobi, School of Nursing Sciences, Master of Science Nursing teachers and classmates for the encouragement and support. Specially thank my classmates Jackline Chepkok, Florence and Lilian for their encouragement and input.

I would like to extend my sincere thanks to Dr.Ayieko, biostatician for doing a comprehensive data analysis.

God bless you all.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

CKD : Chronic Kidney Disease

CRP : C-reactive protein

ESA : Erythropoietin stimulating agents

ESRD : End stage renal Disease

FSGS : Focal and Segmental Glomerulosclerosis

GFR : Glomerular Filtration Rate

HD : Hemodialysis

IDII : In depth Individual interviews

KT : Kidney Transplant

PD : Peritoneal Dialysis

RAM : Roy's Adaptations Model

RRT : Renal Replacement Therapy

SBP : Systolic Blood Pressure

SPSS : Statistical Package for Social Sciences

TNF : Tumour Necrotic Factor

USA : United States of America

WHO : World Health Organization

OPERATIONAL DEFINITIONS

Adaptation : Ability of a client with ESRD to adjust and be able to live positively with their conditions and treatment modalities.

Chronic kidney disease (CKD): Is defined as kidney damage or a glomerular filteration rate less than 60 ml/minute /1.73m body surface area that has been present more than three months (Agar 2010) .

Dietary adaptation : Is adjusting to the new prescribed options of diet once a client has been diagnosed End stage renal disease

Hemodialysis: Is a process of purifying the blood of a patient with chronic kidney illness.

Psycho-dietary adaptation : This refers to End stage kidney disease clients for dialysis adapting to both dietary changes required in kidney patients and the ability to psychological live positively with their new condition..

Psychological Adaptation : Psychological or mental preparedness and adjustment among the End stage Kidney disease patients undergoing dialysis with their condition and the mode of treatment with minimal stress**.**

Stage five chronic kidney diseases, Kidney failure (End stage renal disease): Is defined as the terminal phase of chronic kidney disease .The kidneys no longer filter out toxic compounds, which accumulate in body tissues and fluids and eventually cause death unless treatment is initiated .People with ESRD need renal replacement therapy to survive .In this study End stage kidney disease with kidney failure is used interchangeably.

ABSTRACT

Background: Hemodialysis care requires events of adjustment in dietary options that must be adhered to. The diagnosis of end stage renal disease (ESRD) or renal failure disease and initiation of hemodialysis care influences the psychological status of clients. The level of adaptation will influence the success in haemodialysis care. Poor adaptation results in non-adherence and poor outcome in haemodialysis care or renal disease care or management. Therefore there is a need to investigate how clients with kidney Failure disease adapt psychologically, nutritionally and to determine their anthropometric measurements to hemodialysis treatment.

Objectives: To assess psychological and dietary adaptation, and to determine anthro among clients with End stage renal disease on haemodialysis at Kenyatta national hospital renal unit.

Methods: Descriptive prospective study was used for this study. Purposive sampling was adopted for this study and a sample size of 83 was obtained. Data was collected by use of structured questionnaires with in-depth interview .Hospital anxiety depression scale (HADS-A) standard tool was used to assess psychological adaptation .The anthropometric measurements were taken that is height and weight for body mass index (BMI) for first contact and second BMI repeated after three weeks. The chemical biomarkers total protein and haemoglobin data was obtained from participants file. Eighty three participants were sampled in renal unit. The quantitative results were analyzed by SPSS software and for qualitative data the results were analyzed by NVIVO software. Continuous data was analysed using t-test; categorical data was analysed using chi-square.

Results: Using cut offs of the summative scores for Hospital anxiety Depression subscale (HADS-D) items, the prevalence of anxiety among respondents was 89 % (n=74) .The prevalence of depression was 84% (n=74). There was significant association between depression and Religion (p= 0. 046). There was a significant association between protein level and age (p = 0.006). There was a significant association between BMI and duration since dialysis was initiated (p = 0.039). There was a significant reduction in BMI during second assessment conducted after three weeks with mean BMI at 21.9 (SD 4.1), (t = 4.64, DF = 78, p < 0.001).There was a significant correlation between protein and haemoglobin levels. There was a positive correlation between haemoglobin and protein (Pearson's' correlation coefficient, *rho* = 0.312). The haemoglobin levels increased by 0.3 units for each unit increase in protein level (p = 0.005).

Conclusion: The study has indicated that respondents with end stage renal disease undergoing hemodialysis experience high prevalence of depression and anxiety; they are not adapted nutritionally as indicated by chemical biomarkers and history from respondents, and have significant derangements in anthropometric indices.

Recommendation:

- There is need to enhance counselling process for clients with ESRD on Psychological care, that is counselling before and during hemodialysis.
- Continuous monitoring of hemodialysis clients of their mental state using hospital anxiety depression scale assessment (HADS-A) or the hospital can develop their own tool should be enhanced.
- The nutrionist should be in cooperated in the management of clients undergoing hemodialysis to give individual advice on nutritional requirements.
- The anthropometric measurements monitoring should be done regularly with the feedback of this information given to the patients alongside implementation of corrective actions in cases where changes are noted

CHAPTER ONE: INTRODUCTION

1.1 Background Information

End stage renal disease (ESRD) or kidney failure Is defined as the terminal phase of chronic kidney disease .The kidneys no longer filter out toxic compounds, which accumulate in the body tissues and fluids and eventually cause death unless treatment is initiated .People with ESRD need renal replacement therapy to survive (KDOQI 2007). Clients on haemodialysis have many challenges resulting from the disease itself and the treatment process, there is a change in quality of life, cause of depression, and sometimes can lead to suicide and early death (Karimi et al, 2012).End stage renal disease involves the clients and their families due to the extensive lifestyle changes (Barnett et al., 2008).

Renal failure disease treatment with hemodialysis (HD) has long-term stressors that alter patients' wellbeing and everyday life style (Herlin & Wann-Hansson, 2010).The treatment is inherently distressing, and clients are exposed to different psychological stress, dialysis 2-3 times a week for 4 hours sessions, having permanent fistulas for dialysis. The clients are also subjected to dietary restrictions to fluids, salt and diet. This will lead to changes in client's family roles and ability to work, with feelings of loss of control and fear of death and will interfere profoundly in patients' well-being (Cukor et al., 2007).

Comprehensive medical care requires both optimal biomedical outcomes, and careful attention to psychological outcomes (Barendse et al., 2005). Psychological aspect has been shown to be an independent predictor of survival (Kimmel. 2000). Early identification of psychological problems can prevent the development of depression in these clients and non-adherence to dietary regimen leading to fluid overload and increased potassium levels which will lead to increased dialysis sessions.

Psycho-dietary adaptation refers to clients with ESRD on dialysis adapting to both dietary changes required and the ability to psychological live positively with their new condition. A client who is psychologically adapted is likely to comply with dialysis treatment prescription adhere to fluid and dietary restrictions and have successful dialysis outcome.(Chokephichit, 2003) explored that Clients with ESKD and on hemodialysis and receiving psychological support from their families and friends are found to comply with dietary and fluids restrictions and adhere to other treatment.

Clients with renal disease failure and are on dialysis have to use adaptation for them to comply with the treatment .The psychological adaptation used by this clients have been found to be having family support, seeking social support and trusting in their religion (Harwood et al., 2009). Cognitive styles like positive reappraisal, optimism, realistic expectation and acceptance are also some of adaptation (Mitchell et al., 2009).

Successful adaptation has been related to better quality of life, mental health, and illness remission (Aldwin, 2000). Adaptation efforts might also result in positive adjustment to illness (Holland & Holahan, 2003), care giving responsibilities and body image concerns noted (Kneebone &Martin, 2003).Ineffective adaptation reduces quality of life and increases treatment expenses. Roy (1976) postulated that a maladaptive response to stimuli was due to an increase in stimuli beyond the person's ability to adapt. Clients with end stage renal disease must use adaptive ways which may be Psychological adaptation, Dietary, physical, physiological adaptation and social economic adaptation. For this study the researcher will look at psychological and dietary adaptation

1.2 Problem Statement

Psycho-dietary adaptation is one of the supportive treatment for clients with renal failure disease ,while social economic adaptation mechanisms among renal failure disease clients has been explored adequately there is lack of evidence on psycho-dietary adaptation among these clients yet it is one of the main supportive treatment in the clients with renal failure disease.

At the renal unit KNH, newly diagnosed renal failure clients undergo both dietary and psychological counselling and baseline anthropometric parameters taken prior to initiation of treatment; however there is no data to show whether the clients adapt to the hemodialysis which has a great impact on their treatment outcome. In addition, there is no data for changes on anthropometric parameters which could show whether the clients are nutritionally adjusting to their new treatment and condition adjustments. This study therefore sought to establish, psycho- dietary adaptations and anthropometric parameter changes among these patients as they continue to undergo haemodialysis, which will provide an insight in developing corrective interventions during their course of treatment.

1.3 Research Questions

1. What are the psychological adaptations among clients with end stage renal disease on haemodialysis at KNH?
2. What are the dietary adaptations among clients with end stage renal disease on haemodialysis at KNH?

1.4 Study Objectives

1.4.1 Broad Objectives

To assess psychological and dietary adaptations among end stage renal disease clients on haemodialysis at Kenyatta National Hospital

1.4.2 Specific Objectives

1. To assess psychological adaptation among clients with end stage renal disease on haemodialysis at KNH
2. To examine nutritional adaptation among clients with end stage renal disease on haemodialysis at KNH

1.5 Hypothesis

Psycho-dietary adaptations among patients with end stage renal disease on hemodialysis at Kenyatta National Hospital do not affect treatment outcome.

1.6 Justification of the Study

Well adapted clients to Psycho-dietary are able to acknowledge and express their emotions in a way that allows them to take control of their lives, engage in self-management and try to focus on potential positive outcomes of their illness. When clients are psychologically adapted to their conditions they are likely to adhere to the treatment care and be responsible with the diet that is required of them. Clients that follow dietary plan (which can be determined by assessing and monitoring their anthropometric parameters) reduce progression of disease and their symptoms, reduce fluid overload and reduce the dialysis sessions.

At Kenyatta National Hospital Renal Unit, studies on psycho-dietary adaptation to end stage kidney disease on clients on haemodialysis are not available, Studies on assessment of quality of life have been done but no studies on psycho-dietary adaptation have been done. Further,

no evaluation on anthropometric parameters changes during haemodialysis has been done. Identifying these psycho-dietary adaptations coupled with anthropometric parameter changes is the first step for patients support and intervention.

Assessment of these adaptations will provide nursing staff and health management team at the dialysis unit with more understanding on their clients, give individualized care and teach effective ways of adapting, more effective teaching opportunities for those who have difficulties in adapting to the condition and the treatment, and to support the existing coping strategies or help the patients to develop new strategies.

1.7 Variables for consideration in this study.

Dependent variables

Psychological factors;

- Depression
- Anxiety

Dietary factors-

- Fluid Restriction
- Salt restriction
- Protein restriction
- Fruits and vegetables
- Total Protein levels.
- Hemoglobin levels.

Anthropometric measurements

- Height
- Weight

Independent Variable;

- Demographic data: Age, sex, educational level, Religion,
- Duration of Having ESRD,
- Frequency of dialysis,
- Length since commencement of dialysis.

Outcome; Psycho-dietary Adaptation /maladaptation

1.8. Conceptual Framework

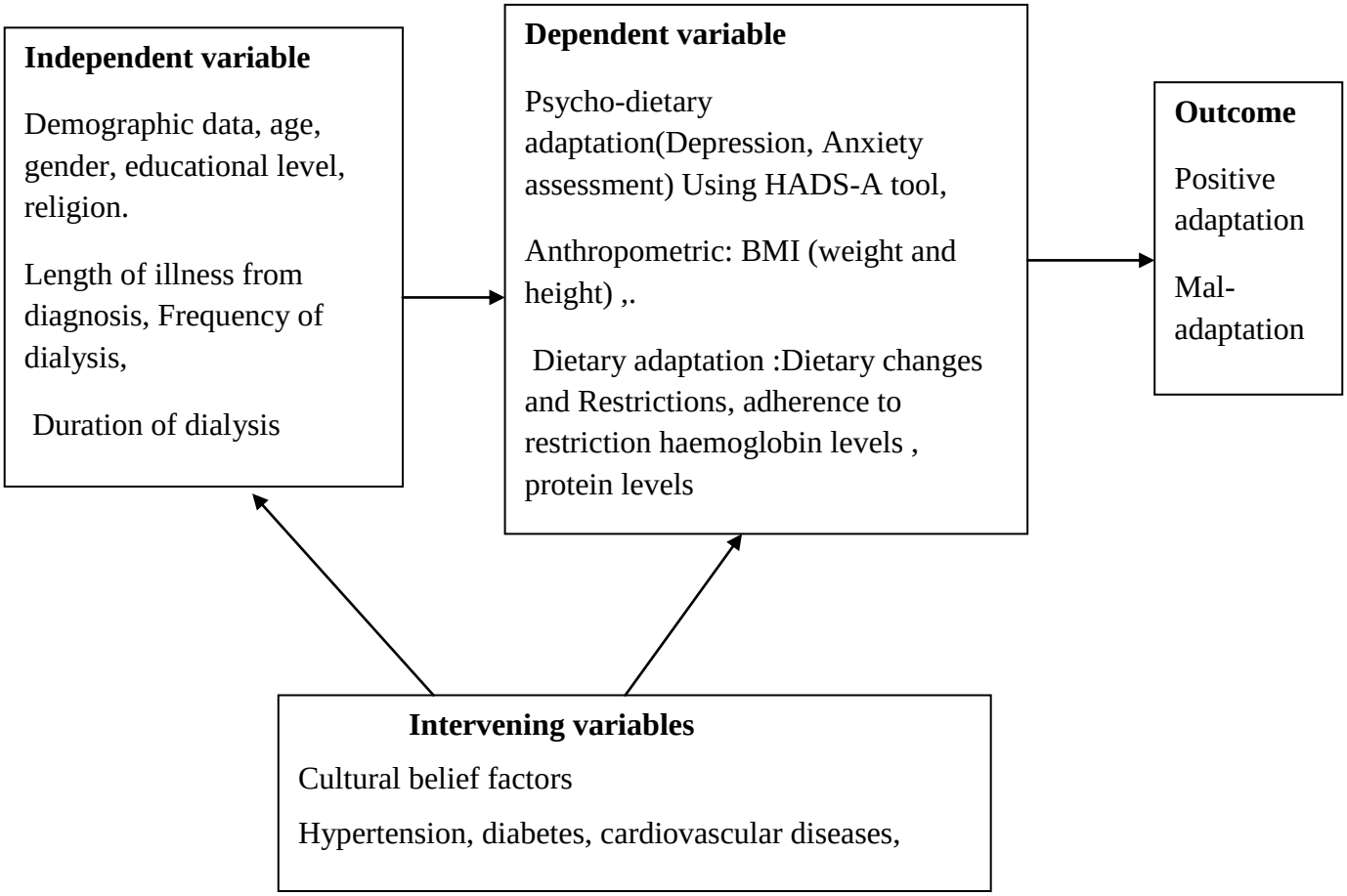


Figure 1.1 Conceptual framework

CHAPTER TWO: LITERATURE REVIEW

2.1. Renal failure (End stage kidney disease), chronic kidney disease stage five.

2.1.1 Definition

End stage renal disease (ESRD) or kidney failure Is defined as the terminal phase of chronic kidney disease .The kidneys no longer filter out toxic compounds, which accumulate in the body tissues and fluids and eventually cause death unless treatment is initiated .People with ESRD need renal replacement therapy to survive (KDOQI 2007) .

2.1.2 Epidemiology

End stage renal disease is a worldwide problem affecting people of all ages, races and economic group's .The prevalence and incidence of the disease which mirrors that of conditions such as diabetes, hypertension, and obesity, is rising .The World health organization (WHO 2013) reported that kidney disease is a major non communicable killer disease globally. In United States alone, more than 20 million people or 1 in 9 adults have kidney failure disease, and another 20 million are at increased risk for development of the disorder, according to (National kidney foundation 2002).

In Jordan, ESRD has been growing rapidly in recent years. The most recent statistics in 2010 indicated an estimated population of Jordan of six million, with more than 577 people per million receiving hemodialysis – an increase from the previous year of 1.1% (Tarawneh & AlQaisi, 2011). End stage kidney disease is a major public health problem in Thailand. In 2014 over 8,000,000 Thai people were diagnosed with CKD, 2,000,000 of who developed end stage renal disease (ESRD) (Thairathonline, 2014).

In a recent paper it has been estimated that number of individuals in India with renal failure is almost 11% of the population (Bhowmik et al., 2008; United States Renal Data System, 2003). This estimate is similar to American estimates which amounts to almost 20 million people in the United States alone, the number however would be far greater in India considering its larger population

In Kenya there is an increase in the number of patients suffering from chronic kidney disease. More than one million Kenyans suffer from kidney disease (Singh, 2012). (Stenvinkel,2010)

noted that diabetes is the leading cause of CKD in many countries in developed and developing countries and so screening of population at risk is essential.

2.1.3 Pathophysiology

A normal kidney contains approximately 1 million nephrons; Glomerular filtration rate is contributed by each nephron. In renal injury regardless of the etiology, the kidney has an innate ability to maintain GFR, despite progressive destruction of nephrons, as the remaining healthy nephrons manifest hyperfiltration and compensatory hypertrophy (Levey et al., 2012). The nephron adaptability allows for continued normal clearance of plasma solute .When total GFR decrease to 50%, the plasma levels of substances such as urea and creatinine start to show measurable increase .With 50% reduction in GFR, plasma creatinine value will approximately double .For example, a rise in plasma creatinine from a baseline value of 0.6mg/dl to 1.2 mg /dl in a patient, which is still within reference range but it actually represents a loss of 50% of functioning nephrons mass (Levey et al.,2012)

The hyperfiltration and hypertrophy of residual nephrons is beneficial and has been hypothesized to represent a major cause of progressive renal dysfunction. Increase in glomerular capillary pressure may damage the capillaries; this will initially lead to secondary focal and segmental glomerulosclerosis (FSGS) and eventually to global glomerulosclerosis (Pradeep, 2015).

2.1.4 Classification of Chronic Kidney Disease

The kidney disease outcome quality initiative (KDOQI), of the National kidney foundation (NKF) classifies the stages of CKD as follows according to (Lervey et al 2003).

Stage 1: Kidney damage with normal or increased GFR (>90 ml/min/1.73m ^{2})

Stage 2: mild reduction in GFR (60-80 ml /min/1.73 m ^{2})

Stage 3: moderate reduction in GFR (30-59 ml /min/1.73 m ^{2})

Stage 4: severe reduction in GFR (15-29 ml/min/1.73 m ^{2})

Stage 5: kidney failure (GFR<15 ml/min/1.73 m $^{2)}$ or dialysis.

The national kidney foundation in the updated classification system advised that GFR and albuminuria levels be used together this is to improve the prognostic accuracy in the assessment of CKD according to (waknine Y 2012) and (KDOQL 2003). They also recommended referral for patients to a specialist with a very low GFR (<15 ml/ min/ 1.73 m

^{2}) or very high albuminuria (>300 mg/24h). Patients with stages 1-3 CKD are frequently asymptomatic. Low kidney function clinical manifestation typically appears in stages 4-5.

2.1.5 Treatment Modalities

1 .Blood pressure control

Aggressive blood pressure control can help to delay the decline in renal functions in patients with CKD. Kidney disease outcome control initiative (KDOQI) suggests a target of blood pressure control of less than 130/80 mmhg. The systolic blood pressure (SBP) control is considered more important than diastolic blood control measures. In elderly patients with CKD control of SBP is not easy.

In a diverse community-based study by (Peralta et al 2012), high SBP appeared to account for most of the risk of progression to end stage renal disease (ESRD).140 mmHg as opposed to current recommended goal of less than 130 mmHg .The highest risk was found among patients with diastolic of 150mmHg.These researchers concluded that blood pressure control in CKD, is treatment approaches that lower SBP.

1. Management of cardiovascular risks
2. Management of metabolic acidosis.
3. Management of bone and mineral disorder.

4. Renal replacement therapy.

The two treatments for kidney failure disease are kidney transplantation and dialysis. Two different types of dialysis can be done haemodialysis and peritoneal dialysis.

2.1.6 Hemodialysis (HD).

Haemodialysis (HD) was initially called ‘extracorporeal dialysis’ because it is performed outside the human body (Yeun & Depner, 2005, p. 308). HD is the most common method of treating ESKD and it is also used to maintain kidney function while people wait for a kidney transplant KT (Chokephichit., 2003).

Hemodialysis is a treatment that removes wastes and extra fluid from the blood. It can be done at home (home hemodialysis) or in a dialysis centre. During hemodialysis, the blood is pumped through soft tubes to a dialysis machine where it goes through a special filter called a dialyzer (also called an artificial kidney).Patients with end stage kidney disease will undergo dialysis 3-4 times a week for four hours according to (KDOQI s 2007) . As the blood is

filtered, it is returned to the blood stream. Only a small amount of blood is out of the body at any time (Cheng, 2008).

2.1.7 Kidney Transplantation

Kidney transplant is becoming the treatment of choice for individual people with CKD. This is because people who receive KT have a higher life expectancy than people who remain on dialysis (Carpenter, Milford & Sayegh, 2010).The increased rate of survival for people who receive a KT is due to advances in surgical techniques and immunosuppressive therapy (Weng, Dai, wang et al., 2008).The kidneys for transplanting are obtained from living donors, deceased donors with or without a heartbeat, this treatment is limited due to lack of donor organs (Lee et al., 2009)

2.2 Nutritional Therapy

Nutrition in haemodialysis is very important in decreasing complications and improving quality life of patients. Nutrition therapy on patients with kidney failure disease on dialysis plays an important role in the process of treatment. The purposes of medical nutrition therapy in dialysis patients are to promote the nutrition, to Correct patients' appetite, to correct systemic complications composed by the loss of nephrons in progress, to reduce protein catabolism to the lowest level, to relieve or prevent the cardiovascular, cerebrovascular, peripheral vascular diseases formation, to prevent increasing fluid and electrolyte disorders, to reduce uremic symptoms such as itching, nausea, vomiting, loss of appetite and to ensure optimum nutrition (Mahan, 2012) **.**

2.2.1 Protein Restriction

Protein requirement of patients on haemodialysis, (Ohkawa 2004) emphasized that the inadequate protein intake increases mortality due to protein malnutrition. The protein requirement should be increased due to the dialysate losses and catabolism in haemodialysis patients. Haemodialysis increases both protein synthesis and degradation .The net effect of haemodialysis is loss of nitrogen in skeletal muscle (Raj et al study 2007).

Protein synthesis and degradation increases by 50-100% of normal values. Hemodialysis causes to increase in catabolic indicators such as interleukin-1 (IL-1), interleukin-6 (IL-6) and tumour necrosis factor alpha (TNF-a). The increase in the production of cytokines causes in protein degradation, amino acid losses into the dialysate, increased protein catabolism,

metabolic and hormonal changes and this causes increase for protein requirements (Raj, 2007). Protein to be consumed should be 1.1-1.2 g / kg / day and should be high in the biological value (of animal origin) of 50 % protein in haemodialysis patients (Cano et al 2006).

2.2.2 Water and Fluids

Fluids adjustment should be made according to oedema and dehydration in the patient. Research about fluid balance indicates that it is important to teach patients how to deal with thirst without drinking liquids. Proposals such as sucking on ice chips, cold sliced fruit ,or sour candies, chewing gums, eat a piece of fruit to reduce thirst, and using artificial saliva (Mahan 2012) .

The daily amount of fluid of haemodialysis patients should be 500ml + the urinary output in a day or around 1000-1500 ml. Restriction of fluids will prevent congestive heart failure, hypertension and oedema of lower limbs (Smith 2010).

2.2.3 Salt Restriction

Salt intake causes an increase for the feeling of thirst and liquid intake , To reduce sodium intake in haemodialysis patients should be advised to avoid olives, pickles, cured meats, garlic sauce, soy sauce, canned foods, sausages, processed meats, ham, chips, pretzels and instant soups from the diet Salt spices, such as vinegar and lemon, can be used for consumption of unsalted foods or as a salt substitute .Salt should be restricted to prevent hypertension, congestive heart failure disease and pulmonary oedema (Lindley 2009 and Fouque 2003).

2.2.4 Foods That Contain Potassium Restriction

Potassium restriction is often necessary, but the measure of restriction depends on residual renal function, serum potassium levels, type of dialysis, and medications (Stark 2011).Potassium restriction is often required because haemodialysis patients are usually anuric. Anuric HD patients are recommended to restrict their potassium intake to 1600-2000mg daily (Fouque 2003) **.** The consumptions of foods that are rich in potassium should be limited, such as milk, meat products, fruits, legumes, cereals, and dried fruits and raw vegetables, and instead eat raw fruit shelled, avoid eating more than two pieces of fruit per day.

2.2.5 Fruits and vegetables

Increasing the amount of alkali-inducing fruits and vegetables in the diet may help to reduce kidney injury (Goraya et al, 2012) . A 30 days of a diet that included fruits and vegetables, in amounts calculated to reduce dietary acid by half, resulted in decreased urinary albumin, N-acetyl β-D-glucosaminidase, and transforming growth factor β in patients with moderately reduced estimated GFR as a result of hypertensive nephropathy. In a cross sectional survey among 50 ESKD patients undergoing haemodialysis in the Kasturba Hospital as the first step of need assessment before the development of dietary guidelines. The study identified that 40% of the persons undergoing haemodialysis felt that there is actually no need for a strict diet modification as haemodialysis takes care of regulating the blood and all of them (100%) said it is difficult to practice dietary modifications, and only 78% practiced some kind of dietary modifications (Blessy et al, 2014).

In a qualitative study done on lived experiences of patients on haemodialysis identified that there is absolute dietary dissatisfaction especially the salt restriction as expressed with statements such as "nobody wants to eat a tasteless food without salt. (Valsaraj et al, 2013)". In a descriptive correlation design study to examine Turkish people on non-adherence to food and fluids restrictions, noted that most patients were non adherent to food and fluid reason being low level of support from family and friends (Kara et al, 2007).

2.3 Psychological Care/ Support and Adaptation.

Patients undergoing Hemodialysis may begin to reevaluate their status, the treatment modality, their satisfaction with life and the impact of these factors on their families and support system. Nurses must provide opportunities for these patients to express their feelings and reactions and to explore their options .The patients should have an opportunity to discuss their feelings, fears, seek more information concerning their disease process with the dialysis team, as well as with psychologist, psychiatric, psychiatric nurse, trusted friend or spiritual advisor. Patients with kidney failure disease have to use adaptation in order to cope with the disease and its treatment. The most used strategies are social support, Religion /spirituality, avoiding ill health.

2.3.1 Avoiding Ill Health

Self-care experiences of people with ESKD receiving HD (Chokepephichit, 2003) found that People tried to avoid ill health to prevent the progression of CKD. For example, they chose

appropriate foods and Avoided salty foods and reduced intake of vegetables and fruits to manage the process of their disease. Many qualitative and quantitative researchers found people seek useful support when dealing with physical, psychological and socioeconomic issues.

2.3.2 Religion and Spirituality

Quantitative research on lived experiences of patients with ESKD and adaptation strategies they use (Ibrahim et al, 2012), found that people receiving HD used religion and spirituality to adapt with their physical and psychosocial problems and improve their wellbeing and quality of life People with ESKD use religion to reorient their lives to manage and accept their condition.

Religion and spirituality are central aspects of the adaptation process and enable People to cope with stressful situations. People receiving HD relied on religion and spirituality to help them overcome their negative life situations.

2.3.3 Loved Ones and Healthcare Professionals Support

In Singapore ((Lai et al 2012, Clarkson and Robinson 2010) in a qualitative research done in USA to explore lived experiences of patients with kidney failure disease and adaptation strategies they use. They found that Support was received from the families of people with ESKD or their loved ones but also from healthcare professionals such as doctors and nephrology nurses. Information Support from family and friend's helps individuals receiving HD understand the disease and its treatment .Information support from their loved ones is likely to be a powerful source of support that helps people with ESKD to learn to live with their chronic illness and its treatment.

Study to explore self-care experiences of people with ESRD receiving haemodialysis (Chokephichit 2003) found emotional support helps individuals with ESRD cope with emotional distress, anxiety, uncertainty, fear of dying and depression and to accept ESRD and its treatment .He also found out that most people on HD had high levels of social support from family and friends, which helped them comply with food and fluid restrictions and adhere to other treatments.

People on dialysis sometimes may be independent and require less support from other people (Moulton, 2008). In addition, unwanted support from family and friends can create tension/conflict therefore, positive support helps people adapt to the disease and its treatment.

2.4. Complications

2.4.1Anxiety

This is common among clients with kidney failure disease ,in a qualitative study by (DeJean , Giacomini,Vanstone and Brundisini 2013) they found that this is associated with feelings of uncertainity about the future , feelings of guilt and loss of a sense of self (Dejean et al.,2013).This could be due to awareness that chronic kidney disease is incurable and the fact that survival depends on dialysis.

2.4.2. Depression

In a study done by ZebSaeed, et al 2012 and Maryam Eghbali et al 2009 showed that 92.2% of HD patients had depression and 95% respectively. The prevalence of high depression according to this study was due to low monthly income, low education and unemployment

Individuals with high levels of depressive affect are usually not complying with the nutritional restriction prescribed by their doctors, poor treatment adherence and higher mortality rates (Drayer et al., 2006,). In addition, depression in HD patients is associated with higher rates of hospital admission, and a greater likelihood of emergency department visits (Abbas Tavallaii et al., 2009; Hedayati et al., 2008). Depression occurs due to loss of autonomy, employment, family role and sexual function (Spiridi et al 2008). Previous studies have demonstrated that depression is an independent risk factor for poor outcomes in ESRD patients (Hedayati et a 2008)

2.4.3. Fatigue

Fatigue is also one of the most debilitating symptoms reported by HD clients, and roughly 60% to 97% of patients on HD experience some degree of it (Jhamb et al., 2008). Clients with chronic renal disease, regardless of whether they are predialysis or receiving Either HD or PD, are reported having high levels of fatigue and are often unable to engage in normal daily activities. (Lai et al., 2012) in phenomenological design to explore the fatigue experiences from people HD .Participants described the three main types of fatigue as physical, affective, and cognitive. Fatigue is induced by HD itself and uremic symptoms.

2.4.4. Anaemia

Anaemia is the most common complication of ESRD. As kidney function deteriorates, so does its ability to produce erythropoietin, which results in anemia (Clarkson & Robinson, 2010, Koshy & Geary, 2008). Anemia is defined as a hemoglobin level less than 12.1 g/dL for females and 13.8 g/dL for males (NKF KDOQI, 2006). Erythropoietin is produced in the kidneys and responsible for stimulating red blood cell production (Koshy & Geary, 2008).

The National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI) recommends the hemoglobin target for ESRD patient be 11.0-12.0 g/dL (2007). This is lower than the recommend level for healthy females which is 12.1-15.1 g/dL, and males which is 13.8-17.2 g/dL. This recommendation was established by NKF KDOQI (2007) because of the associated risk of increase morbidity and mortality and risk of cardiac events seen with higher hemoglobin levels in adults.

2.4.5. Malnutrition

Clients with chronic kidney disease are at risk of malnutrition. (Dwyer 2005) in the evaluation methods used in the nutritional status showed that 18-75% prevalence of malnutrition in hemodialysis clients .This could cause a worse outcome and subsequent mortality. Malnutrition occurs due to reduction of protein –energy intake because of inappropriate dietary restrictions, anorexia and taste alterations, adequate energy and protein should be provided to prevent the vice. It could also occur as a result of increased protein catabolism which is common to patients undergoing dialysis (Siew & Ikizler 2010).

Increased protein catabolism, is common in patients with ESKD undergoing .PEM is, however, just one aspect of a syndrome known as the malnutrition–inflammation complex syndrome, which takes into account the association between chronic inflammation and nutritional status (Kalantar-Zadeh *et al*. 2003).

2.4.6. Loose of Role function

In the partner role, people receiving HD may no longer be able to contribute to the Family income and may find their families become their caregivers. They may suffer from feeling of dependent and a burden on their family (Coyne, 2013).

2.5. Assessment of Psychological adaptation

Screening for depression is reliably assessed using the Hospital Anxiety and Depression Scale (HADS).Before considering a diagnosis of depression and anxiety, patient should be adequately dialysing to exclude uraemic symptoms (Zigmond AS et al 1983). Screening should include not only negative thoughts, as epitomised by the HADS, but also positive thoughts about coping.

Hospital anxiety depression scale is a self-administered questionnaire. It consists of an anxiety subscale (HADS-A) and a depression subscale (HADS-D). Each subscale includes seven items each. But a modification was done in this study to include many items which were not included in the original sale .A rating Scale from 0 to 3 is for each item, and the total scores range from 0 to 21, with higher scores indicating adverse symptom . HADS prevents the reference to somatic symptoms and is widely used to assess anxiety and depression among non-psychiatric, hospital outpatients, and well validated in several clinical situations. , Cronbach's alpha coefficient for HADS-A and HADS-D was 0.781 and 0.759, respectively.

2.6. Theoretical Framework

This study adopt Roy's Adaptation model (RAM) as a conceptual framework to assess adaptation strategies .Sister Callista Roy, the founder of this model, begun her work in the 1960 and first published in 1970 (Roy & Andrews, 1999) .Her prime focus was adaptation .Persons are viewed as adaptive systems that interact with the environment and grow and develop (page 19).

The concept of adaptation originated from scientific assumption of the general system theory and philosophical assumptions identified as humanism and veritivity. Humanism is defined as the broad movement in philosophy and psychology that recognizes the person and subjective dimensions of human experiences as central to knowing and valuing. Humans share in creative power to behave purposefully and strive to maintain integrity and realize the need for relationships .Veritivity is identified as the principle of human nature that affirms a common purposefulness of human existence.

Humans are an adaptive system who acts in unity for purpose with interdependent parts as described by Roy .The human adaptive system is in constant interaction with his environment both physical and social. The environment influences the system, and the system influences the environment .Stimuli is identified as that which provoke responses. Environmental stimuli are external and internal stimuli which originate within the human system.

A human's behaviour or outcome is the result of input stimuli and the adaptation level of the individual .The behaviour may be adaptive or ineffective .The responses then act as a feedback or more input allowing the system to decide whether to increase or decrease efforts to cope with the stimuli (Roy and Andrews 1999).

The stimuli categories

- Focal,
- Contextual
- Residual.

Focal stimuli are those internal and external stimuli that most immediately confront the human system. Contextual stimuli are other stimuli most present which can contribute to the effect of the focal stimuli .Residual stimuli may be environmental factors that are present but whose effects are unclear (Roy and Andrews, 1999).

The focal stimuli in this study are the need to be on haemodialysis and chronic kidney disease. .The contextual stimuli include factors that affect reactions to being on haemodialysis including anxiety, discomfort, fears of complications, fluid and dietary restrictions and interference with life tasks. Residual stimuli include life experiences, values and attitudes.

The adaptation level

This is subdivided into three possible conditions of the life processes of the human adaptive system; (a) integrated, (b) compensatory, and (c) Compromised.

Integrated adaptation levels include structures and functions that work to meet human needs. Compensatory adaptation levels occur when regulator and cognator processes are activated by a challenge to the integrated processes.

Compromised adaptation levels occur when both integrated and compensatory processes are inadequate.

Regulator processes

Regulator processes are identified by Roy and Andrews (1999) as those coping channels that respond automatically to internal and external stimuli. These are the endocrine, neural and chemical channels. In this study, regulator processes would include physiological and psychological reactions that the persons experiences when making decisions about haemodialysis treatments. Examples would include an increase in heart rate, tension and excitement.

Cognator processes

Cognator processes respond through four cognitive- emotive channels: (a) perceptive and information processing, (b) Learning, (c) Judgement, and (d) emotions (Roy and Andrews, 1999). Examples of behavioural responses resulting from these processes include selective attention, memory, developing insight, problem solving and decision making.

In this study, cognator coping processes are related to learning and information processing of the client with chronic kidney disease, decision making with hemodialysis treatment times, and expressed emotions associated with these processes. The responses of behaviours of the adaptive system, or person, to the environment are observed through four adaptive modes identified by Roy and Andrews (1999).

The four adaptive modes are

(a) The physiological-physical mode, (b) role function mode, (c) self-concept- group – identity mode and (d) the interdependence mode.

(a)The physiological- physical mode includes behaviours of the body and has nine components: five basic needs (oxygenation, nutrition, elimination, activity and rest) and four complex processes, which are the (i) senses, (ii) fluid and electrolyte, and acid –base balances, (iii) neurological functions and (iv) endocrine function.

(b)The self-concept-group identity mode pertains to spiritual integrity, body image, self-ideal and the personal self.

(c)The role function mode pertains to expectations one places on oneself in society and expectations one has for others with different roles.

(d)The interdependence mode focuses on relationships and the need for relational integrity. The Roy model of adaptation identifies two sub areas of self-concept: the physical self and the personal self. Body sensation and body image comprise the physical self and include

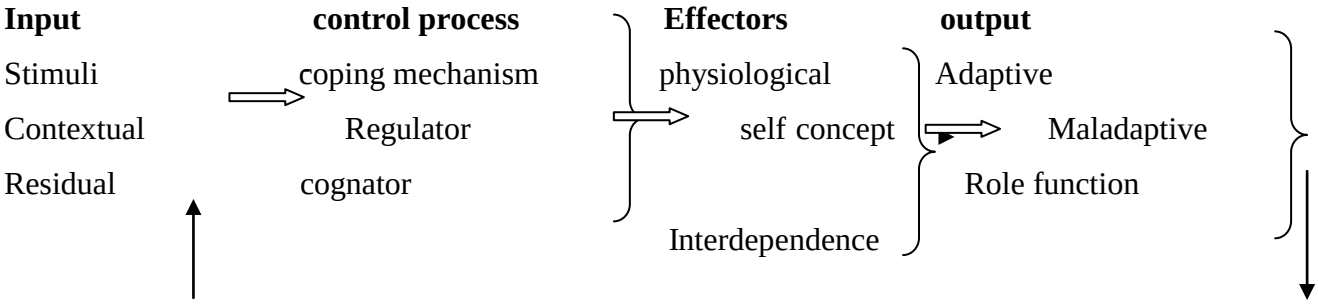
physical attributes ,functioning ,health state , sexuality ,and appearance .personal self-include personal thoughts and ideas of oneself , and beliefs and values one has in relation to the universe.

The diagnosis of chronic kidney disease and subsequent life style changes necessary for life affects all four modes of adaptation .Physiological changes compromise the physiological mode of adaptation by affecting the electrolyte , fluid and acid balance .common physical symptoms with advancing renal disease include swelling of the lower extremities , fatigue , decreased urinary output and nausea.

Alterations of daily life when placed on hemodialysis affect the role function mode and interdependence mode of adaptation .Jobs may be lost, finances change dramatically, and routine exercise is history. Emotional reactions result in mood changes. Roy and Andrews (1999) note that grieving is one of the compensatory processes for the self-concept mode There are many losses experienced by the client with chronic kidney disease on hemodialysis The client has loss of renal function .He or she may experience loss of self, loss of relationships, and loss of interpersonal relationships. If the client on hemodialysis cannot adapt to these incoming stimuli, energies will be directed at compromised processes such as low morale and depression.

Nurses in contact with clients with chronic kidney disease need to have knowledge of these losses and changes experienced by this group. Interventions can be planned during the initial hemodialysis treatment or prior to the first treatment, if possible, to promote successful behavioural responses of the client as he adjusts to the demands of hemodialysis. Modification can be made as behaviour of the client changes to promote successful adaptation.

Roy adaptation model



Adapted from Roy et al 2008.

Figure 1.1 Roy adaptation model

CHAPTER THREE: MATERIALS AND METHODS

3.1 .Study design

A descriptive prospective study design was used for this study, where data collection was done at the first contact with clients undergoing haemodialysis and 3 weeks later after several courses of dialysis sessions. Data collected involved psychological and dietary adaptation.

3.2 Study area description

The study was carried out at Kenyatta National Hospital (KNH) in renal unit and was selected on a purposive basis because it is the largest referral hospital in Kenya and receives the highest number of clients with chronic kidney disease who require dialysis in the country. According to the renal management, the unit receive both inpatient and outpatient clients for hemodialysis. .Approximately three hundred clients undergo haemodialysis every week according to the KNH statistics bio data 2015-2016. Renal transplantation is performed once per week.

In the renal unit, there is a nutritionist who is expected to take baseline anthropometric values and counsel patients on dietary changes which is required of them before dialysis is started. A counsellor who prepares the clients on the psychosocial adjustments expected of the clients as they undergo haemodialysis and informs them of cost of the dialysis. The renal health care team (the nurses and doctors) explains to the clients all that they are expected to know about haemodialysis.

3.3 Study population

The target population were clients with end stage renal disease who are on haemodialysis in renal unit at Kenyatta national hospital. Approximately 120 clients with end stage renal disease seek haemodialysis monthly at the renal unit, this is according to the data obtained from statistics department at Kenyatta national hospital.

3.4 Inclusion criteria

- Clients with confirmed end stage renal disease
- Clients who have been undergoing haemodialysis at renal unit for at least one month. That is having dialysis twice per week.

- 18 – 56 years old clients. The age bracket was chosen because normally after the age of 40 years, there is reduction of kidney functions by 1% yearly.
- Clients who agreed to participate by giving the consent

3.5 Exclusion criteria

- Critically ill or mentally unstable clients. This is clients who were unable to communicate.
- Newly diagnosed end stage renal disease clients who are yet to start haemodialysis
- Clients who declined to give consent of participation.

3.6 Sample size determination and formula

Fisher's formula for sample size calculation;

$$N = \frac{z^2pq}{d^2}$$

Where;

N = desired sample size (pop. >10,000)

Z = normal deviation at the desired confidence interval (95%) = 1.96

P = proportion of the population with the desired characteristics (50% will be used)

Q = proportion of the population without the desired characteristics

d^2 = degree of precision (5%)

Substitution for the formula:

$$N = \frac{1.96^2\,[0.5]\,[0.5]}{[0.05][0.05]} = 384$$

N = 384

We will adjust for the formula since the population is less than 10,000 using the formula below;

$$nf = n/[1+n/N]$$

Where;

No= the adjusted sample size

n = total pop. (The estimated attendance of patient with end stage renal disease on haemodialysis at renal unit)

N = the sample size calculated

nf= 106/ [1+106/384)

106/ [1+0.2760]

106 /1.2760

= 83.07

Sample size will be 83 participants

3.7. Sampling method

Purposive sampling method was used. This is because random sampling method was not possible due to presence of many classifications of renal diseases .The classifications were acute, chronic or end stage renal disease. Any client who was present in the renal unit and met the inclusion criteria and was willing to participate by giving the consent was recruited.

3.8. Data Collection Instruments.

Questionnaires

Data was collected using researcher administered questionnaire (Interview schedule) which included open ended questions along with the psychological assessment tool (PAT) to assess for psychological adaptation among clients with end stage kidney disease on haemodialysis. The questionnaire was divided into socio demographic, Psychological adaptation, Dietary adaptation and anthropometric measures. The Hospital anxiety depression scale (HADS_A) on self-report was modified to assess psychological adaptation. It consists of an anxiety subscale (HADS-A) and a depression subscale (HADS-D). Each subscale includes seven items each. But a modification was done in this study to include many items which were not included in the original sale .A rating Scale from 0 to 3 is for each item, and the total scores range from 0 to 21, with higher scores indicating adverse symptom . HADS prevents the reference to somatic symptoms and is widely used to assess anxiety and depression among non-psychiatric, hospital outpatients, and well validated in several clinical situations. Cronbach's alpha coefficient for HADS-A and HADS-D was 0.781 and 0.759, respectively.

The chemical biomarkers total protein level and a haemoglobin level was obtained from participants file as this is part of their routine investigations.

Descriptive prospective report forms (DPRF's). This was adopted with modifications .The height and weight was included but muscle upper arm circumference (MUAC) was omitted because it is not applicable for adults. This was used to obtain anthropometric data from the clients at first contact and 3 weeks later after the initial contact. This was to assess any

changes on anthropometric parameters. The body mass index could be obtained from the two measurements.

In Depth Individual Interview

For qualitative data, in-depth individual interview (IDII) was conducted, to allow for interaction between individual clients and the interviewer about the topic and some information that was likely to be missed in the questionnaire. IDII was being conducted among clients who are on haemodialysis in renal unit. Clients were interviewed until the saturation in information was reached, to assess adaptation in context to psychological and dietary adaptation among clients with chronic kidney disease on haemodialysis.

3.9 Pre-testing of tools.

The tools were pre-tested at medical wards level 7 and renal clinic. During pre-test, written consent were administered to the client who was willing to participate by signing of consent. Approximately 10% of the sample size (10 x83/100 = 8 clients) were pretested. This was to determine whether the research tools were able to assist the researcher in answering all the research questions or to meet research objectives.

3.10 Training of research assistants.

The research assistants were objectively recruited. The research assistance was 2 BSN graduates, who were trained for two days on the questionnaire, data collection procedure, and consenting process and how to evaluate the questionnaire for completeness.

3.11 Data Collection Procedures

The researcher with the letter of approval from ERC introduced herself to the management of renal unit. The management then introduced the researcher to the medical team working at renal unit and a letter from renal department was provided. Commutation was created between renal staff and the researcher. The researcher was taken round in the unit for familiarization. The researcher could identify the respondents and explained the purpose of the study and request for their participation. The data collection consisted of two sections, the questionnaire and in-depth interview .The clients were to participate in one tool of data collection and not both .This was to avoid re-interview .The recruited participants were then to sign a consent forms as a voluntary acceptance to participate on the part of the respondent.

The researcher and the assistant posed to them questions in the language they could understand (Kiswahili or English and record the answers).The respondents were allowed to choose between English and Kiswahili consent forms. The researcher and research assistance administered questionnaires to the participants (Researcher administered).

The anthropometric measures height and weight were taken, (the dry weight) to obtain BMI. The height was measured using a stadiometer; weight with a clinical scale. The normal BMI range was put at 18.5-24.9 kg/m, <18.5 kg/m underweight and > 25 kg /m overweight. The researcher could obtain the latest laboratory test from the participants file. The laboratory test is the biomarkers for dietary adaptation that is hemoglobin levels and serum protein levels. The recommend haemoglobin target for ESRD patient is 11.0-12.0 g/dl. The protein levels were used as a measure for presence of inflammation and malnutrition and the normal ranges were 60-83 g/dl. The BMI and Hemoglobin levels were repeated after three weeks. The laboratory findings obtained were within a period of one week which was taken as a routine test for participants undergoing hemodialysis.

The Psychological assessment HADS-A was used and a range between 0-7 could indicate no depression or anxiety, 8-10 could indicate borderline and 11-21 could indicate presence of depression and anxiety.

Each questionnaire was evaluated for completeness after the filling in the responses. The process continued until a total of 83 participants were interviewed.

For Qualitative data, Individual in- depth interviews, the clients who have not been interviewed with questionnaire were recruited for in-depth interview. The principal researcher identified the clients who met inclusion criteria and have not participated in the interview with questionnaire for participation in in-depth interview .The clients who were willing to participate by signing informed consent .The in-depth interview continued until saturation with information was reached. Discussions were audio-taped and the principal investigator interviewed and took short notes on the discussion. The reason why questionnaire administration is done first is to prevent clients from being re-interviewed**.**

3.12 Data Quality Control

The researcher reviewed each questionnaire to ensure completeness and clarity. To ensure data validation during entry, the database was employed within value ranges (to prevent out

of range entries) and skip patterns (as provided in the paper questionnaire).Verification of data was conducted by carrying out double entry and comparisons.

3.13 Data Cleaning and Entry

Questionnaires were inspected for completeness before being accepted for data entry. Any questionnaire that was incomplete was not being included in the study. During entry, all hard copy forms were stored in a lockable cabinet to avoid unauthorized access. Once entry was completed, the entered data was compared to the hard copy forms to ensure correctness and completeness.

3.14 Data Analysis Plan and Presentation:

Exploratory data analysis was carried out to describe the study population and indentify any emerging observations. Categorical variables were summarized using counts and proportions while continuous variables were summarized using measures of central tendency and dispersion. Bivariate analysis on haemodialysis was carried out, using t-test for continuous variables and chi-squared tests for categorical variables. P-values were used to determine the statistical significance of results obtained with the cut off set at $p<0.05$. Multivariate logistic regression was carried out to determine independent correlates of adaptation.

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 computer software and was presented using frequency distribution tables, graphs (bar and line) and pie charts. Qualitative data from in-depth interviews was collected during the discussion using audio recording of the discussion. Interviews were transcribed into Microsoft office word document to be transferred into NVIVO software. That is the audio taped discussion was written down in paper as the researcher could listen as the same time write down the information. Qualitative data analysis was done through identification of key words, themes and patterns in the data. Data coding and labelling was done during and after data collection. Coding was to identify themes, ideas and patterns in the data.

3.15 Ethical Considerations.

Ethical clearance was obtained from Kenyatta National Hospital (KNH)/University of Nairobi (UoN) Research Ethics Committee to carry out the study .Participations of the subjects was voluntary and written informed consent was obtained from all participants

before data collection. All information obtained during the study was kept private and confidential as anonymity was observed as no names or any other personal identification was used.

3.16 Dissemination Plan

The report of the study was presented to the renal unit team of Kenyatta National Hospital, University of Nairobi, University of Nairobi main library for depositories and references.

A manuscript from the study is written and ready for publication in peer reviewed journals.

CHAPTER FOUR: RESULTS

4.1 Introduction

The study recruited a total of 83 respondents with end stage renal disease undergoing haemodialysis in KNH attaining 100% enrolment based on the desired sample size .The chapter has both quantitative and qualitative analysis .The analysis has been organized using research questions. The characteristics of these respondents, nutritional and psychological adaptation during haemodialysis are presented in this chapter. The results are presented in tables, pie charts and figures.

4.2 Respondents' characteristics

4.2.1 Demographic characteristics

The mean age of the respondents was 38.2 ± 13.1 years (Mean ± SD) ranging from 18 to 56 years Respondents' age categories were 18-29 years 31.3% (26), 50-59 years 31.3% (26), 30-39 years 26.5% (22) and 40-49 years 10.8% (9), respectively (**Figure1**).

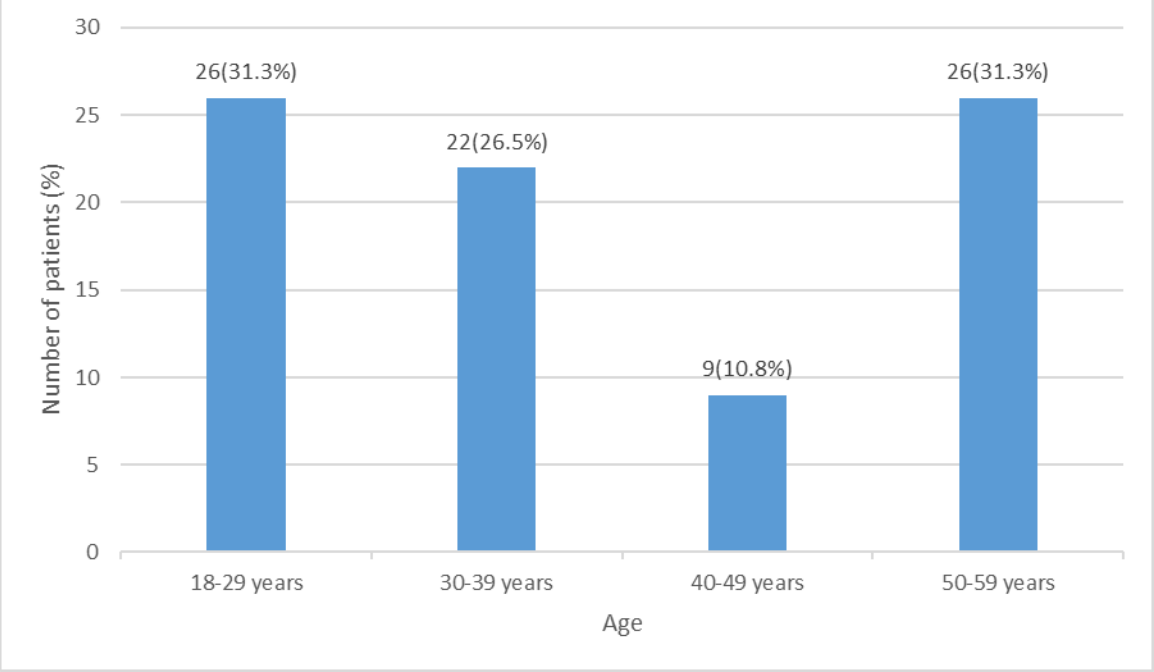


Figure 4.1: Age distribution of ESRD respondents in KNH

Of the respondents, 43.3% (36) were male while 56.6% (47) were females (**Table 1**). Most respondents were married 56.6% (47),followed by single 38.6% (32) and widow /widower 3.6% (3).Respondents reported subscribing to various religion as follows; Catholics 71.6% (58), protestants 18 22.2% (18), while 6.2% (5) were Muslims. Of the respondents, 42.2% (35) had secondary education, 28.9% (24) had primary and 22%.9 (19) attained university

education level. There were 6% (5) respondents who reported that they had not attended any formal education.

Table 4.1: Marital status, sex and religion among ESRD respondents undergoing dialysis in KNH

	Number (n)	**Percent (%)**
Sex		
Male	36	43.4
Female	47	56.6
Marital status		
Single	32	38.6
Married	47	56.6
Divorced	1	1.2
Widower/widow	3	3.6
Religion		
Catholics	58	71.6
Muslim	5	6.2
Protestant	18	22.2
Education		
Primary	24	28.9
Secondary	35	42.2
University/ college	19	22.9
Not educated	5	6

There were 26.5% (22) respondents who were currently employed and 73.5% (61) were unemployed. The median income reported by the respondents in current employment was Ksh 20, 000, and the range of income was from Ksh 1,500 to 70,000. Out of the 83 participants, 65 78.3% (65) reported that they had NHIF cover (Table 2)

Table 4.2: Economic status and health insurance cover of ESRD respondents undergoing dialysis

	Number (n)	**Percent (%)**
Current employment status		
Employed	22	26.5
Unemployed	61	73.5
Median income (in Ksh) among employed patients	20,000	NA
NHIF cover		
Yes	65	78.3
No	18	21.7

4.2.2 History of End stage renal disease

Majority 89% (73) of the respondents had ESRD for less than a year. 68.7% (57) Of the respondents had been on dialysis for less than one year. Dialysis was commonly conducted twice a week 72.3% (60) and 89.7% (70) respondents were aware about the cause of their condition. The main cause of ESKD was 69.9% (58) hypertension, 21.7 %(18), Diabetes, 6% (5) Glomerulonephritis, 2% (2.4) Trauma and NSAIDS. (Table 3).

Table 4.3 : History of End stage renal disease in respondents on haemodialysis.

	Number	Percent
Duration since diagnosis with End stage kidney disease		
Less than one year	73	89
1-5 years	7	8.5
11-15 years	2	2.4
Patients awareness on the cause of condition	70	89.7
Hypertension	58	69.9
Diabetes	18	21.7
Trauma	2	2.4
Glomerulonephritis	5	6
Non steroid analgesic inflammatory diseases	2	2.4
Other cause	1	1.2
Duration on haemodialysis		
Less than one year	57	68.7
1-5 years	24	28.9
6-10 years	2	2.4
11-15 years	0	0
16-20 years	0	0
Frequency of scheduled dialysis per week		
Once	11	13.3
Twice	60	72.3
More than two times	12	14.5
Patient on any medication	55	66.3

4.3 Dietary adaptation of respondents with End stage renal disease

4.3.1 Body mass index

In the body mass index, the dry weight was taken in kilograms and height in meters squared. Then the BMI was obtained by dividing weight by height in meters squared. The initial measurements were taken and the same repeated after a period of three weeks. The values were categorized as underweight < 18.5, Normal 18.5 to 24.9 and overweight as > 25 and above.The mean BMI (Mean ± SD) of respondents with end stage renal disease at

presentation was 22.8 (4.6) with a range of BMI measurements between 13.3 and 35.9. There was a significant reduction in BMI during second assessment conducted after three weeks with mean BMI at 21.9 (SD 4.1), range 12.9 to 32.4 (t = 4.64, DF = 78, p < 0.001). (Table 4)

Table 4.4: The mean values for BMI for 1st and 2nd respondents with ESRD on hemodialysis after three weeks interval

	n	Mean±SD	Difference (95% CI)	P value
BMI				
1st BMI measurement	83	22.8±4.7		
2nd BMI measurement	83	21.9±4.1	0.9(0.5-1.3)	**<0.001**

The BMI was classified as below 18.5 as underweight, 18.5-24.9 as normal weight and over 25 as overweight, the classification of respondents BMI during initial presentation is presented (Figure 2). Most 60% (49) of respondents had normal weight and the remaining were either underweight 17% (14) or overweight 23% (19) (Figure 2).

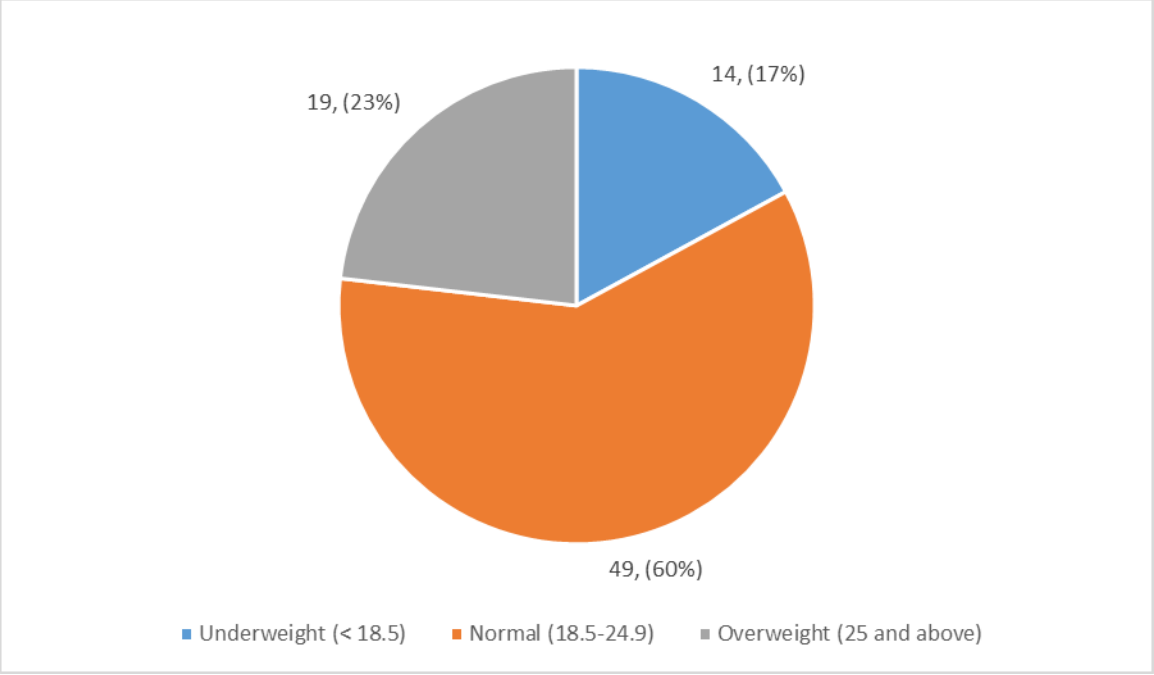


Figure 4.2: BMI of end stage renal disease respondents in KNH

There was a significant association between BMI and duration since dialysis was initiated (p = 0.039). Respondents who had been on dialysis longest (6-10 years) were more likely to be

underweight 2 (100%) compared to those dialyzed for 1-5 years 4 (16.7%) or less than 5 years 8 (14%). (Table 5)

Table 4.5: BMI and characteristics of ESRD respondents undergoing haemodialysis

	BMI					
	Underweight	**Normal**	**Overweight**	**Chi**	**DF**	**P**
Sex						
Male	5(13.9)	21(58.3)	10(27.8)	1	2	0.609
Female	9(19.1)	28(59.6)	9(19.1)			
Age						
18-29 years	5(19.2)	17(65.4)	4(15.4)	11.3	8	0.183
30-39 years	5(22.7)	12(54.5)	4(18.2)			
40-49 years	2(22.2)	7(77.8)	0(0.0)			
50-59 years	2(8.7)	12(52.2)	9(39.1)			
60-70 years	0(0.0)	1(33.3)	2(66.7)			
Duration since diagnosis with end stage renal disease						
Less than one year	11(15.1)	45(61.6)	16(21.9)	4.3	4	0.37
1-5 years	2(28.6)	3(42.9)	2(28.6)			
11-15 years	1(50.0)	0(0.0)	1(50.0)			
Aware of cause of renal disease						
Yes	14(20.0)	42(60.0)	13(18.6)	2.8	2	0.243
No	0(0.0)	5(62.5)	3(37.5)			
Duration since dialysis was initiated						
Less than one year	8(14.0)	35(61.4)	13(22.8)	10.1	4	**0.039**
1-5 years	4(16.7)	14(58.3)	6(25.0)			
6-10 years	2(100.0)	0(0.0)	0(0.0)			

4.3.2 Dietary intake changes history.

Out of the respondents, 67.5% (56) reported that they had ever experienced changes in dietary intake. The most common symptoms experienced after oral intake were filling of fullness 38 (45.8%), nausea 36 (43.3%) and vomiting 21 (25.3%). Most 45 (54.2%) patients reported that they were unable to perform activities of daily living (Table 6).

Table 4.6: Dietary intake changes and symptoms after oral intake in end stage renal disease

	Number	**Percent**
Ever experienced change in dietary intake	56	67.5
Symptoms experienced after oral intake		
Feels full quickly	38	45.8
Nausea	36	43.4
Vomiting	21	25.3
Anorexia	8	9.6
Pain on eating orally	2	2.4
Dysphagia	2	2.4
Dental problem	1	1.2
Ability to perform activities of daily living		
Yes	38	45.8
No	45	54.2

Majority 90.2% (74) respondents with ESRD on haemodialysis reported that they had dietary restriction and that they followed salt, fluid and protein dietary restrictions 73 88% (73). (Table 6). Majority of respondents reported restricting dietary intake of salts 30.1% (25) fluids 24.1% (20) and all three (salt, fluids and proteins) dietary components 57.8%(48) (table 7).

Table 4.7: Dietary restriction in respondents with ESRD.

	Number	Percent
Respondents reported having any dietary restrictions	74	90.2
Type of dietary restrictions		
Salt	25	30.1
Fluids	20	24.1
Protein	4	4.8
Salt, fluids and proteins	48	57.8
Follows dietary restriction	73	88

Most respondents with ESRD reported that they fractionate meals 54.2% (45) and follow recommended diet 51.8% (43). (Figure 5)

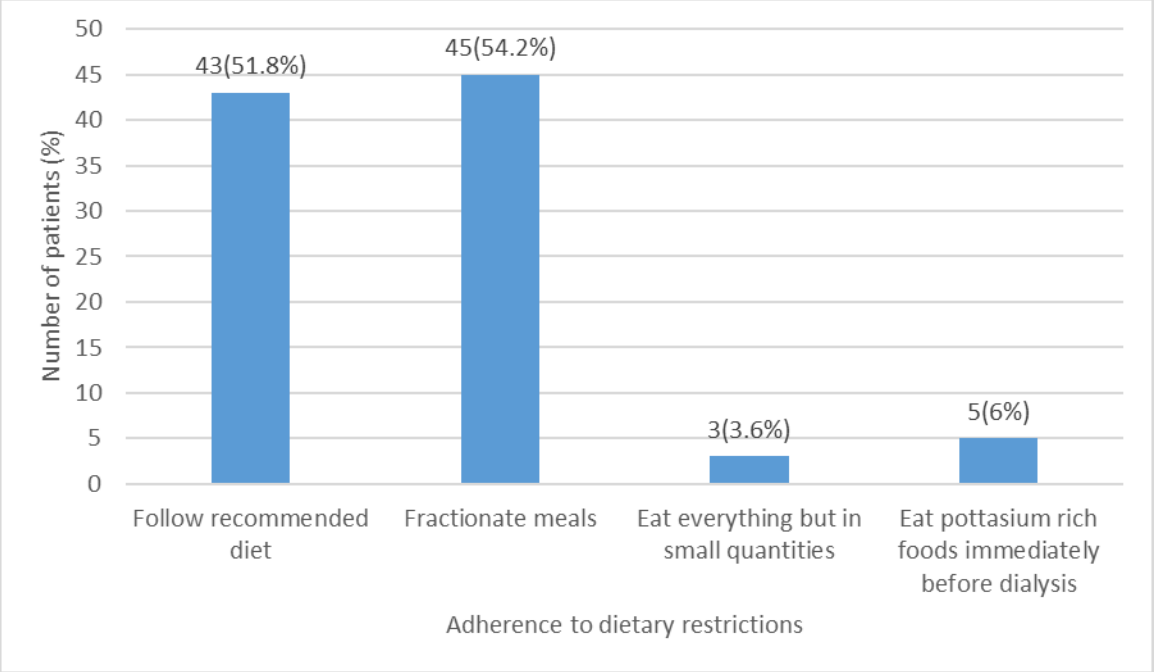


Figure 4.3: Respondents reported adherence to dietary restrictions in ESRD.

Food preferences were reported by 62% (42) respondents with end stage renal disease and on most occasions 77.2% (44) preferred food were available (Table 9).There were 53.6% (37) respondents reporting that they experienced complications in the course of treatment and the most common complication was Lethargy/Fatigue 53% (44), Oedema 27 % (23), pulmonary oedema 4.8% (4) and 10.8% (9) itchy skin. The complications occurred many times 53.8% (28), twice 26.9% (14). (Table 8).

Table 4.8: Food preference and dietary related complications in end stage renal disease

	Number	**Percent**
Any food preferences	49	62
Availability of food preferences		
Readily available	44	77.2
Not available	10	17.5
Available but expensive	3	5.3
Experienced any complication during treatment	37	53.6
Type of complication		
Oedema	23	27.7
Itchy skin	9	10.8
Pulmonary oedema	4	4.8
Fatigue/ lethargy	44	53
Number of times complications have been experienced		
Once	10	19.2
Twice	14	26.9
Many times	28	53.8
Aware of foods that bring complications	31	41.9

4.3.3 Haemoglobin

The mean haemoglobin level (Mean ± SD) in end stage disease was 8.2 ± 1.6 g/dl during the initial measurement and 8.4 ± 1.7 g/dl during the second measurement. Out of the 83 respondents, 8 (9.6%) had haemoglobin levels above 11 g/dl during the first and 5 (6.3%) had levels above 11 g/dl during the second measurements. (Table 9)

Table 4.9: The mean haemoglobin of 1st and 2nd measurement among ESRD

Hemoglobin	**n**	mean	95% CI	P value
1st hemoglobin measurement	83	8.2± 1.6		
2nd hemoglobin measurement	83	8.4 ±1.7	-0.2 (-0.5-0.03)	0.077

The haemoglobin level was not significantly associated with participants' demographic or disease related factors (all p > 0.05) (Table 10).

Table 4.10: Haemoglobin level and characteristics of ESKD respondents undergoing hemodialysis

	Haemoglobin				
	Low	**Normal**	**Chi**	**DF**	**P**
Sex					
Male	33(91.7)	3(8.3)	0.1	1	0.724
Female	42(89.4)	5(10.6)			
Age					
18-29 years	23(88.5)	3(11.5)	4.7	4	0.318
30-39 years	22(100.0)	0(0.0)			
40-49 years	7(77.8)	2(22.2)			
50-59 years	20(87.0)	3(13.0)			
60-70 years	3(100.0)	0(0.0)			
Duration since diagnosis with End stage kidney disease					
Less than one year	67(91.8)	6(8.2)	4	2	0.133
1-5 years	6(85.7)	1(14.3)			
11-15 years	1(50.0)	1(50.0)			
Aware of cause of kidney disease					
Yes	62(88.6)	8(11.4)	1	1	0.313
No	8(100.0)	0(0.0)			
Duration since dialysis was initiated					
Less than one year	51(89.5)	6(10.5)	0.3	2	0.856
1-5 years	22(91.7)	2(8.3)			
6-10 years	2(100.0)	0(0.0)			
Number of dialysis sessions per week					
Once	11(100.0)	0(0.0)	1.9	2	0.394
Twice	54(90.0)	6(10.0)			
More than two times	10(83.3)	2(16.7)			

4.3.4 Total Protein levels

The normal proteins levels are between 61-83 g/dl .The mean protein levels in ESKD respondents was 56.6 (SD 16.7) g/dl. The mean protein levels are presented according to

respondent's age and sex in (Table 11). There was a significant association between protein level and age (p = 0.006) but not with sex (p = 0.243).(Table 11)

Table 4.11: Protein levels of end stage kidney disease respondents undergoing dialysis

Age (in years)	**18-29**	**30-39**	**40-49**	**50-59**
N	26	22	9	26
Mean protein	48.6	65.3	54.9	58.4
SD	20.5	11.4	10.3	13.7
P value	**0.006**			
Sex	**Male**	**Female**		
N	35	43		
Mean protein	56.8	56.5		
SD	18	15.7		
P value	0.942			

The mean protein levels did not differ significantly according to duration since diagnosis (p = 0.269), duration since initiation of dialysis (p = 0.567) or number of dialysis sessions per week (p = 0.062).(Table 12).

Table 4.12: Renal failure disease related factors and respondents protein levels

Duration since diagnosis with end stage renal disease	**< 1 year**	**1-5 years**	**6-10 years**
N	68	7	2
Mean	55.5	66.3	58
SD	17.3	7.1	17
P value	0.269		
Aware of cause of kidney disease	**Yes**	**No**	
N	66	7	
Mean	54.8	67.6	
SD	16.6	14.9	
P value	0.055		
Duration since dialysis was initiated	**< 1 year**	**1-5 years**	**6-10 years**
N	53	23	2
Mean	55.2	59.7	57.5
SD	17.6	14.7	16.3
P value	0.567		
Number of dialysis sessions per week	**One**	**Two**	**> 2**
N	10	59	9
Mean	54.5	55.1	68.9
SD	12.1	16.9	16
P value	0.062		

4.3.5. Correlation between protein level and BMI .

There was no significant correlation between protein level and BMI. There was a weak positive correlation between BMI and protein (Pearson's' correlation coefficient, *rho* = 0.03). The BMI increased by 0.01 units for each unit increase in protein level (p = 0.817).(Figure 6.)

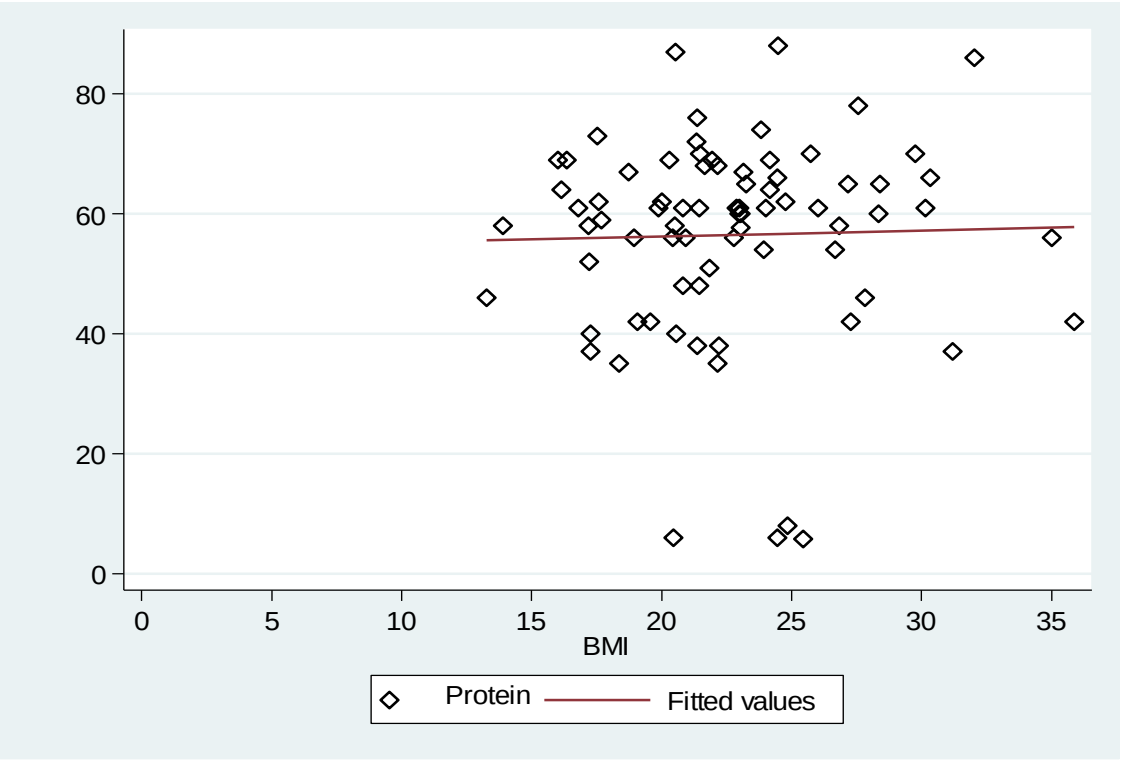


Figure 4.4: Protein levels and BMI in respondents with end stage kidney disease

4.3.6. Correlation between protein level and haemoglobin

There was a significant correlation between protein and hemoglobin levels (Figure 7). There was a positive correlation between haemoglobin and protein (Pearson's' correlation coefficient, *rho* = 0.312). The haemoglobin levels increased by 0.3 units for each unit increase in protein level (p = 0.005).Figure 7.

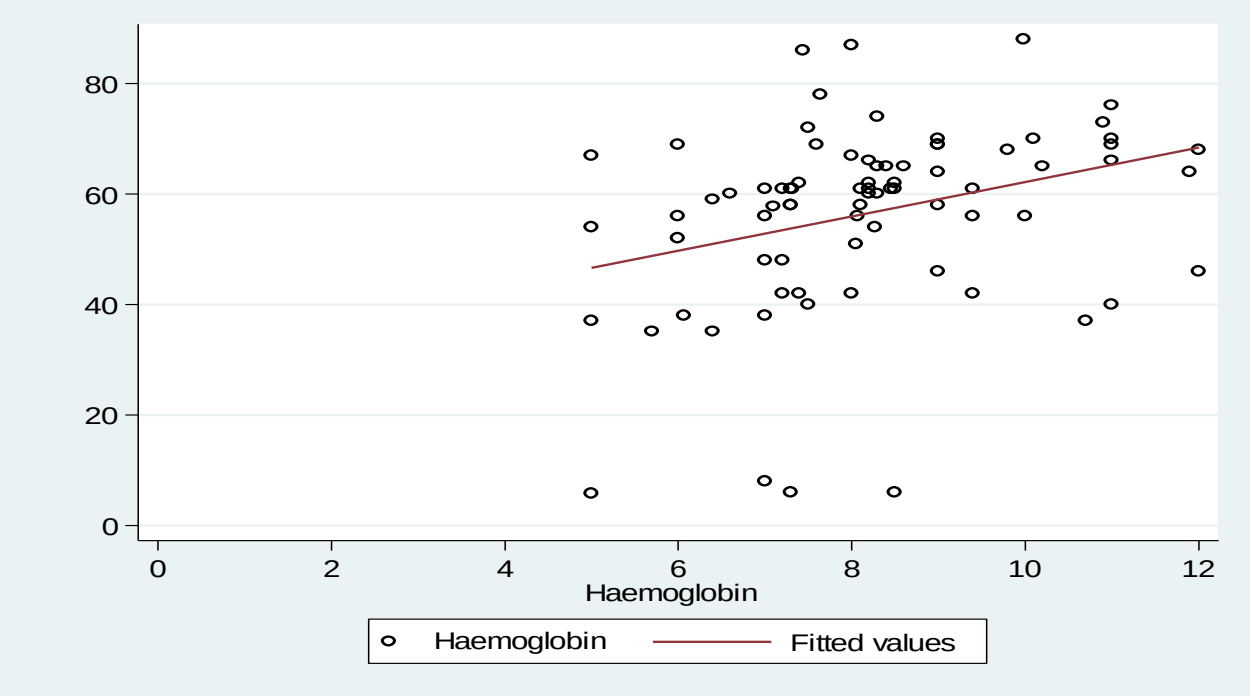


Figure 4.5: Protein levels and hemoglobin levels in respondents with end stage renal disease.

4.3.7 Nutritional adaptation and anthropometric measures

There was no significant association between dietary adaptation and BMI in end stage renal disease respondents undergoing hemodialysis. The percentage of respondents who had ever experienced dietary changes ($p = 0.185$), reported dietary restriction ($p = 0.29$), food preference ($p = 0.131$), or complications in the course of treatment ($p = 0.109$) did not show a significant association with BMI (Table 13).

Table 4.13: BMI and its association with dietary adaptation in end stage renal disease respondents

	BMI			**Chi (DF)**	**P**
	Underweight	**Normal**	**Overweight**		
Ever experienced any changes in dietary intake					
Yes	6(10.7)	37(66.1)	12(21.4)	3.4(2)	0.185
No	0(0.0)	4(50.0)	4(50.0)		
Able to do activities of daily living					
Yes	6(15.8)	24(63.2)	8(21.1)	0.3(2)	0.843
No	8(17.8)	25(55.6)	11(24.4)		
Reported dietary restrictions					
Yes	14(18.9)	44(59.5)	15(20.3)	2.5(2)	0.29
No	0(0.0)	5(62.5)	3(37.5)		
Any food preference					
Yes	12(24.5)	26(53.1)	11(22.4)	4.1(2)	0.131
No	2(6.7)	20(66.7)	8(26.7)		
Any complications in course of treatment					
Yes	7(18.9)	21(56.8)	8(21.6)	1(2)	0.595
No	4(12.5)	18(56.3)	10(31.3)		
Aware of foods that bring these complications					
Yes	5(16.1)	22(71.0)	3(9.7)	4.4(2)	0.109
No	7(16.3)	23(53.5)	13(30.2)		

The percentage of respondents who had ever experienced dietary changes ($p = 0.88$), reported dietary restriction ($p = 0.081$), food preference ($p = 0.117$), or complications in the course of treatment ($p = 0.675$) did not show a significant association with haemoglobin (Table 14).

Table 1 : Haemoglobin and its association with dietary adaptation in end stage renal disease respondents.

	Haemoglobin				
	Low	**Normal**	**Chi**	**DF**	**P**
Ever experienced any changes in dietary intake					
Yes	50(89.3)	6(10.7)	0	1	0.88
No	7(87.5)	1(12.5)			
Able to do activities of daily living					
Yes	32(84.2)	6(15.8)	3	1	0.081
No	43(95.6)	2(4.4)			
Reported dietary restrictions					
Yes	67(90.5)	7(9.5)	0.8	1	0.363
No	8(100.0)	0(0.0)			
Any food preference					
Yes	42(85.7)	7(14.3)	2.5	1	0.117
No	29(96.7)	1(3.3)			
Any complications in course of treatment					
Yes	33(89.2)	4(10.8)	0	1	0.827
No	28(87.5)	4(12.5)			
Aware of foods that bring these complications					
Yes	28(90.3)	3(9.7)	0.2	1	0.675
No	40(93.0)	3(7.0)			

4.4 Psychological adaptation

4.4.1 Anxiety

Table 15 shows that over one-half of the respondents scored six of the seven anxiety items high (4 out of a possible score of 4). At least 60% of respondents felt slowed down 70.4% (57), worried 71.3 %(57) tense 69.1% (56), and frightened that something awful would happen 60.2 %.(50). **(Table 15)**

Table 4.15: Response to anxiety subscale (HADS-A) items in respondents with end stage kidney disease.

	Respondent's score			
	1	**2**	**3**	**4**
I feel tense or wound up	7(8.6)	12(14.8)	6(7.4)	56(69.1)
I get a sort of frightened feeling as if something awful is going to happen.	5(6.0)	12(14.5)	16(19.3)	50(60.2)
Worrying thoughts go through my mind	3(3.8)	7(8.8)	13(16.3)	57(71.3)
I can sit at ease and feel relaxed;	4(4.9)	16(19.5)	27(32.9)	35(42.7)
I feel as if I am slowed down	3(3.7)	12(14.8)	9(11.1)	57(70.4)
I get a sort of frightened feeling like "butterflies" in	4(5.1)	13(16.5)	19(24.1)	43(54.4)
I feel restless as I have to be on the move:	1(1.5)	12(17.9)	17(25.4)	37(55.2)

The prevalence of anxiety based on recommended cut offs of the summative scores for anxiety subscale (HADS-A) items: 11-21 (anxiety present), 8-10 (borderline scores) and 0-7 (no clinically relevant symptoms). There were 74 respondents with anxiety giving a prevalence of 89% (95% CI 80-95%) for anxiety in respondents undergoing dialysis. (Figure 8)

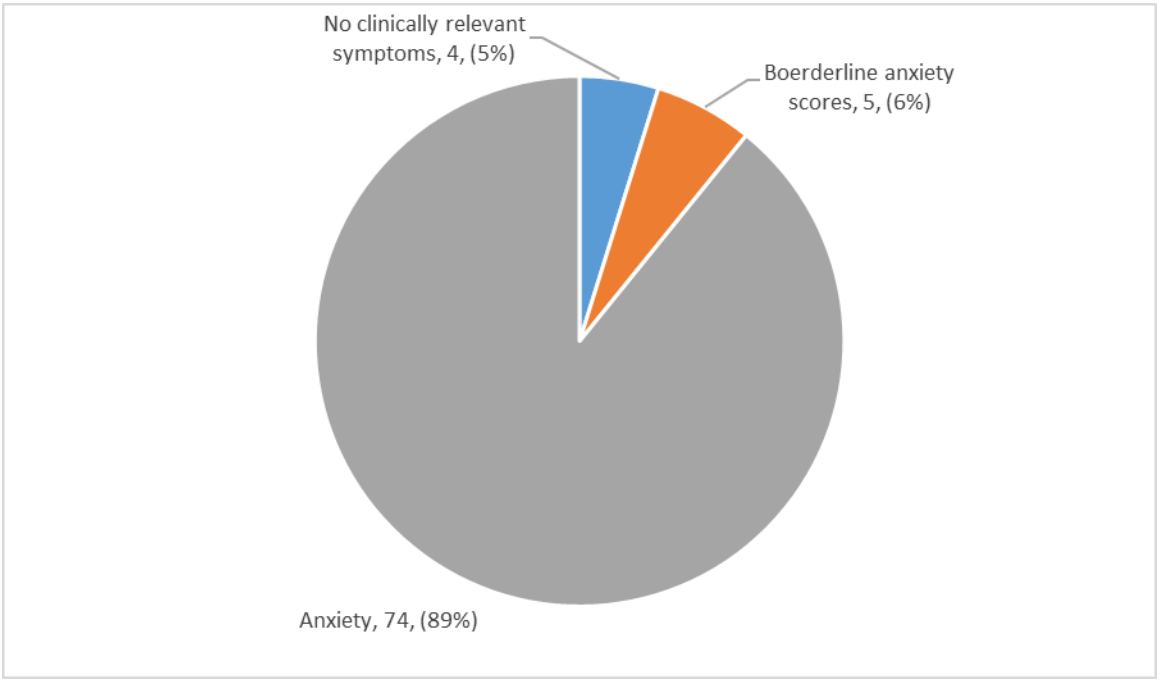


Figure 4.6: presents the prevalence of anxiety based on recommended cut offs of the summative scores for anxiety subscale (HADS-A) items: 11-21 (anxiety present), 8-10 (borderline scores) and 0-7 (no clinically relevant symptoms).

4.3.2: Anxiety and participants demographics

There was no significant association between anxiety and respondents demographics including sex (p = 0.435), age (p = 0.473), marital status (p = 0.901), or religion (p = 0.515), (Table 16).

Table 4.16: Association between respondent's demographics and anxiety

	Anxiety				
	Yes	**No**	**Chi**	**DF**	**P**
Sex					
Male	31(86.1)	5(13.9)	0.6	1	0.435
Female	43(91.5)	4(8.5)			
Age					
18-29 years	21(80.8)	5(19.2)	3.5	4	0.473
30-39 years	20(90.9)	2(9.1)			
40-49 years	9(100.0)	0(0.0)			
50-59 years	21(91.3)	2(8.7)			
60-70 years	3(100.0)	0(0.0)			
Marital status					
Single	28(87.5)	4(12.5)	0.6	3	0.901
Married	42(89.4)	5(10.6)			
Divorced	1(100.0)	0(0.0)			
Widower/widow	3(100.0)	0(0.0)			
Religion					
Christian	53(91.4)	5(8.6)	1.3	2	0.515
Muslim	4(80.0)	1(20.0)			
Protestant	15(83.3)	3(16.7)			

4.4.3: Anxiety and end stage renal disease

The prevalence of anxiety did not show a significant association with end stage kidney disease related factors including: duration since diagnosis (p = 0.826), awareness of cause of disease (p = 0.825), duration on haemodialysis (p = 0.819), and number of dialysis sessions per week (p = 0.406), (Table 17).

Table 4.2 : Association between end stage kidney disease and anxiety

	Anxiety				
	Yes	**No**	**Chi**	**DF**	**P**
Duration since diagnosis of end stage renal disease					
Less than one year	66(90.4)	7(9.6)	0.4	2	0.826
1-5 years	6(85.7)	1(14.3)			
11-15 years	2(100.0)	0(0.0)			
Aware of the cause of ESRD					
Yes	63(90.0)	7(10.0)	0	1	0.825
No	7(87.5)	1(12.5)			
Duration on hemodialysis					
Less than one year	51(89.5)	6(10.5)	3.3	2	0.189
1-5 years	22(91.7)	2(8.3)			
6-10 years	1(50.0)	1(50.0)			
Number of dialysis sessions per week					
Once	11(100.0)	0(0.0)	1.8	2	0.406
Twice	53(88.3)	7(11.7)			
Patient on medications					
More than two times	10(83.3)	2(16.7)			
Yes	49(89.1)	6(10.9)	0	1	0.978
No	25(89.3)	3(10.7)			

4.4.4: Depression

There were five items in the depression subscale on which participants scored high: praying a lot 92.8% (77), seeking spousal support 81.7% (67), and being hopeful about the future 85.2% (69), seeking encouragement in relatives / friends 77.1% (64) and enjoying a good book, radio or TV program 56.1% (46), Table 18.

Table 4.18: Response to modified depression subscale (HADS-D) items in respondents with end stage kidney disease

	Respondents' score			
	1	**2**	**3**	**4**
I still enjoy the things I used to enjoy	14(17.1)	38(46.3)	11(13.4)	19(23.2)
I can laugh and see the funny side of things:	7(8.5)	13(15.9)	24(29.3)	38(46.3)
I feel cheerful	3(3.7)	11(13.4)	27(32.9)	41(50.0)
I have lost interest in my appearance	4(4.8)	24(28.9)	20(24.1)	35(42.2)
I look forward with enjoyment to things:	9(10.8)	20(24.1)	11(13.3)	43(51.8)
I can enjoy a good book or radio, or TV program.	5(6.1)	6(7.3)	25(30.5)	46(56.1)
I don't care anymore what I eat	34(41.0)	35(42.2)	8(9.6)	6(7.2)
I do not like to talk about the problems I go through ,so I hide myself from others	17(20.5)	39(47.0)	7(8.4)	20(24.1)
I don't feel like doing anything for myself as well as for others	14(16.9)	33(39.8)	17(20.5)	19(22.9)
I talk to my friends and family whenever I feel low and need encouragement.	6(7.2)	7(8.4)	6(7.2)	64(77.1)
I no longer have confidence in life because of how I look with a dialysis fistula.	6(7.3)	42(51.2)	16(19.5)	18(22.0)
I pray a lot I talk to Jesus Christ /Allah asking for a miracle	2(2.4)	2(2.4)	2(2.4)	77(92.8)
I do not make conversation with other patients	20(25.0)	34(42.5)	3(3.8)	23(28.8)
I feel I have lost myself worth in providing for my family	2(2.4)	8(9.8)	31(37.8)	41(50.0)
I seek for my husband /wife support with things to do with food cooking and company to hospital.	2(2.4)	3(3.7)	10(12.2)	67(81.7)
I no longer care of how I feel about my self	4(4.9)	45(54.9)	14(17.1)	19(23.2)
I feel hopeful about the future	5(6.2)	0(0.0)	7(8.6)	69(85.2)

Depression prevalence

Using cut offs of the summative scores for anxiety subscale (HADS-D) items it was determined that there were 70 respondents with depression giving a prevalence of 84% (95% CI 75-91%) for depression in participants undergoing dialysis.

4.4.5: Depression and respondents' demographics

There was a significant association between religious practices and reported prevalence of depression in chronic kidney disease (p = 0.046) as shown in Table 19.

Table 4.19: End stage renal disease respondents' demographics and occurrence of depression

	Depression				
	Yes	**No**	**Chi**	**DF**	**P**
Sex					
Male	33(91.7)	3(8.3)	2.6	1	0.108
Female	37(78.7)	10(21.3)			
Age					
18-29 years	23(88.5)	3(11.5)	8.1	4	0.089
30-39 years	17(77.3)	5(22.7)			
40-49 years	8(88.9)	1(11.1)			
50-59 years	21(91.3)	2(8.7)			
60-70 years	1(33.3)	2(66.7)			
Marital status					
Single	25(78.1)	7(21.9)	2	3	0.577
Married	41(87.2)	6(12.8)			
Divorced	1(100.0)	0(0.0)			
Widower/widow	3(100.0)	0(0.0)			
Religion					
Catholics	45(77.6)	13(22.4)	6.1	2	0.046
Muslim	5(100.0)	0(0.0)			
Protestant	18(100.0)	0(0.0)			

4.4.6: Depression and health related factors

The prevalence of depression did not show a significant association with duration of end stage kidney disease (p = 0. 386), duration of haemodialysis (p = 0. 383), number of sessions per week (p = 0. 183) or awareness of the causes of disease (p = 0. 203).Table 20.

Table 4.20: Characteristics of end stage renal disease and occurrence of depression

	Depression				
	Yes	**No**	**Chi**	**DF**	**P**
Duration since diagnosis of end stage renal disease					
Less than one year	60(82.2)	13(17.8)	1.9	2	0.386
1-5 years	7(100.0)	0(0.0)			
11-15 years	2(100.0)	0(0.0)			
Aware of the cause of ESRD					
Yes	58(82.9)	12(17.1)	1.6	1	0.203
No	8(100.0)	0(0.0)			
Duration on hemodialysis					
Less than one year	46(80.7)	11(19.3)	1.9	2	0.383
1-5 years	22(91.7)	2(8.3)			
6-10 years	2(100.0)	0(0.0)			
Number of dialysis sessions per week					
Once	8(72.7)	3(27.3)	3.4	2	0.183
Twice	50(83.3)	10(16.7)			
Patient on medications					
More than two times	12(100.0)	0(0.0)			
Yes	47(85.5)	8(14.5)	0.2	1	0.695
No	23(82.1)	5(17.9)			

4.4.7 .Association between Dietary adaptation and psychosocial adaptation

There was no association between dietary adaptation and psychosocial adaptation (Table 21).

Table 4.21: Dietary adaptation and psychosocial adaptation assessed through features of anxiety

	Anxiety			
	Yes	**No**	**Chi (DF)**	**P**
Dietary adaptation				
Have you experienced any change in dietary intake?				
Yes	50(89.3)	6(10.7)	0(1)	0.88
No	7(87.5)	1(12.5)		
Do you have any dietary restrictions?				
Yes	66(89.2)	8(10.8)	0(1)	0.885
No	7(87.5)	1(12.5)		
Accepted the dietary restrictions				
Yes	39(90.7)	4(9.3)	0.2(1)	0.64
No	35(87.5)	5(12.5)		
Following recommended restrictions				
Yes	38(84.4)	7(15.6)	2.3(1)	0.133
No	36(94.7)	2(5.3)		
Fractionating meals				
Yes	2(66.7)	1(33.3)	1.6(1)	0.202
No	72(90.0)	8(10.0)		
Consuming small quantities				
Yes	5(100.0)	0(0.0)	0.6(1)	0.421
No	69(88.5)	9(11.5)		

There was no association between psychosocial adaptation and dietary adaptation. (Table 22)

Table 4.22: Dietary adaptation and psychosocial adaptation assessed through depressive features

	Depression			
	Yes	**No**	**Chi (DF)**	**P**
Dietary adaptation				
Have you experienced any change in dietary intake?				
Yes	51(91.1)	5(8.9)	0.8(1)	0.379
No	8(100.0)	0(0.0)		
Do you have any dietary restrictions?				
Yes	61(82.4)	13(17.6)	1.7(1)	0.196
No	8(100.0)	0(0.0)		
Accepted the dietary restrictions				
Yes	37(86.0)	6(14.0)	0.2(1)	0.657
No	33(82.5)	7(17.5)		
Following recommended restrictions				
Yes	38(84.4)	7(15.6)	0(1)	0.977
No	32(84.2)	6(15.8)		
Fractionating meals				
Yes	2(66.7)	1(33.3)	0.7(1)	0.391
No	68(85.0)	12(15.0)		
Consuming small quantities				
Yes	5(100.0)	0(0.0)	1(1)	0.32
No	65(83.3)	13(16.7)		

4.5 .Qualitative Analysis Report

4.5.1 Dietary restriction

Eating well is an important part of treatment of ESKD and can help clients feel better. A new diet is essential part to treatment process. Not only will it help clients feel better, it can also help to avoid complications of the renal disease such as fluid overload, high blood potassium, bone disease, and weight loss.

Fluid restrictions

People on dialysis often have decreased urine output, so increased fluid in the body can put unnecessary pressure on the person's heart and lungs. A fluid allowance for individual patients is calculated on the basis of 'urine plus 500ml.' the 500 ml covers the loss of fluids through the skin and lungs. Most clients were very careful on the amount of fluids they take because they were aware of the consequences though they were feeling very thirsty, like one of the participant said,

'' *I have a lot of thirst and am forced to take a (swipe) of water to quench my thirst I cannot take half cup of tea it has defeated me ,I take one cup of tea....I know the danger of taking plenty of water but am able to judge when to quench my thirst''.(p2)*

Salt restrictions

Salt (sodium) is an element that is used by all living creatures to regulate the water content in the body. Usually a salt restriction comes in the form of "No Added Salt." This is necessary because a greater intake of salt will result in poorly controlled blood pressure and excessive thirst which can lead to difficulty adhering to the fluid restrictions in your diet. Most participants restricted their salt intake in their food, they say using little salt in the food has made their food tasteless and therefore take little food which they do not enjoy .One of the participant said

''I use little salt in my food, the little salt has affected the quality of my food because the food don't have any taste, so I eat little food and I do not enjoy the food I eat . How I used before is not how I eat now because I used to eat food with salt, you just eat....'' to just fill your stomach (p4)

Effects of food restriction

The protein in the diet, foods high in potassium and phosphorous should be restricted. This is because normal kidneys are able to excrete these elements in the urine, but in kidneys that are failing there will be build-up of urea, potassium and phosphorous in the blood bringing adverse effects to the body.

'*'You know now I do not take food I used to enjoy because of the effects it has on my body. For example I used to enjoy taking soda and chips ,I cannot take githeri on the hotels or any food, chapatti because I do not know how it was cooked .When I come to hospital I will not eat anything until I go back home because I have to eat food that is acceptable . When I*

*travel I cannot go for long because of food choices and how it is being cooked .But I know the type of food that is required of me and how it is supposed to be cooked**.''***(p3).

Another participant had the following to say.

*''This restriction of food has made little choices of food to make …you find yourself eating same food all over until you are bored, you lack appetite you end up losing energy and you become fatigued most of the time**'' (p1)***

4.5.2 Psychological adaptation

Family Roles

Most participants felt HD affected their basic role in the family, especially their capacity to perform the role of head of family, parent, wife, husband or child. Most participants tried to come to terms with their changed family roles as well as life with HD.

Participants described being tired after HD treatments. Men regarded themselves as the head of the family. Once men commenced HD, their family role changed from being independent to depending on family members often for financial support. The following comment clearly demonstrates one man's distress at his changed role.

'*you know like me I used to work in my farm ,you see I used to be energetic but now I do not have any strength to do anything for myself or even to work in my farm, I depend on my family for provision in everything it is really frustrating...''(p5)*

Loose of self esteem

Some male participants could not perform their role as the head of the family, which
Had a big effect on their self-esteem and compromised their self-confidence.

ESKD and HD also led to changes in women's roles and self-esteem. Women are expected to be virtuous caregivers in the family according to African culture. Some women participants described how HD affected their ability to be the mother and woman, that is, a home maker to their children. HD often led to regret and guilt for women participants. One woman could express how ESKD and HD,

''This disease has affected me because I cannot provide for my children, the condition has made me become a beggar, am a widow, children are looking after me to provide but I cannot, am a bed ridden, though am their mother am like a child because I cannot do most things for myself, they bring me potty and carry me since I cannot work....'' (p1)

HD also had a profound effect on participants' ability to fulfil their hopes and dreams.

Unfulfilled hopes and dreams

Some participants felt hopeless about their future when they realized they might no Longer be able to fulfil their hopes and dreams. For example, one participant felt him would not be able to continue attending university and achieve his dreams of having an Education. He withdrew from his course at the Laikipia University as a 2nd year student pursuing education. He could not continue with his studies because he lacked, energy was fatigued as he said:

‘*’ I was a university student at Laikipia campus but I had to drop out because I used to get tired and fatigued and I could not stand for long ,it is very expensive and I cannot combine treatment with studies because of cost.’’(p4)*

Treatment benefits

Participants’ realised haemodialysis improved their symptoms and well-being despite the difficulties, and appreciated the benefits of haemodialysis. For example, it improved their appetite and maintained their life. They also hoped living with haemodialysis would go well and without complications.

‘’*Hemodilysis makes my life better and keeps my life going ,if I miss dialysis I get unwell but when I do not miss am okay for I live life one day at a time .I follow Doctors advice because I want to live and to avoid complications’’(P1)*

CHAPTER FIVE: DISCUSSION

Adequate adaptation to changes occasioned by end stage renal disease and its management leads to improved patient outcomes, but to date such adaptation have rarely been examined in developing country settings. This chapter discusses the findings of psycho-dietary adaptation of end stage renal disease patients undergoing haemodialysis in KNH, the largest public dialysis facility in Kenya. The chapter discussion is organized by research questions.

5.1 Characteristics of patients with end stage renal disease on haemodialysis

The mean age of respondents on hemodialysis at KNH was 38 years with female dominating. A previous Indian study reported similar sex profile in hemodialysis patients with female patient predominating (Anees et al 2011, Nitsch et al 2006).There are however important differences between these studies and the vast majority of renal studies in literature. For example, in most recent African studies the mean age of chronic kidney disease patients on dialysis ranges between 42 and 55 years (Amira 2011, Adejumo 2015, Ghonemy 2015). In addition, high ratios of male to female patients (up to 3 males for each female patient) have been reported in chronic kidney disease studies done in patients undergoing haemodialysis (Ghonemy et al 2015).

The younger respondent's age and female predominance in the current sample can possibly be explained by the fact that while these previous studies recruited random samples of adult, hemodialysis respondents in the present study an upper bound for age (56 years) was used during participant recruitment. Considering that studies have reported that mean age of male respondents with chronic kidney disease is significantly higher than that of female respondents this age restriction during participant recruitment effectively ensured that younger females were more likely to be recruited hence constituting majority of patients with chronic kidney disease (Okaka et al 2014).

The differences in demographic characteristics of the respondents with chronic kidney disease in this study and particularly with regard to the average age, still there were approximately one-third of respondents between 50 and 60 years which corresponds to distribution in other studies (Ghonemy et al 2015). It is important to note that even the studies reporting higher mean age still document that respondents less than 40 years comprise a large proportion of the population of hemodialysis treated respondents (Okaka et al 2014). It could

also explain the increase of cases of non-communicable diseases among young people which was high in our study with mainly hypertension being the leading cause and diabetes as the second course, similar to study done by (Waldaman et al 2014) who indicated that there is increase in number of young adults who are diagnosed with end stage kidney disease and are on hemodialysis and the causes are hypertension with diabetes.

The majority of the respondents in the current study had been recently diagnosed with end stage kidney disease and similarly been on haemodialysis for a correspondingly short time period. Random samples of adults with chronic kidney disease document longer durations of illness and hemodialysis of respondents with chronic kidney disease with a median duration of 25 months on maintenance dialysis reported in West Africa (Halle et al 2009).

In common with the deviant demographic findings discussed above, the relatively short duration of disease and treatment period are explained by the selective recruitment criteria targeting relatively younger patients. In addition the relatively short duration of hemodialysis could be explained by problems in initiating dialysis due to late referrals, health system constraints, and unaffordable costs of dialysis care (Anees et al 2011). In a Saudi survey (Alharbi et al 2010) only 6% of sampled chronic kidney disease respondents on hemodialysis had been dialyzing for less than one year compared to 68% in KNH.

5.2 Nutritional adaptation among respondents with end stage renal disease on haemodialysis

The anthropometric markers were used to assess the nutritional status of hemodialysis respondents in KNH, namely BMI (weight /height m^2) in hemodialysis respondents with end stage kidney disease BMI is widely studied. In previous prospective studies the mean BMI in hemodialysis respondents was 25.9 kg/m^2 (SD 3.7) (Markaki 2013) and mean BMI in chronic kidney disease was 27.2 (Belarbia et al 2013). These values are higher than the means of reported in the current analysis. These differences could be attributed to corresponding differences in the sex and age distribution between the patients seen in the current KNH study as opposed to comparator studies with proportionately higher number of males. The respondents on hemodialysis in KNH had rates of malnutrition similar to those reported by (Halle et al 2009) in Cameroon where mean BMI was 22.4 kg/m^2 and 28.3% of patients were underweight. It is also important to note that though the respondents in KNH appear to have

relatively low mean BMI studies in other setting done by (Sedhani et al 2015) have reported even lower BMIs with a mean of 19.6 ± 3.2 kg/m^2 in Nepalese haemodialysis patients.

There was significant association between BMI and duration of dialysis. Respondents who had been on dialysis longest were more likely to be underweight .A study which is similar to the one done by (Kirsten et al 2004) which they found that there is association between body mass and duration of dialysis .Respondents with greater body fat mass at dialysis initiation may be protected by greater energy reserves in the face of general wasting or may be less prone to wasting process. Respondents undergoing dialysis appear to waste over time as indicated in the results, and it may be advantageous for a person to begin dialysis treatment at a higher level of adiposity. The fat is actually protective than a body with less fat. In the current study majority of the respondent's experienced dietary restrictions, Majority agreed to be practicing some kind of modification. They also experienced complications in the course of treatment for many times, similar to study done by (Blessy et al, 2014) in Kasturba they found that 40% of the persons undergoing haemodialysis felt that there is actually no need for a strict diet modification as haemodialysis takes care of regulating the blood and all of them (100%) said it is difficult to practice dietary modifications, and only 78% practiced some kind of dietary modifications. Study done by (Kara et al, 2007) found in Turkish people that most patients were non adherent to food and fluid and ends up with complication.

Study by (Valsaraj et al, 2013) identified that there is absolute dietary dissatisfaction especially the salt restrictions expressed with statements such as "nobody wants to eat a tasteless food without salt. In our study it was difficult to assess nutritional adaptation since most of the information was subjective .We could relay on the complications and side effects of treatment with the weight changes and protein levels. Most of the respondents were aware of dietary restrictions and the consequences of not adhering to. They reported that sometimes it is difficult to follow the recommendation because of little choices of food they have

Majority of the respondents were anaemic, this finding is in agreement with other studies which found out that majority of hemodialysis respondents are anaemic, and undernourished (Anees 2011; Qureshi et al 2002). A significant number of patients on haemodialysis have anaemia, a common complication of the hemodialysis. Anaemia occurs as fatigue and may also contribute to symptoms of depression. The cause is erythropoietin deficiency; others

include iron deficiency, shortened red cell survival and folate deficiency. This could also occur due to unnecessary dietary restriction.

In a study done by (Zuo et al 2010) they found that substantial proportion of patients receiving hemodialysis have low HgB concentration .He attributed this to patients receiving dialysis less than 3 sessions 'a week which is below recommended guidelines according to National kidney foundation 2007 which recommends dialysis of 3 minimum sessions a week. Patients who are receiving dialysis less than three sessions a week are less likely to achieve Adequacy target (typically KT/V urea). Raising the possibility of Epoiten hyporesponsiveness.

In United States two third of the patients on HD have HB level between 11-13gm/dl .This is the difference between under developed and developed countries .In underdeveloped countries the focus is still on the survival of the patients as compared to developed countries where the focus is above the survival and more on the quality of life of dialysis patients.

The mean total serum protein in 128 hemodialysis patients in Sweden ranged between 71 and 76 g/litre in patients who had been on dialysis for median duration of hemodialysis of between 13 and 28 months (Qureshi et al 2002.). Similarly in Nepalese hemodialysis patients mean total proteins between 71 and 72 g/litre have been reported (Sedhain et al 2015) these studies differ from current findings in which the mean protein were low. The low protein levels is a marker of inflammation ,in the current study could be related to poor dietary intake and resulting malnutrition or increased metabolism due to the renal disease and or its complications. There was significant association between protein levels and age, this could explain that as you age and on dialysis the proteins levels decreases overtime.

The findings of this study showed that hemodialysis respondents with lower concentration of protein levels had significantly higher prevalence of anemia ,which is in agreement with study done by (Heidari et al 2015) .Low proteins levels is used as a marker of inflammation. The relationship between anemia and inflammatory process in hemodialysis respondents has been shown in several studies. In these studies respondents with low protein levels had lower hemoglobin levels.The result of present study found relationship between low protein levels and anemia, possibly due to restricted dietary intake or hyporesponsiveness to erythropoietin stimulating agents (ESA) in low proteins levels among respondents, although the researcher

could not establish the use of (ESA) among respondents. The mechanism by which inflammation affect erythropoiesis has been explained by the increased levels of cytokines; this cytokines increases production of C-reactive protein (CRP) and reduces serum albumin and transferring synthesis. A low level of transferrin prevents Iron transport to the hematopoietic sites and leads to low hemoglobin synthesis as well as hypo responsiveness to ESA, (Ogawa et al 2014).The improvement of anemia will require increased concentration of albumin.

5.3 Psychological adaptation among respondents with end stage kidney disease on haemodialysis

There is evidence that both renal disease and hemodialysis impact on psychological wellbeing of respondents and their families. The psychological reaction to disease and its management through dialysis involves reevaluating one's status, the treatment modality, their satisfaction with life and the impact of these factors on their families and support system. In common with studies in literature, this study reports relatively high prevalence for both anxiety and depression . The prevalence of anxiety and depression ranges between 30% and 60% and between 20% and 73%, respectively in hemodialysis patients (Kimmel et al 2007).

The use of different tools for assessing symptoms of psychological adaptation could explain the variations, and particularly with the reported differences in sensitivities of the widely used Beck depression inventory (BDI) and the HADS-A which was used in the current study. Separately, anxiety and depression have been described as specific and common post-dialysis effects occurring in up to 10% of patients in the post dialysis period (Sattar et al. 2012). Prevalence of psychological symptoms could thus vary considerably depending on the timing of the assessments of psychological wellbeing.

Depression in HD patients is associated with higher rates of hospital admission, and a greater likelihood of emergency department visits (Abbas Tavallaii et al., 2009; Hedayati et al., 2008) Depression occurs due to loss of autonomy, employment, family role. Individuals with high levels of depressive affect are usually not complying with the nutritional restriction prescribed by their doctors, poor treatment adherence and higher mortality rates (Drayer et al., 2006) Anxiety is common among clients with chronic kidney disease, in a study by (DeJean et al 2013,) they found that anxiety is associated with feelings of uncertainty about

the future, feelings of guilt and loss of a sense of self .This could be due to awareness that chronic kidney disease is incurable and the fact that survival depends on dialysis

There was significant association between depression and religion this analysis is similar to study done by (Ibrahim et al, 2012,) who found that people receiving HD used religion and spirituality to adapt with their physical and psychosocial problems and improve their wellbeing and quality of life. Use of religion was to reorient their lives to manage and accept their condition. Religion and spirituality are central aspects of the adaptation process and enable People to cope with stressful situations and overcome their negative life situations.

5.5 Qualitative Discussion

5.5.1. Food and fluid restrictions

The current and other researchers found people receiving HD experience physical and psychological effects due to food and fluid restrictions, which people find difficult, as their health status worsens if they do not comply (Clarkson & Robinson, 2010; Al Nazly et al., 2013). They knew the complications if they do not comply with the diet such pulmonary oedema, oedema, itchy skin and cardiovascular disease which is a leading cause of death.

The individual's choice not to follow food and fluid recommendations also contributes to anxiety and stress. The current participants felt they were fairly good patients because nursing staff had frequently re-educated them about the adverse effects of not adhering to food and fluid restrictions. Healthcare professionals have good intentions for people with ESKD when they educate them about how to manage their food and fluid intake. However, people with ESKD feel regretful, stressed and depressed, which can lead to distance in the relationship between them and health professionals.

5.5.2. Lose of family roles

The current study and other researchers found males with ESKD are unable to perform usual daily activities and work, which reduces their ability to earn money. Consequently, they viewed themselves as'less of a man' AL Nazly et al., 2013. Men or fathers with ESKD might feel powerless, worthless and have low self-confidence because men regard work as a symbol of masculinity (Al Nazly et al., 2013). These findings suggest men with ESKD might view themselves as 'disabled' or 'weak,' which could impair their ability to integrate ESKD and its treatment into their life.

5 .5.3.Having strong social support

Having strong social support was important to participants in the current study, particularly support from family members, and enabled them to adapt to ESKD and HD similar to other studies show people with ESKD obtained support from various sources mainly family members, friends, healthcare professionals and other people with ESKD on dialysis (Cukor et al 2010). These previous studies highlighted the fact that family members such as husbands or wives, parents and children are a major source of social support for people receiving HD and help them enhance their quality of life (Revenson et al., 1991; Lai et al., 2012). Thus, family members appear to be a buffer to stress and enhance physical and psychological wellbeing, particularly when people with ESKD experience both positive and negative situations.

5.5.4. Benefits of haemodialysis

Participants' realised haemodialysis improved their symptoms and well-being despite the difficulties, and appreciated the benefits of haemodialysis. For example, it improved their appetite and maintained their life. Two of the participants were '*on hold'* while they waited for a kidney transplant. If they could not receive a kidney transplant they would have to live with haemodialysis for the rest of their lives. They also hoped living with haemodialysis would go well and without complications

5.6. Conclusion

- The study has showed that end stage kidney disease respondents undergoing hemodialysis experience high prevalence of depression and anxiety,
- They are not adapted nutritionally as indicated by biomarkers and history from respondents.
- They have significant derangements in anthropometric indices.

5.6 Recommendation

- There is need to enhance counselling process for clients with end stage kidney disease on nutritional care as well as Psychological care.
- The anthropometric indices of patients undergoing hemodialysis need to be monitored regularly with feedback of this information to patients alongside implementation of corrective actions in cases where changes are noted.

- Continuous monitoring of hemodialysis clients of their mental state using hospital anxiety depression scale assessment (HADS-A) or the hospital can develop their own tool should be enhanced.
- There is need to for nursing monitoring and reinforcement of patient adherence to dietary recommendations in chronic kidney disease and hemodialysis with the aim of promoting optimal dietary adaptation.
- KNH administration should increase the number of counsellors and clinical psychologist for counselling services

REFFERENCES

Abbas Tavallaii, S., Ebrahimnia, M., Shamspour, N. & Assari, S. (2009). Effect of depression on health care utilization in patients with end-stage renal disease treated with hemodialysis. *Eur J Intern Med*, 20, (4). 411-414

Agar, J. (Ed.). (2010). *Nephrology made easy* Geelong: Erudite Medical Books.

Adejumo OA, Akinbodewa AA, Okaka EI, Alli OE, Ibukun IF(2016). Chronic kidney disease in Nigeria: Late presentation is still the norm. Niger Med J ;57:185-9.

Aldwin, C.M. and Revenson, T.A., 1987. Does coping help? A reexamination of the relation between coping and mental health. *Journal of personality and social psychology*, *53*(2), p.337.

Alharbi, Khadija A., (2010)"Assessment of nutritional status of patients on hemodilaysis: a single center study from Jeddah, Saudi Arabia."

Amira Alharbi , Khadija A (2010), Assessment of Nutrtional status of patients on hemodialysis a single centre study from Jeddah from Saudi Arabia.

M. Anees, F. Hameed, A. Mumtaz, M. Ibrahim, M N S Khan.(2011) Dialysis Related factors affecting Quality of Life in patients on Hemodiaysis. Iranian JKD, 4 (1): 9-14.

Clarkson, K. A., & Robinson, K. (2010). Life on Dialysis: A Lived Experience. *Nephrology Nursing Journal 37*(1), 29-35

Herlin, C., & Wann-Hansson, C. (2010). The experience of being 30-45 years of age and depending on haemodialysis treatment: a phenomenological study C. Herlin, C. Wann-Hansson Pateints experience in haemodialysis treatment. *Scandinavian Journal Of Caring Sciences*, *24*(4), 693-699.

Levey, A., Stevens, L., Schmid, C., Zhang, Y., Castro, A., Feldman, H., . . . Greene, T. (2009*). A new equation to estimate glomerular filtration rate. Annals of Internal Medicine, 150*(9), 604 - 612.

Levey, A., Stevens, L., Schmid, C., Zhang, Y., Castro, A., Feldman, H., Greene,T. (2009*).* A new equation to estimate glomerular filtration rate. *Annals ofInternal Medicine, 150*(9), 604 - 612.

Barendse SM, Speight J, Bradley C (2005). The Renal Treatment Satisfaction Questionnaire (RTSQ): *A measure of satisfaction scale (PAIS*). J Psychosom Res 30(1), 77-

Barnett T, Li Yoong T, Pinikahana J, Si-Yen T (2008). Fluids compliance among patients having hemodialysis: can an educational program make a difference? *J Adv Nurs*.; 61(3):300–

Bhowmilk D, C. S .pandav, S.C. Tiwari.(2008).*public health strategies for CKD in india*: *Indian journal of public health* ,A.Health,52 (4);224-228

Canoa N, Fiaccadorib E, Tesinskyc P, Toigod G, Drumle W, DGEM: Kuhlmann M, Mann H, Horl WH(2006). ESPEN guidelines on enteral nutrition: adult renal failure. *Clinical Nutrition*,25,295-310.

Carpenter, C., Milford, E., & Sayegh, M. (2010). Transplantation in the treatment of renal failure. In J. Jameson & J. Loscalzo (Eds.), *Harrison's nephrology and acid-base disorders*. New York: McGraw-Hill Companies.

Caspian J Intern Med. (2015) low serum albumin as a predictor of anaemia in chronic hemodialysis patients Summer ;6(3):161-4

Chokephichit, P. (2003). *Self-Care of Chronic Renal Failure Patients Undergoing Hemodialysis* (Master of Nursing Science), Mahidol University. Bangkok

Cukor, D., Cohen, S.D., Peterson, R.A. and Kimmel, P.L., (2007). Psychosocial aspects of chronic disease: ESRD as a paradigmatic illness. *Journal of the American Society of Nephrology*, *18*(12),3042-3055.

DeJean, D., Giacomini, M., Vanstone, M., Brundisini, F. (2013). Patient experiences of depression and anxiety with chronic disease: a systematic review and qualitative

Drayer, R.A., Piraino, B., Reynolds, C.F., 3rd, Houck, P.R., Mazumdar, S., Bernardini, J., et al.(2006). Characteristics of depression in hemodialysis patients: symptoms, quality oflife and mortality risk. *Gen Hosp Psychiatry*, 28, 306-312.

Dwyer JT, Larive B, Leung J, Rocco MV, TOM Greene T, Burrowes J, Chertow GM, Cockram DB, Chumlea WC, Daugirdas J, Frydrych A, Kusek JW (2005) for the hemo study group Are nutritional status indicators associated with mortality in the hemo-dialysis (HEMO) study?. Kidney nt Vol68: 1766-1776 mmeta-Synthesis. *Ontario Health Technology Assessment Series*, *13*(16), 1–33.

Fouque D, Guebre-Egziabher F (2007) An update on nutrition in chronic kidney disease, *Int Urol Nephrol*, 39:239–246. 19.Guideline] KDIGO. (2013) Kidney Int Supp. 3(1):1-150

Goraya N, Simoni J, Jo C, Wesson DE. (2012*)* Dietary acid reduction with fruits and vegetables or bicarbonate attenuates kidney injury in patients with a moderately

reduced glomerular filtration rate due to hypertensive nephropathy. *Kidney Int*. Jan. 81(1):86-93.

Ghonemy TA, Farag SE, Soliman SA, El-okely A, El-hendy Y.(2016) Epidemiology and risk factors of chronic kidney disease in the El-Sharkia Governorate, Egypt. *Saudi J Kidney Dis Transpl*

Hedayati, S.S., Bosworth, H.B., Briley, L.P., Sloane, R.J., Pieper, C.F., Kimmel, P.L., et al.(2008). Death or hospitalization of patients on chronic hemodialysis is associated.

Herzog, C. A. (2011). Kidney disease in cardiology. *Nephrology Dialysis Transplantation,*

Halle MP, Kengne AP, Ashuntantang G. (2009) .Referral of patients with kidney impairment for specialist care in a developing country of sub-Saharan Africa. Ren Fail. 31(5):341–8. *26*(1), 46-50.

Heidari, B., Taheri, H., Hajian-Tilaki, K., Yolmeh, M., & Akbari, R. (2015). Low baseline serum albumin as a predictor of anemia in chronic hemodialysis patients. *Caspian Journal of Internal Medicine*, *6*(3), 161–164.

Holland, K. D.,& Holahan, C. K. (2003). *The Relations of Social Support and Coping to Positive Adaptation to Breast Cancer.* Psychology and Health, 18, 15–29.

Ibrahim, N., Desa, A., & Chiew-tong, N. K. (2012). Religious coping as mediator between illness perception and health-related quality of life among chronic kidney disease patients. *Asian Social Science*, *8*(9), 23-31.

Jhamb, M., Weisbord, S.D., Steel, J.L. & Unruh, M. (2008). Fatigue in patients receiving maintenance dialysis: a review of definitions, measures, and contributing factors.*Am J Kidney Dis*, 52, 353-365

Kara, B., Caglar, K., & Kilic, S. (2007). Nonadherence with diet and fluid restrictionsand perceived social support in patients receiving hemodialysis. *Journal of Nursing Scholarship, 39*(3), 243-248

Karimi Moonaghi H, Hasanzadeh F, Shamsoddini S, Emamimoghadam Z, Ebrahimzadeh S. (2012) A comparison of face to face and video-based education on attitude related to diet and fluids*: Adherence in hemodialysis patients*. Iran J Nurs Midwifery Res.;17(5):360–64.

Kalantar-Zadeh K., Ikizler T.A., Block G., *et al.* (2003). Malnutrition inflammation complex syndrome in dialysis patients: causes and consequences. *American Journal of Kidney Diseases*

Kimmel PL (2001). Psychosocial factors in dialysis patients. Kidney International (59), 1599-1613.

Kirsten L Johansen, Belinda Young, George A Kaysen, and Glenn M Chertow *(2004) Association of body size with outcomes among patients beginning dialysis*

Kneebone, I. I., &Martin, P. R. (2003). *Coping and Caregivers of People with Dementia. British Journal of Health Psychology*, 8, 1–17.

Lai, A. Y., Loh, A. P. P., Mooppil, N., Krishnan, D. S. P., & Griva, K. (2012).Starting on haemodialysis: A qualitative study to explore the experience and needs of incident patients. *Psychology, Health & Medicine, 17*(6), 674-684.

Lee, Y.-J., Lee, J. E., Kim, S.-J., Kim, Y.-G., Kim, D. J., Oh, H.-Y., & Huh, W. (2009). *Renal allograft outcomes from spousal and other living-unrelated Donors. Dialysis & Transplantation, 38*(6), 200-202.

Levey, A. S., Eckardt, K.-U., Tsukamoto, Y., Levin, A., Coresh, J., Rossert, J., Eknoyan, G. (2005). Definition and classification of chronic kidney disease: A position statement from Kidney Disease: *Improving Global Outcomes* (KDIGO).*67*(6), 2089-2100.

Levey, A.S. and Coresh, J.,(2012). *Chronic kidney disease. The Lancet, 379*(9811), pp.165-180

Lindley EJ (2009) Reducing sodium intake in hemodialysis patients.*Semin Dialysis*, May-Jun;22(3):260-3.

Mahan K, Escott-Stump S, Raymond JL (2012) *Krause's Food and the Nutrition Care Process, 13*. Edition, Elsevier

Marinakis D, Xanthopoulos B. Anemia and chronic kidney disease. Treatment. Use of iron preparations, vitamin B12, folic acid and vitamin complexes. Dialysis Living (2009); 24:36 -50.

Menon, V., Sarnak, M. J., & Levey, A. S. (2008). Risk factors and kidney disease. *InB. M. Brenner (Ed.), Brenner & Rector's the kidney* (8 ed., Vol. 1, pp. 633653). Philadelphia: Saunders.

Mitchell, A., Farrand, P., James, H., Luke, R., Purtell, R., & Wyatt, K. (2009).Patients' experience of transition onto haemodialysis: A qualitative study.*Journal of Renal Care, 35*(2), 99-107.

Mok, E., & Tam, B.(2001) *Nurs.* Stressors and coping methods among chronic haemodialysis patients in Hong Kong. *Journal of Clinical ing, 10*(4), 503-511.

Moulton, A. (2008). Chronic kidney disease: the diagnosis of a ‘unique’ chronic disease. *The Canadian Association of Nephrology Nurses and Technologists Journal, 18*(1) , 34-38

National Kidney Foundation Kidney Disease Outcomes Quality Initiative, (2007). KDOQI Clinical Practice Guideline and Clinical Practice Recommendations for Anemia in Chronic Kidney Disease: 2007 Update of Hemoglobin Target. *National Kidney Foundation*. Accessed October 15, 2015

Nitsch D, Felber DD, von EA, Gaspoz JM, Downs SH, Leuenberger P, Tschopp JM, Brandli O, Keller R, Gerbase MW, Probst-Hensch NM, Stutz EZ, ckermann-Liebrich U:(2006) Prevalence of renal impairment and its association with cardiovascular risk factors in a general population: results of the Swiss sapaldia study. *Nephrol Dial Transplant*.

Ohkawa S, Kaizu Y, Odamaki M, Ikegaya N, Hibi I, Miyaji K, Kumagai H: (2004) Optimum dietary protein requirement in non-diabetic maintenance hemodialysis patients. *Am J Kidney Dis*, 43:454–463

Okaka EI, Adejumo OA, Ojeh-Oziegbe OE, Olokor AB, Iyawe IO.(2013) Spot assessment of chronic kidney disease risk factors in a market population in Benin City. Afr J Med Health Sci ;12:10-4

Ogawa T, Shimizu H, Kyono A, et al.(2014) Relationship between responsiveness to erythropoiesis-stimulating agent and long-term outcomes in chronic hemodialysis patients: a single-center cohort study. *Int Urol Nephrol.* ; 46:151–9

Peralta CA, Norris KC, Li S, et al. (2012) Blood Pressure Components and End-stage Renal Disease in Persons With Chronic Kidney Disease: *The Kidney Early Evaluation Program (KEEP).* Arch Intern Med. *Jan 9. 172(1):41-47.*.

Perrett, S.E., 2007. Review of Roy adaptation model-based qualitative research. *Nursing science quarterly*, *20*(4), 349-356.

Raj DS, Adeniyi O, Dominic EA, Boivin MA, McClelland S, Tzamaloukas AH, Morgan N, Gonzales L, Wolfe R, Ferrando A (2007) Amino acid repletion does not de-crease muscle protein catabolism during hemodialysis, Am J Physiol Endocrinol Metab 292: E1534–1542

Rastogi A, Linden A, Nissenson AR. Disease management in chronic kidney disease. *Adv Chronic Kidney Dis*. 2008;15(1):19–28. with a physician-based diagnosis of depression. *Kidney Int*, 74, 930-936

Saeed Z, Ahmad A, Shakoor A, Ghafoor F, Kanwal S(2012). Depression in patients on hemodialysis and their caregivers. Saudi Journal of Kidney Diseases and Transplantation.23 (5):946.

Sattar A, Argyropoulos C, Weissfeld L, et al.(2012) All-cause and cause-specific mortality associated with diabetes in prevalent hemodialysis patients. *BMC Nephrology*. 13:130.

Sedhain A, Hada R, Agrawal RK, Bhattarai GR, Baral A.(2015) Assessment of Nutritional Status of Nepalese Hemodialysis Patients by Anthropometric Examinations and Modified Quantitative Subjective Global Assessment. *Nutrition and Metabolic Insights*. 8:21-27.

Singh, A. (2012) .Kidney failure in Kenya downloaded from Http://www.thekidneydoctor.org/?theisn.or on 16th Nov 2015

Smith K, Coston M, Glock K, BS1, Elasy TA, Wallston KA, PhD4, Ikizler TA, Cavanaugh KL, (2010) Patient Perspectives on Fluid Management in Chronic Hemodialysis, Ren Nutr.*;* 20(5): 334–341.

Spiridi S, Iakovakis A, Kaprinis G. Renal insufficiency: Biological and psychosocial consequences. In: Psychiatry 2008; 19: 28-34.

Stark S, Snetselaar L, Hall B, Stone RA, Kim S, Piraino B, Sevick M A (2011) Nutritional Intake in Adult Hemodialysis Patients, Top Clin Nutr, 26,(1), 45–56.

Siew E.D. & Ikizler T.A. (2010). Insulin resistance and protein energy metabolism in patients with advanced chronic kidney disease.*Seminars in Dialysis*

Stenvinkel, P. (2010). Chronic kidney disease: A public health priority and harbinger of premature cardiovascular disease. *Journal of Internal Medicine, 268*, 456-467.

Tarawneh, M., & Al-Qaisi, S. (2011). *Biannual report 2009-2010* Amman, Jordan: Hashemite Kingdom of Jordan Ministry of Health

Thairathonline (2014). Announcement of CKD' situation in Thailand and expected over 8 million people had end-stage renal disease. Retrieved October 1, 2015 from http://www.thairath.co.th/content/408650

United States Renal Data System – USRDS. (2003*). Mortality and Causes Of Death. Available from*: www.usrds.org/2002/pdf/h.pdf (Retrieved on 24th November, 2015

Waknine Y. (2012) Kidney Disease Classifications to Include Albuminuria Medscape Medical News. Available at http://www.medscape.com/viewarticle/776940. Accessed: Jan 6th 2016.

Weng, L.-C., Dai, Y.-T., Wang, Y.-W., Huang, H.-L., & Chiang, Y.-J. (2008). Effectsof self-efficacy, self-care behaviours on depressive symptom of Taiwanese kidney transplant recipients. *Journal of Clinical Nursing, 17*(13), 1786-1794.

World Health Organization.(*2008-2013) Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*. Geneva.

World Health Report. *(*2008). http://www.who.int/whr/2008/en/index. Html. Accessed November, 15th 2015

Waldman, Carlisa, (2014)"Determining the Correlation Between Hemoglobin Levels and the Quality of Life of Adolecents and Young Adults on Hemodialysis: A Descriptive Correlational Study". *Master of Science in Nursing* .

Zoccali, C. (2008). The burden of cardiovascualr disease in patients with chronic kidney disease and in end-stage renal disease. In C. Ronco & D. N. Cruz (Eds.), *Hemodialysis- From basic research to clinical trials* (Vol. 161, pp. 6367).Basel: Karger AG.

Zigmond AS, Snaith RP(1983); The hospital anxiety and depression scale. Acta Psychiatr Scand.Jun;67(6)320

Zuo L, Wang M, Hou FF, Yan Y, Chen N, Qian J, Wang M, Bieber B, Pisoni RL, Robinson BM, Anand S.(2016) Anemia Management in the China Dialysis Outcomes and Practice Patterns Study. Blood Purif.42 (1):33-43.

APPENDICES

Appendix I: Participant information sheet and information sheet consent form

Title: **Psycho-Dietary adaptation among clients with end stage Renal disease on hemodialysis at Kenyatta national hospital.**

Investigator: Viola j kipturgo Tel.: 0722370501
School of Nursing Sciences,
University of Nairobi
P.O. Box 19676, Nairobi.

Introduction: I am a student at the School of Nursing Sciences, University of Nairobi pursuing a Master of Science Degree in Nursing. I am conducting a study titled: Psycho-Dietary adaptation among clients with end stage kidney disease on hemodialysis at Kenyatta national hospital**. A descriptive prospective study at Kenyatta national Hospital.** This study will be conducted at Kenyatta national hospital renal unit.

The purpose of this information is to give you details pertaining to the study that will enable you make an informed decision regarding participation. You are free to ask questions to clarify any of the aspects we will discuss in this information and consent form. I will also ask you questions regarding the study before you sign the consent form to ascertain your comprehension of the information provided.

Background and objective: The purpose of this study is to assess psycho-dietary adaptation and anthropometric measurements among clients with end stage kidney disease. The research will meet the client at first contact and after 3 weeks later to collect the same data. It will identify adaptation among the clients with chronic kidney disease on hemodialysis. The finding from this study will be used to promote good adaptation and to educate clients on other adaptations and to prevent maladaptation.

Participation: Participation in the study will entail answering questions which will be filled by the interviewer in the semi-structured questionnaire. Anthropometric measurements will

be taken for BMI and Biomarkers data will be obtained from participants file. You will not be subjected to any invasive procedure.

Benefits: There is no direct monetary benefit in participating in this study. However, the results of the study will be useful in facilitating the understanding of the various psycho-dietary adaptations that the clients use in the process of treatment. The findings will be availed to the hospital, other relevant decision makers and stakeholders to aid in putting in place measures that will improve the Adaptation among clients with end stage kidney disease on hemodialysis. To encourage on good adaptation and discourage maladaptation.

Risks: There are no economic or physical risks to participating in the study. However, you will take some time off your schedule to respond to questions from the researcher administered questionnaire. Also during the interview, some questions will require you to disclose some personal information that might trigger some negative feelings and possibly anxiety. If this happens, the researcher will refer you to the hospital counsellor. The researcher will also endeavour to spend approximately 30 minutes with you and 45 minutes for in-depth interview .when the client becomes tired in the process of interview ,the researcher will stop the interview and allow you to rest until such a time you are strong again.

Confidentiality: Confidentiality will be maintained and the information you provide will only be used for the intended purpose of the study. In addition, your name will not be required on any forms or used during publication of the final report thus ensuring your anonymity. All materials used during the study will be under lock and key and only the personnel involved in this study will have access to them. Electronic files will be saved on password and fire-wall protected computers.

Voluntary participation: Participation in this study is voluntary. Refusal to take part will not attract any penalty. You retain the right to withdraw from the study without any consequences. You are free not to answer any question during the interview.

Compensation: There is no compensation for participating in the study. The study is voluntary and so there is no any monetary payment for participation nor change of services that are offered as a result of participating in the research.

Conflict of interest: The researcher and the supervisors confirm that there is no conflict of interest amongst them.

CONSENT FORM

If you Consent to Participate in the study please sign below:

I hereby consent to participate in this study. I have been informed of the nature of the study being undertaken and potential risks explained to me. I also understand that my participation in the study is voluntary and the decision to participate or not to participate will not affect my medical requirement at this facility in any way whatsoever. I may also choose to discontinue my involvement in the study at any stage without any explanation or consequences. I have also been reassured that my personal details and the information I will relay will be kept confidential. I confirm that all my concerns about my participation in the study have been adequately addressed by the investigator and the investigator have asked me questions to ascertain my comprehension of the information provided.

Participants Signature (or thumbprint)……Date……

I confirm that I have clearly explained to the participant the nature of the study and the contents of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure.

Investigator Signature……. Date ……...

Research Assistance signature.....Date.....

For any Clarification, please contact

Viola J. kipturgo
Researcher Mobile Number: 0722370501
Email: violakipturgo@yahoo.com

Or

Dr .Samuel Kimani .
Senior Lecturer, School of Nursing
University of Nairobi.
Mobile Number: **0722384917**
Email address .tkimani@uonbi.ac.ke

Or
Mrs Angeline C. Kirui
Lecturer, school of Nursing
University of Nairobi
Mobile No **O720440665**
Email **chepchirchir@uonbi.ac.ke**
Or

The Chairman
University of Nairobi- Kenyatta National Hospital Ethics and Research Committee
P.O BOX 19676 Code 00202
Tel:(254-020)-2726300 Ext 44355
Email: uonknh_erc@uonbi.ac.ke

Appendix II: Maelezo ya utafiti kwa mshiriki

Ndugu/ Dada Mshiriki ,
Taarifa zifuatazo ni kutolewa kwa kuongoza wewe katika kufanya uamuzi wa iwapo utaweza kushiriki katika utafiti huu

Jina la utafiti : Saikologia - malazi Kukabiliana miongoni mwa Sugu Wateja Magonjwa ya figo juu ya kusafishwa damu katika Hospitali ya Taifa ya Kenyatta
Lengo la utafiti : Ili kuamua marekebisho kisaikolojia malazi miongoni mwa wateja sugu figo kufanyiwa hemodialysis katika kitengo figo, Kenyatta National Hospital

Taratibu za utafiti: Utafiti huu itahusisha Sugu wateja figo kufanyiwa hemodialysis ambao watachaguliwa nasibu. Malengo ya utafiti zitafafanuliwa yao na wao kuombwa kushiriki. Wale ambao wako tayari kushiriki itakuwa waliohojiwa faragha na mtafiti au wasaidizi wake kwa kutumia dodoso. mahojiano itachukua dakika saa zaidi 20 . wateja anthropometric vipimo zitachukuliwa katika mawasiliano ya awali na marudio ya sawa baada ya wiki 3 na hii itachukua dakika 10 . mtu binafsi katika kina mahojiano itachukua dakika saa zaidi 20 .Baada ya utafiti ni kukamilika, matokeo ya utafiti itakuwa kusambazwa kwa wagonjwa sugu ya figo, KNH usimamizi kwa ajili ya kuishi na mabadiliko na hatua za marekebisho

Ushiriki wa hiari : Ushiriki wako ni wa hiari na huwezi kuwa na kulazimishwa kushiriki. Wewe ni huru kukataa kujibu swali lolote bila uonevu . Unaweza kuondoka kutoka utafiti wakati wowote na katika hatua yoyote bila inakabiliwa na kutokubali yoyote au kukuadhibu.

Usiri: utambulisho yako si wazi wakati wa utafiti kama kitambulisho binafsi si kutumika . Utakuwa kupewa namba kificho ambazo zitatumika . Majibu yako si kusababisha aibu yoyote au uonevu kwa njia yoyote. Taarifa zote kutoa wakati wa utafiti yatawekwa binafsi.

Hatari na faida : Hakuna hatari kutabiri kwa wakati wa ushiriki wako katika utafiti. Kama matokeo ya ushiriki wako katika utafiti huu , mapendekezo juu ya marekebisho kisaikolojia malazi miongoni mwa Sugu wateja figo juu ya hemodialysis zitafanywa kwa mamlaka husika katika idara ya figo na KNH

IDHINI SHAHADA

Kauli mshiriki na sahihi

Nimeelezwa kinaga ubaga juu ya utafiti huu. Nakiri kushiriki kwa kutoa majibu. Mimi nimekuwa na nafasi ya kuuliza maswali na kufafanua wasiwasi wangu. Kama niko na maswali katika siku zijazo kuhusu utafiti, najua naweza kuuliza mpelelezi Mkuu kupitia njia ambazo zimetolewa hapa chini:

Mawasiliano:

Kuhusu maswali yoyote, na habari zaidi juu ya utafiti huu, unaweza kuwasiliana:

Viola Kipturgo (**Principal Investigator) School of Nursing,University of Nairobi Mobile no 0722370501.**

Dr. Kimani (**The supervisor) School of Nursing ,University of Nairobi Mobile no 0722384917**

Mrs. Kirui **(The supervisor) School of Nursing ,University of Nairobi Mobile no 072044066 KNH/UON ERC** P.O BOX 20723-00202 Tel. 726300-9 NAIROBI.

Nimefahamishwa kwamba nitapokea nakala ya fomu hii kwa ajili ya kumbukumbu yangu mwenyewe

Naelewa kwamba ushiriki wangu ni kwa hiari na kwamba naweza kukataa kushiriki au kuondoa ruhusa yangu na kuwacha kushiriki wakati wowote bila adhabu yoyote.

Mimi nakubali kushiriki katika utafiti huu bila kushurutishwa.

Mshiriki sahihi ..... Tarehe .....

Msaidizi wa Utafiti sahihi .... Tarehe .....

Appendix III: Loss to follow-up.

Clients may drop out of a study as a result of loss or interest; others might become lost to follow up because of death, relocation or other reasons. Loss to follow up is a problem because it may affect effective sample size and the best interest of the patient's quality of health. To prevent this loss, the principal researcher will ensure that during the initial contact the mobile no of the clients with the next of kin will be obtained and kept by the principal investigator. The researcher with the clients will keep communication line open from initial contact and through the 2nd contact.

Although a client is not obliged to give his/her reasons for withdrawing prematurely from the research, the investigator will make an effort to ascertain the reasons, while fully respecting the subject's rights .The researcher will initiates communication, an explanation recommending the clients treatment course, its benefits, and risks of not adhering to the proposed treatment .

Three (3) attempted telephone contacts should be documented by principal researcher in order to consider the participant lost to follow-up.

Appendix 1V: Questionnaire

Questionnaire number ……. Facility…….. Ward ……..

PI/Designee Initials ……

INSTRUCTIONS

Please do not write your name anywhere in the questionnaire.

Put a tick (√) in box next to the right response

Where no responses/choices are provided please write the response in the spaces provided.

SECTION 1: SOCIO-DEMOGRAPHIC DATA

1. Gender. Male ☐ Female ☐

2. How old are you?_____

3. Marital status? Single ☐ Married ☐ Divorcee ☐ dower/widow ☐

4. Which religion are you? Christian Muslim ☐ Protestant ☐ Hindu ☐

5. How many family members do you live with _____ people?

6. Educational level. ?

Primary ☐ Secondary ☐ University/College ☐ Not educated

7. Are you employed? YES ☐ NO ☐

Approximately how much is your monthly income_____?

8. Are you NHIF contributor_____?

SECTION 2 Assessment Psychological adaptation .

This is a self-administered questionnaire with 24 items. It consists of an anxiety subscale (HADS-A) and a depression subscale (HADS-D). Each subscale includes seven items and seventeen respectively. A rating Scale from 0 to 3 is for each item, and the total scores range from 0 to 21, with higher scores indicating adverse symptom. The cut offs are as follows: 11–21 indicates present anxiety or depression symptom, 8–10 indicates borderline scores and 0–7 indicates no clinically relevant .The scale has been modified to suit our study .

How do you rate your psychological adaptation towards chronic kidney disease being on hemodialysis, on a scale of , 0 strongly disagree ,1 Disagree ,2 agree ,3 strongly agree

Item		0	1	2	3
	Anxiety scale				
9a .	I feel tense or wound up				
9b.	I get a sort of frightened feeling as if something awful is Going to happen.				
9c.	Worrying thoughts go through my mind				
9d.	I can sit at ease and feel relaxed;				
9e.	I feel as if I am slowed down				
9f.	I get a sort of frightened feeling like “butterflies” in				
9g	I feel restless as I have to be on the move:				
	Depression scale				
9i.	I still enjoy the things I used to enjoy				
9j.	I can laugh and see the funny side of things:				
9k.	I feel cheerful				
9l.	I have lost interest in my appearance				
9m.	I look forward with enjoyment to things:				
9n	I can enyoy a good book or radio,or TV program.				

No	Item	0	1	2	3
9o	I don’t care anymore what I eat				
9p	I do not like to talk about the problems I go through ,so I hide myself from others				

9q	I don't feel like doing anything for myself as well as for others				
9r	I talk to my friends and family whenever I feel low and need encouragement.				
9s	I no longer have confidence in life because of how I look with a dialysis fistula .				
9t	I pray a lot I talk to Jesus Christ /Allah asking for a miracle				
9v	I do not make conversation with other patients				
9w	I feel I have lost myself worth in providing for my family				
9x	I seek for my husband /wife support with things to do with food cooking and company to hospital.				
9y	I no longer care of how I feel about my self				
9z	I feel hopeful about the future				

10 .How many years have you had confirmed chronic kidney disease?

Less than one year 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐

above 20 years _____

11. Are you aware on the cause of your condition? Yes ☐ No ☐

If yes which one?

☐ Hypertension

☐ Diabetes

☐ Trauma

☐ Glomerulonephritis

☐ Non steroid analgesic inflammatory diseases

Others, Specify _____

13 .How long have you been on haemodialysis?

Less than a year ☐

1-5 years ☐

6-10 years ☐

11-15 years ☐

16-20 years ☐

14 .How many times are you scheduled for dialysis in a week _____Times?

15. Are you on any medication? Yes ☐ No ☐

If yes, please specify _____

_____

Section 3;Dietary adaptation strategies.

16 . Have you experienced any change in dietary intake?

Yes ☐

No ☐

17 .Symptoms experience affecting oral intake?

Pain on eating ☐

Dental problem ☐

Anorexia ☐

Vomiting ☐

Nausea ☐

Dysphagia ☐

Feels full quickly ☐

18 .Are you able to do activities of daily living?

Yes ☐ No ☐

If No for how long have you not able to do this activities?_____?

19 a. Do you have any dietary restrictions? Yes ☐ No ☐

20 b .If yes which one?

Salt ☐

Fluids ☐

Protein

Fruits and vegetables

Others specify----------

21. Do you follow this dietary restriction? Yes No

If yes how?

Accepting restriction

Follow recommended diet

Fractionate meals

Eat everything but in small quantities

Eating potassium rich foods immediately before dialysis.

22. Do you have any preference of food? Yes No

If yes which ones----------?

23. How available is your food preference

Readily available

Not available

Available but expensive

24. Have you experienced any complications in the course of treatment?

Yes No

If yes which ones

Oedema

Itchy skin

Pulmonary oedema

Fatigue /lethargy

25. How many times have you experienced such complications?

Once twice many times

26. Are you aware of the foods that bring those complications?

Yes

No

If yes which ones----------

---

27. What is your Haemoglobin levels _____?

28. What is your proteins level_____-?

Appendix IX: Descriptive prospective report forms

ANTHROPOMETRIC MEASUREMENTS CHART

Patient Identification Code……

Date 1st contact…… Date 2nd Contact ……..

Signature…… Signature…….

ANTHROPOMETRIC VALUES	**INITIAL CONTACT**	**SECOND CONTACT (AFTER 3 WEEKS)**
Age Sex		
Height (M) Weight (KGS) BMI		
Hemoglobin levels		

Appendix X: Work planning gantt chart

Activities	NOV 2015	JAN	FEB	MARCH	APRIL	MAY 2016	JUNE 2016	JULY 2016	AUGUST 2016
Proposal Development									
Proposal Presentation to the KNH/UON Ethics and Research Committee									
Pretesting **Data Collection** **Data Analysis** **Draft Report Writing**									
Recommendations **Dissemination of Findings** **Final Report Writing**									

Appendix XI: Study Budget

Activity	Activity Description	Item	Unit	Unit Cost	Total In Ksh.
Literature Review	Search for literature in libraries	Transport Subsistence	15 days	300@	4,500
	Internet services	Browsing for 2hours daily	40 days	200@	8000
	Stationary	A_4 notebooks Biro pens Pencils Rubber Proposal printing Photocopying Questionnaire Translation	2 10 5 2 6 drafts 200pages 2	100@ 15@ 20 25@ 400@ 2@ 3000	200 150 100 50 1600 400 6000
Approvals		KNH ERC Ministry of Science and technology	1 1	1000@ 1000@	1000 1000
Subtotal					**23,000**
Research	Pre-testing	Transport and Subsistence Printing and typing questionnaires In-depth interview	2 days 20 copies 1 session	600@ 10 1000	1200 200 1000
	Questionnaires Data collection	Photocopying Transport and subsistence Interview refreshments Research Assistant Questionnaire	200 copies 30 days 8 sessions 8 sessions 30 days	2@ 500@ 500@ 2000@ 1000@	400 1500 4000 16,000 30,000
	Data processing and Analysis	Statistician			35,000
Subtotal					**89,300**
Reports	Draft report Final report	Printing and photocopying Printing and binding Miscellaneous	5 copies 4 copies	400 500	2000 2000 10,000
Grand Total					**126,300**

Appendix XII: Letter to ERC

VIOLA .J.KIPTURGO
UNIVERSITY OF NAIROBI
SCHOOL OF NURSING
REG. H56/75914/2014
25 FEBRUARY 2016

CHAIRMAN
KNH/UON RESEARCH AND ETHICS COMMITTEE
P.O.BOX
NAIROBI
Dear Sir/ Madam

Re: Permission to Conduct Research

I am a Post Graduate student pursuing Msc Medical/ Surgical Nursing. I hereby wish to conduct a study titled **psycho-Dietary adaptation among end stage kidney disease clients on hemodialysis at KNH Renal unit.** The study targets to investigate how clients with chronic kidney disease do adapt to psycho-dietary.

The study is a part of the requirement for fulfilment of Masters of Science in Nursing of University of Nairobi.

I wish to conduct the study from May to July, 2016. Attached please find a copy of my thesis for your review and approval.
Thank you

Sincerely yours,
VIOLA J.KIPTURGO

Appendix XIII: Letter to KNH

VIOLA J.KIPTURGO
UNIVERSITY OF NAIROBI
SCHOOL OF NURSING
REG. H56/75914/2014

25TH FEBRUARY 2016

DEPUTY DIRECTOR CLINICAL SERVICES
KENYATTA NATIONAL HOSPITAL
P.O.BOX 20723 02002
NAIROBI

Dear Sir/ Madam

Re: Permission to Conduct Research

I am a Post Graduate student pursuing Msc Medical/ Surgical Nursing. I hereby seek your approval to conduct a study titled **"psycho-dietary adaptation among clients with end stage kidney disease on hemodialysis in renal unit at KNH"**. The study targets to investigate how clients with chronic kidney disease adapt to psycho-dietary.

This study is a part of the requirement for fulfilment of Masters of Science in Nursing of University of Nairobi.

I wish to conduct the study from May to July, 2016. Attached please find a copy of my proposal for your review and approval.

Thank you

Sincerely yours,
Viola j.kipturgo.

Appendix XIV: Letter to the Ministry of Education, Science and Technology

VIOLA J.KIPTURGO
UNIVERSITY OF NAIROBI
SCHOOL OF NURSING
REG. H56/75914/2014
25th Feb 2016

The Chairperson,
The Ministry of Education, Science and Technology,
P.O. Box 20723-00202,
Nairobi.
Dear Sir/Madam,

RE: RESEARCH AUTHORISATION REQUEST

I am a postgraduate student pursuing a Master's Degree in Nursing (medical surgical). I wish to request permission to carry out research on ***"Psycho-dietary adaptation among clients with end stage kidney Disease on hemodialysis".*** The study will be carried out in Kenyatta National Hospital, Renal unit.

This study is a part of the requirement for fulfilment of Masters of Science in Nursing of University of Nairobi.

I wish to conduct the study from May to July, 2016. Attached please find a copy of my proposal for your review and approval

Thank you.
Yours faithfully,
Viola J. Kipturgo , 0722370501.