TITLE PAGE

FACTORS INFUENCING ADHERENCE TO DIET AMONG PATIENTS ATTENDING RENAL UNIT IN TWO SELECTED HOSPITALS IN ENUGU

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DEDICATION

To the highest God who makes impossible things to become possible in the life of men.

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ABSTRACT

Chronic renal disease is one of the chronic diseases worldwide now assuming epidemic proportion in the developed and developing countries. Renal diet as part of management regimen for renal diseases aims at modifying eating behaviour to relieve the kidneys from accumulating excess waste products like urea. The study was done to determine factors influencing adherence to prescribed diet among patients attending renal units of university of Nigeria Teaching Hospital (UNTH) Enugu and NEO Hospital and Dialysis Centre Enugu. Adherence is strictly keeping to specific dietary instruction given to a patient with renal disease, to eat only the recommended renal diet in the recommended proportion and regularity. Total number of 51 adults' male and female patients on maintenance dialysis for at least 2 months and above was used for this study. A descriptive cross sectional study was done and a researcher designed standardized questionnaire containing 35 items titled self-reported dietary and fluid adherence, adapted from Finchman (2005), University of Stellenbosch, Cape Town, South Africa. This was used to collect data at University of Nigeria Teaching Hospital and NEO hospital and dialysis centre; from November 2015 to December 2015. Majority (54.9%) were men and (68.6%) were married. Mean age was 48 years and (70.6%) had tertiary education while (2.0%) had no form of education. 75% were on special prescribed renal diet and 39.2% were adherent to the diet. 68.6% had spousal support enhancing their adherence and those with higher family income (47.1%) were more adherent. Age was significant at po.034>p0.05. Based on these findings it was concluded that there was impediments to adhering to prescribed renal diet. Recommendations included that patients should be properly educated on the importance of adherence to regimen and proper monitoring of renal patients should be improved on by health care providers.

CHAPTER ONE

INTRODUCTION

Background to the study

Renal diet is a set of diet guide lines for people with kidney disease, designed to help patients, eat the best balanced diet for their body (Jordan 2011; Willis, 2007). A renal diet is a specific type of restriction/elimination diet, intended to modify eating behavior to relieve the kidneys from accumulating excess waste products like urea. It allows the kidneys to devote their energy to effect repair, where possible or delay failure, thereby preserve maximal kidney function.

The diet is designed to control the amount of sodium, potassium, phosphorous and macronutrients which affects the kidney more than others; and removing those elements from the diet is the goal in the renal diet (Jordan, 2011).

Renal disease has taken a dangerous dimension such that, chronic kidney failure (crf) accounts for about 10% of medical admissions in Nigeria hospitals. (Ijoma, 2011). This means about 200-300 patients per million is suffering from renal disease. Chronic kidney disease (CKD) has assumed epidemic proportion globally. In the 2009 CKD surveillance report, the U.S. centers for disease control, found that an estimated twenty six million (11.6%) Americans have CKD (Verneda , Bosky 2012).Worldwide 300 million people suffer from CKD, while 3.4 million people died from it in 2012 (Nipro,2012).

In Sub Saharan Africa, the percentage of renal disease is about (13.9%) (Stranifier, 2014).Gunbers, (2014) stated that about 20% Nigerians are potential renal patients who may require dialysis or kidney transplant; he identified the period of developing renal disease to be during the middle age. While Bamboye (2014) estimated that one in every seven Nigerians is at one stage or another of kidney failure (renal disease) and 15,000 patients developing kidney disease every year with about 50,000 patients requiring dialysis. Unfortunately

majority of affected patients present late and die early, from uremia and cardiovascular disease. (Arongundade et al, 2011).

End stage renal disease (ESRD) is a life threatening, potentially disabling disease, with a growing adjusted prevalence rate that reached 1.500 per million Americans in 2007 (USA renal data system 2009). ESRD has reached epidemic proportion and they are more than 400,000 affected individuals in USA and well over one million worldwide. CKD is at least 30 fold higher than that of ESRD. At the current rate of growth, it is expected that the incidence rate of ESRD cases in the U.S. will be over 400,000 per year in 2030 (Collin et al, 2003)

Kidney disease is the 9th leading cause of death in United States. More than 20 million adults from 20 years plus in U.S have kidney disease unawares. Diabetes and hypertension are the two leading causes of kidney disease (DaVita, 2013).

According to Jordan (2013) when the diagnosis of kidney disease is made, the doctor places the patient on a renal diet to help preserve maximal kidney function. When placed on renal diet, with proper planning and the right mindset, adherence to renal diet will be easy. If followed in detail, a renal diet is the best approach at retaining control over one's life (Jordan 2013).Adopting intervention at early stage of ckd can save a family and the entire nation from the burden of the disease (Huda et al 2012).

In Nigeria problem of chronic kidney disease is enormous and the prevalence of kidney failure is rising. Currently, ckd is emerging as a worldwide public health problem. According to the world health report 2002, the global burden of diseases from CKD causes approximately 850, 000 deaths every year and gave rise to 15, 010,167 disability adjusted life of years. Globally, ckd represent the 12^{th} cause of death and 17^{th} cause of disability. This might be an underscore to the true picture of CKD's contribution to global burden of disease. (Ulasi & Ijoma, 2010). Kidney damage is a major determinant for the development of progression of accelerated atherosclerosis, ischemic vascular disease, and cardiovascular

death. Cardiovascular disease is a risk factor for premature death before reaching end stage. The Cost of provision of health care services for these patients is huge: cost of dialysis, transplant services, indirect cost like human resources lost at the workplace. CKD is under-recognized, under diagnosed in developing countries, patients present late or not at all to health facilities for several reasons ranging from prohibitive cost of health care services to use of alternative treatment like spiritual healing and tradition/native healers(Ulasi & Ijoma, 2010). In developing countries the available renal replacement therapies [RRT] is usually unaffordable by most patients. In Nigeria there is no social security system or health insurance scheme in place to assist the patient and the burden is borne solely by the patient and relations. (Ulasi & Ijoma, 2010). In developed countries over 2 million (12%) of world population is sustained on RRT. That is 20% in about 100 developing countries, 50% world population has ESRD which is associated with very low quality life and an average patient might be sustained on RRT for 10 years only. CKD is treated with good glycemic and blood pressure control, plus other established modifiable risk factors (Couser, Remuzzi, Mendis, Tonelli, 2011).

The incidence of chronic kidney Disease (CKD) in Nigeria has been shown by various studies to range between 1.6 and 12.4 %.The burden of renal disease in Nigeria is probably significantly higher than any previous study on end-stage renal disease (ESRD) because most studies are hospital based and did not include the patients who have no access to hospital care. ESRD among blacks in the United States and South Africa compared with other races also suggests that ESRD may be more prevalent in Africa than in the United State and other developed nations. Common causes of CKD in Nigeria, in adults are glomerulonephritis and hypertension, while common causes in children are glomerulonephritis and posterior urethral valve

In United States, diabetes and hypertension are the commonest causes of CKD. Access to renal replacement therapy (RRT) in Nigeria is limited, and mortality rates are very high, ranging between 40 and 50% there is need for development of prevention programs and increased funding to ensure increased availability of RRT. Health policies concerning CKD must be formulated, and lack of renal registry makes it difficult for this to be done. There is need for the development of a functional organizational structure for the reporting of CKD in Nigeria, in the Nigerian Renal registry (Odubanjo, Oluwasola, Kadiri, 2011).

Careful adherence to a kidney diet can lessen the symptoms of kidney failure and prolong the usefulness of the kidneys (Davidson 2007). Renal disease, both in its acute or chronic stages need to be controlled. All patients with renal disease are required to adhere to diet, fluid and medications regimen. Although technology today is increasingly efficient, the dialysis treatment does not perfectly reproduce normal kidney functions .Renal patients need to adhere to diet to avoid adverse effects of high potassium for instance ; itching, weight loss, fluid overload and bone disease (Higgins 2006).

The researcher wants to know the level of adherence, to renal diet by patients at UNTH. ItukuOzalla/ NEO dialysis center especially, on low protein, salt, and potassium restricted diets.

Statement of the Problem

The population of patients suffering from kidney diseases leading to failure is about 10% of Nigerians (Ijoma, 2011).Bamigboye (2013) lamented that the burden of kidney disease is estimated at 15,000 and new cases are diagnosed every year in the country. It is also estimated that 36.8 million Nigerians suffer from kidney disease (Obinna, 2013). In Nigeria the available resources for caring for this group of patients is very minimal .The cost of care for these patients, is quite expensive with resultant economic and social burden on the patients ,their families, the community and the nation .(Unuigbe 2013; Nalado et al 2012).

According to Davidson (2007) kidney diet research carried out by professionals in many different settings (laboratories, clinics, hospitals) researchers came up; with a set of guidelines to allow patients with kidney failure, to eat and drink in a way that helps to manage their disease most effectively. Patients who follow this diet usually feel better, and can prolong the use of their kidneys. Diet guide line is a set of diet for people with kidney disease i.e. restricted protein, phosphorus, potassium, salt and fluid to suit individual health need. (Jordan, 2011).

The researcher observed that at UNTH ItukuOzalla; dialysis patients come in with worsening kidney symptom with severe edema, extreme weakness, , grossly anemic with major complaint of anorexia ,nausea and vomiting indicating dysfunctional kidney. (Smelter and Bare,2010). Therefore, the researcher who has nursed these patients for a long time with poor outcome, wants to find out; these patients adherence behavior to their dietary prescriptions, extent and factors influencing it.

Purpose of the Study

The purpose of this study is to identify factors that influence adherence to diet among patients , attending renal units in two hospitals in Enugu ; UNTH ItukuOzalla and NEO hospital and dialysis center Enugu.

Objectives of the study are to:

1. Determine the proportion of patients who attend the renal units that adhere to the diet.
2. Determine demographic factors that influence adherence to the renal diet
3. Identify socio-economic factors that influence their adherence to renal diet

Research Questions

1.What proportion of patients who attend the renal unit and dialysis center adhere to the renal diet?

2.What demographic factors influence patients' adherence to the renal diet?

3. Does socio economic factor influence adherence to renal diet?

Significance of the Study

This study will be helpful to health professionals for better planning and organizing of dietary education/counselling activities for patients and their families; to aid quality family support thereby enhancing nutritional management and their adherence behaviour.

Results from the study will help further determine the understanding of the renal patients in planning of age specific nursing care and health education programs for patients with renal failure.

The study will contribute to the wealth of Literature on renal diet such that students, nurses and others who wish to study adherence of renal patients to dietary and other therapies can make use of.

The findings will help the renal patients to realize their limitations and deal with them accordingly to improve adherence to the regimen so as to prolong their life span.

The findings will be made available to the two selected hospital for the study and used to educate the patients at the dialysis centres and beyond.

Scope of the Study

This study is delimited to the adherence of renal diet regimen by patients attending renal unit UNTH and NEO hospital and dialysis center for dialysis.

Operational Definition of Terms

Adherence- is strictly keeping to specific dietary instruction given to a patient with renal disease, to eat only the recommended renal diet in the recommended proportion and regularity.

Renal diet- Restricted diet low in potassium, phosphorous, protein of high biological value (no plant protein) low salt and restricted fluid intake(in this study concentration is on restricted salt and protein).

Patient with renal disease –Is somebody who receives medical treatment as a renal patient i.e. has kidney disease and is challenged with not passing out adequate volume of urine or not at all in any day therefore is placed on renal substitution therapy like dialysis or conservative management using drug.

Factors-There are conditions or situation within the patient, his environment and in the regimen that will influence renal patients' adherence to prescribed diet. In this study the factors of interest include demographic, socio-economic, family support and educational background.

Renal disease- kidney disease/renal disease describes a variety of disease and disorders that affect the kidneys. Most disease of the kidney attacks the filtering units of the kidney-the nephron and damages their ability to eliminate wastes and excess fluid.

Dialysis- is a mechanical way the kidney is relieved of excess fluid and wastes from the body.

Adherence to diet:- keeping strictly to the amount of sodium, potassium, phosphorus, protein and fluid as prescribed for the individual patient by the renal dietician to lessen the symptoms of kidney failure and prolong the usefulness of the kidneys.

CHAPTER TWO

LITERATURE REVIEW

This chapter will present related materials reviewed from books, and journals published and unpublished articles from libraries and internet materials and conference materials.

The review will be presented under the following headings:

Conceptual Review,

- Concept of kidney disease
- Epidemiology of kidney disease
- Stages of chronic kidney disease
- Risk factors for kidney disease
- Burden of kidney disease
- Management of kidney disease
    - Pharmacological therapy
    - Nutritional therapy
    - Anemia treatment
    - Dialysis
    - Surgical intervention
    - Nursing management
- Renal diet
- Adherence
    - Dietary adherence
    - Factors influencing adherence (demographic, socio-economic, situational)
    - Challenges of dietary modification

Theoretical Review

Empirical Study

Summary of literature review

Conceptual Review

- **Concept of kidney Disease**

Kidney disease describes a variety of diseases and disorders that affect the kidneys. Most disease of the kidney attack the filtering unit of the kidneys-the nephrons and damage their ability to eliminate wastes and excess fluids [Smelter,Bare,Hinkle,Cheezer,2010] when the kidney becomes damaged, waste products and fluid can build up in the body, causing swelling in the ankles, vomiting, weakness, poor sleep, and shortness of breath. If left untreated, diseased kidneys may eventually stop functioning completely. Loss of kidney function is a serious and potentially fatal –condition (Johnson, 2013). Kidney disease can be acute or chronic leading to End stage renal disease [ESRD]. [Smeltzer, Bare, Hinkle &Cheezer,2010] Complications of kidney diseases include kidney failures from acute to chronic failures, anemia, cardiovascular disease, Retinopathy, brittle bones disease.

- **Epidemiology of Kidney Disease**

Kidney disease is the 8th leading cause of death in the United States [U.S] and more than 500 million adults 20years and above in the U.S have kidney disease without the awareness. Diabetes and Hypertension are the two leading causes of kidney disease [Ulasi & Ijoma 2010].

Incidence and prevalence of renal disease is increasing worldwide with End Stage Renal Disease [ESRD] now assuming epidemic proportion in the developed countries and some developing countries. [Ijoma, 2011] The trend of poverty in Nigeria makes the patient not to afford the cost of treatment. [Okoye, Oviasu & Ojogwu, 2011].

Approximately 70 – 80 % of patients with CKD develop hypertension which worsens glomerular filtration rate declines. For example; black- population of United Kingdom and Africa. [Makusidi,2014]

Africans may have higher serum levels of human leukocyte antigen [HLA]. High HLA concentration can contribute to increased systematic inflammations, which indirectly may lead to heightened susceptibility for developing kidney disease.

In Nigeria 8-10% adult medical admission into the hospital is as a result of kidney disease. This accounts for 200-300 patient per million population [Ijoma , 2011]

In Australia approximately 1.7 million [1in10] aged 18years and above have indicators of chronic kidney diseases [CKD] Such as reduced renal function and /or the presence of albumin in urine. [Kidney Health Australia, 2014]

CKD caused by hypertension has recently attracted the global nephrology community, because of its growing incidence and prevalence. The associated morbidities and mortalities and enormous health care costs of managing ESRD are major concerns [Olarewaju, 2010]. Majority of the patients die prematurely from cardiovascular disease.

The prevalence of kidney disease in the past decade; Kidney disease diagnosed with objective measures have been recognized as a major public health burden. The population prevalence of chronic kidney disease exceeds 10 %, and is more than 50% in high risk sub populations. Independent of age, sex, ethnic group, and co –morbidity, strong, graded, and consistent associations exist between clinical prognosis and two hallmarks of CKD; reduced glomerular filtration rate is a risk factor for adverse clinical outcomes and the development and progression of CKD. Increasing amount of evidence suggests that the kidneys, are not only target organs of many diseases but also can strikingly aggravate or start systemic pathophysiology processes; through their complex functions and effects on body homeostasis. Risk of kidney diseases has a notable genetic component, and identified genes

have provided new insights into relevant abnormalities in renal structures and the function and essential homeostatic processes. Collaboration across general and specialized health – care professionals is needed to fully address the challenge of prevention of acute and CKD and improve outcomes. [Professors; Eckard, Coresh, Devuyst, Kottagen & Levin, 2013]

- **Stages of Chronic Kidney Disease**

Stages are based on the glomerular filtration rate [GFR] the normal GFR is 125ml/min/1.73m^3.

Stage 1	GFR ≥ 90 ml/min/1.73m^3
	Kidney damage with normal or increased GFR [albuminuria, protein ,hematuria]
Stage 2	GFR=60-89 ml/min/1.73m^3 [albuminuria, protein, hematuria]
Stage 3	GFR=30-59ml/min/1.73m^3 [chronic renal insufficiency, early renal insufficiency
Stage 4	GFR=15-59ml/min/1.73m^3 [chronic renal insufficiency, late renal insufficiency pre- ESRD
Stage 5	GFR<15ml/min/1.73m^3 [kidney failure[ESRD], uremia,]

[Source; Smelter & Bare et al 2010 page, 1313]

Stage 1-Reduced renal reserve, characterized by 40% - 75% loss of nephron function. The patient usually does not have symptoms because the remaining nephrons are able to carry out the normal functions of the kidney.

STAGE 2 –Renal insufficiency occurs when 75% -90% of nephron function is lost. At this point, the serum creatinine and blood urea nitrogen rises, the kidney looses its ability to concentrate urine and anaemia develops. The patient may report polyuria and nocturia.

Stage 3- End stage renal disease [ESRD] the final stage of chronic renal failure occurs when there is less than 10% nephron function remaining.

All of the normal, excretory and hormonal functions of the kidney are severely impaired. ESRD is evidenced by elevated creatinine, blood urea nitrogen [BUN] level, and electrolyte imbalance. Once the patient reaches this point dialysis is indicated. Many of the symptoms of uraemia are reversible with dialysis [smelter and Bare 2004]

- **Risk factors for kidney disease**

  Risk factors for kidney disease are divided into risk factors for acute kidney disease, for chronic kidney disease and other risk factors.

For Acute renal failure: The elderly above 65 years of age. Long term health problems: kidney disease, liver disease, diabetes, heart failure, obesity. Patients acutely ill on admission in intensive care unit [ICU], being the recipient of heart surgery, abdominal surgery, bone marrow transplant [Normadin, Winnie, 2012].Health problems that decrease blood flow and cause damage to the kidneys .examples burns ,dehydration ,hemorrhage ,injury, septic shock ,serious illness, surgery. [Normadin & Winnie 2012]

For Chronic kidney disease: Is secondary to; diabetes, hypertension, heart disease, family history of kidney failure, in African Americans, Hispanics and American Indians. [Increase in diabetes, hypertension, cigarette smoking].High cholesterol, auto immune disease, obstructive kidney disease including bladder obstruction caused by benign prostrate hypertrophy [U.S department of health and human services, national kidney disease education program, 2014]

Other risk factors: Patients with arthrosclerosis, kidney stones, cancers, kidney infections, vasculitis and bladder cancer [Light, Bosky; Oluyomi2012].

- **Burden of Kidney [Renal] Disease**

The people suffering from kidney disease are faced with impaired quality and quantity of life resulting from the acute to chronic complication in ESRD and finally dialysis /

transplantation. Kidney disease causes oedema of the legs, arm, lungs (pulmonary oedema), hypertension and pericarditis. Increased potassium level in the blood stream [hyperkalemia] causes increased heart rate that can lead to death. Demineralization leads to brittle bones [fracture]. Anemia occurs due to deficient erythropoietin production; thereby necessitating substitution with injection erythropoietin. Decrease immunity, due to increasing rate of infections and morbidity. Depression and lower quality of life is inevitable. Malnourishment sets in because of rigid dietary control. Adults with CKD are prone to premature death from cardiovascular disease than in adult without ,about 16 – 40 times more likely to die than to reach ESRD [Couser,Remuzzi,Mendis,Tonelli,2011].

- **Management of Kidney disease**

The goal of management of kidney disease is to maintain function and homeostasis as long as possible. All reversible conditions identified and treated [obstruction] [Smelter, Bare, Hinkle, Cheezer, 2010] the five component of kidney disease management are; conservative management with drugs, diet therapy, treatment of anemia, dialysis and surgical intervention, [kidney transplantation] and nursing management.

- **General Guideline:**

Dietary modification (e.g low salt/ low protein), life style modification, pre-dialysis pscho education, manage anaemia, monitor nutritional status; to prevent malnutrition and obesity, manage renal bone disease and manage metabolic acidosis (Odubanjo, Olusola & Kadiri, 2011)

- Pharmacological Therapy

Anti -hypertensive drugs; Angiotensin converting enzyme [ACE] Inhibitors; and or angiotensin receptor blockers [ARBs] to reduce proteinuria and progression of CKD. Non – dihydropyridine calcium channel blockers. Lipid lowering stat in therapy example: aspirin or other low dose antiplatelet therapy.

The main cause of kidney disease worldwide is usually secondary to chronic disease entity of hypertension, diabetes and infection. Patients are placed on hypertensive drugs, diabetic drugs, antibiotics, and diuretics, iron supplement to help treat symptoms and complications and slow down further kidney damage.[Courser et al, 2011] The anti –hypertensive B/P target is usually 130/80mmhg or 125/75mg. If there is proteinuria: of>1g/day. Drug of choice may include; tab lisinopril [or any ACE inhibitor] tab valsartan [or any ARBs] ∝methyldopa; hydrochlorothiazide etc. Diuretics to alleviate fluid retention; tablets/injections frusemide, tablet metholazone. Gut protection with tablet ranitidine, tab omeprazole or any proton pump inhibitor .Electrolyte imbalance; e.g. hypocalcaemia treat with calcium carbonate injection /tablets. Anemia; injections iron sucrose, erythropoietin, etc.

- **Nutritional Therapy:**

Goal of nutritional therapy is to prevent accumulation of excess fluid/waste products in the body; to reduce stress on the kidneys.

Acute Renal Failure [ARF] causes nutritional imbalance [nausea, vomiting] impaired glucose use and protein synthesis, increased tissue catabolism. Patient is weighed daily and can be expected to lose 0.2 to 0.5kg daily if nitrogen balance is negative [below caloric requirement] Dietary protein –limited to 1g/kg during oliguria phase to minimize protein breakdown/accumulation of toxic products. High carbohydrate meal, given to meet caloric requirement. Restricted fluids and foods containing potassium or phosphorous. [Banana, citrus fruits and juices, coffee] potassium intake restricted to 40 -60 meq/day sodium intake restricted to 2g/day. Oliguric phase may last10-20 days followed by diuretic phase. [Kidney function is returning] close monitoring of electrolytes/body fluid and proper parental replacement. After diuretic phase, patient is placed on high- protein, high caloric diet and excess fluid and other electrolyte disturbances treated with dialysis [Smeltzer and Bare et al 2010] Low sodium foods, meals are cooked with herbs and spices to season the food while

avoiding salt. Low phosphorous foods: apples, grapes, cabbage and strawberries.[ARF] .Low potassium foods: Dieticians adviced on quantity [Palmer,2014]

For Chronic Renal Failure [CKD]

Dietary intervention is important because of impaired function. Careful regulation of protein, sodium, potassium, to balance losses and fluid intake to balance fluid losses, is done. Protein of high biological value, [dairy products, eggs, meat] is recommended. Fluid allowance: -is 500-600 more than the previous days 24 hours urine output.

Calories – carbohydrate and healthy fat is required to prevent wasting. Vitamin supplementations are important especially for dialysis patients who loose- water soluble vitamins from blood during dialysis treatment. [Smelter et al 2010]. Dietary advice depends on review by the doctor of the patient's laboratory results. Restricted diet improves symptoms of advanced disease e.g. nausea and prevents serious complication of CKD like he artattack and bone deterioration. Protein: ESRD patients on dialysis, increased protein are advised because dialysis removes amino acids from the blood. Post-transplant patient eat extra protein for speedy recovery. Avoid /limit intake of food high in potassium; carrots, oranges, milk and banana, milk product, potatoes, tomatoes. Phosphorus-beer, oysters, legumes, egg yolk, cheese, yoghurt, beans nuts. Sodium: limit table salt, soy sauce, avoid canned soups, most frozen meals, chips and salty snacks. Fluid intake –restrict fluid intake to a particular limit. Food such as ice cream, water melon high water content is factored into the patient's total daily intake. [Zirker, 2014]

- **Anaemia Treatment:**

Reduction of hemoglobin level occurs for a variety of reason. Approximately 90% of the hormone erythropoietin is produced by the kidneys. When there is hypoxia in the kidney it causes an increase in the production of erythropoietin, which subsequently stimulates

erythropoiesis. The kidney, in turn, senses increased oxygenation because of the formation of the new erythrocytes and decrease erythropoietin production. As functional renal tissue declines in patients with CKD, the body is unable to produce adequate amounts of erythropoietin in response to hypoxia in the kidney

In CKD, there is platelet dysfunction, giving rise to increased risk of gastro intestinal bleeding, shortened erythrocyte survival time [30-60% of the normal 120 days] and haemolysis secondary to uraemic toxin accumulation occurs. In patients receiving haemodialysis treatment, chronic blood loss resulting from frequent laboratory studies, loss of blood in the dialysis tubing and dialyzer after each hemodialysis treatment result in reduced HB values. Finally; malnutrition and deficiencies of iron foliate, and vitamin B12 have been found to cause a reduction in haemoglobin concentration. Impart of anaemia on the patient includes fatigue, dizziness, shortness of breath; anaemia causes more severe problems-cardiovascular complications: left ventricular hypertrophy and congestive heart failure. In diabetic patients anemia has led to decline in kidney function. When anaemia is properly treated it results in improvements in exercise capacity and endurances, energy, physical mobility, and patient's satisfactions evidenced by higher quality of life scores, improved sexual function, better cognition, less depression, better socialization .In non-dialysis patient stabilization, of renal function has been associated with treatment of the anaemia of CKD. Finally treatment of anaemia has been shown to reduce hospitalization and mortality rates. Injection erythropoietin 4,000 international unit, given once weekly; for non-dialyzing patients .Peritoneal dialysis patients= once weekly. Haemodialysis patients= thrice weekly. Darbepoetin -longer serum half-life than epoetin alpha, initiated once a week. Patients not on dialysis, once every four weeks 250-375mg, infused over one hour. [Lindberg, 2010].

- **Dialysis :**

According to Berman, Synder, Korzier & Erbs, [2008] dialysis is a technique by which fluids and molecules pass through a semi permeable membrane according to the rules of osmosis. The most two common methods of dialysis are haemodialysis and peritoneal dialysis.

Hemodialysis: (HD) is extra-corporal

In hemodialysis, is an external technique whereby the patients' blood flows through vascular catheters, passes by the dialysis solution in the dialyzer attached to the dialysis machine externally and then returns to the patient. Is a form of treatment which attempts to clean the body of toxic wastes; It tries to do what the healthy kidneys used to do, but in an artificial manner [http://www.kanti.com/kidney.htm] otherwise is a procedure that is a substitute for many of the normal duties of the kidneys. Dialysis is a mechanical process using a machine to remove waste/excess water from the body across a semi permeable membrane by osmosis, diffusion and convention in the dialyzer. Hemodialysis is the major treatment for renal failure globally.

Peritoneal dialysis (Pd) [intra-corporal dialysis]

Is an internal technique for blood purification it uses the heart as blood pump, peritoneum as dialyzer, no machine technique, heparin is not needed as in HD. Dissolved substances [electrolytes, urea, glucose, albumin and other small molecules] are exchanged from the blood].Through a small, peritoneal catheter (Berman, Synder, Korzier&Erbs2008)The dialysate fluid pulls the waste and extra fluid from the patient's blood into the peritoneal cavity and dwells in the abdomen for a specified duration of time once the dialysate is drained, and fresh dialysate is replaced to clean the blood. This procedure could be continuous ambulatory peritoneal dialysis [CAP] done about four times daily. Automated peritoneal dialysis [APD] or continuous cycling peritoneum dialysis [CCPD] usually preferred, patients can comfortably have dialysis at home during sleep. [Odubanjo, 2011]

- **Surgical Intervention: Kidney Transplant:**

Is the major replacement therapy for patients that have kidney failure .Kidneys are extracted from life donors or from cadaver donor. The diseased kidneys are left intact. The donated kidney is planted at the lower cavity and connected to the ureter.

- **Nursing Management:**

Nursing management is done effectively using nursing process. Assessment is done using 11 Gordon's functional typology. Health perception/health management pattern, nutritional /metabolic pattern, elimination pattern, activity exercise pattern, sleep/rest pattern, cognitive perceptual pattern, self –perceptions/ self-concept, patient's feeling about self. Role relationship pattern, sexually /reproduction pattern, coping/stress tolerance pattern, value belief pattern. From the above, nursing diagnosis is derived and action plan made to provide best nursing intervention to the patient at the clinic, hospital and home/ continuing care to enable the nurse assess home environment, evaluate patients adherence to prescribed regimen:-drugs and diet ;asses the patient's ability to cope with lifestyle changes, assess patient and family knowledge of medications and complications/side effects, provide opportunity to reinforce learned information, to direct patient to community resources like pulmonary rehabilitation programs and smoking cessation programs, opportunity for enhancing health promotion activities.

- **Renal diet:**

Renal diet of various dimensions is for individuals with kidney diseases. Good dietary regulations help to maximize the remaining ability of the kidneys to filter and excrete toxins in the blood, without straining the kidneys. When the kidneys loses over 85-90% of their functions, treatment options becomes very specific and the renal diet becomes even more tightly controlled [Munuo, 2014] the nutrition needs of the CKD patient changes as the stages

of the disease progresses. This affects the way in which the patient metabolizes protein water, salt, potassium, phosphorous and carbohydrates substrates [Munuo, 2014].

Protein requirement are based on body weight and degree of renal failure. O.6g/kg body weight [B.wt] for adults. O.8g/kg [B .wt.] can be prescribed earlier in chronic renal failure when creatinine levels are still below 500mmol/litre [k/DOQI NKF, 2002] 40gm protein in an adult of unknown weight. 65 -75% of total protein of high biological value [HBV] example eggs, meat, poultry, milk and fish. Proteins of high biological value are essential because total protein intake is restricted. Adequate protein levels helps maintain –fluid balance, healing, skin integrity; immune function [NKF, 2000].Intake of protein rich foods is controlled to reduce production of nitrogenous waste products as well as maintain positive nitrogen balance [k/DOQI NKF,2002].

The diet is designed to maintain optimal nutritional status and energy. Other foods are stepped up to compensate for the restricted protein; from carbohydrates and fats to increase the caloric intake and minimize breakdown of body protein.

Daily recommendation for patient's<60years -35kcal/kg/day, ≥60 year -30-35kcal/kg/day [K/DOQI NKF, 2002. [Munuo, 2014]

Fluid consumption restricted to 1,000- 1,500 ml per day to avoid congestive heart failure, pulmonary edema, hypertension, pedal edema.

Kidney failure results in high level of phosphorus in the blood disrupting calcium/phosphorous balance. The adverse effect can lead to metastatic calcification (soft tissue calcification), secondary hyperparathyroidism, and renal osteodystrophy.

Recommended Daily Intake -800-1000 mg/day. (Haemodialysispatient). -1200mg/day (peritoneal dialysis patient)(NKF/DOQI, 2003).

Foods rich in calcium should be avoided because of its high phosphorous content (Munuo, 2014). Potassium restrictions are determined by the level of potassium in the blood, type of

dialysis, medications and residual renal function. Patients accessing haemodialysis recommended dose is 2000-3000 milligram/day (to prevent hyperkalemia between treatments). Peritoneal dialysis patients – more potassium intake, is recommended because most is lost in the dialysis solution during exchange (Munuo, 2014).

Restricted potassium diet; Reduce intake of all fruits to one or two servings. Boil vegetable and potatoes in large volume of water for about half an hour, discard water and change new one before eating.(Munuo, 2014). This is to reduce the level of potassium in the food. Patients are advised to avoid food high in potassium; nuts, bananas, honeydew, beans, chocolate, and coffee, ice cream (Joshi, 2010).

Reduced sodium intake is to prevent hypertension, congestive heart failure, pulmonary edema etc. It reduces thirst and therefore maintains acceptable fluid balance.

Recommended Daily Intake: = 1000-3000mg/day (for hemodialysis patient).Recommended Daily Intake: 2000-4000mg/day (for peritoneal dialysis K/ DOQI, 2007).

Patients are advised to read the content of what they eat. To identify and avoid high sodium content foods; cheese, soups, snacks, canned foods, fast foods, smoked foods, ham, bacon, luncheon meats (Munuo, 2014). Dialysis patients are given B-complex supplementation and vitamin C, folic acid, vitamin D, Iron supplement determined by the blood chemistry results in dosing. Vitamin A is not given because is a high molecular protein and is not dialyzed out during dialysis and the kidney cannot excrete it out. (Munuo, 2014)

Table 1: Nutrient Recommendation for Patients on Dialysis.

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

Source: Brown et al; 2010.

Nunes, Anderson, Greene, Ikizler, Granaugh,(2015). In their study of a novel screening tool measuring dietary sodium knowledge in patients with CKD revealed that reducing dietary sodium, has potential benefits with chronic kidney disease (CKD) by preventing cardiovascular events and reduces hypertension and proteinuria associated with kidney failure. They surveyed 155 candidates using a short sodium knowledge survey (SSKS) package developed and administered to pre-dialysis CKD patients. They were asked if they received counseling, on dietary sodium reduction and about recommended intake. They examined sodium knowledge and the characteristics of the patients who answered the SSKS questions correctly were compared to those who did not to draw the above conclusion.

Every individual with kidney disease is unique, and treatment is very individualized based on the cause, stage of progression, other co-existing health conditions, and medications. At the earlier stages some can manage their condition with diet, exercise, medications [Munuo,

2014] Dietary modification is essential in individuals with kidney diseases and the nutritional recommendations vary depending on each patients stage of progression, cause of disease and other treatment methods [Munuo,2014]. Nutrition plays an important role in the treatment of many chronic diseases, but uniquely to CKD. Nutritional therapy allows good control of several consequences of the disease and has therefore the same clinical relevance as other types of medical therapies (Munuo, 2014).

The risk of malnutrition (MN) increases as CKD progresses and often, many patients are malnourished by the time they start dialysis. Studies have shown that as many as 78% of dialysis patients do not comply with diet restriction, though such adherence has demonstrated a decrease of risk symptoms and medical complications and increase in quality of life (Munuo, 2014). Further, studies has shown that MN rates are between 28- 48% in pre dialysis patients or those at CKD stage 1-4 (Munuo, 2014) and as many as 50% of patients with ESRD may be malnourished (Munuo, 2014) MN maybe caused in part by inadequate nutritional management of the patients during pre-dialysis phase. Treatment goals require that the best possible nutritional statues be established and maintained, and that a nutritional plan, which the patient can accept and adhere to be created.(Munuo,2014).

- **Adherence**

Adherence is the extent to which a person's behavior [e.g. Taking medications, following a diet ,and/or executing lifestyle changes] corresponds with agreed or prescribed recommendations from health-care providers [Burrowes ,2013].Adherence is the single most important modifiable factor that compromises treatment outcomes. It is also a primary determinant of the effectiveness of treatment because poor adherence attenuates optimum clinical benefit. The best treatment can be rendered ineffective by poor adherence. [Burrowes, 2013].

Adherence is necessary for optimal health and well-being. Adherence is collaboration between the patient and the treatment provider. [Higgins, 2006].

Palmer, Hanso, Russo, Craig, Strippoli, Campbell, Johnson, Tong (2014) in their qualitative study Dietary and fluid restrictions in CKD;A thematic synthesis of patients views from qualitative studies at the department of medicine ,university of Otago Christchurch ,New Zealand they noted that adherence to dietary regimen of CKD is challenging due to the burden of constant choices about food and drink, the adaptation to complex eating patterns, existing cultural practices and the competing demand of CKD is challenging due to the burden of constant choices and competing demands of CKD and related illness. While interventions are considered central to the management of CKD, health professionals cite insufficient time to implement recommendation and inclusion of patients experiences, and perceptions of dietary treatments in CKD guidelines is limited.

- **Dietary Adherence**: Adherence to diet prescription is critical for successful management of CKD. Poor adherence exposes patient to complications e.g. fluid over load, hyperkalaemia, hyperphosphatemia, malnutrition, patient-practioner relationship hindering quality care rendered. Patient with CKD do have co-morbidities e.g. diabetes, cardiovascular disease which may complicate treatment measure leading to poor treatment outcomes. Poor adherence leads to wastes in health care resources, expenditure, increase morbidity and mortality, poor adherence might be undetected except a patient reports himself or through laboratory results

Factors influencing adherence

Demographic factors: gender, age, marital status, religion, tribe, level of education, occupation

Socio-economic factor: that affects adherence is due to poverty, illiteracy, poor educational level, unemployment, lack of effective social network, unstable living conditions, travelling a

long distance to and from the treatment centers, high cost of medication, cultural and lay belief about illness, treatment. Burrowes, [2013] confirmed that factors that may influence adherence include social support from family and / or care givers and the health practioners, knowledge of the patient's culture, food habits, beliefs, and practices. While inhibitors of dietary adherence include the patient's lifestyle, attitudes towards the disease, socio – economic status, and cultural barrier

Evidence suggests that individual's perception about their situation will determine whether they will adhere to medical regimen. This highlights the need for nurses to help patients to articulate the meaning that they ascribe to their illness. [Higgins 2006] For, a positive outlook, in their disease state. Locus of control [LOC] is the way a person perceives their ability to control their lives. Internally oriented patients are more likely to take responsibility for and place a higher value on health than externally orientated patients. [Higgins, 2006.]

Situational factors include: Inability to accept limitation of diet. Consumption of food, in private or public .Consumption of food or fluids by others at home, in restaurants and entertaining guests. Multiple prescriptions; under-dosing, over dosing, missingmedications [Higgins,2006].

Challenges of dietary modification.

Interference roles with– patients especially the dialyzing ones experience challenges with their roles with others. They felt infantilized and scolded about their diet. Family members policed their diet intake and search them to find out any hidden food. Dialysis patient receive so many advice. (Palmer et al 2014).

***Social limitation* –** Dialysis patients avoid social events for privacy to avoid stigmatization or rejecting food & drink offered which might offend their hosts; while others drink & eat normally to cover up and suffer later. Food restriction especially salt might be seen as poverty amongst Bangladash immigrants in United Kingdom. (Palmer et al 2014).

Being a burden- some dialysing patients depend on family for preparing their meals in accordance with their dietary restriction. They felt guilty of the new menu for the family, while Bangladash women felt it will cause rejection. Some patients maychoose to adhere to diet to achieve quality life and not become a burden to their family, wasting nurses and Doctors time.

Feeling deprived- In addition to experiencing severe illness, diet and fluid restrictions is seen as deprivation, patients see diet as being imposed on them and made difficult to accept, felt food is blank & tasteless, life pleasure is removed. Dialysis patients see it as having a meaningless existence (Palmer et al 2014). Some had hope of a better life after transplant .Patients feel happy when restriction on diet is removed.

Disrupting held truths-Some patients disliked restricted diet as some traditional foods were left out. [Palmer.et al, 2014].

Breaking habits and norms- usual diet habits, exercise on daily basis was affected causing anxiety some admitted forgetting the dietary recommendation, due to the change in their routine.

Overwhelmed by information- when learning about diet management, many information differed from their cultural background or existing food preference, unfamiliar foods, Comorbid conditions (D m, heart disease) led to conflicting advice. Patients prefer to be taught by the renal dietician. Kidney transplant patient questioned appropriate ways to follow dietary freedoms in a healthy way (Palmer, 2014).

Negotiating priorities-patients struggle with making choices between getting pleasure from food and fluid versus staying in control and keeping well. Some that cheat on their diets claim to eat in moderation, others eat a little bit of none recommended diet in secret, while others see it very important to stick to the diet.

***Resisting impositions* –** some patients may feel that dietary advi**ce** was unreasonable when advised to eat ½ bananas not to finish it.

***Mental invasion* –** compulsive thoughts about fluid provoked "mirages" that made them look for water even when it was not present.

***Withstanding physiologic needs* –** food and water are very essential. Patients may not conceive of how medical advice leading to dehydration could be beneficial. Dietary restrictions were both "fighting nature" and "fighting against themselves against thirst or appetite. (Palmeret el, 2014).

Problem Solving; Optimizing Health in renal diet adherence

***Accepting responsibility* –** Adherence to diet and fluid restrictions became more manageable when patients learned to accept responsibility for their treatment and recognized the potential consequences of their behavior on their future health. They made adjustments in food, fluid tolerance and new diet was no longer a challenge.

Valuing self- management- some patients discovered diet, fluid advice is an integral part of caring for themselves to feel better, some even became diet/fluid counselors to colleagues to improve quality of life based on their own critical experience dealing with fluid overload (Craig 2014) while some gained confidence in their own dietary control by regulating their diet according to blood test results.

***Preventing CKD progression* –** some patients found out comprehensive guidance about how to prevent the progression of their disease and regretted not taking heed of dietary advice in order to have slowed down the rate of their CKD progression.(Tong , Sainsbury , Chad ban , 2009)

Preparing for transplant; and protecting a transplant – Accepting and keeping dialysis appointments to prepare for transplant is a motivation to keep them healthy. When there is no hope of transplant, is equivalent to giving up hope. (Palmer, 2014)

Kidney transplant recipient adhered to diet to avoid rejection.

Comprehending paradoxes – patients who had adapted learnt how to incorporate complicated dietary ideals into their lives. Their new conception about their diet and fluid guidance made it become part of them. Some of them were confident to share their experience.

Finding solution – some dialysis patient bought books based on their diet, read labels of food to identify sodium-free products. Learnt more about content of food, regular visits to their renal dieticians, and associate with their peers to build confidence. They advocated for their care givers to be part of education sessions and also a repeated problem-solving approach rather than didactic teaching methods when learning how to manage their food intake.

Mastering change and demands- Gaining and keeping control over diet and fluid was one way of achieving quality life.

All end stage renal disease (ESRD) is marked by extreme loss of personal control , an array of acute and chronic stressors , emotional distress, and the challenge of lifelong behavioral change (Kara et al 2007).

When renal function ceases, fluid, metabolic toxins, electrolytes accumulate in the blood and body tissue causing harm. The treatment of ESRD majors on replacing lost renal functions and consists of several component: a dietary prescription composed of fluid, mineral and foodstuff restrictions and extensive use of medications, and dialysis treatment. Dieticians describe the renal diet as the most restrictive for any patient group, and many restrictions contradict current recommendations for healthy eating current renal replacement therapies include a number of dialysis treatment alternatives or renal transplantation. Generally choice

of a particular treatment is influenced by non-medical factors such as patient and provider preferences and judgments about which modality is likely to be most favorable for the patients adherence, quality of life (Lindberg, 2010)

Theoretical Framework Related to the Study

THE THEORY OF REASONED ACTION(TRA)

This is one of the adherence models developed by Martin Fishbein and IcekAjzen in 1967. Theory of reasoned action (TRA) is based on the relationship that exist between attitudes and behaviors within human action. (TRA) is critically concerned with behaviour) the TRA is used as a predicator of how a person will behave based on his / her underlying attitude and behavioural intention. Therefore, a person's decision to take a particular action will be determined by the anticipated result of his action. The theory gives insight into an individual's voluntary behavior following a motivation to perform an action with the expectation of achieving a specific outcome. It reveals that stronger intentions leads to increased effort to perform the expected behaviour which will also increase the likelihood for the behaviour to be performed. The individual's judgement whether the behaviour is good or not is determined by two behavioural beliefs (i) beliefs about the outcome of the behaviour, and (ii) evaluation of the expected outcome (is the outcome rewarding) example, a person have the attitude that ''exercise is a good thing to do? : Which may have developed from the belief that ''exercise can help prevent heart disease and make me feel good" and the evaluation that "I don't want to develop heart disease" and "I want to feel good."

Two factors are involved in TRA (1) Behavioural intention which is a function of (a) attitudes and (b) subjective norms which combines to produce the intention, which leads to the performance of the behaviour. Thus, attitude generated from their belief are likely to produce the intention to exercise, which will lead them to, in turn do it.

TRA proposes beliefs are affected by a variety of factors such as age, gender, education, social class, and religion and personality traits.

Fishbien and Ajzen pointed out attitudes have two components; the evaluation and strength of a belief, while subjective norms have two components; normative beliefs (what others expect me to do) and motivation to comply (how important it is to me to do what I think others expect). The attitude and subjective norm to be achieved there are conditions that come into play (i) measure of intention must correspond with respect to their levels of specificity that is to predict a specific behaviour which must be equally specific (ii) stability of intentions between time of measurement and performance of behaviour. Intention must remain the same between the time given and the time the behaviour is performed. (iii) the degree to which carrying out the intention is under the volitional control of the individual, because the individual is solely responsible for performing the behaviour or not. The above conditions has to do with the transition from verbal to actual behaviour.

The factors from age, religion etc. indirectly determine the behaviour because she believes that performance will lead to more "good" than "bad" consequences and / or because she believes that most of her important others (i.e. the individual she wants most to comply) with thinks she should perform that behaviour. Fishbein (1980)

Ajezen and Fishebien (1980)in the study of a weight loss programme determines specific acts for diet and exercise, as well as a general measure to lose weight and general measure to engage in dieting and exercise by rating the degree of their intention to engage in exercise were both related to specific behavior. Also dieting aided weight loss and was a significant predicator of weight loss, although exercising was not.

Application of the theory to the study

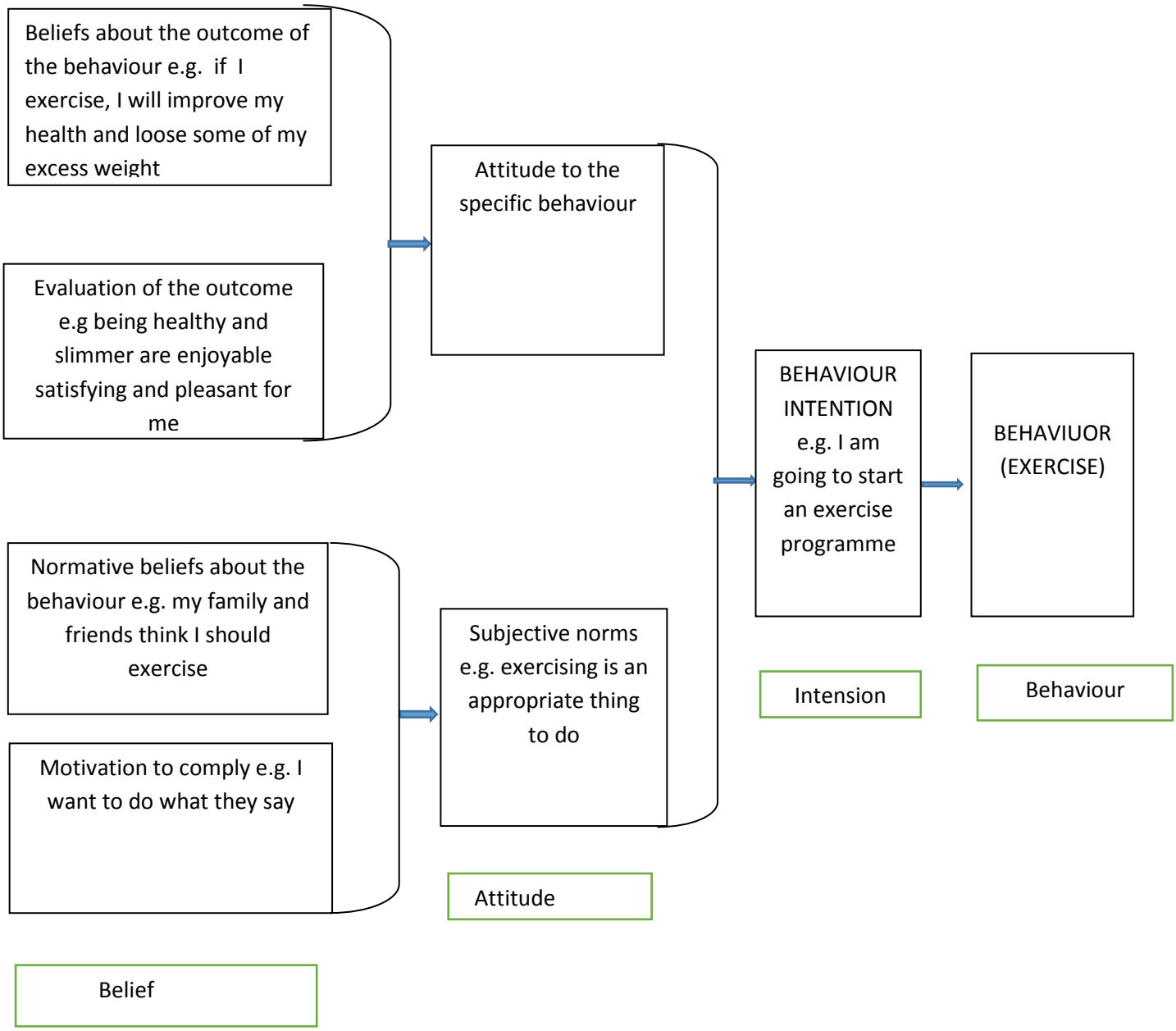
To relate TRA to this study, patients who are diagnosed of renal failure with symptoms of anorexia and nausea, vomiting, insomnia, excess fluid volume and poor quality life will under the concept of TRA attitude and subjective normspredict behavioural intent that makes it possible for them to accept a change of attitude to a new prescribed diet. For instance, a renal patient after being exposed to the health education on importance of renal diet; may want to adhere to his prescribed diet, but may eventually not reason so especially his young adult friends may convince him that man must surely die. Whether they adhere or not so why not enjoy life and eat what you desire now you are still alive. The question will for him be; Do I adhere or not? Another example, of how attitude leads to dietary adherence is if there is money to prepare a separate pot of food recommended, but if there is lack of money it will prevent the formed attitude from being practiced.

This model used for this study focuses on the individuals' acceptance of current state of health; and his change of attitude about life and diet as influenced by the significant others in order to achieve a prolonged and a more quality life.

The relationship of normative belief and adherence to renal diet is that a renal patient may wish to strengthen his persuasion to adhere for example, strengthening the encouragement of the relatives that he needs to live to train his children hence making him adhere to his diet to be able to live. While it may also oppose the relationship with people who do not make you adhere to the diet, asking

THE THEORY OF REASONED ACTION

Fishbein and Ajazen Adapted 1985



Empirical Review

There are a lot of researched works on adherence: adherence to the restricted protein diet advised to non-dialyzed chronic kidney disease patients; depressive symptoms and dietary adherence in patients with End-stage Renal Disease; Hemodialysis patients' adherence to a strict diet, fluid and medication regimen etc.

Nwaokoro et al, (2013) carried out a descriptive study with 37 patients using structured questionnaire to assess the knowledge of CKD patients about dietary management and factors influencing it at the OUATHC, Ile Ife, in Osun State. They discovered that 78.4% of the respondents knew the importance of the dietary management but only 67% of them were aware of the actual recommended limits.81% of the respondents agreed to having been counselled by a medical professional on dietary management .Family support 61% and non-palatability of food 69% were reported as the major factors influencing compliance to dietary management's .They concluded that educating these patients with available local food will help achieve a positive change of behavior. Dietary therapy is a contemporary therapy besides routine treatments, and has been known to reduce the progression of kidney disease.

Avesani et al (2012) in their study: Adherence to restricted protein diet advised to non-dialyzed chronic kidney disease patients. They found out that adherence to restricted protein diet is low and needs to be improved. There are few studies devoting attention to the role nutrition education program play in CKD patients. These studies showed positive results, with improvement in nutritional status, lower CKD parameters and better adherence to the low protein diet. Therefore, nutrition is a vital parameter in CKD management.

Lamidi et al(2015) carried out a retrospective study on the impact of structured dietary program on attitude to dietary prescriptions and compliance among in-patients at kidney center Ondo ,on a total of eighty eight in patients admitted between March and November 2014.(9 month period).forty five (58.4%) had a poor attitudinal score to healthy diet . The

most frequently prescribed diets for in-patients were low salt (97.4%), low protein (77.9%), high protein, (3.9%) and trace protein (7.8%) diets. Tolerance rate, compliance rate and adjustment rates were 83.1%, 89.6%, and 89.6% respectively. They concluded that the general attitude of patients to globally accepted healthy diet was found to be poor. The use of structured dietary program in the care of renal failure patients contributed significantly to attitudinal change of in-patients to healthy diet, improved tolerability and compliance. Dietary assessment, counselling, dietary adjustment, regular monitoring and conferences with the nephrologist and nurses, dietician were the main components of structured dietary program employed to ensure compliance and tolerability.

Morale et al (2015) in their study determination of factors conditioning adherence and accomplishment of renal protection diets in patients with chronic renal failure: pilot study for the elaboration of dietary guide. The study by means of a previously validated questionnaire, which are the psycho- sociocultural factors that affect, and to what extent, assumption and adherence to the dietary therapy while determining the degree of disease perception and several factors related with it. The study; using 81 patients, from the nephrology clinic of the "12 de Octubre "hospital of Madrid, with CRF in a pre-dialysis status. 59.26% feel a high level of familial support, and 35.77% alter dietary behavior when environmental conditions change. Most of the interviewees (87.65%) do not have difficulties finding the prescribed foods, and 70.37% considers their cost is not excessive. For most half of the patients (48.76%), renal protection diets represents a variation of their dietary habits, a similar percentage expresses difficulty with elaboration. Food palatability is not a problem in 67.90% of the cases. 51% does not perceive difficulty with cooking procedures. 70.9% feels support in one way or the other, by health care staff, although just 56.79% reports that the diet has not been explained to them. Only 18.51% questions the diet's effectiveness as regards to their disease course. As far as gender variable, there were significant differences ($p<0.05$),with a

higher influence on men in sections relating to apathy and family support, the women having the highest scores for food management, diet transgression at family meetings, and less information received about the prescribed diet. On family support there are significant differences only by age groups, patients more than 65 years needs more psychological support. Another group with < than 25mls/min [GFR] are the one expressing; less categorically their appreciation on diet effectiveness.

Factors that may affect adherences: Environmental changes, change in traditional habits, degree of diet explanation, organoleptic characteristics, and the lack of knowledge of appropriate cooking procedures. All these indicators confirm the need for enhancing nutritional education of their patients and family environment, also showing the need for nutritional intervention that completely supports patients in the process of adaptation and maintenance of their new dietary habits.

Avesani et al (2013) carried out a study asking: Can renal nutrition education improve adherence to low-protein diet in patients with stage 3-5 chronic kidney failure disease? This was a randomized controlled clinical trial conducted at the CKD outpatient clinic at Pedro Ernesto University Hospital , Rio de Jeneiro, Brazil, using 89 patients who had received their first referrals to a renal dietician and with an estimated glomerular filtration rate (eGFR)<60ml/min/1.73m^3. 46/89 of normal counseling,43/89 intense counseling. The number of patients who adhered to a low-protein diet was high but did not differ between groups (in the last visit 69% vs.48%; P=48; intense vs. normal counseling, respectively). The reduction in protein intake from base line was greater for intense counseling group compared with normal counseling group (at the last visit,-20.7/day (-30.9%) vs -10.5g/day (-15.1%), intense vs. normal counseling, respectively; P=.04)

They concluded intense nutritional education led to reduction of protein intake in the stage 3-5 CKD over and above our standard dietary counseling, therefore highly effective in increasing patient adherence to protein intake recommendations.

Lopez, Burrowes, Gizis, Brommage, [2006] carried out a cross sectional study using a descriptive –comparative design to identify the factor that influence dietary adherence between Hispanic and non –Hispanic patients at the haemodialysis centers at Winthrop – University Hospital, New York. A total of 17 adults from each group; having dialysis thrice a week: for 3 months with an equal number of age-and sex-matched of both group. Information was obtained by a questionnaire about knowledge of the diet, preferred language for education, consumption of potassium-[k[t] and phosphorus-[P0 [4] containing foods, and adherence attitudes and behaviors'. Serum albumin [SA1b].K [+], and P0 [4] for the past 3 months were obtained from medical records and evaluated to asses dietary adherence. The main outcome measure was a mean SA1b of 3.2g/dl or greater, k [+] of 5.5meq/l or less, and P0 [4] of 5.5mg/dl or less.

Both groups adhered to diet because their mean levels of SAIb, k [+], and PO [4] were within acceptable limits. Dietary adherence was observed in 76%, of the Hispanic patients for SA1b, 88%, and 76%, respectively, for the comparison group. Both groups were adherent to the restrictions of the renal diet, more patients from both groups were adherent to k [+] than P0 [4] restrictions. Among the factors that probably influenced dietary adherence to the renal diet, where some socio economic status, family support, patients' education involving the family members with their local language.

Wachukwu et al (2010) in their study pattern of serum uric acid concentration and it's correlated in young adult Nigerian: University of Port Harcourt Teaching hospital. Their subjects were undergraduates of the University of Port Harcourt. Males comprised 218(72.7%) while 82(27.3%) were females. The aim of the study was to detect only

modifiable factors of CKD in population groups and early intervention is the most plausible strategy to possibly prevent CKD and therefore reduce its prevalence. Hyper uricaemia and high-normal serum uric acid level have been linked to cardiovascular disease, hypertension, renal disease and metabolic syndrome and recent study showed that treatment with allopurinol slowed the progression of renal disease and reduced the risk of cardiovascular events in patients with CKD. Tested variable revealed only body weight ($r=0.145$, $p=0.012$) and BMI ($r=0.139$, $p=0.016$) had significant positive correlation with serum uric acid.

Chan et al (2012) in their study, determinants of compliance behaviours among patients undergoing Hemodialysis in Malaysia.

Found positive correlations in perceived barriers contributing to non-complaint to treatment regimens were identified. A total of 86.2% of the subjects admitted compliant to fluid prescription was the most difficult and challenging aspect, especially during hot weather while 72.9% reported difficulty following their dietary prescription. The need to change eating habits and inability to resist favourite foods (88.1%) and the highly complexity of dietary recommendations (87.0%) were the major factors. There were 12.2% of the subjects admitted having difficulty to comply with dialysis attendance attributed by financial constraint and lacks of transportation facility.

- The results suggested that subjects who were employed were more likely to be non-compliant to dietary and fluid restrictions. Longer dialysis vintage was associated with poorer compliance on fluid ($r = 0 – 0.410$, $P < 0.01$).
- End stage renal disease patients may be more eager to change their dietary habits to meet the requirement of a newly received lifesaving hemodialysis treatment. However as time passes, these patients may feel bored and easily frustrated with the need to comply with long lists of dietary and fluid restrictions. Patients new to dialysis treatment may also receive more social support and therefore higher degree of

compliance is expected. However, over the long run, it may be difficult for patient to resist wide variety of food available. Health care professionals should recognize that the perceived barriers to compliance vary according to types of treatment.

- Kim et al (2011) in their study relationship between illness perceptions, treatment adherence, and clinical outcomes in patient on maintenance Heamodialysis. Using 151 patients from (8) outpatient dialysis centers in Los Angeles, California about two-thirds (68.2%) of patients claimed to be adherent to their dietary restrictions during the previous week, and the measured ESRD AQ mean score of 154.97± 48.56. Most of them were knowledgeable and are aware of the importance of dietary recommendation .57.6% had difficulty following their dietary prescription, just could not accept to restrict because of inability to resist favourite foods (56.3%)

Ninety-five percent (95%) of patients were aware of the importance of fluid restrictions because of knowledge and awareness.

- Moonaghi; et al (2012) in their video based education and haemodialysis study where mean age of the subjects was 49.8(11.6%) years. 60% percent were men and 78.7% of them were married, 57.4% had just primary education and 30.7% of them were house wives. The average income of subjects was 345.8 dollars. A 75.1% of the people had social security insurance. Eighty-four percentage of them underwent dialysis 3 times a week. The mean duration of haemodialysis of subjects was 3.4 (2.6) years and mean dialysis adequacy was 0.48(0.18). For the majority of subjects duration of a dialysis session was 4hours (94.6%).
- Zrinyi et al (2015) in their study Dietary self-efficacy: determinant of compliance behaviours and biochemical outcomes in haemodialysis patients found that dietary self-efficacy capabilities was positively linked to the age of the respondent ($r = 0.22$; $P = 0.25$); older people exhibited more efficacy than the duration of therapy.

- Lam et al (2010) in their study self reported adherence to a therapeutic regimen among patients undergoing continous ambulatory peritoneal dialysis. Patients perceived themselves as more adherent to medication (83%; 95%) confidence interval 77-88%) and dialysis (93%; 95%) confidence interval (88-96%) than to fluid (64%; 95%) confidence interval 56-71%) and diet (38%, 95%) confidence interval 30-45%) restrictions. Those who were male, younger or had received dialysis for 1-3 years saw themselves as more non adherent compared with other patients.
- Wokoma et al (2010) in their study income distribution and sources of funding for maintenance Haemodialysis of patients in the university of PortHarcourt Teaching hospital. This study was done using 24 males and 16 females m/f = 1.4:1 mean age 4.62+14.9 years, and mean duration on dialysis of 5.03±1.6 (3-12) months to find out income distribution and sources of funding for maintenance Haemodialysis of patients at UPTH. The mean annual income of the patients was N1, 147, 172.02 (N60.000.00 to N3, 200,000.00) estimated cost of dialysis in PH per patient is N2, 340.000.00. Sixty (60) percent of the patients earned below one million naira per annum. Only 10% of the patients earned over 3 million naira P.A. Annual incomes showed positive correlation with the duration on dialysis (r = +0.14) and number of dialysis sessions received (r = + 0.3)

Funding – family income 65%

Funding - extended family 17.5%

Funding - philanthropic sources 10%

Funding - Government 0%

Based on the financial Burden US created a medicare end stage renal disease (ESRD) programe into law in 1973; for patients and took over the financial burden on the patient/family. All other country have such but Nigeria non with her vast wealth in oil no care

for renal patients, (Wokoma et al (2010) there are seen on TV asking for support while on dialysis machines.

Karamanidou et al (2008) in their study systematic review of the prevalence and determinants of non adherence to phosphate binding medication in patients with end stage renal disease.

- Revealed (Age) that older age was consistently associated with higher levels of adherence, suggested reasons for this finding are that older people may be more concerned about their mortality and have more structured lives in which to accommodate the demands of the treatment regimen, that younger patients may have difficulty coming, to terms with having a chronic condition, or simply that younger patients are more willing to report non adherance than older patients.
- It is interesting that whilst marrital status/living arrangements alone were often associated with adherence, patients' perceptions of the actual support they received and the quality of their family relationships were more likely to be associated with adherence. Hence the quality rather than quantity of social support is important in predicting mental and physical outcomes.
- Hala et al (2015) in their study Effect of an Educational Program on adherence to Therapeutic Regimen among chronic kidney disease stage 5 (CKD5) patient under maintenance hemodialysis found that patient education is an essential part of all health care adherence. This study showed a statistically significant relation found between level of education and total adherence score (43.64%) described that it is important to follow dialysis scheduled as this makes them more healthier active and more powerful to meet their life demands. As regard limiting fluid intake about (36.36%) reported that this make their body healthy also (30.91%) had a consensus that the main cause of keeping diet recommendation is that their kidney condition requires that. This study disagrees with the study patient education is an essential part

of all healthcare adherence Hala et al (2015) where there was no correlation between ages in general and the adherence score. This is in line with the study by hala et al 2015 where large number of hemodialysis patients in both countries (US and German) have difficulties maintaining their diet (80.4%) and contrary within our result they had difficulties maintaining fluid (75.3%) restrictions.

- In Molto et al (2012) prevalence of adherence to fluid restriction in kidney patients in haemodialysis: objective indicator and perceived compliance in Spain where the group classified as adherent to adjusted intra dialysis weight gain (IWG) restriction was older (t = 4.888; P = 000), had lower dry weight (t = - 2.151; P = .008), lower potassium levels (t = - 2.815; P = .006) and had been on dialysis for a shorter period t = 2.016; P = .046).

Summary of Literature Review

Literature reviewed looked at the disease entity of the kidney, attacking the filtering units the nephrons and the resultant damage making the kidney to malfunction in its role of maintaining homeostasis, the epidemiology of the kidney disease, stages of the disease, the risk factors for both acute and chronic stages of kidney disease, the burden of kidney disease and managements of kidney disease.

The review discussed renal diet, the component of the renal diet and the factors influencing adherence to prescribed diet for the renal patients; challenges of dietary modifications and the positive benefits to the patient. Discussions on the theoretical framework related to the study using the health belief model.

The empirical review revealed most studies done on adherence on renal diet were in developed countries, While the studies in developing countries concentrated on the assessment of knowledge of CKD patients about dietary management and factors influencing renal adherence at the OATH C, Ile Ife. Osun State. Researcher is unaware of any study on

factors influencing adherence to diet among the patients attending renal unit of UNTH. ItukuOzalla.

This existing gap places a demand to assess adherence behavior among this patients and the group assessing NEO hospital and dialysis center.

CHAPTER THREE

RESEARCH METHOD

This chapter discusses the research design, area of study, study population, sample size, sampling procedure, and instrument for data collection and plan for data analysis.

Research Design

A descriptive cross sectional design was used for this study. This design was used successfully to identify the factors that influence dietary adherence between Hispanic and non- Hispanic patients at the hemodialysis centers at Winthrop University Hospital, New York by Lopez, Burrowes, Gizis and Brommage, (2006). Nwaokoro, Famakinwa and Olarinoye [2013] used it to assess the knowledge of chronic kidney disease(CKD) patients about dietary management and factors influencing it in Obafemi Awolowo University Teaching Hospitals Complex, Ile Ife. Also Gbadesign, Ayodele, Okunola, Arogundade and Akinsola (2013) used it to study renal risk profiling in newly diagnosed hypertensive patients at the general outpatient department of both Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital and General Hospital, Asubiaro, Osogbo. Therefore, it is deemed appropriate for this study.

Area of Study

Enugu is the area of study and is the capital of Enugu state. University of Nigeria Teaching Hospital. [UNTH] now operates at its permanent site at Ituku- Ozalla, along Enugu-Port Harcourt express road with effect from 8th January 2007 .The medical outpatient hosts the nephrology clinic that runs twice weekly, Wednesdays and Thursdays with two different nephrology consulting units and in- patient facilities where medical care is provided. The(renal unit) dialysis unit is located adjacent to ward 8. The dialysis unit renders 24 hours

service to both inpatient and outpatient for their dialysis treatment, this was the setting for this study.

The Nochie, Emeka, Onodugo (NEO) Hospital and Dialysis Center which is located in Enugu urban at 27 Nza street Independence layout, behind Government house in Enugu North. The hospital is the biggest private dialysis center in Enugu with renowned nephrologists in attendance rendering outpatient/ dialysis care to their numerous patients.

Population of the Study:

Total population of 51 adults both males and females' patients aged 21 -86 years, who are on appointment for dialysis treatment will be used for this study. Total patient from UNTH : 25 and 26 from NEO hospital.

Inclusion Criteria.

Patients who met the inclusion criteria below were used

- Male and female adults from 21-86 years
- On dietary prescription for kidney diseases stages 3-5
- Regular attendance on appointment at the dialysis units: 2-3 times a week
- Patient on haemodialysis treatment from 2 months and above
- Willingness of the patient to participate in the study.

Instrument for Data Collection

The instrument for data collection is the researcher's developed questionnaire. Items in the questionnaire were generated from the reviewed literature based on the objective set for the proposed study. The instrument has three sections; A, B and C. Section A comprise of the respondent's demographic characteristics questions (1-6) and section B contains items designed to elicit data to realize the research objectives on socio-economic factors items 7-10 while section C contained items 11-35 that answered the self-reported renal diet adherence questions.

Validation of Instrument

The face validity of the questionnaire was done by submitting the instrument to the researcher's supervisor and two senior lecturers in the department of Nursing Sciences, Enugu campus. They examined the purpose and the objectives set for the study in line with the items in the instrument. They assessed the language used to develop the instrument and made necessary modifications. Their input and suggestions were used and practice precision effected in the final draft of the questionnaire before submission to the researcher's supervisor who approved it after due corrections was made.

(A copy of the request for validations is attached in appendix 11)

Reliability of the instrument

A pilot study was conducted in parklane hospital a centre different from the centres for the study. Fifteen (15) copies of the questionnaire were administered and collected to test for internal consistency of responses using a measure of reliability called split-half. This is used in place of test-retest to avoid bias.

A cronbach's alpha value of 0.894 for the 1st part and 0.865 for the second part, as well as the correlation between forms of 0.839 indicate that the instrument is reliable for the study.

Ethical Consideration

Ethical clearance has been obtained from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital Ituku-Ozalla (see appendix V1) Administrative permission from the Chairman Medical Advisory Committee UNTH, Ituku-Ozalla, and from the Chief Medical Director Neo Hospital and Dialysis Centre, Enugu, was obtained. The purpose of the study was made known to the respondents and a signed informed consent made available to them before data collection.

Assurance of confidentiality and anonymity was given before data collection.

Procedure for Data Collection

Data collection was done by the researcher with the help of three (3) research assistants who were trained on what to do, the purpose of the study, who and when to administer the questionnaire . The questionnaire was administered to patients on the spot (in the clinic and renal unit) this was filled within 20 minutes and collected back. Data collection lasted for 4 weeks.

Method of Data Analysis

Data collected was entered and analysed using statistical package for social sciences (SPSS) version 20. Frequency, percentage, means and standard deviation were used to analyse and answer the research questions while logistic regression analysis was used to test for association between variables means greater than the criterion mean of 3.00 for positive questions are regarded as positive response and while mean < 3.00 as negative response. P values less than 0.05 level of significance are also regarded as significant. Results were presented in tables and charts.

CHAPTER FOUR

DATA PRESENTATION

This chapter discusses the presentation of data collected. Results were presented in accordance with the objectives of the study and the research questions. A total of 51 questionnaires were collected from the field giving a return rate of 100%. Frequencies, percent's, means and standard deviations were used for the descriptive statistics.

Table 2a: Demographic profile of the respondents

	Frequency	Percent
Gender		
Male	28	54.9
Female	23	45.1
Age group		
21 – 30	10	19.6
31 – 40	12	23.5
41 – 50	5	9.8
51 – 60	13	25.5
61 – 70	8	15.7
>70	3	5.9
Mean age/ Standard deviation	47.18± 16.39	
Marital status		
Single	12	23.5
Married	35	68.6
Widowed	4	7.8

Table 2b Socio-Economic Profile of the Respondents

Religion		
Moslem	2	3.9
Christianity	49	96.1
Tribe		
Igbo	45	88.2
Hausa	2	3.9
Yoruba	4	7.8
Level education		
None	1	2.0
Primary	2	3.9
Secondary	12	23.5
Tertiary	36	70.6
Occupation		
Unemployed	5	9.8
Retired	9	17.6
Student	7	13.7
Civil servant	14	27.5
Business	15	29.4
Artisan (carpenter e.t.c)	1	2.0
Income		
Not on income	16	31.4
< N20,000	3	5.9
N20,000 - N35,000	8	15.7
N36,000 - N50,000	10	19.6
> N51,000	14	27.5
Sponsorship		
Personal income	14	27.5
Family/relations	36	70.6
Social groups/clubs	1	2.0

Table 1 shows that 28 (54.9%) of the respondents are males while 23 (45.1%) are females. The table also shows that 10 (19.6%) of the patients are within 21 and 30 years of age, 12 (23.5%) are within 31 and 40 years, 5 (9.8%) within 41 and 50 years, 13 (25.5%) within 51 and 60 years, 8 (15.7%) within 61 and 70 years while 3 (5.9%) are greater than 70 years of age. From the table, 33 (64.7%) of them have been dialysed for less than a year, 12 (23.5%) for 1 to 2 years and 6 (11.8%) for more than 2 years. The patients that were single were 12 (23.5%), whereas 35 (68.6%) and 4 (7.8%) of them were married and widowed respectively. The dominant religion and tribe were Christianity (96.1%) and Igbo (88.2%). The predominant level of education attained by the respondents were tertiary level (70.6%) and secondary (23.5%). Their occupation include: civil servant (27.5%), Business (29.4%), artisan (2.0%). There were 5 (9.8%) unemployed, 9 (17.6%) retired and 7 (13.7%) students. The table also shows that 16 (31.4%) of the patients do not have an income, 3 (5.9%) earn less than N20, 000, 8 (15.7%) earn between N20, 000 - N35, 000, 10 (19.6%) earn between N36, 000 - N50, 000 while 14 (27.5%) earn more than N51, 000. From the table, 14 (27.5%) of the patients sponsor themselves, 36 (70.6%) are supported by family/relations while 1 (2.0%) by social groups/clubs.

Objective 1: To determine the proportion of patients who attend the renal units that adhere to the diet.

Table 3: Self-Reported Renal Diet Adherence

	Adherence (cumulative result)	Frequency	Percent
Follow doctor's dietary instructions	Rarely-Never	6	11.8
	Always-most times-sometimes	45	88.2
* Cannot resist drinking beer or wine	Rarely-Never	25	49.0
	Always-most times-sometimes	26	51.0
* Cannot resist eating forbidden food	Rarely-Never	28	54.9
	Always-most times-sometimes	23	45.1
* Sometimes allow self to eat forbidden food	Rarely-Never	29	56.9
	Always-most times-sometimes	22	43.1
* Feel no different if eating food not allowed	Rarely-Never	21	41.2
	Always-most times-sometimes	30	58.8
* Careless about food when upset	Rarely-Never	20	39.2
	Always-most times-sometimes	31	60.8
* Drink fluids today as always	Rarely-Never	24	47.1
	Always-most times-sometimes	27	52.9
Family helps to eat the proper food	Rarely-Never	5	9.8
	Always-most times-sometimes	46	90.2
* When eating out, eat wrong food	Rarely-Never	34	66.7
	Always-most times-sometimes	17	33.3
Restrict the quantity of protein eaten	Rarely-Never	4	7.8
	Always-most times-sometimes	47	92.2
Avoid foods containing salt	Rarely-Never	13	25.5
	Always-most times-sometimes	38	74.5
Careful not to drink too much fluid	Rarely-Never	13	25.5
	Always-most times-sometimes	38	74.5
Restrict the type of fruits and vegetable eaten	Rarely-Never	14	27.5
	Always-most times-sometimes	37	72.5
* Preoccupied with food	Rarely-Never	27	52.9
	Always-most times-sometimes	24	47.1
Careful to weigh food	Rarely-Never	18	35.3
	Always-most times-sometimes	33	64.7
Difficult to drink less fluid in dry season	Rarely-Never	19	37.3
	Always-most times-sometimes	32	62.7
Weigh self regularly	Rarely-Never	9	17.6
	Always-most times-sometimes	42	82.4
* Decides what food to eat	Rarely-Never	28	54.9
	Always-most times-sometimes	23	45.1
* Always eat salt with food	Rarely-Never	25	49.0
	Always-most times-sometimes	26	51.0
* Frustrated because of diet	Rarely-Never	44	86.3
	Always-most times-sometimes	7	13.7
Restrict the amount of salt eaten	Rarely-Never	10	19.6
	Always-most times-sometimes	41	80.4
* Just cannot accept having to restrict	Rarely-Never	41	80.4
	Always-most times-sometimes	10	19.6
Restrict the amount drank	Rarely-Never	12	23.5
	Always-most times-sometimes	39	76.5
* Diet prevents self from enjoying social	Rarely-Never	42	82.4
unction	Always-most times-sometimes	9	17.6
Diet becomes easier to follow over time	Rarely-Never	12	23.5
	Always-most times-sometimes	39	76.5
Overall adherence	Rarely-Never	38	74.5
	Always-most times-sometimes	13	25.5

implies negatively framed items; for positive items = yes (adherence); for negative items = no (adherence); For item by item response freq., see Appendix IX

Table 3 presents the result on adherence of renal diet by patients. For the positively framed items (that is, what ought to be done), adherence was above average in all the items. However, highest adherence was observed in the area of restricting the protein eaten (92.2%). Other areas in which adherence were also highly observed included: family helping to eat proper food (90.2%), following doctors' dietary instruction (88.2%), weighing oneself regularly (82.4%) and restricting the amount of salt eaten (80.4%).

For the negatively framed items (that is, what ought not to be done), highest non-adherence was observed in the area of being frustrated because of diet (86.3%). Other areas of high non-adherence included: diet preventing from enjoying social function (82.4%) and not being able to accept having to restrict (80.4%). In general, 74.5% of the patients adhered to renal diets.

Objective 2: To determine demographic factors that influence adherence to renal diet

Table 4: Association between demographic factors and patients' adherence to renal diet items 1-6 were used to address this association.

	Adherence		P value	OR	95% C.I for OR
	Frequency	Percentage			
Age group					
≤ 40	22	43.1	0.034	0.231	0.060 – 0.896
>40	29	56.86			
Dialysis duration					
< 1 year	33	64.71	0.782	1.202	0.327 – 4.423
≥ 1 year	18	35.30			
Marital status					
Single	12	23.52	0.150	0.361	0.090 – 1.445
Married	39	76.47			
Religion					
Moslem	2	3.92	0.999	5833	0.000 - NA
Christianity	49	96.07			

*OR = Odds ratio

Since at least one of the demographic variables (age) was significantly associated with renal diet adherence ($P = 0.034$; $P < 0.05$), therefore the null hypothesis was rejected and alternative hypotheses accepted. Therefore, there is a significant association between demographic factors and patients' adherence to renal diet. Patients 40 years of age or below were less likely to adhere to renal diet than those above 40 years (OR = 0.231, 95% C.I for OR = 0.060 – 0.896). However other demographic factors such as marital status, religion and dialysis duration were not significantly associated with renal diet adherence ($P > 0.05$).

Objective 3: identify the socio-economic factors that influence their adherence to renal diet.
Table 5: Association between socio-economic factors and patients' adherence to renal diet items 7-10 were used to address this association.

	Adherence		P value	OR	95% C.I for OR
	Yes	No			
Level of education					
Secondary & below	15	29.41	0.212	2.860	0.550 -14.877
Post secondary	36	70.58			
Occupation					
Unemployed	21	41.17	0.818	1.164	0.320 – 4.226
Employed	30	58.82			
Income					
≤ N50,000	37	72.54	0.756	1.244	0.313 – 4.954
>N50,000	14	27.45			
Treatment sponsorship					
Personal income	14	27.45	0.307	0.497	0.129 – 1.905
Support from other people	37	72.54			

Table 5 showed that level of education did not influence their diet adherence behaviour at P. P = 0.212 >0.05 level of significance. There occupation did not influence their on adherence behaviour at P= 0.818> 0.05 level of significance.

Their income status did not influence their dietary adherence behaviour at P =0.756.

Treatment sponsorship revealed P =0.307 >0.05 level of significance.

Logistic regression was used to test this association and the P value of the above variables were greater than the 0.05 level of significance.

To address the Ho2: There is no significant association between socio-economic factors and patients adherence to renal diet.

Since level of significance for all the variable tested at P= >0.05 the null hypothesis is hereby accepted. Therefore there is no significant association between socio-economic factors and patients adherence to renal diet.

CHAPTER FIVE

DISCUSSIONS AND MAJOR FINDINGS

This chapter discusses the major findings in relation to previous studies. It also covers the recommendations, limitations of the study, conclusions and summary.

Discussions of findings:

Subject's characteristics:

Majority of the respondents were males 28(54.9%) and 23(45.1%) were females. This was also similar in the studies by Oluyomi et al (2012); Lamidi et al (2015) where the percentages of males were higher than females.

Most adult males are exposed to infections; (Light, Bosky 2012, Oluyomi et al 2012) most common cause of the stage 3 Aki requiring hemodialysis was sepsis syndrome and male patients are exposed to urinary tract infections, sexually transmitted disease, glomerular nephritis, obstructive nephropathy from cancers of the prostrate and injuries from chemical consumptions like alcohol and tobacco. They are involved in frequent eating outside their homes, because of the nature of their occupation.

The age range of the respondents was 21-86 years; the mean and standard deviation were 47.18±16.28.While the predominant age group was 51-60; 13(25.5%) which indicates that these disease occurs from the middle ages. Older adults are likely to have complications from uncontrolled hypertension, glomerular nephritis, diabetes and obesity with its resultant effect on the kidney resulting to diabetic nephropathy, hypertensive nephropathy etc. This was close to the findings of Lamidi et al (2015) where the respondents mean age was 47.1 with standard deviation of 17.1.

Majority of the patients were married as the result showed 35(68.6%), 12 (23.5%) are single while only 4(7.8%) were widowed.

The respondents (98%) were Christians. This is because Enugu is a Christian dominated region.

The tribe of the respondents were Igbo 45 (88.2%) while Yoruba 4 (7.8%) and Hausa 2 (3.9%). The tribe predominantly Igbos is because Enugu is an Igbo land.

To determine their duration on renal replacement therapy (RRT) majority of the respondents 33 (64.7%) are less than 12 months, 12 (23.5%) are on it for 12-24 months while only 6 (11.8%) are on RRT for more than 2 years. This confirms the study prevalence of chronic kidney disease and its factors in Edo State Nigeria. Okoye et al (2011) who said the trend of poverty in Nigeria makes the patient to die prematurely from the complications of the disease like anemia, uraemia, cardiovascular disease and brittle bone disease Smelter, Bare, Hinkle &Cheezer (2010); Arongundade et al (2011)

Majority of the respondents 36(70.6%) had tertiary educational qualification. The result showed that 12(23.5%) had attained secondary school level, 2(3.9%) had attained primary school level while only 1(2.0%) had no education.

Occupation – majority of the respondents were businessmen 15 (29.4%) civil servants 14 (27.5%), Retired 9 (7.6%) students 7(13.7%) and unemployed 5(9.8%)

Majority of the respondents average monthly income 16(31.4%) were not on income, followed by those 14 (27.5%) on above income of N51, 000; 10 (19.6%) on income of N36, 000 – 50,000 and 8 (15.7%) on income of N20, 000-35,000 while 3 (5.9%) were on income below N20, 000.

The above result indicates the reason why patients cannot consistently maintain dialysis of 2-3 times a week session and this also affected the population of this study. The cost of dialysis per session in Enugu is within the range of N21, 000-N25, 000 depending on the centre (Teaching Hospital or private dialysis centre).

Majority of the respondents 36 (70.6%) are being sponsored by family /relations while 14 (27.5%) are self sponsored. In Nigeria there is no social security system or health insurance scheme in place to assist the patient and the burden is borne solely by the patient and relation (Ulasi & Ijoma, 2010).

Objective One: What proportion of patients who attend the dialysis unit/ center that adheres to the renal diet?

The study showed that out of the 51 respondents 38 (74.5%) are on special diet while 13(25.5%) are not.

In this study 42 (82.4%) of the participants reported that their diet prevents them from enjoying social function. This further shows that this group of respondents do not adhere to renal diet. This is in line with the study by Lam et al (2010)self-reported adherence to a therapeutic regimen among patients undergoing continous ambulatory peritonal dialysis where patients perceived themselves as more adherent to medication at (83.95%) confidence interval (77-88%) and dialysis (93%; 95%) confidence interval (56-71%) and diet (38%; 95%) confidence interval 30-45%) restrictions. Those who were male, younger or had received dialysis for 1-3 years saw themselves as more non adherent compared with other patients. Also in Palmer et al (2014) patients avoid social functions and are confused, by multiple advice contrary to their normal cultural believe and is difficult to implement fully. Patients find new diet and fluid difficult to accept plus other loses associated with CKD.

Dietary prescription becomes difficult because of their various social activities, pressure from clubs/ groups make them eat outside their homes. Most of them are actively involved in their various work capacities and need more energy than the older adults. This is in line with the study by Chan et al (2012) on determinants of compliance behaviours among patients undergoing dialysis in Malaysia where compliance rates of dietary prescription were 27.7%,

fluid 24.5%, medication 66.6% and 91.0% respectively. Younger male patients, working and those with longer duration on hemodialysis were found more likely to be non compliant. This was attributed to lack of adequate knowledge, inadequate self-efficacy skills, forgetfulness and financial constraints were the major barriers towards better adherence to their diet etc. Chan et al (2012), Ulasi and Ijoma (2010); Zrinyi et al (2015) some of the respondents 41 (80.4%) could not just accept having to restrict their diet. This is in line with Higgins (2007) in her study where young male patients had poor control over their lives and adherence was poor, because they were unable to accept limitation of diet, consume food at inappropriate time. This is similar to Lam et al (2010); where male and younger adults were more adherent to medication (83%; 95%) confidence internal 77-88% and dialysis (93%; 95%) confidence interval (88-96%) than to fluid (64%; 95%) confidence interval 56-71% and diet (38%:95%) confidence interval 30-45%.

This is contrast to their older adults who are more concerned about their mortality and have some structured lives in which to accommodate demands of the treatment regimen than young people still struggling with the acceptance of chronic illness.

The respondents 46 (90.2%; x 4.09) their family helped them to eat the proper food. Family system cares for family members when sick deeply. This can be seen in hospitals, where more than 3-5 people are in a hospital: to care and provide for that sick member even going to the extent of selling landed properties to ensure continuity of care for that person in Nigeria. This is also similar to the study by Kara and Caglar (2007) where family support was relatively as high 5.5± 1.9 median range (1-7) amongst Turkish community that has strong family ties and the family comes first; main interest is to protect the health of other family members. For the patients sponsored treatments; majority 36 (70.6%) are supported by family/relations in this study. This is in line with Kara and Caglar (2007) support from other people important in health and well being; effective support from family and close friends

can buffer and influence stress, depression, healthcare services ,utilization and problem solving. Otherwise Lam et al (2010) explained that mental status/living arrangements alone were often associated with adherence, patients perception of the actual support they received and the quality of their family relationship were more likely to be associated with adherence. Hence the quality rather than quantity of social support is important in predicting mental and physical outcomes.

Majority of the respondents 45(88.2%) follow their doctor's dietary instructions (x 3.88± 1.14), when initial diagnosis is made and dialysis instituted, renal patients may be more eager to change their dietary habits to meet the requirement of a newly received lifesaving haemodialysis treatment. And various supports from family, friends, church members, hence they are eager to co-operate to live longer for their dear ones. This is similar in the study by Chan et al (2012) determinants of compliance behaviours among patients undergoing haemodialysis in Malaysia. The respondents 47 (92.2%) restrict the quantity of protein they eat.(x 3.84± 1.05). In Nigeria patients over restrict the consumption of protein whereby relations will not give it to their sick ones and most times they are anemic, they confess they are told not to eat meat but only dry fish, no plant protein. This is in contrast to the study by Avesani et al (2012) where adherence to restricted low proteins non-dialyzed kidney patients .Lamdi et al (2015) carried out a study on attitude to dietary prescriptions and compliance at kidney center Ondo and, they found out that the most frequently prescribed diets for in patients were low salt (97.4%), low protein (77.9%), high protein, 93.9%), and trace protein (7.8%) diets. Avenani et al (2013) also found out that the randomized controlled clinical trial conducted at the CKD outpatient clinic at Pedro University Hospital; RiodeJeneiro, Brazil. The group counseled by dietician primarily did better and finally the normal counseling group (at last visit; 20.7/day (30.9%) vs-10.5g/day (15.1%), intense vs .normal counselling, respectively; p = 0.4) for the respondents 30 (58.8%) that felt no different if they ate food

they should not.(x 3.69±1.12) they are non-adherent to their diet prescription because most of them; over time on dialysis start relaxing concerning their diet prescription because as symptoms of the disease are wearing off, in response to the dialysis treatment and improved health, they gradually start eating wrong diet. This is similar to the study in Molto et al (2012) patients demonstrate a greater level of adherence at the start of treatment especially during the first 6 months, with decrease in the following three years.

The respondents 42 (82.4%) that weigh themselves regularly (x 3.73± 1.23) the patients are knowledge about the disease, diet/fluid therefore are very careful and conscious of their weight to avoid excess accumulation of weight and fluid which can aggravate their health condition. This is in line with Lam et al (2010) where patients are adherent to dialysis (93%, 95%) C.I (88.9%) and fluid (64%; 95%) C.I. (56-71%) Also in Molto et al (2012) where the group classified as adherent to adjusted intra dialysis weight gain (IWG) restriction was older (t = 4.888; P = 000), had lower dry weight (t = -2.151; P = .008), lower potassium levels (t =-2.815; P = .006), and had been on dialysis for a shorter period (t = 2.016; P = 046) Also in Zrinyi et al 2003; dietary efficacy capability positively linked to the age of the respondents (r = 0.22; P = 0.25), older people exhibited more efficacy than the duration therapy. Respondents 27 (52.9%) that are careless about food when they felt upset (x 3.67± 1.34). As the illness progresses these patients felt bored with all the food, fluid, fruits restrictions therefore it became a source of worry to them. This is similar to the study by Morale et al (2015) where most of the respondents' renal protection diets represent a variation of their dietary habits and a similar percentage expresses difficulty with elaboration. The respondents that their diet becomes easier to follow over time 39 (76.5%) (x 3.65± 1.32) did not represent a high percentage of this group more than half of the population. This is in line with the study by Lopez et al 2006) in their comparative study to identify factors that influence dietary adherence between Hispanic and non-Hispanic patients at the haemodialys centers at

winthrop-university hospital New York. Both groups adhered to diet because their mean levels of SALB, K (+), and PO (4) were within acceptable limits. Palmer et al (2014) otherwise found out that once patients experienced an increased sense of responsibility for food and fluid management as "part of the deal", they became empowered and the dietary changes became less challenging to them. The respondents 38 (74.5%) that avoids food containing salt or restrict salt, might be the respondents having hypertension as co-morbidity and so very careful with salt, are all adhering to the need to reduce sodium content of their body chemistry and its resultant fluid gain effect. Otherwise without salt the diet will not be palatable. Low salt adherence is also seen in the study by Nunes et al (2015) in their study A novel screening tool measuring dietary sodium knowledge in CKD. Where 97% of patient post counselling cut down on sodium intake.

From the self reported adherence result with grand mean of 3.33± 0.48 which is above the criterion mean of 3.00 indicates that the respondents generally adhere to renal diet. Is important health personal take it upon themselves to help this patients extensively. Considering the varied adherence behaviour in this study.

Objective Two: to determine the demographic factors that influence adherence to the renal diet.

To address the above research objective a hypothesis was set

Ho1: There is no significant association between demographic factors and patients' adherence to renal diet.

Sex, marital status religion, tribe how long dialysed were not significantly associated with adherence to renal diet (P>0.05) in this study. In this study male patients were found to be more in number 28 (54.9%) This shows that those demographic factors do not predict adherence to renal diet. Though significantly it was not associated. This contrast the finding in Ham et al (2010) were sex had significant association in non adherent by the

male patients. This is in line with the finding in Wachukwu et al (2011) were males were more in number 218(72.7%) while 82(27.3%) were female; Lam et al (2015). This contrast the findings in Arongundade et al (2010) where females were more in number 513 (50.5%), while 50(9.5%) were males. This study with 51 population had 23(45.%) adhering to diet always, 17(33.3%) most times and 9(17.6%) sometimes which means there is strong support found among the respondents with their finding since 3(5.9%) rarely had family support and 2(3.9%) never had support from their family. These last two groups probably are living alone or with somebody that does not care, may be a nanny who is not related to the patient. In Nigeria extended family system is very strong, even the single ones are living with parents or relations or siblings. The single 7(58.3%) in this study are adhering above average and the married ones 31(79.5%) adhering which means whether single or married there is adherence. Statistically tested (P=0.150; P>0.05) there is no significant association. Although the married subject 35(68.6%) definitely are being cared for by their spouse in this study. This is in line with the studies by Morales et al (2015) where 59.2% feel a high level of familial support; Nwokoro et al (2013) familial support 61%. Relations/family gave adherence at 36 (70.6%) level. Kara &Caglar (2007) where family support was relatively as high 5.5±1.9 median range, 6-5(1-7) followed by significant other 1.8±1.5 median range (1-7).

In summary 23 (45.1%) showed that the respondents always eat the proper food ($\bar{x}$ 4.09±1.08 which can be further due to spousal support since majority are married 35 (68.6%). This is in line with Khali et al (2007) where there is no association between perceived supports as predictor to fluid or dietary adherence. In contrast in Kara et al (2007) found that younger, married with lower level of support were likely to be non adherent.

Age (P = 0.034; P<0.05) was significantly associated with adherence to renal diet. Respondents who were 40 years of age or below were less likely to adhere to renal diet than those above 40 years (OR = 0.231, 95% C.l OR = 0.0-0.896). This is in line with Zrinyi et al (2003) where dietary efficacy capabilities was positively linked to the age of the respondent (r = 0.22; P = 0.25); older people exhibited more efficacy than the duration of therapy. Also in Lam et al (2010) younger males, were non adherent compared with other patients. Karamanidon et al (2008) older age was consistently associated with the level of adherence. In contrast Kara et al (2007) revealed non adherence to fluid and diet restrictions due to decrease in intake, cooking difficulty, shopping, decreased taste and smell sensation. Also dementia and other degenerative disease might have set in or under the care of a nanny without commitment to persuade them eat the prescribed diet.

Dialysis duration P = 0.782; P> 0.05) is not significant but those on few years dialysis adhere more than those on above 3 years dialysis. In Lam et al (2010) this is in line with Khalili et al (2007) were age was associated with non-adherence. They found out for every one year increase in age the likelihood of dietary adherence increased by 5%. In Lam et al (2010) younger male were non adherent. While older age was associated with higher level of adherence probably due to their more structured life, to accommodate the demands of the treatment regimen while the younger ones could not accept the demands of the chronic disease.

Since at least one of the demographic variables (age) was significantly associated with renal diet adherence (P = 0.034; P < 0.05) therefore reject the null hypothesis and accept the alternative. Therefore, there is a significant association between demographic factors and patients' adherence to renal diet.

Objective 3: To identify the socio-economic factors that influence adherence to renal diet.

To address the above objective, Ho: 2 was set: There is no significant association between socio-economic factors and patients' adhrence to renal diet.

Level of education, occupation, and income status and treatment sponsorship were not associated with adherence to renal diet in this study.

There are many studies carried out where education is associated with adherence to treatment regimen. In this study patients who had no education the ones who had secondary education 13(86.7%) adhered to renal diet while 2(13.3%) did not. The patients with tertiary educational qualification 25(69.4%) adhered while 11(30.6%) did not adhere. The one with lower educational qualification adhered better than the higher educated patients. Which means education is not a determinant factor in these two groups. Whereas the higher educated patients must have read or heard much about the disease and the treatment regimen more than the lower one from media, dietary advice by the health worker there were expected to be more adherent. The lower educated ones could have been more in attendance during clinic counseling and are eager to achieve good health. The two groups irrespective of their level of education will like to adhere. The non adherent group could be due to lack of support or understanding. Education did not show any association with renal diet at $P = 0.212 > 0.05$ level of significance (OR = 2.860; 95% C.I for OR = 0.550 – 14.877) therefore Ho2 accepted no significant association between education and renal diet adherence.

This is in contrast to the study by Burrowes et al (2006) where education was amongst the factors that influence adherence especially education involving the family members with their local language .Avesani et al (2012) in their study can education improve adherence, 16 weeks improved adherence to low-protein diet in patients with stage 3-5 CKD. Intense counseling group had reduction of protein from baseline greater 20.7 (30.9%) while normal counseling group 10.5 (15.1%). Hala et al (2015) revealed in their study "effect of

educational program for CKD patient undergoing haemodialysis" as significantly associated with level of education and total adherence score (43.64%) they confessed it aided them to keep haemodialysis appointment, because it makes them healthier. In this study Hal et al (2015) among their haemodialysis patients in US and German disagreed with the above since (80.4%) had difficulty maintaining their diet and (75.3%) maintaining fluid restriction.

The respondents occupation analytically tested revealed no association to renal diet adherence P = 0.818, P>0.05 therefore the Ho2 was accepted. In this study majority of the respondents were business men 15(29.4%) who leave their houses early and eat most times outside their home which is outside their prescribed diet, followed by civil servant 14(27.5%) who spent greater part of their day in the office, therefore diet adherence will be difficult for this people. This is in line with Chan et al (2012) where subjects who were employed were more likely to be non-compliant to dietary and fluid restrictions and longer dialysis vintage was associated with poorer adherence on fluid (r = 0 -0.410; P <0.01) The unemployed 5(9.8%) retired 9 (17.6%) student 7(13.7%) generally adhere at (76.2%) while non adherent at 5 23.8%) which means whether employed or not patients still desire to adhere inorder to encourage their loved ones. This group must have made an impact in the lives of people when active before retirement or now unemployed because of the disease burden. Students are dependent on their family therefore has no option than to adhere to the treatment regimen to make their parents happy. There is no significant difference in their adherence behaviour. P = 0.818 = P > 0.05 therefore no association between occupation and renal diet adherence was found.

The respondents not on income 16(31.4%) and 3(5.9%) <N20, 000 with 8 (15.7%) on income of N20, 000 – N35, 000 made up the population of the respondents on less than ≤ N50, 000 per month hence 28 (75.7%) of them adhere while 9(24.3%) of them do not

adhere to renal diet. These patients most of them are adhering while 9(24.3%) of them are not adhering. This is similar to the study in Wokoma Emem-Chioma (2010) where patient income revealed that majority 60% of the patients earned below one million per anum while only 10% earned over 3 million naira per annum. Annual income showed positive correlation with the duration on dialysis (r = + 0.14) and number of dialysis session (1-3 times a week) received r = + 0.3). Major funding was from family income 65%, extended family 17.5%, Philanthropic sources 10%, Government – 0%. This source of funding is in contrast to this study where personal income is 14 (27.5%) while family/relations 36 (70.6%). Hence in this study treatment sponsorship did not affect adherence at 64.3% and 78.4% adherence level for the two groups. This also confirms the finding in Ulasi and Ijoma (2010) in their study enormity of chronic kidney disease in Nigeria; emphasis on non affordability of the RRT by patient's, burden is solely borne by patients and relative. Couser et al (2011) in the study the contribution of CKD to the Global burden of major non communicable disease reported that 50% world population has ESRD which is associated with very low quality life an average patient might be sustained on RRT for only ten years. In this study those on higher income group 10(19.6%) N36,000 – N50,000; 14 (27.5%) > N51,000 were more in number which means when there is adequate funding for dialysis and improved quality of life achieved. The patient will be more adherent to diet, drugs, fluid restriction etc. This could be why you see the groups more in the dialysis centers for proper health care and there are more adherent than the low income earners. Because of high cost of dialysis some patients seek alternative medicine thereby exposing themselves to herbal therapies that results in early deaths, from toxicity. This is in contrast to this study in Moonaghi, et al (2012) where mean age of the subjects was 49.8(11.6) years. 60% percent were men and 78.7% of them were married, 57.4% had just primary education and 30.7% of them were house wives. The average income of subjects was

345.8 dollars. A 75.1% of the people had social security insurance. An 84.3% of them underwent dialysis 3 times a week. Irrespective of their poor financial status. Therefore, the null hypothesis Ho2: There is no significant association between socio-economic factors and patients adherence to renal diet was accepted at P = 0.756 >0.05 level of significance (OR = 1.244, 95% C.1. for OR = 0.313 – 4.954)

For the treatment sponsor no significant difference between them at P = 0.307; > 0.05 level of significance (OR = 0.497:95% C.I for OR 0.129 – 1.905) the null hypothesis was accepted.

This is in contrast with the study by Lopez et al (2006) where socio-economic status was a determinant in adherence behaviour.

Summary/Conclusion

Haemodialysis places multiple and unavoidable demands on patient's life style, related to dialysis regimen, dietary and fluid restrictions, the requirements of multiple medications with potential side effects as well as management of multiple co-morbid conditions. To improve adherence of such patients these include promoting positive attitude; among patients and increasing their perceptions of behavioural control towards dietary and fluid adherence. Improved dietary and fluid adherence among haemodialysis patients is likely to result in reduced incidence of medical complications associated with dietary and fluid non-adherence, and subsequently reduce the CKD mortality rate. (Hala et al 2015 Health care professionals should take cultural and local diet issues into consideration when setting dietary and fluid restriction guideline. Additional attention and support are required for patients who identify themselves as more non-adherent.

This study was done to determine the factors influencing adherence to diet among patients attending renal units in two selected hospitals in Enugu and, to determine the proportion of

patients that adhere to the diet, influence of age, family/social support, socio-economic factors and relationship between education and compliance to renal diet adherence.

Cross sectional descriptive design was used for the study and the renal unit of University of Nigeria Teaching Hospital/ Neo hospital dialysis Centre was the setting for the study. The population of the study were adults above 21-86 years on dialysis from 2 months and above who had dialysis during the four weeks of data, collected between November to December 2015. The population of the study was 51 and all of them were used (as most of them did dialysis 2-3 times weekly and are meant to fill the questionnaire once while others were not yet on dialysis up to 2 months)

The data gathered were cleansed and analyzed using a statistical software package for social sciences (SPSS) version 20.0.

The analysis of the data revealed that there was an association between demographic factors and patient's adherence to renal diet i.e. age was significantly associated with renal diet adherence ($P = 0.034$; $P < 0.05$) therefore the null hypothesis was rejected and the alternative accepted .Patients aged below forty (40) years were less adherent to their diet (OR = 0.231, 95% C.I for OR = 0.060 -0896) Test for the association between socio-economic factors and patients' adherence to renal diet revealed no significance, P values of all the logistic regression statistics were greater than 0.05 therefore the null hypothesis was accepted. Family support especially spousal support aided adherence since the married ones 35 (68.6%) were the most occurring group and support from other people 29 (78.4%) for the treatment sponsored.

Educational level did not influence adherence at $P = 0.212>0.25$ level of significance but 25 (69.4%) with tertiary education are adhering and 13 (86.7%) with secondary and below are adhering which means every renal patient at any level will want to adhere due to the dietary counselling and exposure. Gender point of view, males were more in this study, this could be

due to their financial empowerment unlike the female patients which is in contrast to most studies where females are more and also more adherent to diet, fluid and medication. Community intervention targeted at interrupting transmission of these infections and population screening for early detection of communicable diseases like CKD, hypertension and Diabetes mellitus should be vigorously pursued. Arodiwe, Ike, Nwokodiuko, Ijoma, Ulasi, and Onodugo (2012).

Recommendations

Patient with CKD need to adhere strictly to drugs, dialysis, dietary advice. Patients need to be supported and not blamed (Hala et al 2015)

Health care providers should refer all patients to the dieticians for proper monitoring and guidance.

The team approach with the Nephrologist, dialysis nurse psychologist dieticians especially should be enhanced. In this study patient were mostly discussing their dietary prescription by the doctor and not by a dietician. More monitoring and education is needed on dietary prescription pre-dialysis status to prolong the commencement of dialysis treatment. Regular patients teachings and workshop on specific quantity of food, type of fruit, water and their regularity should be encouraged.

The Nephology nurses should be able to provide nursing interventions to patients undergoing hemodialysis to improve their health related issues.

Limitation of the study:

- The researcher encountered difficulty during the literature search in UNTH, no such study has been done in Nigeria. The other studies done in the country focused on the knowledge about dietary management and factors influencing it. Most studies on adherence to low protein were majorly in other foreign countries.

- Population of study was quite small from both hospitals and they had similar demographic characteristics.
- Cost for a broader study using more than 2 hospitals in Enugu.

Suggestion for further studies:

- Adherence to renal diet among pre-dialysis patients in stages 1-3 of renal disease to help delay further deterioration of the kidney.
- Factors that influence non adherence to diet among renal patients and find solution to enhance adherence.
- Factors that influence adherence to renal diet for patients on dialysis from 5 years to 10 years in older adults from 60 years and above to reduce incidence of medical complications associated with dietary and fluid non adherence. Subsequently reduce the end stage renal disease mortality rate.
- Search for healthy local food stuff good for the CKD patients should be carried out in Nigeria, so that renal diet will be appreciated and higher adherence achieved.

Implications of the study.

This study has some implication to nursing practice in all health institution and communities on whom the families depend on for their health care services.

Majority of the patients were males (54.9%) who are exposed to urinary tract infection, sexually transmitted disease, glomerulonephritis and obstructive nephropathies from cancers of prostrate, posterior ureteric valves. Hence the need for educating mainly males on the causes and complication of renal failure. There is need for periodic health checks for mainly males because of the structure and functions of their reproductive organs.

Income status: about 16(31%) of the respondents are not on any income. The implication is that since the cost of management of renal failure is high, government and philanthropists

should subsidize the cost of treatment and dialysis for these patients .The National Health Insurance Scheme covers only three sessions of dialysis hence should be reviewed.

Furthermore, since the proportion of patients who adhere to renal diet strictly is 39.2% therefore those who do not adhere, needs further strengthened strategies to improve adherence through the dietary counselling and improved family support in order to achieve satisfactory level of adherence among renal patients.

The demographic point of view in relation to the association between employment and adherence reveals that majority of those who adhered 22(73.3%) were employed. Government should provide employment opportunities for all while retirement age of 65 should be implemented at all levels of public services.

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QUESTIONNAIRE

Introduction: This questionnaire is a proposal designed to obtain information for writing up a study on factors that influence adherence to renal diet among patients attending the dialysis unit of U.N.T.H. ItukuOzalla and dialysis center (NEO hospital) in Enugu metropolis, which is in partial fulfillment of the requirement for a master's degree in nursing at the faculty of health science and technology of Nigeria, Enugu Campus (UNEC)

SECTION A: DEMOGRAPHIC DATA

1] Gender: male ☐ female ☐

2] What is your age? Please specify ----------

3] How long have you been on dialysis? Years----------Months----------

4] Marital status: single ☐ married ☐ divorced ☐ widowed ☐

5] Religion: Moslem ☐ Christianity ☐ others specify----------

6] Tribe: Igbo ☐ Hausa ☐ Yoruba ☐ others specify----------

SECTION B: SOCIO-ECONOMIC FACTORS

7] Level of education: a) none ☐ b) primary ☐ c) secondary ☐ d) tertiary ☐

8] What is your occupation? a) Unemployed ☐ b) retired ☐ c) student ☐

d) Civil servant ☐ e) business ☐ f) artisan (carpenter etc) ☐

9) Average monthly income: a) not on income ☐ b)<#20,000 ☐

c)#20,000--#35,000 ☐ d)#36,000--#50,000 ☐ e)<#51,000 ☐

10) How is your treatment sponsored? a)Personal income ☐ b) family/relations ☐

c) community support ☐ d) Social groups/clubs ☐

SECTION C: SELF REPORTED DIETARY ADHERENCE

		Never	Rarely	Some time	Most-time	always
11	I follow my doctor's dietary instructions:					
12	I cannot resist drinking beer or wine					
13	I cannot resist eating forbidden food					
14	Sometimes I allow my self to eat forbidden food					
15	I feel no different if I eat food I should not					
16	I am careless about food when I feel upset					
17	I drink fluids today as always					
18	My family helps me to eat the proper food					
19	When I eat out, I eat food that I should not					
20	I restrict the quantity of protein I eat					
21	I avoid foods containing salt					
22	I am careful not to drink too much fluid					
23	I restrict the type of fruits and vegetable I eat					
24	I am preoccupied with food					
25	I am careful to weigh my food					
26	It is difficult to drink less fluid in dry season.					
27	I weigh myself regularly					
28	I decide what food I eat					
29	I always eat salt with my food					
30	I am frustrated because of my diet					
31	I restrict the amount of salt I eat					
32	I just cannot accept having to restrict what I eat					
33	I restrict the amount I drink					
34	My diet prevents me from enjoying social function					
35	My diet becomes easier to follow over time					

APPENDIX 1

QUESTIONNAIRE

Department of Nursing Services
Faculty of Health Science and Technology
University of Nigeria,
Enugu Campus
12th October 2015

Dear Respondent,

I am a post graduate student of the above named institution, conducting a research on the factors influencing adherence to diet among patients attending renal units in two selected hospitals in Enugu state. The research study is for my dissertation, kindly assist me by answering the questions in the questionnaire, all information will be held highly confidential.

Thanks in anticipation, for your co-operation.

Agwu, Nnenna Eke

PG/M.SC/08/47836

07035839205

APPENDIX II

Department of Nursing Sciences
Faculty of Health Sciences and Technology
University of Nigeria,
Enugu Campus.
12th October 2015

Dear Madam,

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

RE: SELF DEVELOPED QUESTIONNAIRE

I am a post graduate student of the department conducting a study on the factors that influencing adherence diet among patients attending renal units in two selected hospitals in Enugu State.

I humbly request, may you use your expert knowledge in the area of nursing education to go through, correct and assess the validity of the attached instrument. I promise to effect corrections that will be made.

Thanks for your continual commitment in ensuring the successful completion of the work.

Yours faithfully
Agwu, Nnenna Eke
PG/M.SC/08/47836
07035839205

APPENDIX III

Department of Nursing Sciences

Faculty of Health Sciences and Technology

University of Nigeria, Enugu Campus

12th October 2015

The Chairman Medical Advisory Committee (CMAC)

Thro: The Head of Department Internal medicine

Thro: The Head of Department Renal Unit

Thro: The DDN/HNS Nursing Services Division

University of Nigeria Teaching Hospital Ituku-Ozalla

Dear Sir,

PERMISSION TO USE RENAL PATIENTS FOR MY STUDY

I, Agwu Nnenna Eke, a post graduate student of nursing sciences Department ,UNEC with registration number PG/MSc/0847836 wish to carry out a study on the factors influencing adherence to diet among patients attending the renal units of two selected hospitals in Enugu state .

I humbly ask for permission to use the patients attending the renal unit of the hospital for the study.

Attached is the ethical clearance obtained from the Ethical Committee of University of Nigerian Teaching Hospital Ituku – Ozalla.

The findings of the study will be treated confidentially.

Thanks in anticipation

Yours faithfully
Agwu, Nnenna Eke
PG/MSc/08/47836
O7035839205

APPENDIX IV

Department of Nursing Sciences
Faculty of Health Sciences and Technology
University of Nigeria, Enugu Campus
12th October 2015

The Chief Medical Director
NEO Hospital and Dialysis Centre
No 27 Nza Street
Independence Layout
Enugu

Dear Sir,

PERMISSION TO USE DIAYSIS PATIENTS FOR MY STUDY

I, Agwu Nnenna Eke, a post graduate student of nursing sciences department, UNEC with registration number PG/MSc/0847836 wish to carry out a study on the factors influencing adherence to diet among patients attending the renal units of two selected hospitals in Enugu State.

I humbly ask for permission to use the patients attending the dialysis centre of the hospital.

Attached is the ethical clearance obtained from ethical committee of university of Nigeria Teaching Hospital. ItukuOzalla.

The findings of the study will be treated confidentially.

Thanks in anticipation.

Yours faithfully
Agwu, Nnenna Eke
PG/MSc/08/47836
07035839205.

APPENDIX V

Department of Nursing sciences
Faculty of Health science & Technology
University of Nigeria, Enugu campus.
12th October, 2015.

The chairman,
Ethical committee
University of Nigeria Teaching Hospital
Ituku –Ozalla
Enugu state

APPLICATION FOR ETHICAL CLEARANCE

I am carrying out a research project in partial fulfillment for the award of M.sc in Nursing in the department of nursing science of the above named school. My topic is factors influencing adherence to diet among patients attending renal unit of two selected hospitals in Enugu state.

My research supervisor is Prof. (Mrs) C.B Okafor, informed consent would be sort from the respondents and information obtained would be treated confidentially.

I hereby apply for an approval to enable me proceed with the project.

Attached are the copies of my introductory letter, subject consent, the research proposal and the payment receipt.

Thanks in anticipation.

Yours Faithfully
Agwu, Nnenna Eke
PG/MSC/08/47836

APPENDIX VI

ETHICAL CLERANCE CERTIFICATE

APPENDIX VII

INFORMED CONSENT FORM

Introduction: my name is Agwu, Nnenna Eke. A post graduate student of Nursing Sciences Department , Faculty of Health Science and Technology , University of Nigeria , Enugu Campus.

Voluntary nature of participation: Subjects' participation in this study is entirely voluntary. You have the right to withdraw consent and discontinue participation at any given time.

Study procedure: my study is on factors influencing adherence to diet among patients attending renal units of two selected hospitals in Enugu State. You will be required to fill a questionnaire, please feel free to ask for any clarification for any question you do not s

Risk: the process of filling the questionnaire will not cause you any harm or injury.

Confidentiality: the information you give will be kept confidential.

Feedback: in case of any clarification, call me on 07035839205

Response: the study has been explained to me and I understood the consent of the study process. I will be willing to participate in the study described above.

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Signature of participant	Signature of Witness	Signature of Researcher
---	---	---
Date	Date	Date

APPENDIX VIII

Objective 1: to determine the proportion of patients who attend the renal unit and dialysis center that adhere to the renal diet? Questions 11-35 of the questionnaire answered the above question.

Table 3: The proportion of patients who adhere to the renal diet.

N=51

Items	Always N (%)	Most times N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)	Mean ± SD
I follow my doctor's dietary instructions	20 (39.2)	13 (25.5)	12 (23.5)	4 (7.8)	2 (3.9)	3.88 ± 1.14
I cannot resist drinking beer or wine	12 (23.5)	9 (17.6)	4 (7.8)	6 (11.8)	20 (39.2)	3.25 ± 1.67
I cannot resist eating forbidden food	9 (17.6)	6 (11.8)	13 (25.5)	5 (9.8)	18 (35.3)	3.33 ± 1.51
Sometimes I allow myself to eat forbidden food	7 (13.7)	14 (27.5)	8 (15.7)	9 (17.6)	13 (25.5)	3.13 ± 1.4
I feel no different if I eat food I should not	1 (2.0)	8 (15.7)	12 (23.5)	15 (29.4)	15 (29.4)	3.69 ± 1.12
I am careless about food when I feel upset	4 (7.8)	8 (15.7)	8 (15.7)	12 (23.5)	19 (37.3)	3.67 ± 1.34
I drink fluids today as always	4 (7.8)	4 (7.8)	16 (31.4)	19 (37.3)	8 (15.7)	3.45 ± 1.10
My family helps me to eat the proper food	23 (45.1)	17 (33.3)	6 (11.8)	3 (5.9)	2 (3.9)	4.09 ± 1.08
When I eat out, I eat food that I should not	7 (13.7)	18 (35.3)	9 (17.6)	4 (7.8)	13 (25.5)	2.96 ± 1.43
I restrict the quantity of protein I eat	16 (31.4)	17 (33.3)	14 (27.5)	2 (3.9)	2 (3.9)	3.84 ± 1.05
I avoid foods containing salt	16 (31.4)	11 (21.6)	11 (21.6)	10 (19.6)	3 (5.9)	3.53 ± 1.29
I am careful not to drink too much fluid	12 (23.5)	17 (33.3)	9 (17.6)	11 (21.6)	2 (3.9)	3.51 ± 1.19
I restrict the type of fruits and vegetable I eat	10 (19.6)	12 (23.5)	15 (23.5)	8 (15.7)	6 (11.8)	3.24 ± 1.27
I am preoccupied	6 (11.8)	6 (11.8)	15 (29.4)	12 (23.5)	12 (23.5)	3.35 ± 1.29

with food						
I am careful to weigh my food	11 (21.6)	15 (29.4)	7 (13.7)	12 (23.5)	6 (11.8)	3.25 ± 1.35
It is difficult to drink less fluid in summer (dry season)	9 (17.6)	5 (9.8)	18 (35.3)	16 (31.4)	3 (5.9)	2.98 ± 1.17
I weigh myself regularly	16 (31.4)	18 (35.3)	8 (15.7)	5 (9.8)	4 (7.8)	3.73 ± 1.23
I decide what food I eat	7 (13.7)	8 (15.7)	13 (25.5)	10 (19.6)	13 (25.5)	3.27 ± 1.37
I always eat salt with my food	3 (5.9)	11 (21.6)	11 (21.6)	16 (31.4)	10 (19.6)	3.37 ± 1.19
I am frustrated because of my diet	20 (39.2)	14 (27.5)	10 (19.6)	0 (0.0)	7 (13.7)	2.22 ± 1.35
I restrict the amount of salt I eat	11 (21.6)	16 (31.4)	14 (27.5)	8 (15.7)	2 (3.9)	3.51 ± 1.12
I just cannot accept having to restrict	10 (19.6)	23 (45.1)	8 (15.7)	4 (7.8)	6 (11.8)	2.47 ± 1.24
I restrict the amount I drink	17 (33.3)	10 (19.6)	12 (23.5)	12 (23.5)	0 (0.0)	3.63 ± 1.18
My diet prevents me from enjoying social function	22 (43.1)	15 (29.4)	5 (9.8)	3 (5.9)	6 (11.8)	2.14 ± 1.36
My diet becomes easier to follow over time	16 (31.4)	18 (35.3)	5 (9.8)	7 (13.7)	5 (9.8)	3.65 ± 1.32
	Grand Mean					3.33 ± 0.48

Table 3 show the proportion of patients that adhere to the renal diet. Analysing their responses to the self reported renal diet adherence. A criterion mean of 3.00 was set as a yardstick of measure and 3.33± 0.48 as the grand mean for all the items. Mean response value greater than the criterion mean of 3.00 is a positive response while below 3.00 criterion mean is a negative response.

From the stable the respondents tested for all the items and 5 of the items had a negative response below criterion mean of 3.00. The respondents 22 (43.1%) reported that always their diet prevents them from enjoying social function. Some of them 20 (39.2%) indicated that

they are frustrated because of their diet always. The other group 23 (45.1%) most times could not just accept having to restrict. Another group 18 (35.3%) most times eat food that they should not especially when they eat out.

The respondents with higher criterion mean above 3.00, had 23 (45.1%) whose family always helped them eat the proper food. And 20 (39.2%) who always follow their doctors dietary instruction. Others 18 (35.3%) weigh themselves regularly most times. Others 15 (29.4%) rarely felt no different if they ate food they should not. Some 19 (32.3%) when upset never care about their food. 18(35.3%) of them most times found their diet becomes easier to follow over time. 17 (33.3%) always restrict the amount they drank. Some 16(13.4%) always avoid foods contain salt. The others 17 (33.3%) most times are careful not to drink too much fluid.

In summary, the grand mean of 3.33 ±0.48 indicates that the respondents adhere to renal diet.