ASSESSMENT OF ADHERENCE TO TREATMENT REGIMEN ON HEALTH RELATED QUALITY OF LIFE AMONG HAEMODIALYSIS PATIENTS IN SELECTED HOSPITALS IN KANO METROPOLIS

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DECLARATION

I declare that the work in this dissertation entitled "Assessment of adherence to treatment regimen on health related quality of life among haemodialysis patients in selected Hospitals in Kano Metropolis" was carried out by me in the Department of Nursing Sciences, Faculty of Allied Health Sciences. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

Tijani Raimi	……	……
	Signature	Date

CERTIFICATION

This dissertation entitled ASSESSMENT OF ADHERENCE TO TREATMENT REGIMEN ON HEALTH RELATED QUALITY OF LIFE AMONG HAEMODIALYSIS PATIENTS IN SELECTED HOSPITALS IN KANO METROPOLIS by Tijani RAIMI meet the regulation governing the award of the degree of Masters of Science in Nursing of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This dissertation is dedicated to my lovely family for their psychological support throughout the study period. I love you all.

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LIST OF ABBREVIATIONS

ADL	–	Activity of Daily Living
ARF	–	Acute Renal Failure
AKD	–	Acute Kidney Disease
AKTH	–	Aminu Kano Teaching Hospital
CDC	–	Center for Disease Control
CKD	–	Chronic Kidney Disease
CRF	–	Chronic Renal failure
ESRD	–	End-Stage Renal Disease
ESRD-AQ	–	End-Stage Renal Disease- Adherence Questionnaire
HBM	–	Health Belief Model
HD	–	Haemodialysis
HRQOL	–	Health Related Quality of Life
MCS	–	Mental Component Summary
PCS	–	Physical Component Summary
PD	–	Peritoneal Dialysis
QOL	–	Quality of Life
RRT	–	-Renal Replacement Therapy
SF-36	–	Short Form -36 questionnaires

OPERATIONAL DEFINITION OF TERMS

Adherence: patient's conformance with health care providers' recommendations with all aspect of dialysis treatment without supervision.

Chronic Kidney Disease (CKD): A progressive irreversible deterioration in the kidney function with a glomerular filtration rate <60mL/min/1.73M^2 for three months or more, irrespective of cause.

Dialysis: It is a procedure that helps to remove excess waste from the body, which the kidney cannot remove because it is in failure. Dialysis utilizes the principle of osmosis, diffusion and ultrafiltration.

End Stage Renal disease: End stage renal disease (ESRD) a terminal phase of CKD resulting from a variety of disease processes resulting in dropping of glomerular filtration rate to below 15% requiring treatment with any form of renal replacement therapy which includes dialysis or transplantation.

Glomerular Filtration Rate: is the amount of renal filtrate formed by the kidneys in one minute, and averages 100 to 125 ml per minute. This is a marker of the kidney function which measures the rate at which the kidneys filter blood as it passes through them.

Haemodialysis: a form of dialysis in which a machine is used to mechanically process blood to remove toxin and excess fluid with the aid of a dialyzer (artificial kidney).

Health related quality of life: how the health of an individual impaired his or her quality of life

Nephrology Nurse: nursing subspecialty concentrating on the kidney and its function.

Quality of Life: An individually constructed satisfaction with life and life processes.

Renal failure: when the kidneys cannot remove the body's metabolic wastes or perform their regulatory functions. Renal failure in this study implied stage 4 and 5 of CKD when the patient is on dialysis therapy.

Renal replacement therapy: The term Renal Replacement Therapy (RRT) refers to transplantation or dialysis, which includes both peritoneal dialysis and haemodialysis used in the treatment of end stage renal disease.

ABSTRACT

Patients' with end-stage renal disease need to adhere to treatment regimen in four aspects; dialysis, medication, fluid and dietary restrictions. Adherence is thought to improve health related quality of life of these patients. Adherence level to treatment regimen varies and so also is the health related quality of life among haemodialysis patients. Therefore, the aim of this study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis. The objectives were to determine level of adherence to treatment regimen and health related quality of life, to identify factors affecting adherence to treatment and to explore the relationship between adherence and health related quality of life among haemodialysis patients in Kano metropolis. The health belief model was applied as a theoretical framework. A descriptive cross sectional correlation study was carried out using a modified version of End-Stage Renal Disease adherence Questionnaire and Short Form 36 questionnaire as data collection tools for adherence to treatment and health related quality of life respectively. A total of 83 patients participated in the study. Data collected were analysed using descriptive and inferential statistics. The result of the study revealed mean age of 43.9±12.7 years, 53% of patients were male and majority are married (78.3%). Majority of the patients undergo two sessions (62.7%) of dialysis per week, while 90.4% spent 4 hours per session. Overall good adherence level was 55.4%. Factors such as financial constraint, clotted vascular access, side effects of haemodialysis and poor knowledge of fluid and dietary restrictions were found to affect adherence. The overall health related quality of life of 62.7% of the patients was low. There was a statistical significance between adherence and health related quality of life using Pearson's correlation ($r= 0.275$, $P < 0.012$). It can

be concluded that, there is still the need for haemodialysis patients to improve on adherence to treatment regimen. Based on these there is the needs to raise the standards of patients' education among health care professionals. Both the Federal and State governments need to subsidize treatment for patients with renal disease towards improving adherence to treatment regimen.

CHAPTER ONE

INTRODUCTION

1.0 Introduction and Background

Renal failure results when the kidneys cannot remove the body's metabolic wastes or perform their regulatory functions (Hinkle & Cheever, 2013). The substances normally eliminated in the urine accumulate in the body fluids as a result of impaired renal excretion, leading to a disruption in endocrine and metabolic functions as well as fluid, electrolyte, and acid–base disturbances (Hinkle & Cheever, 2013). The risk factors for renal failure include but not limited to severe dehydration due to diarrhoea and vomiting, septicaemia, acute and chronic glomerulonephritis, uncontrolled hypertension, and diabetes mellitus (Hinkle & Cheever, 2013).

Renal failure may be acute or chronic. Acute renal failure (ARF) or Acute kidney disease (AKD) which occur suddenly with severe sudden interruption of kidney function but often reversible may be caused by bacterial infection, injury, shock, congestive heart failure, drug poisoning and severe bleeding (Hinkle & Cheever, 2013). If AKD is not properly managed, it could lead to chronic renal failure (CRF) which is also called Chronic Kidney Disease (CKD). Chronic kidney disease can occur without an episode of AKD. Chronic kidney disease is a progressive deterioration of kidney function over a long period, which is irreversible (Hinkle & Cheever, 2013). If diagnosed early the degenerative process can be slowed but not reversed by interventions that ranges from restricting fluid intake and protein consumption to about 60g per day, to taking drugs that will manage the underlying diseases that are damaging the kidneys. Some patients may go on to develop End-Stage Renal Disease (ESRD)

with a glomerular filtration rate of less than 10%, a life threatening condition that requires long-time dialysis or a kidney transplant (Hinkle & Cheever, 2013).

Dialysis is a therapeutic process used to removes nitrogenous and other waste products, and corrects electrolyte, water, and acid-base abnormalities associated with kidney disease (Daugirdas, Blake, & Ing, 2014). Dialysis requires the use of a semi permeable membrane that will allow the passage of water and small molecular weight solutes, but not large molecules like proteins (Daugirdas, Blake, & Ing, 2014). There are two types of dialysis; peritoneal dialysis and haemodialysis (Daugirdas, Blake, & Ing, 2014). Peritoneal dialysis utilizes the peritoneal membrane as the semi permeable membrane for exchange while haemodialysis treatment is accomplished by cleansing blood and removing excess fluid with a haemodialysis machine. In haemodialysis blood is removed and returned via a catheter, fistula, or graft access surgically placed primarily in the patient's arm or chest (Daugirdas, Blake, & Ing, 2014). Toxins are filtered during the blood exchanges by semi permeable membranes and disposed off by the dialysis fluid. Haemodialysis therapy is time-intensive, expensive, and requires fluid and dietary restrictions (Kamau, Kayima, Otieno, Maritim, & Wanzala, 2012). Long-term dialysis therapy itself often results in a loss of freedom, dependence on caregivers, disruption of marital, family, and social life, and reduced or loss of financial income (Bonner, Havas, Douglas, Thepha & Bennet., 2014). The renal failure patient's physical, psychological, socioeconomic, and environmental aspects of life are negatively affected, leading to compromised quality of life (Theofilou, 2011a: Kamau, Kayima, Otieno, Maritim & Wanzala, 2012).

Quality of life encompasses all physical, psychological, and social aspects of patient life (Kamau, Kayima, Otieno, Maritim, & Wanzala, 2012). The quality of life concept addresses the effects of individual health (including the effects of both disease and its treatment) on physical, cognitive, and social functioning in day-to-day life (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012). Patients with ESRD who are treated with haemodialysis experience many threats to Health Related Quality of Life (HRQOL), both from the myriad symptoms of ESRD itself and from the physical and mental burden of haemodialysis treatment. One way of ensuring quality of life for haemodialysis patients is adherence to treatment regimen.

Adherence is defined as the extent to which a person's behaviour in taking medications, following a diet, and/or executing lifestyle changes that corresponds with agreed recommendations from a healthcare provider (Lam, Lee & Shiu, 2014). Adherence in patient with ESRD undergoing haemodialysis usually consists of four components, which include attendance at haemodialysis sessions, adherence to the recommended medications, and fluid and diet restrictions (Sontakke, Budania, Bajait, Jawaisal & Pimpalkhute, 2015). Lack of adherence to prescribed ESRD treatments is a public health issue, as it is a major contributor to poor outcome (Venkateswararao, Stephen, Indoria & Rama, 2015). Adherence rates of dietary, fluid, medication and dialysis varies. The available literatures on haemodialysis patients' non-adherence identify a range of reasons for this behaviour one of which is inadequate education about their illness and illness management (Allen, Wainwright & Hutchinson, 2011). According to Chan, Zalilah and Hii, (2012) and Venkateswararao, Stephen, Indoria and Rama (2015), inadequate health knowledge, self-efficacy skills, forgetfulness and financial constraints

were the major perceived barriers towards better adherence to fluid, dietary, medication and haemodialysis.

1.1 Statement of the Problem

During the 2010 global burden of disease study, CKD has risen to 18th from 27th in the year 1990 (Jha, Garcia-Garcia & Iseki, 2013: National Kidney Foundation, 2015). The number of patients with ESRD requiring Renal Replacement Therapy (RRT) globally is estimated at over two million, yet this number may only represent 10% of people who actually need treatment to live (Couser, Remuzzi, Mendis & Tonelli, 2011: National Kidney Foundation, 2015). The global prevalence of ESRD is predicted to rise sharply in the next 20 to 30 years with the highest growth in low resource setting (Liyanage, Ninomiya, Jha, Neal & Patrice, 2015). About 88.2% of all incidence of ESRD world wide start RRT with haemodialysis (Zyoud, Daraghmeh, Mazyed, Khdeir & Swafta, 2016). In africa the number of patients with ESRD requiring dialysis is estimsted at 949,000 (Liyanage, Ninomiya, Jha, Neal & Patrice, 2015). Haemodialysis results in significant change in daily living, physical and psychological impairments, disruption of marital, family, and social life (Kamal, Kamel, Eldessouki & Ahmed, 2013).

In Nigeria, the situation is such that CKD represents about 8–10% of hospital admission (Ulasi & Ijeoma, 2010). This may be a huge under representation of the true situation (Ulasi & Ijeoma, 2010). In Nigeria as in most other developing countries, 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 relatives (Ulasi & Ijeoma, 2010: Makusidi, Liman, Yakubu, Isah, Abdullahi & Chijioke, 2014). This surely will have a bearing on patient's adherence to treatment and health related quality of life.

Nalado, Abdu, Muhammad, Abdu, Sakajiki and Adamu (2012) reported that the risk factors of chronic kidney disease are common among civil servant in Kano. Some of the risk factors identified are; hypertension, diabetes mellitus, proteinuria and consumption of herbal medications. This means the likelihood of developing CKD is high. More so the numbers of patients requiring dialysis have consistently risen over the years in Aminu Kano teaching hospital, dialysis centre. Most of these patients are often look sick and always needing support of family and relatives to carry out activities of daily living despite undergoing dialysis treatment which is expected to improve their health. One is forced to ask why the patients are not able to function optimally as expected.

Adherence to treatment is an issue in ESRD patients' due to long term illness, complex regimen, multiple non-pharmacological treatment strategies (Gracia-Llana, Remor & Selgas, 2013). Adherence rate to dietary, fluid, medication and haemodialysis varies (Venkateswararao, Stephen, Indoria, & Rama, 2015). Lack of adherence to prescribed renal failure treatment is a public health issue as it is a major contribution to poor outcome (Venkateswararao, Stephen, Indoria, & Rama, (2015). Non-adherence to treatment regimen can lead to more serious complications, frequent hospitalization, and loss of job hours and impaired health related quality of life (Wells, 2015). With the high statistics of people with CKD, if nothing is done to improve adherence level to treatment regimen this could lead to loss of productivity due to increase morbidity thus affecting the social and economic life of the patients and the community at large.

1.2 Aim of the Study

The aim of the study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis.

1.3 Specific Objectives

The aim of this study was achieved through these objectives:

1. To determine the level of adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis.
2. To identify the factors affecting adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis.
3. To determine the level of health related quality of Life among haemodialysis patients in selected hospitals in Kano metropolis.
4. To explore the relationship between adherence to treatment regimen and health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis.

1.4 Research Questions

1. What is the level of adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis?
2. What are the factors affecting adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis?
3. What is the level of health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis?
4. What is the relationship between adherence to treatment regimen and health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis?

1.5 Significance of the Study

The result of this study will give insight into the level of adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis and help to identify factors affecting adherence with a view to proffering solutions toward improving adherence rate. The study will also provide knowledge about the health related quality of life among the studied patients. Understanding of factors contributing to patient adherence to treatment and HRQOL can provide vital statistics to the health care providers especially the nephrology nurses and nephrologists toward improving care being rendered to patients undergoing haemodialysis in Kano. The finding from this study will help to advance medical knowledge and contribute to existing literature on patents with ESRD, adherence and HRQOL among haemodialysis patients.

1.6 Scope of the Study

The target population in this study were adult haemodialysis dependent ESRD patients. Participating patients would have been on haemodialysis therapy for a minimum of three months. Participants would be limited to those patients receiving haemodialysis in Aminu Kano Teaching Hospital and Muhammad Abdullahi Wase Specialist Hospital both in Kano metropolis being the only hospitals with haemodialysis centres in Kano.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter will be presented under the following headings;

1. Concepts of dialysis.
2. Concept of adherence to dialysis treatment regimen.
3. Adherence to fluid regimen
4. Adherence to dietary regimen
5. Adherence to medication
6. Concept of quality of life and health related quality of life among haemodialysis patients.
7. Summary.
8. Theoretical framework

2.2 Concept of Dialysis

Dialysis is a therapeutic procedure used in acute and chronic renal failure including those with ESRD to lower the blood level of metabolic waste product (urea, creatinine and abnormal electrolyte and fluid balance). Dialysis utilizes the principle of osmosis, diffusion and ultrafiltration (Daugirdas, Blake & Ing, 2014). Dialysis is a procedure that helps to remove excess waste from the body, which the kidney cannot remove because it is in failure. Dialysis is a form of chronic mechanical life support which replaces organ function (Daugirdas, Blake & Ing, 2014). Haemodialysis demands tremendous commitment on behalf of the patient and family.

Most ESRD patients receive dialysis treatments three times a week for an average of four hours during each treatment (Claudie & Thomas, 2012: Flythe, Curhan & Brunelli, 2012: Makusidi, Liman, Yakubu, Isah, Abdullahi & Chijioke, 2014). Health complications can occur during dialysis, primarily as a result of fluid and chemical shifts from the cellular and vascular systems. Complications include headaches, weakness, nausea, cramping, hypotension, and infections at the access site (Claudie & Thomas, 2012). Fistula or graft access involves often painful needle punctures with each treatment using 16-14 gauge needles large enough to accommodate dialysis pressures. Despite these problems, the reality is that dialysis is the only way for ESRD patients to stay alive aside undergoing kidney transplantation (Theofilou, 2011a).

2.2.1 Types of dialysis

There are two main types of dialysis; these are haemodialysis and peritoneal dialysis (Daugirdas, Blake & Ing, 2014). Haemodialysis treatment is accomplished by cleansing blood and removing excess fluid with a haemodialysis machine. Blood is removed and returned via a catheter, fistula, or graft access surgically placed primarily in the patient's arm or chest, although other sites can be used if these sites are not viable. Toxins are filtered during the blood exchanges by semi permeable membranes and disposed of by the dialysis fluid (Daugirdas, Blake & Ing, 2014). Haemodialysis fluid is an electrolyte solution with a composition very similar to that of normal plasma (Daugirdas, Blake & Ing, 2014). In haemodialysis, the patient's blood passes through a compartment formed by a semi permeable membrane surrounded by dialysis fluid. Most plasma proteins, red blood cells, white blood cells, and platelets are too large to pass through the membrane. Smaller particles, for example urea, creatinine, and glucose, can cross the dialysis membrane easily and so can be filtered out and removed (Daugirdas, Blake & Ing,

2014). This diffusion of differing sized particles across a semi permeable membrane is the basic process of dialysis. The dialyzer also referred to as the artificial kidney, removes uremic toxins, corrects acid-base disturbances, and restores electrolyte balances (Daugirdas, Blake & Ing, 2014). Frequent haemodialysis reduces the interval for accumulation of wastes and fluids.

Peritoneal dialysis (PD) is very similar to haemodialysis, however with this form of treatment; blood is cleansed while still inside the body (Daugirdas, Blake & Ing, 2014). The peritoneal cavity is filled with dialysis fluid through a surgically inserted catheter in the abdomen; this exposes the blood vessels in the peritoneum to the dialysis fluid. The peritoneum functions like an artificial membrane in a dialyzer where excess water and wastes pass from the blood capillaries through the peritoneum into the dialysis fluid (Daugirdas, Blake & Ing, 2014). The dialysis fluid is then drained from the body and discarded. The process is repeated 4 to 6 times in every 24 hour period (Daugirdas, Blake & Ing, 2014).

2.2.2 Component of dialysis treatment regimen

Patients undergoing dialysis apart from the dialysis treatment have additional therapeutic interventions in ESRD which comprises of use of medications, dietary and fluid regulations (Masina, Chimera, Kamponda & Dreyer, 2016).

Patients undergoing haemodialysis are often given intravenous iron intermittently, erythropoietin stimulating agents to prevent anaemia due to inability of the kidney to produce erythropoietin. Other drugs often prescribed are vitamin D receptor activating

agents' e.g. alpha calcidol and phosphate binding medications (Masina, Chimera, Kamponda & Dreyer, 2016).

Dietary restriction especially protein is one of the key treatment modality for patient undergoing haemodialysis. This is done to reduce the production of nitrogenous waste from protein metabolism. Dietary protein may be decreased to around 60g per day or 0.6g/kg body weight and limited to protein high in essential amino acids (Hinkle & Cheever, 2013). Sodium, patassium and phosphote rich diet are also restricted to prevent fluid retention and acidosis.

Fluid restiction is another component of the treatment regimen of patients undergoing haemodialysis. Fluid is restricted based on the urine output of the patient in twenty four hours or the residual renal function usually calculated by the glomerular filtration rate (GFR). Usually fluid is restricted to about 400ml to 500ml plus the precious day urine output (Hinkle & Cheever, 2013). Patients undergoing haemodialysis are expected to adhere to the whole component of the treatment regimen because they all play important role in enhancing good therapeutic outcome.

2.2.3 Roles of medical surgical nurses on patient with ESRD undergoing dialysis

The role of a nurse in the management of a patient with renal failure undergoing dialysis cannot be over emphasize as nurses especially, nephrology nurses occupy a pivotal position in the care of these patients. Nephrology nurses practice in dialysis clinics or/and hospitals, kidney transplant programs, and many other inpatient and outpatient settings. In inpatient settings, patients are often critically ill and care is challenging. In outpatient settings, the nephrology nurse is an integral member of a multidisciplinary

team that cares for patients with complex needs. The nurse in this setting functions as advocate, educator, consultant, care coordinator, and direct caregiver and oversees long-term care of chronically ill patients. As such, the nephrology nurse can have a positive impact on the quality of patients' lives. The role of nurses can be view under three level of care:

1. **Primary care role:** The nephrology nurse in the dialysis setting is involved in the delivery of primary nursing care for patients with ESRD. These cares include: nursing assessment, identification of risk factors, patient education, initiation of dialysis, patient and machine monitoring during dialysis, and termination of the dialysis procedure and nursing care immediately prior to and following renal transplantation.
2. **Secondary care role:** The nephrology nurse is involved in the delivery of secondary care of patients with ESRD through: Introducing treatment modalities to the patient and family, Coordinating multidisciplinary care for the person with ESRD, nursing intervention to prevent complications, decreasing the need for hospitalizations, assisting patients in achieving rehabilitative potential and Collaborating with the patient and family to understand their goals and expected outcome. Nurses also Collaborate and coordinate care with appropriate health care team members who can help patient and families achieve expected outcome like the dietician and the social welfare team.
3. **Tertiary care role:** This level of care is concerned with rehabilitation of patients with ESRD with the hope of making them adapt to the limitations imposed by ESRD by changing their life style through health education and

support, to make them independent as much as possible and have improved quality of life.

2.3 Concept of Adherence to Dialysis Treatment Regimen

Adherence is defined as the extent to which a person's behaviour in taking medications, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations from a healthcare provider (Lam, Lee & Shiu, 2014). Cohen, (2009) defined adherence as persistence in the practice and maintenance of desired health behaviour as a result of active participation and agreement. He further said that adherence is dependent on the development of a concordant relationship between the patient and the health personnel.

Compliance is use interchangeably with adherence by some researchers but according to Cohen, (2009) adherence is different from compliance in that compliance is the extent to which the patient's behaviour matches the health professional's recommendations. This he belief did not give the patient freedom of decision making. Compliance has been criticized for its negative connotation in that it implied a passive role for the patient and suggests an element of blame for the individual who fails to comply with correct treatment instructions provided by experts (Kaufman & Birks, 2009). The term adherence is broader than compliance because it allows patients to use their right and role to make a decision related to their life (Kaufman & Birks, 2009). Adherence is not only about sticking to a programme or recommendation from prescriber, but also allow patients to think further about their life. Patient's awareness of the importance of his or her life will encourage the patient to decide the best for him or herself. The term

adherence is more appropriate to be used in relation to HRQOL of patients with ESRD undergoing haemodialysis (Bissonette, 2008).

Adherence in patient with ESRD usually consists of four components, which include attendance at haemodialysis sessions, adherence to the recommended medications, fluid and diet restrictions (Venkateswararao, Stephen, Indoria & Rama, 2015). The deterioration of kidney function requires considerable dietary adaptations to reduce the risk for increased morbidity and mortality, including changes in the intake of energy, macronutrients, certain minerals and fluid (D'Alessandro, Piccoli, Calella, Brunori & Pasticci, 2016).

The ESRD patients are expected to continue the haemodialysis session for life except where they undergo kidney transplant. Gracia-Llana, Remor and Selgas, (2013) belief there is a positive correlation between frequency of dialysis sessions and adherence. The time demanded by thrice weekly dialysis treatments often interferes with the daily life of patients and care givers (Wells, 2015). Despite the importance of need for adherence to their treatment there still exists large percentage of non-adherence to treatment. Adherence to dialysis shows wide range of results. Some studies reported about 52% adherences for dialysis sessions (Al-Khattabi, 2014: Naalweh, Barakat, Sweileh, Al-Jabi & Zyoud, 2017). Lam, Lee and Shiu (2014) reported that adherence to dialysis sessions is almost 100% because patients perceived that dialysis drained toxins out of their body and keep their condition under control. In a similar vein Chan, Zalilah and Hii (2012) reported 91% adherence for dialysis sessions among Chinese patients.

2.3.1 Adherence to fluid regimen

Adherence to fluid restrictions is essential to the long term health and survival among individuals with ESRD. When the kidneys fail, they make less urine. The less urine the body makes, the less liquid or fluid a person should take because the excess fluid accumulate in the body. For most individuals receiving haemodialysis, who no longer produce urine, liquids are usually limited to 1000 ml per day (DaVita, 2013). Fluid gains between dialysis treatments are restricted to four percent of body weight (about one litre for an average size adult). Fluid restrictions are challenging for most individuals with ESRD as these restrictions often change the way they socialize and interact with others. This can sometimes make these individuals feel different and increase their desire to be like everyone else thus promoting non-adherence to fluid restrictions (Tovazzi & Mazzoni, 2012). Fluid adherence varies from one study to another. According to Tovazzi and Mazzoni, (2012) 42% of patient with ESRD are adherent to their fluid restrictions while 58% are not. Chan, Zalilah and Hii (2014) reported 24.5% adherence to fluid restriction while Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud (2017) reported 31% among haemodialysis patients in Palestine. Al-Khattabi (2014) reported a high fluid adherence rate of 87.9% among haemodialysis patients in Makah.

2.3.2 Adherence to dietary regimen

It was reported that protein is the core issue of dietary manipulation in ESRD patient undergoing haemodialysis (D'Alessandro, Piccoli, Calella, Brunori, Pasticci, Egidi et al., 2016). Low protein regimen is a dietary protein of less than 0.8g per kilogram body weight per day (D'Alessandro, Piccoli, Calella, Brunori, Pasticci, Egidi et al., 2016). The benefits of low protein diet are reduction of hyperphosphataemia and urea,

amelioration of metabolic acidosis and protection against cardiovascular complications (D'Alessandro, Piccoli, Calella, Brunori, Pasticci, Egidi et al., 2016). A renal diet restricts any food containing high levels of phosphorus, sodium, or potassium along with protein (D'Alessandro, Piccoli, Calella, Brunori, Pasticci, Egidi et al., 2016). The renal diet limits potassium intake to about 2000 milligrams per day while no more than about 2000 milligrams of sodium per day is prescribed. With the help of a registered dietitian, diet and fluid restrictions guidelines are tailored to the needs of each individual patient's. Consumption of fruits, nuts, milk, cheeses, and processed foods are also limited. Despite the importance of need for adherence to their treatment regimen there still exists large percentage of Non-adherence to dietary restrictions among haemodialysis patients (Sontakke, Budania, Bajait, Jawaisal & Pimpalkhute, 2015). Chan, Zalilah and Hii (2012) reported that 27.7% of patients are adherent to dietary restrictions while 24% was reported to be adherent by Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud (2017). Al-Khattabi (2014) reported a higher percentage of 88.37 among haemodialysis patients in Makah.

2.3.3 Adherence to medication

Patients undergoing dialysis are expected to be on some medications to control hypertension and prevent anaemia. Non-adherence to medication can be harmful as well as expensive for patients and reduces health benefits of drug therapy (Sontakke, Budania, Bajait, Jawaisal & Pimpalkhute, 2015). According to Sontakke, Budania, Bajait, Jawaisal and Pimpalkhute, (2015), 34% patients were non-adherent to prescribed medication schedule, whereas 37.33% patients showed low adherence and only 28.67% are adherent to their medications. Other studies shows a higher percentages for medication adherence; Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud

(2017) 81%, Chan, Zalilah and Hii (2012) 66.5% and 87.99% was reported by Al-Khattabi (2014). Poor adherence was found to have positive correlation with number of concurrent illnesses and number of medications prescribed. Not buying all medicines and not taking medicines for required duration were the most common types of Non-adherence (Sontakke, Budania, Bajait, Jawaisal & Pimpalkhute, 2015). Other reports observed that non-adherence is most common for fluid restrictions and somewhat less common for dietary restrictions and medication (Theofilou, 2012). Many factors have been found to influence medication adherence, and those associated with non-adherent behaviour (Theofilou, 2012). Some of the factors include; forgetfulness and inability to abstain from the desire to eat or drink especially when the restrictions were newly imposed on the patients (Lam, Lee & Hii, 2014). Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud (2017) reported that overall adherence of patients to dialysis treatment regimen is such that 55.5% of patients have good adherence score while 40.5% have moderate adherence and 4.1% have poor adherence score on an adherence score scale of 100. Al-Khattabi (2014) observed that there are wide divergent results from different studies about the prevalence of adherent to dialysis treatment regimen due to lack of clear cut and consistent definition of adherence.

2.3.4 Factors affecting adherence to dialysis treatment regimen

Adherence is a multidimensional phenomenon determined by the interplay of some sets of factors. It is clear that adherence is a complex behavioural process strongly influenced by the environments in which people live, health care providers practice, and health care systems delivery. Adherence is related to people's knowledge and beliefs about their illness, motivation to manage it, confidence in their ability to engage in illness management behaviours, and expectations regarding the outcome of treatment

and the consequences of poor adherence. Some of the factors that may influence adherence include:

1. Socioeconomic factors-. One of the major factors responsible for this is poor affordability due to high cost of treatment (Makusidi, Liman, Yakubu, Isah, Abdullahi & Chijioke, 2014). Haemodialysis sessions frequency is often limited by financial constraint to below the standard practice of thrice weekly (Nguyen, Bose, & Finkelstei, 2016). Whether high cost is responsible for poor adherence to treatment would depend on whether patients have to pay out of pocket for treatment or the expenses are covered by health insurance. According to Makusidi, Liman, Yakubu, Isah, Abdullahi and Chijioke, (2014) only about 12% of patient could sustain at least two sessions per week of haemodialysis before defaulting because of financial constraint in a study carried out in Sokoto state, Nigeria. Most haemodialysis treatment in sub-saharan Africa is provided in fee paying haemodialysis units (Nguyen, Bose & Finkelstei, 2016), this could affect adherence to haemodialysis scheldule among patients because of the high cost of dialysis treatment. According to Lam, Lee and Shiu (2014) a major factor influencing adherence is support from family members. Age , gender and residence have been shown to have a positive association with adherence, specifically elderly male patients living in the city have better adherence (Naalweh, Barakat, Sweileh, Al-Jabi & Zyoud 2017). But Ibrahim, Hossam and Belal, (2015) reported that there were no statistical differences between adherent and non-adherent patients with regards to age, gender, educational level and employment status.

2. Health care system factors; the kind of relationship between the Provider and patient, Provider communication skills once patient commence haemodialysis often affect adherence (Wells, 2015). Lack of positive reinforcement from the health care provider, Weak capacity of the system to educate patients and provide follow-up care could lead to poor or low adherence (Gracia-Llana, Remor & Selgas, 2013). Abnormal indicators of adherence always led to reinforcement of need of adherence by health care professionals which makes the patients to adopt stricker adherence to treatment regimen (Lam, Lee & Shiu, 2014)
3. Treatment related dimensions; Complexity of treatment regimen (number of daily doses of drugs), dietary restrictions, and time spent on haemodialysis per week, all these interfere with their work schedule and other family commitments (Wells, 2015). Frequent changes in treatment regimen, social stigma attached to constructed arteriovenous fistulas and arteriovenous graft, unpleasant side effects of haemodialysis treatment interfere with lifestyle or require significant behavioural changes could promote non-adherence (Wells, 2015). Unpalatable taste and not liking the allowable foods was reason given for non-adherence with diet and fluid restrictions by participants in a study carried out among ESRD patients undergoing haemodialysis (Wells, 2015).
4. Lack of knowledge; Lack of knowledge about the usefulness of treatment regimen is another reason reported for non-adherence (Venkateswararao, Stephen, Indoria & Rama, 2015). Lack of awareness about type and quantity of food to be restriced, how to tackle thirst and wrong perception of the patient that haemodialysis will help in the removal of all fluid consumed (Gracia-Llana, Remor & Selgas, 2013). Thus, it is evident that low health literacy along with

complex treatment schedule contributes to Non-adherence (Chan, Zalilah & Hii, 2012; Sontakke, Budania, Bajait, Jawaisal & Pimpalkhute, 2015). Lam, Lee and Shiu (2014) reported that patients attributed their partial adherence to lack of knowledge, inability to see the impotance of adherence to treatment regimen.

5. Patient perception; patient's perception toward illness and health care provider play a key role in determining adherence pattern (Gracia-Llana, Remor & Selgas, 2013). Negative illness perception often lead to low adherence rate to medication, fluid and dietary restrictions among patient with ESRD on haemodialysis (Kim & Evangelista, 2010: Wells, 2015). According to Lam, Lee and Shiu (2014) patients describes adherence to dialysis treatment regimen as troublesome, impractical and confusing and that permanent strict adherence was perceived as impossible.

2.4 Concept of Quality of Life and Health Related Quality of Life among Dialysis Patients

The emergence of quality of life research in health shows a change from the usual management of acute to chronic disease and the focus on morbidity rather than mortality as an outcome of medical interventions. According to Marcel, (2014) the recognition of Quality of Life (QOL) goes back to 1947 World Health Organization (WHO) definition of health as a "state of complete physical, mental and social well-being and not merely the absence of disease and infirmity". The use of well-being in this definition according to Marcel (2014) has contributed significantly to the concept of health and quality of life. Health use to be defined primarily in terms of death and the extent of morbidity but the emerging conceptualization of health encompasses how well people function in everyday life and personal well-being (Ware, 1949 cited in Marcel,

2014). Quality of life have no universal definition according to Taylor, Gibson and Franck (2008), that is why there are various definition of quality of life among authors and researchers. Jaar, Chang and Platinga (2013) defined quality of life as a broad multidimensional concept that usually includes subjective evaluation of both positive and negative aspect of life. Theofilou (2011a) defined Quality of life as encompassing all physical, psychological, and social aspects of patient life. Quality of life measure incorporates four broad health dimensions which are physical health, mental health, social and functional health (Marcel, 2014). According to Marcel (2014), Physical health deals with disease, symptoms and treatment side effects while mental health covers positive well-being and diagnosable psychological disorders. Social health on the other hand deals with social contact and interaction with people and the environment while functional health looks at the self care, physical activity level and social role function of the individual. Another feature common to quality of life measure is the reliance on the subjective judgment of patients' themselves rather than rating provided by health personnel or family members (Marcel, 2014). This is because from the various definition discussed above, it can be deduced that quality of life is an individual experience which is influenced by their perceptions of living with illness or disability or the degree of satisfaction or dissatisfaction felt by an individual with various aspect of his or her live.

The concept of Quality of Life (QOL) and Health Related Quality of Life (HRQOL) is used interchangeably. According to the Center for Disease Control(CDC) (Center For Disease Control and Prevention, 2016), the concept of health related quality of life evolved since the 1980s and it encompasses those aspect of overall quality of life that can be clearly shown to affect health. Karim and Brazier (2016) defined HRQOL as the

way health is empirically estimated to affect QOL. Health related quality of life encompasses the appraisal of a patient regarding his or her physical or mental health. This appraisal depends upon whether patients experience limitations due to their disease and/or the extent to which their disease interferes with their life and overall functioning (De Gucht, 2015). Health related quality of life addresses the effects of individual health (including the effects of both disease and treatment) on physical, cognitive and social functioning in day to day life (Jaar, Chang & Platinga, 2013).

In general, patients suffering from ESRD and undergoing haemodialysis have to cope with many adversities, e.g. physical symptoms, limitations in food and fluid intake, work and economic status, social roles, activity levels, self-image, health status, and normal routines, while their control over treatment cannot always be predicted (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012), Such constraints are expected to affect the patients' lives and their physical and social functioning.

Functional status which is the ability to perform activities, such as walking bathing, dressing, getting out of bed, and using the toilet are key aspect of the quality of life, a strong predictor of survival, a determinant of care giving needs and health care costs, and a factor in decisions about medical procedures, such as haemodialysis (Theofilou, 2013: Makkar, Kumar, Mahajan & Khaira, 2015). It can be concluded that Quality of Life (QOL) is a broader concept which cover all aspect of life because it includes evaluation of non-health related features of life while Health related Quality of Life (HRQOL) focus on the effect of illness specifically on the impact treatment may have on QOL.

The treatment of ESRD by haemodialysis creates considerable stress on patients, including potential changes in family relations and social life and more specifically social restrictions (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012). Studies on health related quality of life among patient undergoing haemodialysis usually look at two major components, which are the Physical Component Summary (PCS) score and the Mental Component Summary (MCS) score (Yarlas, White, Yang, Saris-Baglama & Bech, 2011). In a study carried out at Kenyatta National Hospital on HRQOL among patients undergoing maintenance haemodialysis, it was reported that HRQOL of the patients are lower in the physical component summary (PCS) score compared to the mental component summary (MCS) score. The mean PCS and MCS score were 39.09 and 41.89 respectively (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012). According to Alvares, Cesar, Acurcio, Andrade and Cherchiglia (2012) the mental aspect of a patient is less affected than the physical aspect with people having ESRD and undergoing haemodialysis. Masina, Chimera, Kamponda and Dreyer (2016) in their study carried out in Malawi reported a low overall level of HRQOL among haemodialysis patients' in both the PCS and MCS score with the lowest score being in the PCS score. Kamal, Kamel, Eldessouki and Ahmed, (2013) repoted that 64% of haemodialysis patients have below average HRQOL score and HRQOL was lower in the old, female, married, illitrate and unemployed patients in a study carried out in El-Minia University hospital, Egypt. Rad, Mostafavi, Delavri and Mostafavi (2015) however reported an overall HRQOL mean of 52.26 among dialysis patients in Iran. The mean HRQOL score were relatively higher in younger age group in all domain (Abdelghany, Elgohary & Nienaa, 2016).

2.4.1 Factors affecting health related quality of life of patients undergoing haemodialysis

There are various factors influencing health related quality of life among dialysis patients. Some of these factors include:

1. Sociodemographic factors**;** Sociodemographic factors, such as; age, sex, race, educational level and marital status affect health related quality of life of patients undergoing dialysis (Theofilou, 2011a). Low socioeconomic status influences health in many ways, such as inadequate access to health services, preventive medical care and examination for early detection of disease (Alvares, Cesar, Acurcio, Andrade & Cherchiglia, 2012). Women have lower HRQOL scores than men which has been associated with women's multiple domestic tasks due to their biological and cultural roles and responsibilities (Alvares, Cesar, Acurcio, Andrade & Cherchiglia, 2012). Men of all ages have a higher score in terms of their social interactions compared to women of corresponding age (Gerogianni, Babtsikou, Gerogianni, Koutis, Panagiotou & Psimenou, 2016).
2. Educational factors; patients with lower educational level face problems with their psychological well-being, their social relationships, and their general health (Theofilou, 2011b).
3. Social support system; Social support includes economic support, informational support and emotional support. Patient's family support plays an important role in improving the HRQOL of patient through the support given by a spouse and significant others. Married patients seem to enjoy better quality of life and are more satisfied with their lives according to Theofilou, (2011b).

4. Employment status; patients' who are employed have better HRQOL because to have job certainly exerts a positive effects on an individual's perception of their health and capacity to feel useful and this influence the physical health (Alvares, Cesar, Acurcio, Andrade & Cherchiglia, 2012). According to Abdelghany, Elgohary and Nienaa, (2016) unemployed patients have statistically reduced HRQOL in a study carried out at the haemodialysis unit of Karmouz Health Insurance Hospital, Alexandria, in Egypt among patients undergoing haemodialysis.
5. Religious and spiritual influence; religious and the spiritual attachment of an individual to the belief of a supreme being that control man's activities plays a role in influencing HRQOL. Claudie and Thomas, (2012) find out that religious and spiritual elements may be associated with prolong survival rates and greater HRQOL among haemodialysis patients. Similarly Santos, Junior, Filho, Ferreira, Filho and Oliveria (2017) also reported that there is positive correlation between positive religious and spirituality coping and HRQOL especially general health and vitality (energy/fatigue) subscale.
6. Co morbid state; the presences of other diseases or health problem with patient undergoing haemodialysis affect their HRQOL negatively (Zyoud, Daraghmeh, Mezyed, Khdeir, Swafta, Ayaseh, et al., 2016). In the same vain the physical, psychological and social stressors engendered by the disease and its treatment result in impaired HRQOL (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012).

2.5 Summary

Dialysis is defined as a therapeutic procedure of removing excess nitrogenous waste and correction of electrolyte and fluid balance when the kidneys are in failure. There are two main type of dialysis; haemodialysis and peritoneal dialysis. Dialysis treatment regimen also includes, medication, dietary and fluid restrictions.

Adherence is the extent to which patient's behaviour matches agreed recommendation of the prescribers. Adherence also involves patients' exercising their right and role to make decision related to their life. Socioeconomic factors, patients' perception and belief have been shown to influence adherence.

Quality of life and health related quality of life are used interchangeably because they are both measured using same measuring instrument. The measure of quality of life and health related quality of life includes; physical function, mental status and ability to engage in normative social interaction. Quality of life is broader than health related quality of life. Health related quality of life is concerned with how disease, disorders and injury affect quality of life. Marital status, age, gender, employment status, co-morbid state among others, has been found to affect health related quality of life. Health care provider should have an understanding of the concept of adherence and health related quality of life in the context of patient care to guide patient self care behaviour.

2.6 Theoretical Framework

The theoretical framework for this study is the Health Belief Model (HBM). The HBM was first developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels working in the United State of America, public health services (Rosenstock, 1974). The model was developed in response to the failure of a free tuberculosis health screening program. Subsequently, it was extended by Leventhal, Rosenstock, Becker and others to explain differing reactions to symptoms and to explain variations in adherence to treatment (Champion & Skinner, 2008).

Health belief model addresses the relationship between a person's beliefs and behaviours. It provides a way of understanding and predicting how clients will behave in relation to their health and how they will comply with health care therapies (Glanz & Bishop, 2010). The HBM has been found to be helpful in explaining individual's health actions under condition of uncertainty (Simons-Morton, McLeroy, & Wendel, 2012).

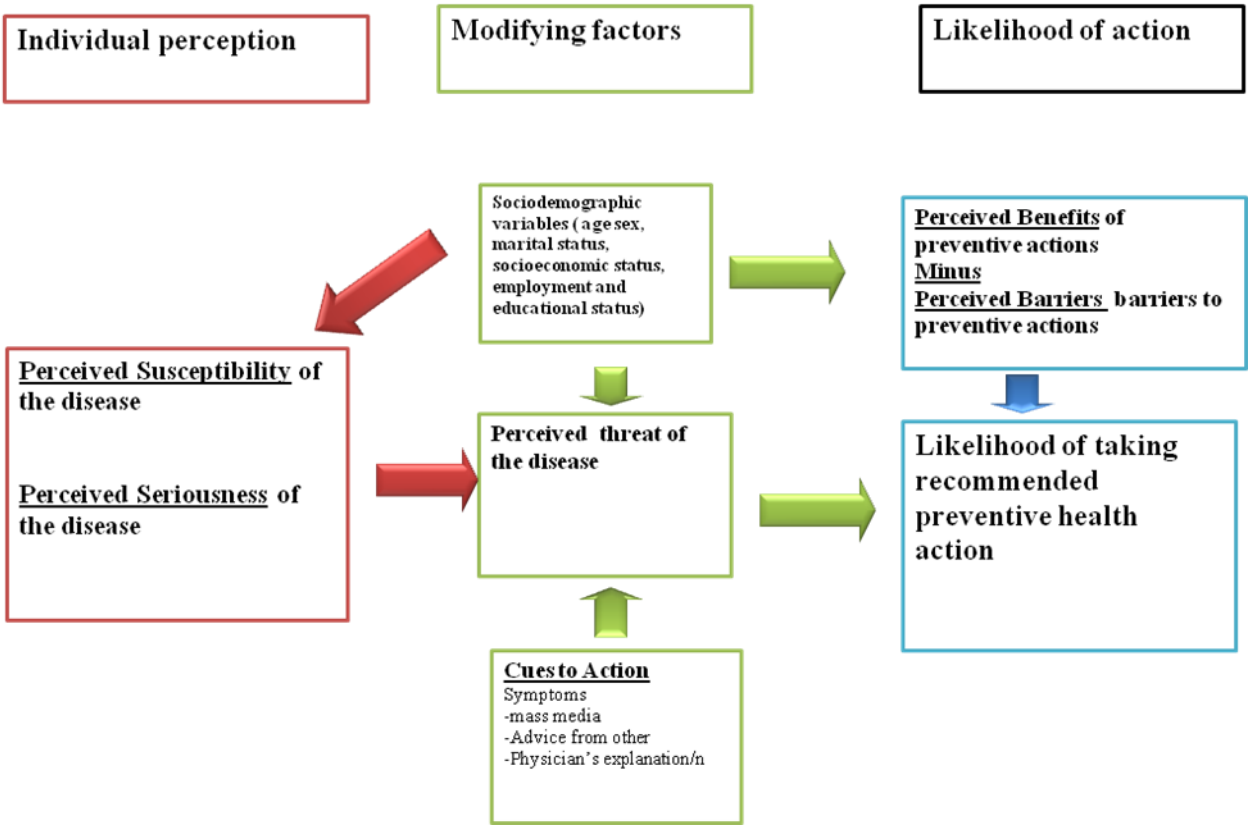


Figure 2.1 The Health Belief Model (Stretcher & Rosenstock, 1997).

2.5.1 Assumptions of the Health belief Model (HBM)

The underlying concept of the original HBM is that health behaviour is determined by personal belief and perception about a disease and the strategies available to decrease its occurrence (Hochbaum, 1958 cited in Glenz, Rimer, & Viswanath, 2008).

The core assumption of the HBM according to Champion and Skinner (2008) is based on the understanding that a person will take a health-related action if that person:

1. Feels that a negative health condition can be avoided.
2. Has a positive expectation that by taking a recommended action, he or she will avoid a negative health condition.
3. Believes that he or she can successfully take a recommended health action.

2.5.2 Theoretical construct of the health belief model

The original health belief model have four construct which are perceived seriousness, perceived susceptibility, perceived benefit and perceived barriers. Each of these perceptions individually or in combination can be used to explain health behaviour. But more recently other construct have been added to the HBM, thus the model has been expanded to include; cue to action (Champion & Skinner, 2008).

According to Champion and Skinner (2008) the HBM postulates that health-related actions and compliance depend on the perceptions of the individual in these areas:

1. **Perceived Susceptibility;** Perceived susceptibility refers to beliefs about the likelihood of getting a disease. Personal risk or susceptibility is one of the more powerful perceptions in prompting people to adopt healthier behaviours.
2. **Perceived seriousness or Severity;** the construct of perceived seriousness speaks to an individual belief's about the seriousness or severity of a disease, while the perception of seriousness is often based on medical information or knowledge, it may also come from beliefs a person has about the difficulty a disease would create or the effect it would have on his or her life in general. Feelings about the seriousness of contracting an illness or of leaving it untreated include evaluations of both medical and clinical consequences. The combination of perceived susceptibility and perceived severity is labelled as perceived threat.
3. **Perceived Benefits;** the construct of perceived benefit is a person's opinion of the value or usefulness of a new behaviour in decreasing the risk of developing a disease. People tend to adopt healthier behaviour when they believe the new behaviour will decrease their chances of developing a disease. Perceived benefit play an important role in adoption of preventive behaviour such as screenings. Even if a person perceives personal susceptibility to a serious health condition

(perceived threat), whether this perception leads to behaviour change will be influenced by the person's beliefs regarding perceived benefits of the various available actions for reducing the disease threat.

4. **Perceived Barriers;** this is an individual's own evaluation of obstacles in the way of him or her adopting a new behaviour. Perceived barriers are the most significant in determining behaviour change (Janz & Becker, 1984). In other for a new behaviour to be adopted, a person needs to believe the benefit of the new behaviour outweigh the consequences of continuing the old behaviour. Perceived barriers may act as impediments to undertaking recommended behaviours. A kind of nonconscious, cost-benefit analysis occurs wherein individuals weigh the action's expected benefits with perceived barriers. It could help me, but it may be expensive, have negative side effects, and be unpleasant, inconvenient, or time-consuming. Thus, combined levels of susceptibility and severity provide the energy or force to act and the perception of benefits minus barriers provide a preferred path of action (Rosenstock, 1974 cited in Champion and Skinner,2008).

5. **Cue to action;** the HBM suggested that behaviour is also influenced by cue to actions. Cue to actions are events, people or things that move people to change their behaviours. Examples include illness of family member, media reports, advice from others, and reminder postcards from health care providers or health warning on product (Ali, 2002).

2.5.3 Criticism of the health belief model

The health belief model have been criticized for focusing heavily on beliefs about risk, rather than emotional responses to perceived risk, which also predict behaviour

(Lawton, Conner & Parker, 2007). It emphasizes on the individual and ignores social and economic factors that could also determine health behaviour.

2.5.4 Application of the health belief model

The Health Belief Model has been applied to a broad range of health behaviors and subject populations. The first is in Preventive health behaviors, which include health-promoting (e.g. diet, exercise) and health-risk behaviors as well as vaccination and contraceptive practices. The second is in Sick role behaviors, which refer to adherence with recommended medical regimens, usually following professional diagnosis of illness and lastly it is applied in clinical situation, which includes physician visits for a variety of reasons.

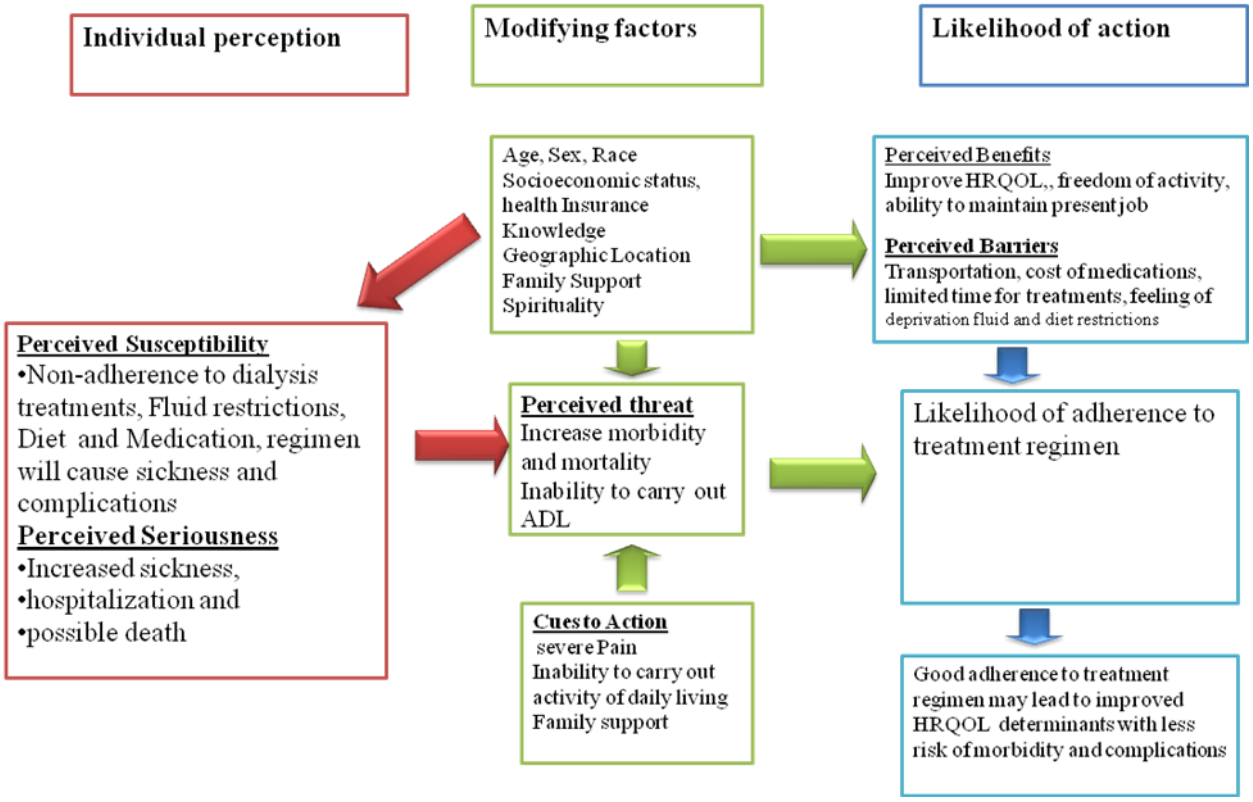


Figure 2.2 Application of Health belief Model to Haemodialysis Patients

2.5.5 Application of health belief model to this study

The health belief model is one of the most widely used models in nephrology research (Russell, Knowles & Peace, 2007). It has been used to predict adherence to dialysis treatments for individuals or groups of individuals with ESRD and to help renal professionals identify modifying factors that could improve health related outcomes for individuals receiving dialysis treatments. Research has shown that its key variables are associated with adherence behaviours (Simons-Morton, McLeroy & Wendel, 2012). According to Champion and Skinner (2008) the HBM postulates that health related actions and adherence depend on the perceptions of the individual. The HBM is adopted

and modified to study adherence to treatment regimen on HRQOL among patients undergoing haemodialysis.

1. **Perceived Susceptibility;** Perceived susceptibility refers to beliefs about the likelihood of getting a disease. The greater the perceived risk the greater the likelihood of engaging in behaviour to decrease the risk. In the case of haemodialysis patients, it is a belief about the likelihood of getting sick or developing complications associated with ESRD.
2. **Perceived seriousness or Severity;** feelings about the seriousness of contracting an illness or of leaving it untreated include evaluations of both medical and clinical consequences. It is a belief about the severity of consequences for one's actions. For example, Non-adherence to dialysis treatments can increase the risk of medical complications, increase hospitalizations, and possibly cause death (Tovazzi. & Mazzoni, 2012).
3. **Perceived Benefits;** the construct of perceived benefit is a person's opinion of the value or usefulness of a new behaviour in decreasing the risk of developing a disease. Even if a person perceives personal susceptibility to a serious health condition (perceived threat), whether this perception leads to behaviour change will be influenced by the person's beliefs regarding perceived benefits of the various available actions for reducing the disease threat. The perceived benefit is that the benefits of adhering to dialysis treatments will strongly lead to reduce illness and hospitalization thus leading to improve HRQOL of the patient.
4. **Perceived Barriers;** this is an individual's own evaluation of obstacles in the way of him or her adopting a new behaviour. Perceived barriers may act as impediments to undertaking recommended behaviours. A kind of nonconscious, cost-benefit analysis occurs wherein individuals weigh the action's expected

benefits with perceived barriers. It could help me, but it may be expensive, have negative side effects, and be unpleasant, inconvenient, or time-consuming. The perceived barriers might include the cost of medications, the time needed to complete the dialysis treatment, or the feeling of deprivation associated with fluid and diet restrictions. These barriers have been identified as contributing factors for increased depression among individuals with ESRD and depression has been shown to lead to non-adherence of dialysis treatments (Theofilou, 2011b). All these barriers can be overcome if the patient is well educated on the details of the benefit of the treatment regimen which include ability to be fit to go to work, socialise with friends and family and improved health generally.

5. **Cue to action;** Cue to action are events, people or things that move people to change their behaviours. Examples of these in haemodialysis patients are frequent hospitalization and lack of strength for activities due to non-adherence to treatment regimen seen in other patients.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

The aim of the study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in Kano metropolis. It's composed of research design, study area, target population, sample size, instrument for data collection, method of data collection, ethical considerations and method of data analysis.

3.2 Research Design

A descriptive cross sectional survey design was used for the study. Cross sectional survey provide a snapshot of the frequency of a disease or other health related characteristics in a population at a given point in time (Polit & Beck, 2012).

3.3 Study Area and Setting

Area of study was Kano State North West of Nigeria. It lies on Latitude $11^{0}59^{0}$N and Longitude $8^{0}30^{0}$E of the equator. The population of Kano according to the 2006 census was 9.4 million (National Population commission, 2010). The study was carried out at haemodialysis centre of Aminu Kano Teaching Hospital (AKTH) and Muhammad Abdullahi Wase Specialist Hospital (MAWSH). Both hospitals are located within Kano metropolis being the only hospitals where haemodialysis is carried out in Kano.

Aminu Kano teaching hospital is located along new court road Gyadi Gyadi and Zaria road in Kano metropolis. It is a 500 bedded hospital (Aminu Kano Teaching Hospital,

2013). According to Abdu, (2007) the renal unit of AKTH became functional with the commissioning of the haemodialysis unit in August 1999. Presently the dialysis unit has fourteen haemodialysis machine that are functional. There are four consultant Physician (Nephrologists), four dialysis technicians and twenty-two haemodialysis trained nurses working in the dialysis centre. This dialysis centre has three shift duty schedules, thus run twenty-four hour service throughout the week.

Muhammad Abdullahi Wase Specialist Hospital (MAWSH) is a 226 bedded capacity hospital located in Nassarawa area of the Kano metropolis. The haemodialysis unit of the hospital was opened in the year 1996. The centre presently has eight machines of which only five are functional. One Nephrologist, seven nurses and one dialysis technician are working in the dialysis centre. The dialysis centre runs two shift duties (morning and afternoon) throughout the week.

The choice of Kano for the study was informed because the researcher lives and works in Kano as a nephrology nurse and the needs toward assisting patients undergoing haemodialysis on improving their health related quality of life, through identifying factors affecting them through this research study.

3.4 Target Population

The target population was all patients with ESRD undergoing haemodialysis at Muhammad Abdullah Wase Specialist Hospital and Aminu Kano Teaching Hospital both in Kano metropolis during the study period of eight weeks.

3.5 Sample Size

Census size of patients in both hospitals was used. A total of eighty-three (83) ESRD patients were recruited into the study. These numbers of patients were all the patients

that meet the inclusion criteria in both dialysis centres. The use of all patients in both haemodialysis centres is informed by the manageable size of patients' numbers. Table 3.1 below shows the patients population in each of the hospital that meets the inclusion criteria.

Table 3.1 Population of patients in each hospital

Name of hospital	Number of patients on dialysis	Number of patients that meet inclusion criteria
Aminu Kano teaching Hospital, Kano	113	70
Muhammad Abdullahi Wase Specialist Hospital, Kano	20	13
Total	**133**	**83**

Muhammad Abdullahi Wase specialist hospital dialysis centre has a total number of twenty (20) patients on maintenance haemodialysis according to the centre register during the study period, of these number only thirteen patients meets the inclusion criteria. Three (3) patients just started haemodialysis during the week of the study while four (4) are diagnosed of acute kidney injury. Aminu Kano Teaching Hospital has one hundred and thirteen (113) patients on maintenance haemodialysis during the same time frame. A total number of seventy (70) patients meet the inclusion criteria and agreed to participate in the study. Twenty-two (22) patients are having acute kidney injury, five (5) are paediatric patients, eleven (11) patients in the register did not come for dialysis throughout the study period probably lost to follow up and five (5) patients were transferred to the dialysis centre nearer to their home town a week to the study period. So the only patients accessible that meets the inclusion criteria in both dialysis centres

were eighty-three (83) which represent 62.4% of the total patients in both hospitals. According to Polit & Beck (2012), a general recommendation in quantitative research is to use the largest sample possible, because the larger the sample the more representation of the population its likely to be.

3.5.1 Inclusion criteria

The criteria for inclusion are:

- Patients with ESRD who are aged 18 years and above of either gender.
- Patients on regular twice or thrice a week haemodialysis for at least three months before the study period
- Patients that is fully conscious to provide informed consent to participate in the study and undergoing haemodialysis in both centers.
- Patients who agreed to participate and meet the inclusion criteria.

3.5.2 Exclusion criteria

Patients that were excluded are:

- Those diagnosed with or known to have malignancies, tumors or multiple organ system failure, major hearing impairment (inability to hear loud speech even with a hearing aid), or any major surgical interventions in the previous three months
- Those that decline to participate in the study despite meeting the inclusion criteria.
- Patients with acute kidney injury.

3.6 Sampling Technique

Purposeful sampling technique was use in selection of patients in the following steps:

1. Patients' files and dialysis records were reviewed in both hospitals
2. All patients that meet the inclusion criteria were informed of the research study.
3. All patients that accepted to participate in the study were given detailed information about the study using the informed document created for the study (Appendix III).
4. After the detailed information given to patients and all questions by the patients answered, they are given informed consent form to sign.
5. These steps were repeated till all the sample size was obtained.

3.7 Instrument for Data Collection

Two main tools were adapted and used for data collection for this study.

1. End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) by Kim, Evangelista, Phillips, Pavlish and Kopple (2010) (Appendix I). This tool was used to collect data on adherence to treatment among haemodialysis patients. The End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ) for patients requiring in-centre haemodialysis was designed to measure treatment adherence behaviours in four dimensions: Haemodialysis attendance, medication use, fluid restrictions, and dietary restrictions recommendations. The ESRD-AQ consists of 46 questions divided into five sections. The first section deals with general information (Sociodemographic characteristics) about patient (6 items), and the remaining four sections ask about treatment adherence to haemodialysis sessions (17 items), medications (8 items), fluid restrictions (7 items), and dietary

recommendations (8 items). Responses to the ESRD-AQ utilize a combination of Likert scales and multiple choices, as well as “yes/no” answer format. The scoring of the ESRD-AQ is such that some sections have score value while others don’t.

Table 3.2 Scoring of ESRD-AQ Instrument

Question numbers	Original response	Recorded value
1 to 15		No value (descriptive statistics is used to analyse responses)
16	1 2 3 4 5	300 200 100 50 0
17 to 20		No value (descriptive statistics is used to analyse responses)
21, 30, 33, 46	1 2 3 4 5	200 150 100 50 0
22	1 2 3 4 5	100 75 50 25 0
23,24,25,26,27,28,29,31,32 and 34 to 45		No value (descriptive statistics used to analyse responses)

The scores (table 3.2) range from 0-300 in question 16, 0-100 for question 22 and score of 0-200 for questions 21, 30, 33 and 46. The adherence behavior subscale is scored by summing the responses to questions 16, 21, 22, 30, 33 and 46. Questions 16, 21 and 22 are specifically haemodialysis subscale. While questions 30, 33 and 46 are specific to medication, fluid and diet adherence subscales respectively. The attitude/perception subscale was analysed using the responses to questions 14, 19, 25, 26, 34, 35, 41, and

42. While factors affecting adherence to haemodialysis treatment regimen was analysed using descriptive statistics from responses to questions 23, 31, 38 and 45. Other questions have no score allocated to them were also analyzed using descriptive statistics. The ESRD-AQ is designed such that higher scores indicate better adherence (Kim, Evangelista, Phillips, Pavlish, & Kopple, 2010). The score were converted to a scale of 100. The final score was graded as shown in table 3.3.

Table 3.3 Grading scale for final scores of level of adherence of haemodialysis patients

Score (100)	Adherence level grade
Less than 25	Poor
25 – 49	Low
50 – 74	Moderate
75 – 100	Good

2. The Short Form 36 (Appendix II) medical outcome survey (SF-36) by Waje & Sherbourne (1992), was used to assess the HRQOL in the studied patients. It comprises of 36 questions that measures eight different dimensions of health: bodily pain, functional capacity, physical aspects, social aspects, emotional aspects, mental health, energy/fatigue (vitality) and general health (Ainguah & Hill, 2014). The instrument allows the construction of two summary measures, the physical and mental components of SF-36. Physical Component Summary(PCS) Score gives added weight to physical functioning, energy/fatigue, role limitation due to physical health, bodily pain, and general

health, whereas the Mental Component Summary(MCS) Score gives more credence to items concerned with emotional wellbeing (emotional health), role limitation due to emotional health and social functioning.

Table 3.4 Scoring of SF-36 Questionnaire

Question numbers	Original response	Recorded value
1, 2, 20, 22, 34, 36	1	100
	2	75
	3	50
	4	25
	5	0
3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1	0
	2	50
	3	100
13, 14, 15, 16, 17, 18, 19	1	0
	2	100
21, 23, 26, 27, 30	1	100
	2	80
	3	60
	4	40
	5	20
	6	0
24, 25, 28, 29, 31	1	0
	2	20
	3	40
	4	60
	5	80
	6	100
32, 33, 35	1	0
	2	25
	3	50
	4	75
	5	100

The scoring of the SF-36 (Table 3.4) is such that all questions are scored on a scale from 0 to 100, with 100 representing the highest level of functioning possible and 50 being average score. Aggregate scores are compiled as a percentage of the total points possible. The scores from those questions that address each specific area of functional

health status are then averaged together (Table 3.5), for a final score within each of the eight (8) dimensions measured.

Table 3.5 Averaging items according to specific subscale on HRQOL

Scale	**Number of items**	**Average the following items from table 3.4**
Physical functioning	10	3, 4, 5, 6, 7, 8, 9, 10, 11, 12
Role limitation due to physical health	4	13, 14, 15, 16
Role limitation due to emotional health	3	17, 18, 19
Energy/ fatigue(Vitality)	4	23, 27, 29, 31
Emotional wellbeing (mental health)	5	24, 25, 26, 28, 30
Social functioning	2	20, 32
Bodily Pain	2	21, 22
General health	5	1, 33, 34, 35, 36

All 8 categories are scored in the same way; lower score means more disability while higher score means less disability. The sections are; Energy/Fatigue (Vitality), Physical functioning, Bodily pain, General health, Physical role functioning, Emotional role functioning, Social role functioning and emotional wellbeing (Mental health).

The overall score was graded into the following level as shown in table 3.6 below;

Table 3.6 Grading scale for final scores of level of health related quality of life of haemodialysis patients

Score(100)	Health Related Quality Of Life
Less than 25	Poor
25 – 49	Low
50 – 74	Moderate
75 – 100	Good

3.7.1 Validity

Validity is how well an assessment tool measure what it is purported to measure. The ESRD-AQ is the first self-report instrument to address all components of adherence behaviors of patients with ESRD (Kim, Evangelista, Phillips, Pavlish, & Kopple, 2010). The ESRD-AQ is a pre-validated instrument. The instrument is valid and is easy to administer (Kim, Evangelista, Phillips, Pavlish, & Kopple, 2010). SF-36 is also a pre-validated generic tool for measuring HRQOL and shows good internal consistency, stability, and very high reliability (Zhang, Qu, Lun, Guo, & Liu, 2013: Ainguah & Hill, 2014).

Both instruments were also sent to five jurors for vetting for content validity for this study.

3.8 Method of Data Collection

The data for this study was collected by the researcher alone. An initial visit to the two hospitals for familiarization with the staff and patients of the dialysis centres. During

this initial visit the patients' dialysis records were reviewed and patients that meet the inclusion criteria were identified. During the second and subsequent visits by the researcher, patients that were identified to meet the inclusion criteria were informed about the research study and provided the informed consent document about the details of the research study. Those patients that agreed to participate in the study were made to sign an informed consent to participate in the study. The researcher then proceeds with the administration of the data collection tool with the ESRD-AQ and SF-36 using interview method. The questionnaires were administered in English language, while for those patients who do not understand English language; the questions were translated to Hausa at the point of administration. The questions were administered on the day of each patient's dialysis session. It took approximately forty-five minutes to administer the questionnaires per patient. At the end of each administration of the questionnaire, the researcher thanked the patient for his/her time and wished him/her stable health. These steps were followed until all the eight-three (83) patients were covered.

3.9 Ethical Consideration

The following steps were adopted to make this study meet ethical requirements.

- Patients were well informed of the purpose of the study and of their right to withdraw from the study at any time and that their withdrawal will not affect their services at the hospital.
- Patients were made to give/ sign an informed consent form (Appendix III).
- An official introductory letter was obtained from the department of nursing sciences, Ahmadu Bello University which was delivered to the two hospitals to be used for the study (Appendix IV)

-Approval was obtained from the health research ethical committee of Aminu Kano Teaching Hospital (Appendix V) and that of Muhammad Abdullahi Wase Specialist hospital (Appendix VI) to carry out this study.

- Privacy and confidentiality of all information obtained was ensured and used for the research purpose only.

3.10 Method of Data Analysis

Data collected was cleaned and coded, before been entered into Statistical Package for Social Sciences (SPSS) version 24 statistical software, which was used for data analysis. For continuous and categorical variables, mean, standard deviations and percentages were calculated. Pearson's correlation test was used to evaluate the relationship between the various patient variables and adherence. The relationship between adherence and HRQOL was tested also using Pearson's correlation test at $P < 0.05$ and Confidence Interval of 95%.

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The aim of the study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis. A total of 83 patients undergoing haemodialysis in both Aminu Kano teaching hospital and Muhammad Abdullahi Wase specialist hospital were assessed. Response rate was 100%.

This chapter is presented in frequency distribution and percentages, with mean and standard deviation calculated where applicable. This chapter presents data and analysis of the data obtained from the study according to the research objectives in addition with the Sociodemographic, haemodialysis treatment history and correlation of adherence and Health related quality of life against Sociodemographic variables of patients. The data are presented as follows:

1. Sociodemographic data of patients (Table 4.1).
2. Haemodialysis treatment history (Table 4.2).
3. Level of adherence to treatment regimen (Table 4.3).
4. Factors affecting adherence to treatment regimen (Table 4.4).
5. Level of Health related quality of life among haemodialysis patients (Tables 4.5 and 4.6).
6. Correlation between Sociodemographic data of patients and adherence to treatment regimen (Table 4.7)
7. Correlation between Sociodemographic data of patients and health related quality of life (Table 4.8)

8. Correlation of adherence to treatment regimen and health related quality of life of patients (Table 4.9).

Table 4.1 Socio-Demographic Characteristics of Haemodialysis Patients (n= 83)

Variable	F	%
Age in years		
18–24	5	6
25-31	11	13.3
32-38	14	16.9
39-45	19	22.9
46-52	6	7.2
53-59	19	22.9
60 and above	9	10.8
Mean age = 43.94±12.65		
Gender		
Male	44	53
Female	39	47
Marital status		
Single	12	14.5
Married	65	78.3
Divorced	2	2.4
Widowed/widower	4	4.8
Educational qualification		
Tertiary	32	38.6
Secondary	22	26.5
Primary	10	12.0
Informal/Quranic	19	22.9
Occupation		
Student	19	22.9
Business	20	24.1
Artisan	2	2.4
Civil servant	18	21.7
Unemployed	11	13.3
House wife	13	15.7
Religion		
Islam	60	72.3
Christianity	23	27.7

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Table 4.1, Shows that the mean age of the patients was 43±12.67. About half of the patients are male 44(53%), majority are married 65(78.3%), practice Islam as religion 60(72.3%) and literate 64(77.1%), only 19(22.9%) did not have any formal western education. About a quarter of the patients are business men and women 20(24.1%) while 19(22.9%) are students and 18 (21.7%) are civil servants.

Table 4.2 Haemodialysis treatment history of patients (n=83)

Variable	F	%
First started dialysis		
Less than 1 year	52	62.7
1 – 2 years	21	25.3
3 – 4 years	5	6.0
5 – 6 years	3	3.6
Above 6 years	2	2.4
Mean year = 1.0±1.1		
Sessions of dialysis per week		
2 sessions	52	62.7
3 sessions	31	37.3
Numbers of hours per session		
Less than 3 hours	1	1.2
3 hours	6	7.2
4 hours	75	90.4
More than 4 hours	1	1.2
Distance of dialysis centre		
Less than 10Km	47	56.6
11 – 20Km	6	7.2
21 – 30Km	6	7.2
31 – 40Km	2	2.4
41 – 50Km	2	2.4
Above 50Km	20	24.1
Source of fund for dialysis		
Self-sponsored	19	22.9
Family / Relatives	57	68.7
Employer	6	7.2
A philanthropist	1	1.2

Table 4.2 Shows that majority of the patients have been on dialysis for less than a year 52(62.7%) and about a quarter 21 (25.3%) for one to two years. The mean year on dialysis was 1.0±1.1 year. The table also showed that the major source of fund for dialysis is from family and relatives of the patients 57(68.7%). Most of the patients

attend dialysis twice a week 52(62.7%) and 75(90.4%) spent 4 hours on dialysis per session. About half of the patients 47 (56.6%) live within 10 Km radius of the dialysis centres. While about a quarter 20 (24.1%) lived greater than 50 km from the dialysis centres.

Table 4.3 Level of adherence to treatment regimen of haemodialysis patients (n = 83)

Variable	Poor		Low		Moderate		Good		Mean±SD
	F	%	F	%	F	%	F	%	
Haemodialysis	5	6.9	17	20.5	27	32.6	34	41.0	58.14±21.06
Medication	-	-	1	1.2	20	24.1	62	74.7	81.63±24.41
Fluid	1	1.2	4	4.8	31	37.3	47	56.6	68.98±23.29
Dietary	-	-	6	7.2	7	8.4	70	84.3	81.93±21.50
Overall adherence	-	-	12	14.5	25	30.1	46	55.4	67.86±15.68

*Poor < 25, Low; 25-49, Moderate; 50-74, Good; 75- 100

Table 4.3 Shows that patients' adherence to dietary restriction is the highest with 70(84.3%) having good adherence score, followed by adherence to medication 62(74.7%) and adherence to haemodialysis is the lowest 34(41.0%). The table also Shows that the overall adherence level (i.e. when the four components of adherence are summed up together) of the patients are good 46(55.4%), moderate 25(30.1) and low 12(14.4%) for treatment regimen.

Table 4.4 Factors affecting Adherence to treatment regimen among haemodialysis patients (n = 83)

Questions / Responses	F	%
Reason for missing dialysis?		
Did not miss dialysis	40	48.2
Transportation problem	11	13.3
Lack of fund	21	25.3
Clotted vascular access	8	9.6
Hospitalised	3	3.6
Reason for shortening dialysis time?		
Did not shorten dialysis time	40	48.2
Side effects	20	24.1
Clotted vascular access	17	20.5
Work schedule	2	2.4
Transportation problem	1	1.2
Staff convenience	3	1.6
Reason for missing medication?		
Did not miss any medication	54	65.1
Medicine cost	17	20.5
Side effects to medications	4	4.8
Forgetfulness	5	6.0
Drug not available	3	3.6
Kind of difficulties you had with fluid restrictions?		
Not interested	8	9.6
Unable to control thirst	60	72.3
Don’t understand the restrictions	8	9.6
Others	7	8.4
Type of difficulties you had with dietary restrictions?		
No difficulty	56	67.5
Not willing to control diet	13	15.7
Unable to control certain diet	11	13.3
Lack of knowledge	1	1.2
Others	2	2.4

Table 4.4 Shows that the major factors affecting adherence to treatment regimen among haemodialysis patients are lack of fund 21(25.3%), transportation problem 11(13.3%) for missing dialysis and side effects of dialysis 20(24.1%) and clotted vascular access 17(20.5%) for shortening dialysis session. Major factors affecting other component of treatment regimen according to the table are cost of medicine 17(20.5%) for medication adherence, unable to control thirst 60(72.3%) for fluid restriction and not willing to control diet 13(15.7%) for dietary restriction.

Table 4.5 Subscale score of health related quality of life of haemodialysis patients (n = 83)

Variable	Poor		Low		Moderate		Good		Mean ± SD
	F	%	F	%	F	%	F	%	
Physical functioning	20	24.1	30	36.1	21	25.3	12	14.5	41.51±24.42
Role limitation due to physical functioning	70	84.3	6	7.2	4	6.8	3	3.6	6.93±20.03
Emotional wellbeing	1	1.2	6	7.2	63	75.9	13	15.7	69.73±15.48
Role limitation due to emotional health	51	61.4	4	4.8	4	4.8	24	28,0	33.73±45.23
Energy / fatigue	2	2.4	33	39.8	45	54.2	3	3.6	50.24±14.77
Social functioning	8	9.6	30	38.1	34	41.0	11	13.3	35.81±23.81
Bodily pain	9	10.8	29	34.9	22	26.5	23	27.7	57.38±24.10
General health	11	13.3	53	63.9	15	18.0	4	4.8	37.89±14.69

*Poor < 25, Low; 25-49, Moderate; 50-74, Good; 75- 100

Table 4.5 Shows that the mean score on physical functioning scale was 41.51±24.42 and 50(60.2%) of the patients scored below 50 on this subscale. The score on role limitation due to physical functioning shows that 76(91.5%) of patients scored below 50 (mean; 6.93±20.03), role limitation due to emotional health 54(66.2%) of patients scored below 50 (mean; 33.73±45.23) and on general health 64(77.2%) scored below 50 (mean; 37.89±14.69). Most of the patients scored above average on the subscale of emotional wellbeing 76(91.5%) mean score was 69.73±15.48. In social functioning subscale 45(54.3%) patient scored above 50 (mean: 35.81±23.83). The subscale for energy and fatigue shows that 48(57.8%) scored above 50 (mean: 50.24±14.77) and there was less bodily pain as about half (45(54.2%) of patients scored above 50 with a mean of 57.38±24.10.

Table 4.6 Summary scales score and overall health related quality of life (HRQOL) of patients (n = 83)

Variable	Poor		Low		Moderate		Good		Mean ± SD
	F	%	F	%	F	%	F	%	
Physical component summary	16	19.3	46	55.4	20	24.1	1	1.2	37.87±15.84
Mental component summary	2	2.4	38	45.8	24	28.9	19	22.9	54.08±19.56
Overall HRQOL	7	8.4	53	62.7	23	27.7	1	1.2	42.64±14.19

Table 4.6 Shows that the mean score for physical component summary scale was 37.87±15.84, with only about a quarter 21(25.3%) scoring above 50 point. While about half of the patients 43(51.8%) scored above 50 in the mental component summary scale with mean score of 54.08±19.56. This table also revealed that 53(62.7%) have low HRQOL and 7(8.4) have poor HRQOL. while 23(27.7%) of patients have moderate and 1(1.2%) have good HRQOL. This shows that 60 (71.1%) of the patients HRQOL is below average of 50 in a 100 point score. The result revealed that physical aspects of the patients are affected more than their mental aspect of life. It also revealed that the HRQOL level of majority of haemodialysis patients in this study is low.

Table 4.7 Pearson's correlation coefficient between Sociodemographic data of patients and adherence to treatment regimen

Variable	Pearson's (r)	P value
Age	-0.073	0.511
Gender	0.073	0.509
Marital status	0.224	0.042*
Religion	0.072	0.518
Occupation	-0.054	0.625
Education	-0.090	0.418
Year first started dialysis	-0.128	0.247

*Significant

Table 4.7 Shows that there is a positive correlation and statistical significance between marital status and adherence to haemodialysis treatment regimen of the patients, r = 0.224 P = 0.042. This means that married patients have better adherence to treatment regimen compared to the unmarried patients.

Table 4.8 Pearson's correlation coefficient between Sociodemographic data of patients and health related quality of life.

Variable	Pearson's (r)	P value
Age	-0.181	0.101
Gender	-0.135	0.222
Marital status	-0.128	0.247
Religion	0.143	0.199
Occupation	-0.126	0.257
Education level	0.378	0.000*
Number of dialysis sessions per week	0.254	0.020*

*Significant

Table 4.8 Shows that educational level ($r = 0.378$, $P < 0.001$) have a positive correlation and statistical significance when correlated with health related quality of life of haemodialysis patients. This means that the higher the educational level of a haemodialysis patient, the higher his/her health related quality of life. The number of sessions a patient undergo per week also showed a positive correlation and statistical significant with health related quality of life ($r = 0.254$, $p = 0.020$). This means that patients that had more sessions of dialysis per week had a better health related quality of life among haemodialysis patients.

Table 4.9 Pearson's correlation coefficient of adherence to treatment regimen and health related quality of life.

Variable	Pearson's (r)	P value
Adherence / HRQOL	0.275	0.012*

*Significant

Table 4.9 Shows that there is a positive relationship and statistical significance between adherence to haemodialysis treatment regimen and health related quality of life among haemodialysis patients in Kano metropolis (r = 0.523, P = 0.012). This shows that as the adherence to treatment regimen level of haemodialysis patients increases, their health related quality of life level also increases.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

The aim of the study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis. This chapter discusses the findings of the study according to the research objectives in addition with the Sociodemographic and haemodialysis treatment history of patients. The discussion is presented as follows;

1. Sociodemographic characteristics of patients.
2. Haemodialysis treatment history of patients.
3. Level of adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis.
4. Factors affecting adherence to treatment regimen among haemodialysis patients in selected hospitals in Kano metropolis.
5. Level of health related quality of life among haemodialysis patients in selected hospitals in Kano Metropolis.
6. Relationship between adherence to treatment regimen and health related quality of life among haemodialysis patients in selected hospital in Kano metropolis.

5.2 Sociodemographic Characteristic of Haemodialysis Patients

The total number of patients that participated in the study was 83 with 100% response rate to all the questions items. This was made possible because the questionnaires were interviewer administered. The mean age of patients was 43.94±12.67. About half of the patients 44(53%) are male and 39(47%) were female. Most of the patients are married

65(78.3%) and literate 64(77.1%) of which those with tertiary education are the majority. The religion of most of the patients was Islam 60(72.3%); this is not surprising because Kano is predominantly a Muslim state. About a quarter 20(24.1%) of the patients are into business, 19(22.9%) are students, while 18(21.7%) are civil servants and 11(13.3%) are unemployed. Masina, Chimera, Kamponda and Dreyer, (2016) also reported mean age of 44.8±16 years among haemodialysis patients in Malawi while Gerogianni, Babtsikou, Gerogianni, Koutis, Panagiotou, and Psimenou, ((2016) and Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud, (2017) reported a mean age of 54.5 years. This shows a mean differences of about 10 years between those studies reported in Africa as against European countries. This difference may be due to higher life expectancy among the Europeans than the African. The mean age of the patients in this study is mostly in the productive age, this may affect their contribution to social development as compared to the Europeans where the mean age is slightly elderly.

5.2.1 Haemodialysis treatment history

More than half of the patients first started haemodialysis less than a year ago 62.7%, while a quarter have being on dialysis for about 1 to 2 years and only 2.4% of patients are on haemodialysis for more than 6 years. Mean duration of patients on haemodialysis was 1.0±1.1 years. This is similar to what was reported by Masina, Chimera, Kamponda and Dreyer (2016) in Malawi but different from 5.6±3.0 years reported by Ibrahim, Hossam and Belal, (2015) and 4.5 years mean age reported by Gerogianni, Babtsikou, Gerogianni, Koutis, Panagiotou, and Psimenou, (2016) and Alvares, Cesar, Acurcio, Andrade, and Cherchiglia, (2012) in Greece and Brazil respectively. These differences in mean duration on haemodialysis by patients may be due to the better care being given

to patients in Europe which make them to survive for long on dialysis as compared to developing countries like Nigeria and Malawi. It could also be due to availability of social health insurance for patients in these countries as against Nigeria and Malawi where patients pay out of pocket for their dialysis treatment. The most probable reason is due to lack of social health insurance scheme for patients undergoing haemodialysis in Nigeria as majority of patients paid out of pocket for dialysis which may affect their adherence level as patients cannot sustain the cost of treatment for a long period thus increasing their risk for morbidity and mortality. Almost 90.4% of all the patients are on twice a week session of dialysis, four hours per session and most of their dialysis sessions are paid for by family and relatives. This is different from what was reported in other studies where majority of ESRD patients undergo three sessions per week as the standard practice (Gerogianni, Babtsikou, Gerogianni, Koutis, Panagiotou & Psimenou, 2016; Nguyen, Bose & Finkelstei, 2016; Zyoud, Daraghmeh, Mezyed, Khdeir, Swafta, *et al.,* 2016). The reason for this may be due to patients paying out of pocket for their dialysis sessions as against other countries where treatment are paid for under social health insurance. Kugler, Meading and Russell (2011) reported haemodialysis patients in United State of America and Germany have 99% and 100% coverage for their haemodialysis treatments respectively, this is not what is obtainable in most of the developing countries, Nigeria inclusive.

Table 4.8 revealed that there is a statistical significance between number of dialysis sessions patients undergo per week and their HRQOL. This means that patients who undergo dialysis thrice a week have a better level of HRQOL, as compared to those that dialysed twice a week. This is true because more sessions of dialysis means more clearance and removal of metabolic and excess fluid from the patients (Daugirdas, Blake, & Ing, 2014).

5.3 Level of adherence to treatment regimen among haemodialysis patients

The overall level of adherence of the patients from the study revealed that about half of the patients 55.4% have good level of adherence to treatment regimen. This is similar to the findings of Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud, (2017) that also reported 55.5% for adherence among Palestine dialysis patients. Despite the level of adherence, an appreciable number of patients undergoing haemodialysis are non-adherent to haemodialysis treatment regimen. This is in line with the studies of Kugler, Meading and Russel, (2011) and Sontakke, Budania, Bajait, Jawaisal and Pimpalkhute, (2015), which reported that despite the importance of the need for adherence to treatment regimen by haemodialysis patients a large percentage of non-adherence still exist among them.

In relation to adherence to the components of treatment regimen among haemodialysis patients, which include; haemodialysis, medication, fluid and dietary restrictions. Finding from the study revealed that good level of adherence behaviour was highest for diet 84.3% and lowest for haemodialysis 41.0%. This result is contrary to the findings of Chan, Zalilah and Hii (2012) that reported 27.7% and 91.0% for dietary and haemodialysis adherence respectively. Ibrahim, Hossam and Belal (2015) also reported 64% good level of adherence to haemodialysis treatment sessions. Three reasons could be given for the low level of adherence to haemodialysis sessions in the studied sample. First it may be due to patients seeking for vehicle on their own to travel a long distance before reaching the dialysis centre as against the developed countries where hospital ambulances picked patients right from their home to the dialysis centre and back home. Secondly it could be due to patients paying for their haemodialysis session out of pocket, which means patients only go to the dialysis centre when they have money to pay for their dialysis sessions. Unlike in other countries where there is social health

insurance for people with kidney diseases undergoing haemodialysis (Kugler, Meading, & Russel, 2011). Thirdly, poor vascular access is another reason why haemodialysis session adherence is low, as most patients are on catheter access, which often become clotted and sometimes difficult to insert due to repeated puncturing of the vascular site leading to fibrosis of the blood vessels. This is unlike Europe where almost all patients are having Arterio-venous fistula created before the commencement of dialysis in all ESRD patients (Daugirdas, Blake, & Ing, 2014). All the three reasons explained above could be responsible for the low level of adherence to haemodialysis sessions in the studied patients and these could be related to the health belief model perceived barriers that have been identified as the most significant determinant influencing whether an individual will adhere to the recommended behaviour (Champion & Skinner, 2008). It can be seen that all the barriers identified above in this study are absent from studies reported from Europe, i.e. transportation, poor vascular access and patients paying for dialysis out of pocket. These may be the reason why adherence to haemodialysis session is higher in Europe compared to what was obtained in this study. According to the health belief model when the perceived barriers outweigh the perceived benefit of the recommended health behaviour the individual is likely not to adhere (Champion & Skinner, 2008).

The other components of treatment regimen of medication and fluid from the findings revealed 74.7% and 56.6% for good level of adherence to medication and fluid respectively. This result is similar to Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud, (2017) that reported 81% and 31% good level for medication and fluid adherence respectively and Chan, Zalilah and Hii (2012), that reported 66.5% and 24.5% for good level of medication and fluid adherence respectively. This shows that adherence to

medication is often higher than that of fluid adherence from the various studies available. This may be due to the general perception that medication is seen as a necessity for every illness while fluid restriction is not. The studied sample though have better adherence to fluid (56.6%) as against what was reported in other studies. The high level of adherence to fluid in this study could be due to smaller sample size or due lack of uniformity in the cut-off point used to determine adherence and non-adherence among the various studies as observed by Al-Khattabi, (2014). It could also be due to patients over rating their adherence level to fluid since the assessment tool relied only on patient's subjective assessment of his or her adherence level. Kugler, Meading and Russel (2011) reported wide variations in self-reported adherence against laboratory values. The most tenable reason for the high percentage of fluid adherence in this study is due to both lack of uniformity in the cut-off point used to determine adherence and patients over rating their adherence level for fluid.

5.4 Factors affecting adherence to treatment regimen among haemodialysis patients

The factors affecting adherences from the findings of this study are; lack of funds, clotted vascular access site, transportation problem and side effects to dialysis and medications. Other factors affecting fluid and dietary adherences are inability to control fluid intake and certain foods, lack of knowledge and understanding of fluid and dietary restriction. According to Makusidi, Liman, Yakubu, Isah, Abdullahi and Chijioke, (2014) only about 12% of patients could sustain at least two sessions per week of haemodialysis before defaulting due to financial constraint. Gracia-Llana, Remor and Selgas, (2013) and Wells, (2015) identified lack of positive reinforcement and weak capacity to educate patients by health care providers as some factors that often lead to

low adherence level among haemodialysis patients. This assertion can be likened to lack of knowledge and understanding of dietary and fluid restrictions identified in this study among haemodialysis patients in Kano metropolis. Similar to the findings in this study, Kugler, Meading and Russel, (2011) and Wells (2015) identified unpleasant side effects of haemodialysis and medications for promoting non-adherence among haemodialysis patients. Whenever a patient experiences severe side effect of dialysis such as hypotension, fever, disequilibrium syndrome etc, he or she is likely to miss the next session because of fear of experiencing same. Adherence is a dynamic process where patients followed all instructions at the initial stage but gradually fades out strict adherence with time (Lam, Lee, & Shiu, 2014). This means that the longer the patient is on haemodialysis treatment the more likely his or her adherence level will begin to taper down as against when they first started dialysis treatment. This is because at the beginning of dialysis they are eager to follow all recommendations with the hope that their kidney disease will be resolved and they are often surrounded and supported both financially and psychological by friends, families and relatives who are hopeful of recovery. But with time their support wane and the patient is left to cater for him or herself by their immediate family members because of the high cost of treatment involve in managing ESRD. It is not surprising then that only 55.4% of the studied patients have good adherence level to treatment regimen. This is because all the identified factors serves as barrier to adherences and where these outweigh the expected outcome of adherence the patients are likely not to adhere to treatment regimen according to Champion and Skinner, (2008) in their explanation of the construct of "perceived barrier" of the health belief model. Take for instance the issues of lack of fund and side effects to haemodialysis therapy and medication. If the patient have adequate knowledge of the benefit of adherence, if he or she have no funds for dialysis

or buying of drugs he or she has no option but to default on his/her dialysis sessions and taking medication. In other words the patient though have good perception of the threat non-adherence will have on his or her health but the barriers to adherence as perceived and experienced by the patient outweigh the capacity of the patient's perceived benefit of adherence thus patient will fail to adhere strictly to the treatment regimen. This was what Rosenstock, (1974) was referring in the health belief model when he said, the combine levels of susceptibility and severity provide the energy or force to act and the perception of benefit minus barrier provider a preferred path of action(Rosenstock, 1974 cited in Champion & Skinner, (2008).

Two areas identified as factors affecting adherence in this study but were not reported in other available studies are transportation problem 13.3% and haemodialysis staff reducing dialysis time for their convenience 3.6%. Transportation is a problem because 24.1% of patients travel over fifty kilometres to the dialysis centres and almost all these patients use public transports and need a relative to accompany them for each trip to the dialysis centre due to low ability to carry out some activities of daily living by some haemodialysis patients. Considering the bad road network in most rural areas and difficulty in getting public transport to town, all these could be time consuming and tiring because of time spent at the bus stations. This often affects the patient's arrival time to the dialysis centre and thus dialysis schedule time and when patients will finally returned back home. This cumbersome schedule could prompt non-adherence among some patients due to the stress imposed on them. Haemodialysis staff according to some of the patients (3.6%) occasionally reduced dialysis session time due to some factors such as the staff wanting to complete his or her job on time so as to leave the unit early and sometimes due to power outage. This behaviour of some of the

haemodialysis nurses will affect patient's dialysis adequacy and health related quality of life due to ineffective clearance of metabolic waste during dialysis sessions.

When Sociodemographic variables was correlated with adherence, the result (Table 4.7) revealed that there is a positive correlation and statistical significant between marital status and adherence to treatment regimen ($r = 0.224$ $p = 0.042$). This means that married patients have a better adherence level compared to the unmarried patients or those without spouse. This is similar to Lam, Lee and Shiu, (2014) that reported better adherence among patients that have spouses and family support. Lam, Lee and Shiu, (2014) believed that spouse of a patient tends to remind the partner of the needs for adherence and reinforces the health care provider's recommendations when the patient is trying to deviate. Psychological support from a partner tends to boost the morale of the sick partner toward self-efficacy thus improving his or her health related quality of life. This is true because patients in this study reported that family and relatives assisted them is carrying out some activities of daily living. A patients with a spouse means the spouse will always be supportive while one without is at the mercy of friends and other family members that may not always be there with the patient.

The result in table 4.7 also revealed that there is no statistical significance between some socio-demographic variables such as gender ($P = 0.461$), religion ($P= 0.099$), occupation ($P = 0.077$) and adherence to treatment regimen. This is similar to what was reported by Ibrahim, Hossam and Belal (2016) that there were no statistical differences between adherent and non-adherent haemodialysis patients with regards to age, gender, education and employment status. This is however different from Naalweh, Barakat, Sweileh, Al-Jabi and Zyoud, (2017) that reported positive association of age, gender

and residence with adherence scores. These divergent reports may be due to some other extraneous factors such as environment, sample size and the mean ages of the studied populations.

5.5 Level of health related quality of life among haemodialysis patients

The overall health related quality of life of majority (62.7%) of the patients was low. The mean score was 42.64±14.19 for this study which was below the average score of 50. Kamal, Kamel, Eldessouki and Ahmed, (2013) reported that 64% of haemodialysis patients have below average health related quality of life. Similarly Kamau, Kayima, Otieno, Maritim and Wanzala, (2012), Jaar, Chang, and Plantinga, (2013), Masina, Chimera, Kamponda and Dreyer, (2016) and Karim and Brazier, (2016), all reported a low level overall health related quality of life among haemodialysis patients. From these studies it can be concluded that health related quality of life among haemodialysis patients irrespective of the environment is often low. This could be due to the burden which ESRD and haemodialysis imposed on the individual patient's. Haemodialysis treatment involves an important change in the life style affecting social, occupational, personal and physical aspect of patients. This often lead to reduce ability to work, loss of job and deterioration of their living condition and health related quality of life (Gerogianni, Babtsikou, Gerogianni, Grapsa & Vasilopoulos, et al., 2014).

The subscale score of health related quality of life (Table 4.5) shows that emotional wellbeing score was the highest with 91.5% patients scoring above the average of 50 (mean; 69.73±15.48). While role limitation due to physical functioning was the lowest with 91.5% patients scoring below average score of 50 (mean; 6.93±20.03). This shows that the physical aspect of the patients' are affected more than their emotional aspect.

Most haemodialysis patient have difficulties in carrying out activities of daily living such as bathing, grooming and walking several block of distance unassisted by family and relative (Kamau, Kayima, Otieno, Maritim & Wanzala, 2012; Alvares, Cesar, Acurcio, Andrade & Cherchiglia, 2012). Patients often have low energy to carry out activities which is why most often they lost their job due to reduce ability to work after starting dialysis (Gerogianni, Babtsikou, Gerogianni, Grapsa & Vasilopoulos, et al., 2014). This makes the patients feel less satisfied with their health related quality of life.

The mental component summary scale (MCS) score was better than the physical component summary scale (PCS). The mean score for the MCS was 54.08±19.56 while that of the PCS was 37.87±15.84 (Table 4.6). This is similar to Kamau, Kayima, Otieno, Maritim and Wanzala, (2012) that reported mean PCS and MCS of 39.09 and 41.89 respectively. Alvares, Cesar, Acurcio, Andrade and Cherchiglia, (2012) also reported that the mental aspect of a patient is less affected than the physical aspect with people having ESRD and undergoing haemodialysis. The cognition of the patients are less affected because the patients need less energy to carryout cognitive activities unlike physical activities that need lots of energy which the patients' don't seems to have due to the burden of the disease on the physiological function of their body.

When the Sociodemographic variables were correlated with health related quality of life of the patients, the result (table 4.8) revealed that there is a positive correlation and statistical significance ($r = 0.378$, $p < 0.001$) between education and health related quality of life. This mean that patients with higher educational level had better health related quality of life among the studied patients. This is similar to what was reported by Theofilou, (2011a; 2011b) and Gerogianni, Babtsikou, Gerogianni, Grapsa and Vasilopoulos, et al., (2014) that patients with lower education level face more problems

with psychosocial well-being and their general health and that people with higher education may have a comfortable standard of living that gives them satisfaction, wellbeing and a better quality of life. It is also worth saying that the higher the educational level the more likely the patient would understand and comprehend the importance and need for following recommended treatment regimen. Table 4.8 also showed that there is no statistical significance between health related quality of life and some Sociodemographic variables such as gender, occupation and religion. This result is contrary to that of Theofilou, (2011a; 2011b), Alvares, Cesar, Acurcio, Andrade and Cherchiglia, (2012), Gerogianni, Babtsikou, Gerogianni, Koutis, Panagiotou and Psimenou, (2016) who all reported that gender, religion and occupation have an influence on health related quality of life. They reported that women have a lower level of HRQOL score, compared to men because of their multiple domestic tasks, biological and cultural roles and responsibilities. They also stated that patients who are religious and spiritually inclined have been associated with prolonged survival rate and higher level of HRQOL among haemodialysis patients. The reasons for the difference between this study and other reported studies among these variables may be because all the patients in this study are religiously inclined; they are either practising Islam or Christianity unlike in Europe and other countries of the world where there are large number of free thinkers who do not belief in God or practice any religion. Similarly while gender was not significantly related to HRQOL in this study may be due to the single factor of lack of fund for dialysis which cut across gender because patients have to pay for all their haemodialysis treatment out of pocket as there is no social health scheme in place as obtained in some countries of the world.

5.6 Relationship between adherence to treatment regimen and health related quality of life among haemodialysis patients

This study revealed that there is a positive correlation and statistical significance between adherence to treatment regimen and health related quality of life ($r = 0.275$, $P = 0.012$). This means that with increasing adherence level the health related quality of life level of haemodialysis patients also increases. This result is similar to what was reported by Ibrahim, Hossam and Belal (2015) that health related quality of life was significantly higher in adherent compared to non-adherent haemodialysis patients. Kim and Evangelista (2010) also affirmed that specific adherence behaviour can affect clinical outcome. This simply means that how well a patient followed his/her treatment in all aspect of the treatment will determine his/her health related quality of life. This is also in line with the health belief model used as theoretical framework for this study that shows that good adherence to treatment regimen may lead to improved health related quality of life with less risk of morbidity and mortality.

CHAPTER SIX

6.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary

The aim of this study was to assess adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis. The study design was cross sectional design. Two instruments were adapted and used for data collection that is ESRD-AQ and SF-36 for adherence to treatment and health related quality of life respectively. The questionnaires were interviewer administered by the researcher. The study was carried out in two government hospitals in Kano metropolis being the only hospitals that carry out haemodialysis for patients in the entire state. These are Aminu Kano teaching hospital and Muhammad Abdullahi Wase Specialist hospital.

Haemodialysis treatment regimen consist of four aspects which includes; dialysis, medication, diet and fluid. Keeping to the recommended treatment in these four aspects are complimentary of each other. Adherence to these treatment regimens are often challenging to patients despite knowing the consequences of non-adherence which could lead to increase morbidity and disease burden thus affecting the health related quality of life of people with ESRD and undergoing haemodialysis.

Findings from the studies revealed that about half of the patients' were adherent to treatment regimen. Haemodialysis attendance has the lowest adherence level among the four components of treatment regimen. Lack of funds, side effects to medication and haemodialysis and distance of dialysis centre were some of the factors affecting

patients' adherences to treatment. The health related quality of life of the patients was also found to be low with the physical aspect being affected more than the mental aspect.

6.2 Conclusion

Based on the results from the study, it can be concluded that a significant percentage of haemodialysis patients are non-adherence to treatment regimen. Lack of fund, clotted vascular access, transportation problem, side effects of medication and haemodialysis sessions are the major factors affecting adherence to treatment regimen among others. The health related quality of life of haemodialysis patients were low with the physical aspect being affected more than the mental aspect, this is evident as most of the patients are dependent on relatives to carry out activities of daily living such as bathing, grooming and walking, this often lead to loss of job among them. There was a positive relationship between adherence to treatment regimen and health related quality of life of the studied patients.

6.3 Recommendations

Based on the result and discussion, the following recommendations are made:

1. The dialysis centres should put in place a routine educational programme before every dialysis session to listen to patients and educate patients appropriately about challenges with adherence and how the patients could cope with it
2. The health care providers should encourage spouse and relatives support for patients undergoing haemodialysis as this boost the confidence of the patients and enhance their adherence level.
3. There is the need for all haemodialysis patients in both centres to have a permanent vascular access created as this will help reduced the incidents of

clotted vascular access and thus enhance adherence rate as majority of the patients in both hospitals are using temporary (catheter) access which often become blocked.

4. Staff in the haemodialysis units should strive at all time to make patients complete their effective dialysis prescribed time on the machine as this will help enhance adherence and thus improved health related quality of life of the patients.
5. The federal and state government should establish more dialysis centres at different location (each senatorial zone) in the state to ease the distance patients need to travel to access haemodialysis considering the size of Kano in terms of population and land mass.
6. The federal and state government should subsidize the cost of dialysis treatment, if possible make it free as this will enhance adherence and thus improve health related quality of life among patients with end-stage renal disease in Kano and the country at large.
7. The federal government should include total coverage for haemodialysis treatment in its national health insurance scheme as against what is obtained presently where the coverage is just for six sessions of haemodialysis per year for only patients captured under the national health insurance scheme.
8. Further research should be carried out using longitudinal study and including clinical parameters in data collection so as to compare patients' subjective report with objective clinical data in making inference on adherence level.

6.4 Limitations

The strength of this study lies in the use of standardize tools for data collection, being its first in this part of Nigeria based on the available literatures. The use of all patients that meets the inclusion criteria in both centres of study. Despite these strengths the study has some limitations which include; the study design which was cross sectional, this only addresses sample characteristic at a point in time. A longitudinal study would better capture the adherence and health related quality of life among haemodialysis patients as both are subject to changes over time. The sample size of 83 patients may be considered small to make generalization about haemodialysis patients. This study did not consider clinical parameters of the patients but relied solely on patients' subjective assessment of their adherence and health related quality of life rating.

6.5 Implication to Nursing Practice

The study raise the awareness of some important roles of the nurses especially the nephrology nurses, needs to implement toward improving adherences level and thus improving health related quality of life of patients with End-stage renal disease undergoing haemodialysis. This includes;

1. Nurses should give adequate education to patients about their treatment so that they will understand the benefits of the treatment as this will help the patients make informed decision about adherence to treatment regimen.
2. Nurses need to teach the patients coping strategies as it relates to treatment adherence especially fluid and dietary restrictions as these are not affected by financial constraints as such the patients could be made to comply through good and detailed patient education.

3. Nurses need to enhance patient – nurse relations by working with patients to identify areas where modifications are possible to empower patient to live a near normal life.
4. Nurses should use family concept theory of care in caring for these patients as shown in the study that those patients that have partners or support from relatives have better adherence level.

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Appendix I

End-Stage Renal Disease Adherence Questionnaire (ESRD-AQ)

A. General Information

1. How old are you in years?

a) 18 – 24 years	b) 25 – 31 years	c) 32 – 38 years
d) 39 – 45 years	e) 46 – 52 years	f) 53 – 59 years
g) 60 years and above		

2. What gender are you?

a) Male	b) Female

3. What is your marital status?

a) Married (1)	b) Single (2)
c) Divorced (3)	Widowed//widower (4)

4. What is your religion?

a) Islam (1)	b) Christianity (2)	c) Others specify (3)……

5. What is your occupation?

a) Civil servant	b) Student
c) Business	d) Unemployed
e) Artisan	f) Others (specify),,,,,,,,,

6. What is your highest qualification?

a) Tertiary (1)	b) Secondary (2)
c) Primary (3)	d) Informal education (4)

B. Haemodialysis Treatment

7. When did you first started dialysis

a) Less than 1 year (1)	b) 1 to 2 years (2)
c) 3 to 4 years (3)	d) 5 to 6 years (4)
e) Above 6 years (5)	

8. What is your source of fund for dialysis?

a) Self sponsored (1)	b) Family/ relatives (2)
c) Employer (3)	d) A philanthropist (4)
e) Social health insurance (5)	f) Others ,specify (6)

9. How many days a week do you receive haemodialysis treatment

a) once (1)	b) 2 days (2)	c) 3 days (3)	d) other specify (4)

10. How many hours are you treated for each haemodialysis?

a) Less than 3hours (1)	b) 3hours (2)	c) 4hours (3)
d) More than 4hours (4)		

11. How far away is the dialysis centre from your home in kilometres (Km)?

a) Less than 10Km (1)	b) 11 - 20Km (2)
c) 21 - 30Km (3)	d) 31 – 40Km (4)
e) 41 – 50Km (5)	f) Greater than 50Km (6)

12. Is your dialysis schedule convenient for you?

a) Yes. (1)	b) No (2)

13. If NO, why?

a) Because I have to come to the dialysis center too early. (1)
b) because I have to come to the dialysis center too late(2)
c) because of my work schedule.(3)
d) (Other) specify (4)

14. How important do you think it is to follow your dialysis schedule?

a) Very important (1)	b) A little important (2)
c) Not important (3)	

15. Why do you think it is important to follow your dialysis schedule?

a) Because I fully understand that my kidney condition requires dialysis as scheduled (1)
b) Because following the dialysis schedule is important to keep my body healthy (2)
c) Because medical professional (my doctor, nurse, or dietician) told me to do so(3)
d) Because I had an experience that I was sick after I missed dialysis (4)
e) Because I had an experience that I was hospitalized after I missed dialysis (5)
f) I don't think following the dialysis schedule is very important to me(6)
g) Other (Specify)(7) _____

16. During the last month, how many dialysis treatments did you miss completely?

a) None (I did not miss any treatments) (1)	b) Missed one dialysis treatment (2)
c) Missed two dialysis treatments (3)	d) Missed three dialysis treatments (4)
e) Missed four or more dialysis treatments (5)	

17. What was the main reason you missed your dialysis treatment last month?

a) Not applicable: I did not miss any treatment(1)
b) Transportation problems (2)
c) I had no fund for dialysis (3)
d) Haemodialysis access (graft, fistula, or catheter) clotted (4)
e) I was hospitalized (5)
f) Other (Please specify) (6)……..

18. When was the last time a medical professional (your doctor, nurse, dietician, or other medical staff) talked to you about the importance of not missing your dialysis treatment?

a) This week (1)	b) Last week (2)
c) One month ago (3)	d) More than a month ago (4
e) When I first began dialysis treatment (5)	f) Never(6)
g)) Other (Specify)(7) _____	

19. How often does a medical professional (your doctor, nurse, or other medical staff) talk to you about the importance of staying for the entire dialysis time during your dialysis treatment?

a) Every dialysis treatment (1)	b) Every week (2)
c) Every month (3)	d) More than one month (4)
e) When I have abnormal blood or other test results (5)	f) Never (6)
g) Others specify (7)……..	

20. How much difficulties have you had staying for your entire dialysis treatment as ordered by your doctor?

a) No difficulty (1)	b) A little difficulty (2)
c) Lot of difficulty (3)	

21. During the last month, how many times have you shortened your dialysis time?

a) Not applicable: I have not shortened my dialysis time (1)	b) Once (2)
c) Twice (3)	d) Three times (4)
e) Four to five times (5)	f) Other (Specify frequency) (6) …….

22. During the last month, when your dialysis treatment was shortened, what was the average number of minutes?

a) Not applicable: I have not shortened my dialysis time (1)	b) Less than 10 minutes or 10 minutes (2)
c) 11 to 20 minutes (3)	d) 21 to 30 minutes (4)
e) More than 30 minutes (5)	f) Other (Specify) (6)…….

23. What was the main reason you have to shorten your dialysis treatment?

a) Not applicable: I have not shortened my dialysis time (1)	b) Due to side effects (2)
c) Access (graft, fistula, or catheter clotted (3)	d) Work schedule (4)
e) Transportation problems (5)	f) Other (Please specify) (6)

C. MEDICATION

24. When was the last time a medical professional (your doctor or nurse) spoke to you about your medicines?

a) This week (1)	b) last week (2)
c) last month (3)	d) more than one month ago (4)
e) When I first began dialysis treatment (5)	f) Others specify (6) ……..

25. How often does a medical professional (your doctor, nurse, or other medical staff) talk to you about the importance of taking medicines as ordered?

a) Every dialysis treatment (1)	b) Every week (2)
c) Every month (3)	d) Every 2 to 3 months (4)
e) Every 4 to 6 months (5)	f) Others (Specify) (6) ……..

26. How important do you think it is to take your medicines as scheduled?

a) Very important (1)
b) Little important (2)
c) Not important (3)

27. Why do you think it is important to take your medicines as scheduled?

a) Because I fully understand that my kidney condition requires to take medicines as scheduled (1)
b) Because taking medicines is important to keep my body healthy (2)
c) Because a medical professional (my doctor, nurse, or other medical staff) told me to do so (3)
d) Because I had an experience that I was sick after I missed medicines (4)
e) Other (Specify) (6) ……..

28. Have you had any difficulty with taking your medicines

a) Yes (1)	b) No (2)

29. How much difficulty have you had with taking your prescribed medicines?

a) No difficulty (1)	b) A little difficulty (2)
c) A lot of difficulty (3)	

30. During the past week, how often have you missed your prescribed medicines?

a) None of the time: I did not miss my medicines (1)	b) Very seldom (2)
c) About half of the time (3)	d) Most of the time (4)
e) All of the time (5)	

31. What was the reason for not taking your medication this past week?

a) Not applicable: I did not miss medicines (1)	b) Forgot to take medicines (2)
c) Medicine cost (3)	d) Side effects (4)
e) Other specify) (5) _____	

D. FLUID

32. When was the last time a medical professional (your doctor, nurse or dietician or other medical staff) spoke to you about your fluid restrictions?

a) This week (1)	b) Last week (2)
c) One month ago (3)	d) More than a month ago (4)
e) When I began dialysis treatment (5)	f) Other(Specify)(6) _____

33. During the past week, how often have you followed the fluid restriction recommendations?

a) All of the time (1)	b) Most of the time (2)
c) About half of the time(3)	d) Very seldom (4)
e) None of the time (5)	

34. How important do you think it is to limit your fluid intake?

a) Very important (1)	b) A little important (2)
c) Not important (3)	

35. Why do you think it is important for you to limit your fluid intake?

a) Because I fully understand that my kidney condition requires limiting fluid intake (1)
b) Because limiting fluid intake is important to keep my body healthy (2)
c) Because a medical professional (my doctor, nurse, dietician, or other medical staff) told me to do so (3)
d) Because I got sick after I drank lots of fluid (4)
e) Others (Specify) (5)

36. Have you had any difficulty with limiting your fluid intake?

a) Yes (1)	b) No (2)

37. How much difficulty have you had following your fluid restriction recommendations?

a) No difficulty (1)	b) A little difficulty (2)
c) A lot of difficulty (3)	

38. If you had difficulty following your fluid restriction recommendations, what type of difficulty have you had?

a) A Not interested (1)	b) I was unable to control fluid intake (2)
c) I don't understand how to follow the fluid restriction (3)	d) Other(4) _____

E. DIET

39. When was the last time a medical professional (your doctor, nurse, dietician, or other medical staff) talked to you about your diet?

a) This week (1)	b) Last week (2)
c) One month ago (3)	d) More than a month ago (4)
e) When I first began dialysis treatment (5)	f) Other (Specify); (6) _____

40. How often does a medical professional (your doctor, nurse, dietician or other medical staff) talk to you about the importance of following a proper diet?

a) Every dialysis treatment (1)	b) Every week (2)
c) Every month (2)	d) Every 2 to 3 months (4)
e) When I have abnormal blood test result (5)	f) Never (6)
g) Other (Specify) _____	

41. How important do you think it is to watch the types of food you eat each day

a) Very important (1)	b) A little important (2)
c) (3) Not important	

42. Why do you think it is important for you to watch your diet daily?

a) Because I fully understand that my kidney condition requires to watch my diet (1)
b) Because watching my diet is important to keep my body healthy (2)
c) Because I got sick after eating certain food that I was not supposed to eat (3)
d) I don't think watching my diet is important to me (5)
e) Other (Specify (7) _____

43. Have you had any difficulty following your dietary recommendations?

a) Yes (1)	b) No (2)

44. If yes, how much difficulty have you had following your dietary recommendations?

a) No difficulty	b) A little difficulty
c) A lot of difficulty	

45. What type of difficulty have you had keeping your dietary recommendations?

a) Not applicable: No difficulty (1)
b) I was not willing to control what I want to eat (2)
c) I was unable to avoid certain unrecommended food (3)
d) I don't understand what type of diet to follow (4)
e) Others (Specify): (5) _____

46. During the past week, how many times have you followed the diet recommendations?

a) All of the time (1)	b) Most of the time (2)
c) About half of the time (3)	d) Very seldom (4)
c) None of the time	

Appendix II

SF-36 Item Survey Instrument for Health Related Quality Of Life

1. In general, would you say your health is:	
Excellent	1
Very good	2
Good	3
Fair	4
Poor	5

2. **Compared to one year ago**, how would you rate your health in general **now**	
Much better now than one year ago	1
Somewhat better now than one year ago	2
About the same	3
Somewhat worse now than one year ago	4
Much worse now than one year ago	5

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

(Circle One Number on Each Line)

	Yes, Limited a Lot	Yes, Limited a Little	No, Not limited at All
3. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	[1]	[2]	[3]
4. **Moderate activities**, such as moving a table, cleaning or playing golf	[1]	[2]	[3]
5. Lifting or carrying groceries	[1]	[2]	[3]
6. Climbing **several** flights of stairs	[1]	[2]	[3]
7. Climbing **one** flight of stairs	[1]	[2]	[3]
8. Bending, kneeling, or stooping	[1]	[2]	[3]
9. Walking **more than a mile**	[1]	[2]	[3]
10. Walking **several blocks**	[1]	[2]	[3]
11. Walking **one block**	[1]	[2]	[3]
12. Bathing or dressing yourself	[1]	[2]	[3]

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**? **(Circle One Number on Each Line):**

	Yes	No
13. Cut down the amount of time you spent on work or other activities	1	2
14. **Accomplished less** than you would like	1	2
15. Were limited in the **kind** of work or other activities	1	2
16. Had **difficulty** performing the work or other activities (for example, it took extra effort)	1	2

During the **past 4 weeks,** have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?
(Circle One Number on Each Line)

	Yes	No
17. Cut down the **amount of time** you spent on work or other activities	1	2
18. **Accomplished less** than you would like	1	2
19. Didn't do work or other activities as **carefully** as usual	1	2

20. During the **past 4 weeks,** to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?
(Circle One Number)

Not at all	Slightly	Moderately	Quite a bit	Extremely
1	2	3	4	5

21. How much **bodily** pain have you had during the **past 4 weeks**?
(Circle One Number)

None	Very mild	mild	Moderate	severe	Very severe
1	2	3	4	5	6

22. During the **past 4 weeks,** how much did **pain** interfere with your normal work (including both work outside the home and housework)?
(Circle One Number)

Not at all	Slightly	Moderately	Quite a bit	Extremely
1	2	3	4	5

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks** . . .

(Circle One Number on Each Line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
23. Did you feel full of high spirit?	1	2	3	4	5	6
24. Have you been a very nervous person?	1	2	3	4	5	6
25. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
26. Have you felt calm and peaceful?	1	2	3	4	5	6
27. Did you have a lot of energy?	1	2	3	4	5	6
28. Have you felt downhearted and blue?	1	2	3	4	5	6
29. Did you feel worn out?	1	2	3	4	5	6
30. Have you been a happy person?	1	2	3	4	5	6
31. Did you feel tired?	1	2	3	4	5	6

32. During the **past 4 weeks,** how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

(Circle One Number)

All of the time	Most of the time	Some of the time	A little of the time	None of the time
1	2	3	4	5

How TRUE or FALSE is each of the following statements for you.

(Circle One Number on Each Line)

Statement	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
33. I seem to get sick a little easier than other people	1	2	3	4	5
34. I am as healthy as anybody I know	1	2	3	4	5
35. I expect my health to get worse	1	2	3	4	5
36. My health is excellent	1	2	3	4	5

Thanks for your time

Appendix III

INFORMED CONSENT DOCUMENT

Title: Assessment of adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis.

Investigator: Tijani Raimi Ahmadu Bello University Zaria, Kaduna state.

Introduction

You are being asked to take part in a research study. Please read this explanation about the study and its risks and benefits before you decide if you would like to take part. You should take as much time as you need to make your decision. You should ask the study invigilator to explain anything that you do not understand and make sure that all of your questions have been answered before signing this consent form. Participation in this study is voluntary.

Purpose of the study

The aim of the study is assessment of adherence to treatment regimen on health related quality of life among haemodialysis patients in selected tertiary hospitals in Kano metropolis.

Study procedure

The study involves an interview administered questionnaire that will take about one hour of your time. The questionnaire will be administered while you are on the dialysis machine during the first hour of your dialysis session.

Risk related to being in the study

There are no medical risks if you take part in this study. Sometimes answering questions about yourself or your thoughts and beliefs can make you feel uncomfortable; however, you may refuse to answer these questions.

Benefit to being in the study

You will not directly benefit from being in this study. Information learned from this study may in the future help people on dialysis. This study may help us to find areas of concern for your health that may benefit from treatment outside of this study. At your request the collected information may be passed onto your dialysis doctors and nurses

Voluntary participation

Your participation in this study is voluntary. You may decide not to be in this study, or to be in the study now, and then change your mind later. You may leave the study at any time without affecting your care. You may refuse to answer any question you do not want to answer.

Confidentiality

The information that is collected for the study will be kept in a locked and secure area. Only the study invigilator will have access to your record. The information given will be used for research purpose only. You will not be named in any reports, publications, or presentations that may come from this study.

Expenses Associated with Participating in the Study

There will be no cost to you nor will you be paid to participate in this study.

CONSENT FORM

I ……have read the information provided and detailed procedure explained to my satisfaction. I understand everything that have been explained and hereby consent to participate as required in the study entitled “assessment of adherence to treatment regimen on health related quality of life among haemodialysis patients in selected hospitals in Kano metropolis”.

Participant’s signature…… Date ……..

I certify that I have explain the study to the participant and consider that he//she understands what is involve and freely consents to participate

Researcher’s name……

Researcher’s signature…… Date …….

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