

**STRATEGIES FOR COPING WITH STRESS RELATED TO INTRADIALYTIC
EVENTS UTILIZED BY PATIENTS ON HEMODIALYSIS AT THE RENAL UNIT,
KENYATTA NATIONAL HOSPITAL**

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H56/11883/2018

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF MASTER OF SCIENCE IN NURSING (RENAL) OF THE
UNIVERSITY OF NAIROBI.**

NOVEMBER 2020

DECLARATION

I, **Lydia Ndanu** declare that this is my original work and has not been submitted for any award to any other institution of higher learning or publication.

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DEDICATION

I dedicate this work to Almighty God for the gift of life, grace and provision throughout my studies. A special dedication to my husband, Meshack and son, Leon Levi for their love and immeasurable support during my study. To my entire family and especially my mother, Serah Mueni for the prayers and words of encouragement they have given me throughout this study.

To all patients with kidney diseases for being strong warriors through hard times.

ACKNOWLEDGEMENT

My heartfelt appreciation goes to everyone that has helped me throughout my study.

My supervisors Dr. Maina, Dr. Kimani and Ms. Inyama for their immeasurable guidance and support in writing this dissertation.

To my friends that encouraged and supported me during this study.

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OPERATIONAL DEFINITION OF TERMS

Chronic kidney disease: an abnormality in kidney function or structure present for more than 3 months with an effect on ones' health status. Usually categorized into 5 stages depending on the rate of glomerular filtration or 3 stages (A1-A3) according to the amount of albumin in urine.

End stage renal disease: the last stage of CKD, stage 5 where the patient has estimated glomerular filtration of less than 15ml/min/1.73m² body surface area. It is the stage at which the patient can only survive on renal replacement therapy.

Coping mechanism: psychological and behavioural changes an individual adopts to manage a situation that has been considered stressful with an aim of maintaining ones' emotional well-being. Examples include avoidance, engaging activities and problem solving.

Cognitive appraisal: a process by which an individual mentally assesses a situation to determine whether it poses a threat to ones' well-being or it is well manageable using the available resources. The end result determines if a situation is stressful or not and how one can solve the stressor to maintain ones' emotion well-being.

Effective coping: cognitive and behavioural changes that result in a long-term solution towards a perceived problem leading to an improved mental and emotional well-being. Once applied, one can adapt well to a stressful or traumatic situation and will be less likely to suffer from psychological illnesses like anxiety and depression.

Health related quality of life: this is a multi-dimensional concept that includes domains related to physical, mental, emotional, and social functioning aspects in relation to the state of well-being of an individual.

Hemodialysis: it is a form of renal replacement therapy that involves blood filtration of waste products, correction of electrolyte imbalances and removal of excess fluid from the body of a patient with insufficient kidney function.

Intradialytic events: complications that occur during hemodialysis treatment session which could be because of technical errors, HD prescription or patients' characteristics. These complications must strictly not be present before commencing HD session. They include hypotension, muscle cramps, nausea and vomiting, headache, fever/chills, chest pains and hypoglycemia.

Physiological stressors: physical situations or stimuli that result in any form of discomfort, for example pain, injury, extreme temperatures, and chronic illness like CKD. Intradialytic complications in this case will fall under this category.

Psychological stressors: mental straining as a result of physical or emotional situation which has been perceived as threatening to ones' emotional status. It could be external or internal stimuli.

Stress: tension resulting from either internal or external situation that has been perceived to be harmful to ones' emotional or physical well-being. This tension initiates adaptive responses towards the situation. In this study, this will be referring to tension resulting from intradialytic complications.

ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of variance
AV	Arterial-Venous
BFR	Blood Flow Rate
BRCS	Brief Resilient Coping Scale
CKD	Chronic Kidney Disease
COPE	Coping Orientation to Problems Experienced
CRI	Coping Responses Inventory
CRRT	Continuous Renal Replacement Therapy
CSES	Coping Self-Efficacy Scale
CVC	Central Venous Catheter
DCI	Dyadic Coping Inventory
DM	Diabetes Mellitus
ESRD	End Stage Renal Disease
GFR	Glomerular Filtrate Rate
HD	Hemodialysis
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HRQOL	Health Related Quality of Life

HTN	Hypertension
IDE	Intradialytic Events
JCS	Jalowiec Coping Scale
KDIGO	Kidney Disease: Improving Global Outcomes
KNH	Kenyatta National Hospital
KRA	Kenya Renal Association
PCI	Proactive Coping Inventory
QOL	Quality of Life
RRT	Renal Replacement Therapy
UF	Ultrafiltration
WCCL	Ways of Coping Checklist

ABSTRACT

BACKGROUND: Chronic Kidney Disease (CKD) prevalence has increased immensely, estimated at 8-16% globally, consequently resulting in large numbers of patients with end stage renal disease (ESRD) requiring renal replacement therapy (RRT). Hemodialysis (HD) is mostly used in the developing countries like Kenya. Hemodialysis is linked with complications that affects the quality of life of these patients. These complications are stressful to the patients, requiring them to cope. Coping mechanisms are broadly categorised into problem focused and emotion focused. Most patients on HD tend to use emotion-oriented coping strategies to cope with stress. Emotion focused strategies have been associated with poor therapy outcome and low health related quality of life. This study aimed at identifying the strategies utilised by patients on hemodialysis at Kenyatta National Hospital to cope with stress related to intradialytic complications.

OBJECTIVE: To identifying the coping strategies used by patients to cope with intradialytic related stress, and to also determine the common types of intradialytic complications experienced at the renal unit as well as the level of stress.

METHODOLOGY: Quantitative cross-sectional study design was used to meet the objectives of this study. A researcher administered questionnaire was used to obtain demographic and clinical data. Jalowiec coping scale was used to identify coping strategies. 96 respondents were recruited using random sampling method.

RESULTS: Majority (61.5%) of the respondents were male, married (58.3%) and aged (33.3%) between 40 to 49 years. Respondents with hypertension were the majority (63%). Majority (89.6%) of the respondents reported to have experienced IDEs more than once in the past 3 months. Most (51%) respondents reported that they had never been guided on ways of coping with stress related to IDEs. Muscle cramps (55%), headaches (54%) and hypertension (47%) were the most common experienced intradialytic complications among the respondents. The mean level of stress was rated at 5.13 ± 2.1 and the commonly used coping strategies were confrontive (45%), fatalistic (46%) and supportant (48%). There was a statistical significance ($p \leq 0.05$) found in the relationship between the level of stress experienced and the use of coping strategies.

CONCLUSION: Hypertension is the main cause of CKD among the patients. Central venous catheters are the main venous access used by the patients for HD. Muscle cramps, headaches and hypertension are the most common intradialytic complications experienced. Patients are not adequately informed of the intradialytic complications and are not trained on stress coping mechanisms. There is need for trainings on stress management and coping. Emphasis on use of problem focused coping strategies is required through tailored counselling services.

CHAPTER 1: INTRODUCTION

1.1 Background

Chronic kidney disease (CKD) is a major health problem. It affects approximately 15% people globally with the greatest burden found in developing countries (Delles & Vanholder 2017). This burden is greater in the Sub-Saharan Africa with almost 16% of the population suffering from CKD, with 14% in the East Africa region, ranking it the 6th fastest growing cause of mortality worldwide (Hodel et al., 2018). The Kidney Diseases Improving Global Outcomes (KDIGO) defines CKD as any abnormalities in the kidney structure or function, which has been present for more than three months (KDIGO) 2017). The final stage in the CKD continuum is the progression of the disease to end stage renal disease (ESRD), necessitating renal replacement therapy (RRT) for patient survival (Razmaria 2016). While RRT encompasses hemodialysis, transplantation, peritoneal dialysis and conservative management, hemodialysis is the most common approach used in the developing countries (Abdelwahab & Shigidi, 2015). It is estimated that nearly 90% of ESRD patients globally are on HD therapy (D'Onofrio et al., 2017). This is probably due to ease of access of HD services compared to other approaches making it more affordable. There are various types of RRT, namely, hemodialysis, peritoneal dialysis and kidney transplant.

There has been tremendous evolution and improvement on HD to make it more efficient and safe in order to assure improved quality of life and better chances of survival for the patients (Singh RG et al., 2015). Despite this, patients on HD are still prone to complications related to technical errors. Bartula et al. (2019) reported a death in every 75000 sessions of HD. Other complications are related to the procedure and can occur during or after the HD session. When the complications occur during hemodialysis, they are known as intradialytic events (IDE), and can

range from mild to life threatening. The common IDEs are hypotension (24%), muscle cramps (28%), nausea and vomiting (36%), headache (23%), itching (14%), chest pains (15%), fever with chills (37%) and hypoglycemia (10%) (Mahmood et al., 2018). Other rare IDEs include cardiac arrhythmias (8%), seizures (7%), hemorrhage (7%) and hoarseness of voice by the end of hemodialysis session (5%) (Singh et al., 2015). The significance of these complications cannot be ignored. When a patient experiences an IDE, they are twice likely to sign off early or miss hemodialysis all together (Khattak et al., 2019). In addition, these IDEs have been attributed to increased stress among patients on HD. Tchape et al., (2018) reported that stressors impact self-care, adherence and overall participation in the treatment. This will in turn influence therapy outcome and subsequently health related quality of life. Without a doubt, IDEs have been identified as a stressor to the patients, and this means that, in order to remain psychologically healthy, the patient must employ various coping mechanisms (Rojas 2017). These mechanisms are aimed at reducing the impact the stressor has on the patient and enable adaptation to the stressful situation. Different individuals adapt differently to various stressors and the coping strategies vary.

Coping strategies used by an individual may be influenced by various factors like previous encounters, social support systems, societal and personal beliefs, availability of resources and genetic makeup (Rojas 2017). A correlation between coping, level of education and age has also been identified (Dehkordi & Shahgholian 2013) and attributed to the magnitude of exposure to stressors and a difference in level of understanding of the stressor. Niihita et al., (2017) suggested that coping mechanisms can be manipulated to get a desired outcome and facilitate use of problem oriented coping strategy. They also concluded that this was helpful in mitigating stress, resulting in higher survival rates and better health related quality of life.

Coping mechanisms are broadly categorized into emotion –oriented and problem oriented (Parvan et al., 2015). Most patients on hemodialysis tend to use emotion focused coping strategies and such patients tend to have negative attitude towards the disease thereby influencing the patients’ adjustment to therapy (Hwang et al., 2018). This could lead to non-adherence to treatment regimen. Therefore, identification of the coping strategies and the stress level towards HD is important in helping the patients with psychological stress to plan care and assist them in identifying coping mechanisms that are beneficial to their health (Rojas, 2017). The knowledge on coping mechanisms can be used in establishing programs geared towards addressing psychological stressors related to HD for patients and their families.

1.2 Problem statement

Hemodialysis is a lifesaving treatment which improves the quality of life of patients with end stage renal disease and increases their survival. Over time, major technological advancements combined with expertise have improved on the safety of the hemodialysis procedure. Despite this, patients on HD still experience complications. It is estimated that approximately 75% of patients experience intradialytic complications, with 50% of them experiencing more than one complication at some point during the session (Goudarzian et al., 2015). In Kenya, Kipturgor (2016) observed that 53.6% of patients on HD experienced IDEs during the HD session.

These complications are a source of physiological and psychological stress to the patients. The results are that the patients have to initiate coping strategies. These coping mechanisms can be categorized as either problem focused or emotion focused strategies. The coping mechanism used could influence the treatment outcome and the patients’ quality of life (Chironda & Bhengu 2016). The majority of patients on HD use emotion focused strategy, while few of them use palliative and compulsive coping strategies (Shahrokhi et al., 2014). Niihita et al., (2017)

associated use of emotion oriented coping strategy with non-adherence to HD prescriptions, depression and poor health related quality of life. Problem focused coping strategy was linked to better physical and psychological health related quality of life in patients on HD (Nasiri et al., 2013). This is related to better state of mind attributed to acknowledging the problem at hand.

In Kenya, studies have shown that patients undergoing hemodialysis face similar problems as other patients over the world. The adherence to HD prescription is at 51.5% (Gichoni, 2018). This means that half of the patients on HD do not comply to the treatment. Kipturgor (2018) reported that 89% of the patients undergoing HD suffered from anxiety while 84% suffered from depression. This was collaborated by Kamau, Kayima and Otieno (2014), who reported that the patients on HD had a low health related quality of life (HRQoL) which was attributed to both psychological and physiological factors. In spite of these observations, assessment of coping mechanisms among patients undergoing HD at renal unit, KNH has not been done. Targeted counselling on stress and coping is not practiced to mitigate the psychological stressors affecting the patients. There are no established training programs for the patients and relatives on how to effectively cope with stress related to disease and complications of HD, which could have contributed to the observations made. This study therefore aims at identifying the coping strategies used by patients on HD at KNH towards stress related to intradialytic events.

1.3 Study objectives

Main objective

To determine the coping strategies utilized by patients to adapt to stress related to intradialytic events at the renal unit, KNH.

Specific objectives

- I. To determine the common IDEs occurring among patients at the renal unit, KNH.

- II. To assess the level of stress associated with HD experienced by the patients at the renal unit.
- III. To identify the coping mechanisms utilized by the patients during IDEs.

1.4 Research questions

- I. Which IDEs are experienced by patients undergoing HD at KNH?
- II. What is the level of stress towards HD experienced by patients at renal unit, KNH?
- III. How do patients at renal unit KNH cope with intradialytic events?

1.5 Research Hypothesis

There is no difference between the level of stress experienced towards HD and the type of coping mechanism used.

1.6 Study Assumptions

- I. All the participants will have been exposed to an IDE and employed any type of coping mechanism.
- II. The participants will be honest in their responses and will remember as much information as possible concerning the IDE.

1.7 Study Justification

Identification of coping mechanism used by the patients will enable the renal team especially the nurses who spent most of the time with the patients, to provide better support to them during stressful events like IDEs. This way, the renal team can design appropriate interventions to facilitate adaptation of helpful coping mechanism that would result in better adaptation to therapy requirements and improved HRQOL.

The results of this study will inform policy makers and curriculum planners in designing protocols and educative programs that would facilitate training on stress management for the patients and their families, as well as ensuring that regular psychological counselling and assessments are done that would promote adaptation of helpful coping mechanisms.

Most studies on coping mechanisms have been done outside Kenya as there is no data available on stressors and coping mechanism used by patients on HD. This study will therefore provide data on the coping mechanisms used by patients locally and will be a source of literature for other studies related to the same. Recommendations will be made for further studies from the results attained from this study.

1.8 Conceptual Framework

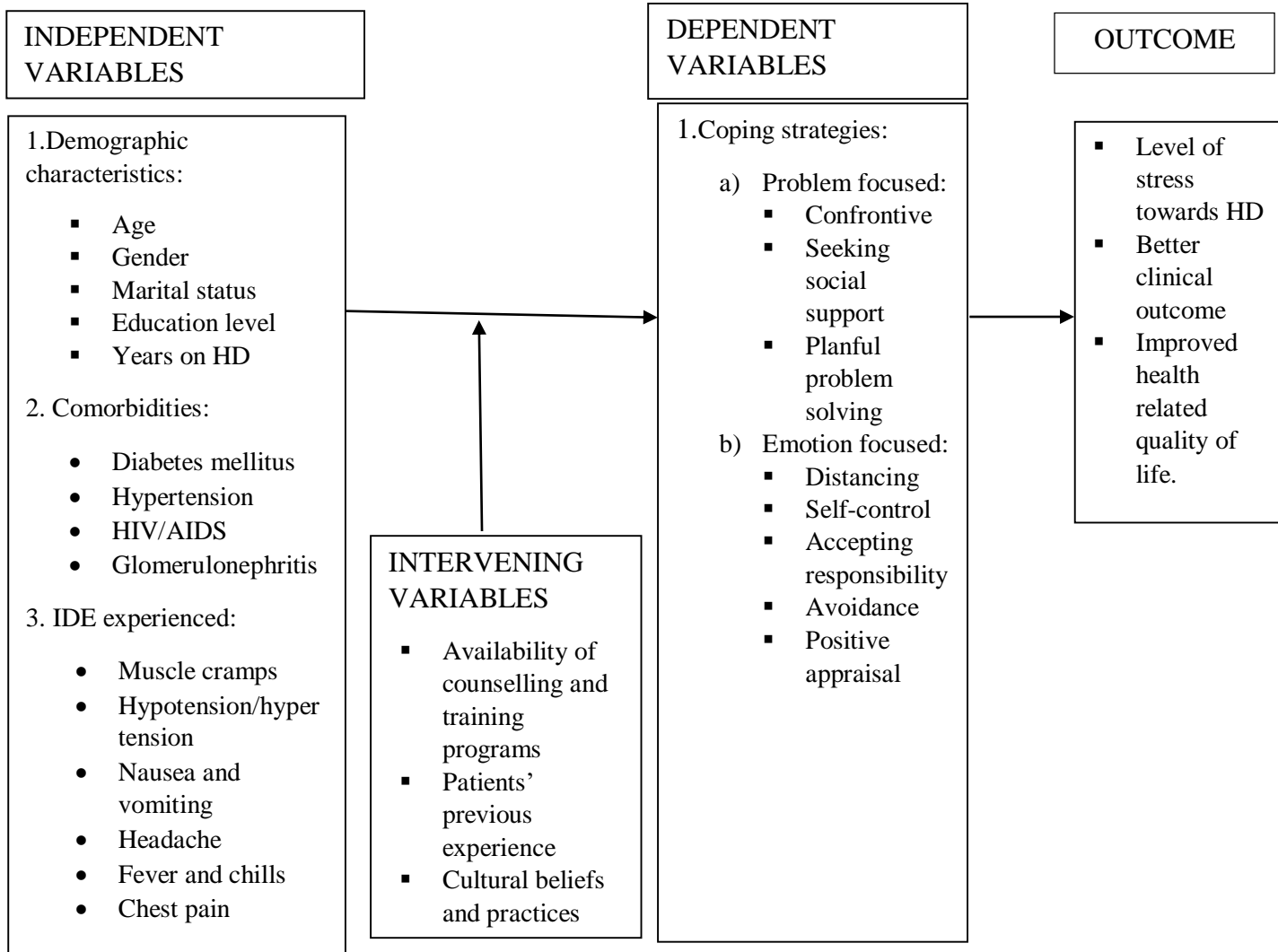


Figure 1. Conceptual framework

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This study is aimed at identifying the coping strategies employed by patients on HD to cope with stress related to intradialytic complications. This chapter reviews literature regarding chronic kidney disease, hemodialysis, intradialytic complications, stress among patients on HD and coping strategies. This was achieved by use of search engines like google scholar, PUBMED, HINARI as well as use of library databases like journals, e-books and web resources. All cited resources are peer reviewed and included literature published within 10years. Some of the key search terms were chronic kidney disease, hemodialysis, intradialytic complications, stress and coping among patients.

2.1 Chronic kidney disease

Chronic Kidney Disease (CKD) is defined as abnormalities of kidney structure or function, present for >3 months, with implications for health, and requires one of two criteria documented or inferred for >3 months: either GFR <60 ml/min/1.73 m² or markers of kidney damage, including albuminuria (KDIGO, 2017). Regarding GFR, it is categorized into stage 1 to 5 while under albuminuria it is graded as category A1 to A3 based on the severity. Razmaria (2016) suggested that CKD is the progressive deterioration of renal function for more than 3 months, usually with an effect on one's health status. The National institute of Diabetes, Digestive and kidney diseases (NIDDK) defined it as gradual damage to kidneys that has taken place over time resulting in accumulation of waste products in the body (Norton et al, 2017). The consensus on the definition of CKD means that patients cannot be misdiagnosed and at the same time, those who require treatment receive it promptly. It is estimated that CKD affects 15% of the world's population (Delles & Vanholder, 2017) and majority are in low and middle income countries

where it imposes a great health and economic burden (Stanifer, 2016). The Kenya Renal Association (KRA) approximates that 4 million Kenyans are affected by kidney diseases with 12,500 people having ESRD (Sokwala, 2018).

Chronic kidney disease is multifactorial. However, majority of the cases are due to diabetes mellitus and hypertension while others are due to old age (above 60 years), polycystic kidney disease, infections, obesity, and chronic use of nonsteroidal anti-inflammatory drugs (Olivier et al., 2015). Patients with CKD are at higher risk of developing cardiovascular diseases, anaemia, metabolic diseases, as well as progression to end stage renal disease when the GFR is less than 15ml/min mandating RRT (Ware, 2018).

Figure 2. Schematic presentation of chronic kidney disease (CKD) categories (KDIGO 2017)

		Albuminuria categories (mg/g creatinine)			
		A1	A2	A3	
		< 30	30–300	> 300	
GFR categories (ml/min × 1.73 m ²)	G1	≥ 90			
	G2	60–89			
	G3a	45–59			
	G3b	30–44			
	G4	15–29			
	G5	< 15			
G5 D/T		Kidney failure	Usually defined by KRT		

2.2 Hemodialysis

Hemodialysis is a technique used for extracorporeal removal of toxic metabolic waste from blood as well as excess fluid using a semipermeable membrane called dialyzer by diffusion (Levy, Brown & Lawrence, 2016). It can be done as an outpatient or inpatient in a hospital,

stand-alone clinics or at home. The first hemodialysis was done in 1945 in Dutch to treat acute kidney disease (Piccoli, Richiero, & Jaar, 2018). Since then, much improvement with new techniques has made it possible for HD to be used to recuperate the quality of life of patients requiring the therapy (Cavalli et al., 2010). This therapy mimics most of the kidney functional roles but not the endocrine functions hence a patient has to be given erythropoietin supplements to maintain their hemoglobin levels. There is paucity of data on the definite number of patients on hemodialysis due to lack of national renal registries in most developing countries. However, it is the most frequently used RRT modality in Asia, Middle East and Africa (Abe et al., 2017) with an estimation of 90% of patients with ESRD using this form of therapy (D'Onofrio et al. 2017). Locally, KRA estimates that 2,400 patients were on HD as of March 2019 (Kabinga et al. 2019). The number continues to increase as a result of government's initiative of installing dialysis centres in every county to cater for the increasing number of patients requiring RRT. The Kenya National Hospital Insurance Fund pays for 2 sessions/week for its members on HD, enabling more patients to access the service.

The main aim of HD is to improve quality of life enabling most patients on hemodialysis to be able to perform their daily living activities without any difficulties (Balaban et al., 2017). The improvement in HRQoL is related to reduced levels of uraemia and consequently the feeling of well-being. Hemodialysis also increases the survival rates for patients with ESRD (Karkar, 2012) This is not always the case as this procedure is often associated with complications that impact significantly on the HRQOL. These complications can occur during HD (intradialytic), after dialysis (postdialytic) or in between HD sessions (interdialytic). This study will focus on intradialytic complications.

2.3 Intradialytic events

Intradialytic events are complications that occur during the hemodialysis session. It is estimated that the IDE occur in 30% of all HD sessions (Costa et al., 2015). The frequency and the number of intradialytic events vary, approximately 75% of patient's experience one intradialytic complication while 50% of them experience more than one complication at some point (Goudarzian et al., 2015). Hypotension is the commonest intradialytic complication occurring in 25-55% of all sessions with muscle cramps rated second at 5 to 20% occurrence (Chironda & Bhengu, 2016). Other complications include nausea and vomiting at 5-15%, headache 6.6%, cardiac arrhythmia 5-75%, itching 50%, chest pain 5- 75%, hemorrhage 10-15%, fever with chills occurring in 1 to 4% cases, hypertension less than 1%, shivering 1-4% and seizures in less than 1% (Asif et al., 2018; Mahmood et al., 2018). These values vary in different groups of patients and dialysis centres.

Hypotension, which presents with diaphoresis, difficulty in breathing, tachycardia, loss of consciousness or confusion is associated with high temperatures of dialysate, a high ultrafiltration rate, as well as taking anti-hypertensive drugs prior to start of HD (Levy, Brown & Lawrence, 2016). It has been noted to occur mostly to patients during emergency sessions and long duration of HD therapy (Amira, Braimoh & Bello, 2012). Patients who undergo emergency dialysis are more likely to experience hemodynamic instabilities compared to those on chronic hemodialysis. Long duration of therapy contributes to higher ultrafiltration and consequently lowered blood volume. Nausea and vomiting is thought to have multiple causes including hypotension, infections, uraemia, and disequilibrium syndrome (Costa et al., 2015). Abrupt loss of fluids which causes hypovolemia or hypotension, tissue hypo-perfusion, sudden loss of

electrolytes, hypocalcaemia, hyponatremia and hypomagnesia which occur mostly during emergency sessions cause muscle cramps (Asif et al., 2018).

Itching can be caused by various factors. It is common among CKD patients due to uremia, but it is also related to allergic reaction towards heparin or dialyzer preservatives which can result in skin tearing, bleeding, pustules and nodules in some patients (Amira, Braimoh & Bello, 2012). It has been noted to occur more in females, younger patients, patients with ischemic heart disease and hypertension (Levy, Brown & Lawrence, 2016). In a section of patients on hemodialysis, fever results from infections related to low immunity or presence of intravenous devices. This can be mitigated by emphasizing aseptic techniques during the procedure, maintaining patients' immune system intact and their general cleanliness, especially for those using catheters venous access (Chironda & Bhengu, 2016). Headache has various causes including hypertension, hypotension, hyponatremia, decreased serum osmolarity, low plasma renin, changes in blood urea nitrogen levels and hypomagnesemia (Raja & Seyoum, 2020). It is also thought to be caused by tension and anxiety related to HD (Levy, Brown & Lawrence, 2016). Shivering could be related to infections, fever or hypoglycemia. A section of patients on HD also experience hemorrhage which is related to high doses of anticoagulants or uremia. Seizures are caused by sudden electrolyte disturbance or disequilibrium syndrome. Seizures can be prevented by doing short duration but frequent dialysis sessions and gradually increasing the duration (Asif et al., 2018). Most of these complications can be prevented by comprehensive patient assessment and individualization of HD prescription. When they occur, they should be treated immediately to avoid morbidity and mortality.

2.4 Factors influencing the occurrence of intradialytic events (IDEs)

A study by Costa et al. (2015) highlighted various factors influencing the occurrence of IDEs among them being frequency of HD whereby patients on twice weekly sessions experienced lesser complications than those who had irregular HD sessions. Another study suggested an association of IDEs with age as well as various comorbidities like diabetes and hypertension with the older patients getting more complications than the younger ones (Bartaula et al., 2019). This is also supported by another study done by Lin et al. (2018) that concluded that the elderly patients were at higher risk of developing IDEs as well as those with diabetes and cardiovascular diseases. They also noted that the patients who had been on HD for long and those who required higher UF volumes were at higher risk of developing intradialytic hypotension, muscle cramps and headaches.

In addition, Thongdee et al. (2020) found that longer HD sessions and UF more than 12ml/kg/Hr was associated with higher prevalence of IDEs. They also found that patients with higher residual kidney function had less intradialytic complications. Use of central venous catheter access has been linked with higher risk for catheter related infections (Fysaraki et al., 2013) causing fever, chills and rigors during HD. Borzou et al. (2016) and Halle et al. (2020) found a correlation of feeding during HD and occurrence of hypotension, nausea and vomiting.

2.5 Impact of IDEs on the patient and HD therapy

Intradialytic complications have been linked to a poor HRQoL (Georgia & Fotoula, 2013). Age, anemia and co-morbidities also contribute to the complications. Inadequate dialysis related to failure to achieve the prescribed HD when a session has to be discontinued after an IDE has occurred leads to the reduced HRQoL (Karkar, 2012). This is thought to increase risks for morbidity and mortality. Non-compliance to HD schedules has been observed more in patients

who have experienced IDEs. Bayoumi et al., (2013) reported that the risk of death increased by 25 to 30% when a patient skipped one hemodialysis session, the resultant increase in uremia contributed to organ damage and subsequently mortality. The risk of death is related to the frequency of IDE which result from inadequate dialysis. Chironda and Bhengu (2016) found that 17.9% of early sign-offs from HD are due to muscle cramps, while Khattak et al. (2019) found that febrile reactions during HD were responsible for 27% of early HD sign-offs, with hypotension and hypertension resulting in 7.1% and 6.9% early sign offs respectively. In addition to affecting adherence to HD regimen, IDEs have been reported to be the common cause of physiological stress to the patients (Georgia & Fotoula, 2013). Occurrence of IDEs therefore affects the outcome of HD therapy.

2.6 Hemodialysis - related stress

Stress is a common occurrence among patients undergoing hemodialysis. It develops when an individual perceives a situation as potentially harmful to them (Lazarus, 1983). Hemodialysis is a stressful procedure to both the patients and their relatives, it includes both physiological and psychological stressors resulting in a reduced quality of life (Vida, Fatemeh & Anoshirvan, 2015). This contradicts the main objective of HD, which is to improve quality of life. Low quality of life has been reported in various groups of patients on HD, especially those that report higher levels of stress (Shinde & Mane, 2014). Approximately 36% and 14% of HD patients suffer from moderate to severe levels of stress respectively (Fatma et al., 2013). The consequences of the stressors vary. Vida et al. (2010) concluded that the higher the levels of stress, the curtailed the quality of life and the ability of self-care.

Among the chronically ill patients, patients with CKD and undergoing HD have been found to have the highest levels of stress and hence at higher risk of developing mental illnesses such as

anxiety and depression (Georgia & Fotoula 2013; Gurkan, Pakyuz & Demir 2015; Chironda & Bhengu 2016). The high levels of stress reduce coping capabilities of the patients. Shafipour, Alhani and Kazemnejad (2015) found that 85% of the patients on HD had severe stress, while Shahrokhi et al. (2014) found that 65.2% patients on HD had been diagnosed with some form of psychological illness attributed to stress. The mental illnesses have also been reported in Kenya. Kiptrugo (2016) identified 89% of patients on HD with anxiety and 84% having depression. This could be attributed to inability to use effective coping mechanisms to cope with stressors. This leads to overwhelming tension and stress towards hemodialysis, poor adjustments and non-adherence to treatment regimen resulting in poor clinical outcome (Muayyad & Eman 2014; Comelis (2016). This highlights the need to ensure patients cope to the stressors to reduce their risk of developing such illnesses.

The most frequently reported physiological stressors are fatigue, fluid/food limitations, and HD complications while the psychosocial stressors are limits on vacation and place, sleep disturbances and boredom during HD sessions (Johnson et al., 2019). Majority reported that physiological stressors are more tasking than the psychosocial ones (Shahrokhi et al. (2014); Bujang et al., (2015) probably because they lack knowledge on how to alter their physiological status.

Factors influencing the levels of stress experienced include age, gender, type of stressor, cultural practices, and social support system available (Zahra et al., 2014). Severe stress has been identified in females more than in males and also patients older than 56 years were found to have less stress compared to the younger patients below 20 years. Married patients tend to have less stress than the single and divorced patients (Mahboobeh et al., 2013) which suggests the significance of social support in coping with stressful situations.

2.7 Stress coping mechanisms.

2.7.1 Coping mechanisms

Coping is an action taken by an individual to amend a problem or lower discomfort caused by a stressful event (Folkman, 2011). Patients on HD ought to employ coping mechanisms to adapt to the stressors resulting from HD. There are two major categories of coping mechanism; problem oriented and emotion oriented with subscales under each category (Parvan et al., 2015).

2.7.2 Problem focused coping

The problem oriented coping mechanism involves dealing with the cause of stress and eventually doing away with the stressor and thought to result in a long term solution to the stressor (Shinde & Mane, 2014). It includes confrontive strategies, problem solving actions and use of social support systems available to deal with cause of stress and more applicable to internal stressors. Although it may not be practical to use it in all situations, it has been shown to be more effective in coping with stressful events (Compas et al., 2012). Confronting the problem ensures that the patient is aware of the issue at hand and is willing to confront it. It is more helpful in dealing with stressful events and if used effectively, it can result in better quality of life in HD patients (Parvan et al., 2015). Other studies found a direct correspondence between use of problem focused strategy and higher survival rates for HD patients with evidence of improved physical status, better adherence to treatment schedules as well as improved psychological functioning of these patients (Graven & Grant 2013; Niihata et al., 2017).

There is minimal use of problem oriented strategy by patients undergoing HD. This could be because of patients' limited knowledge on the effectiveness of this mechanism in adapting to stressors (Kobra et al., 2015). Positive thinking has been associated with effective coping and

better health outcomes (Naseem & Khalid, 2010). This can be emphasized through counselling on adaptation strategies.

2.7.3 Emotion oriented coping

Emotion oriented strategy is aimed at lowering the negative emotions caused by stressful events such as embarrassment, fear, frustrations or excitement specifically if the stressor is external to the individual (Muayyad & Eman, 2014). The techniques used in this mechanism include distraction, emotional disclosure, which may involve talking to someone or writing about the negative feelings, praying for guidance and strength, meditation, eating more, use of alcohol or drugs, cognitive appraisal which is aimed at altering the impact caused by the stressor, inhibition of the negative thoughts to avoid them (Endler & Parker, 1990). The emotion oriented coping strategy has been linked to poor health outcomes (Penley, Tomaka & Weibe, 2012; Graven & Grant, 2013). This is probably because this strategy does not involve tackling the stressor but avoiding it and making one feel better. Hwang et al. (2018) reported that non-adherence to HD regimen was higher in patients who used emotion focused strategy particularly hopeful thinking as compared to those who used problem focused mechanism. This has led to higher morbidity and mortality rates among these patients.

2.7.4 Factors influencing choice of coping mechanism

Factors such as age, gender, comorbidities, personal experience, personal and cultural beliefs, available resources, social support systems available and genetic background determine the choice of coping mechanism exploited by an individual, (Zahra et al., 2014). This choice impact on morbidity and mortality in patients (Tchape et al., 2018). Although a positive correlation between problem oriented coping mechanisms and the quality of life has been reported, most HD

patients tend to use emotion oriented strategies (Mahboobeh et al., 2013). The reason for the adoption of each strategy varies.

Gender has been implicated in the choice of coping strategy. Male patients have a tendency of using emotion focused while female patients use problem-solving method (Comelis- Bertolin, 2016). Females tend to be more psychologically ready to face difficult situations compared to men, they are more likely to talk to friends and family about their challenges compared to the male patients. As a result, social support and religion are likely to influence the coping strategy in face of chronic disease (Kim et al., 2010; Fatma et al., 2013). Similarly, the education level has been identified as a factor influencing choice of coping mechanism. Higher levels of education are correlated to adoption of emotion focused strategy as compared to lower levels where patients tend to use problem focused strategy (Muayyad & Eman, 2014). Persons with higher levels of education are more likely to understand the disease process and the consequences on the quality of life and hence likely to avoid facing the implications.

Age is a variable that can affect the selection of a coping strategy. Older patients are more likely to adopt emotion focused strategy (Gurkan, Pakyuz & Demir, 2015). These patients tend to avoid the reality of chronic disease and hence the emotional response. The patients who have been on HD for more than 4 years were found to utilize emotion oriented more as opposed to those who had been on HD for less than 1 year (Mahboobeh et al., 2013). The longer the patient is on hemodialysis, the more likely that they understand the consequences of the disease better and still choose avoidance. These findings compare to those of Muayyad and Eman (2014) who reported a negative correlation between the length of time on HD and accepting responsibility and seeking social support. Single patients would tend to use problem-oriented mechanism as compared to the rest (Zahra et al., 2014).

Availability of resources like reading materials, training programs and counselling could influence the choice of coping strategy. Ahadi, Delavar and Rostami (2014) suggested that if an individual perceives a stressor as manageable, there is a likelihood that they will use problem oriented strategy to tackle the stressor. Mehta et al., (2011) proposed that cognitive behaviour therapy had positive results on patients with coping problems.

2.8 Assessing coping mechanisms

This section will discuss some of the tools that have been developed to assess coping mechanisms.

2.8.1 Coping Inventory for Stressful Situations

This is a four- factor model of coping mechanisms that was developed by Endler and Parker in 1990. It entails three main coping strategies; emotion-oriented, task oriented, and avoidant which is further divide into distraction and social diversion. According to the founders of this scale, task oriented coping strategy involves controlling emotions and ensuring that one remains focused in solving the problem experienced whereas emotion oriented strategy focuses on suppressing the negative feelings caused by the stressor especially if the stressor is perceived to be unchangeable. Avoidance (distracted coping) is used when a stressor is external and uncontrollable and usually one ignores the presence of the problem by distracting themselves with other interesting activities while in social coping, one distracts themselves by interacting with other people around them (Endler, & Parker, 1990). This scale has 2 versions; 48 items scale and 21 item scale with the latter having the items that were found to have higher validity. It has been used in various groups of people including students, general population and the sick preferably above 16 years of age.

2.8.2 Cope Inventory

COPE (coping orientation to problems experienced) inventory is a 15 item scale used to determine coping under 4 broader aspects which include; self-sufficient (problem focused), avoidant coping mechanism, socially supported strategy and self-sufficient (emotion focused). The 15 items included in this scale are Positive reinterpretation and growth, Mental disengagement, Focus on and venting of emotions, Use of instrumental social support, Active coping, Denial, Religious coping, Humour, Behavioural disengagement, Restraint, Use of emotional social support, Substance use, Acceptance, Suppression of competing activities, and Planning. It was created by Carver in 1989. A participant is given a list of statements related to the 15 strategies and expected to respond in a scale of 1 to 4, in accordance to how often they use such strategy. 1 representing “I usually don’t do this at all” while 4 rating “I usually do this a lot”. There is also a brief version of this COPE inventory that comprises of 28 statements instead of 60 used in the original version and is more focused on the frequency of use of stated strategies.

2.8.3 Coping Self Efficacy Scale (CSES)

This scale was invented by Dr. Margaret Chesney in 2006 partnering with Dr. Albert Bandura initially for use on staff and patients at a AIDS centre in California. It is similar to COPE inventory with an emphasis on the confidence one has using a certain coping strategy especially the positive strategies. It consists of 26 items prefaced with a statement ‘when things aren’t going well for you, or when you’re having problems, how confident are you that you can do the following’ then a list of statements is given and the participant scores their response from 0 to 10 whereby 0 means ‘cannot do at all’, 5 meaning ‘moderately confident I can do’ while 10 means

‘certain I can do’. A higher score designates a high level of self-efficacy when it comes to implementing positive coping strategies.

2.8.4 The Brief Resilient Coping Scale (BRCS)

This scale was designed by Sinclair and Walston in 2004 targeting to measure one’s ability to cope with stress in highly adaptive ways. It contains 4 statements that a participant rate in a scale of 1 (does not describe me at all) to 5 (describes me very well) then a sum score is tabulated. A score of 17 to 20 is interpreted as a highly resilient coper whereas 4 to 13 indicated a low resilient coper.

2.8.5 The Proactive Coping Inventory (PCI)

This tool was developed by Greenglass and Schwarzer in 1998 aiming to measure different proactive approaches to coping under 7 subscales including; proactive Coping, preventive Coping, reflective Coping, strategic Planning, instrumental Support seeking, emotional Support Seeking, and avoidance Coping. The inventory consists of 55 statements which participants are asked to give each statement a score between 1 (Not at all true) and 4 (Completely true).

2.8.6 The Dyadic Coping Inventory (DCI)

The DCI was designed by Bodenmann in 2008 and was specifically developed to be used within close relationships, for when one or both partners are experiencing stress. It contains 37 statements which aim to measure communication and dyadic coping. Dyadic coping relates closely to partners in close relationships and has 4 strategies namely; Supportive, delegated, negative and Joint. Dyadic coping also involves: One partner’s attempt to reduce the stress of the other partner and a joint effort from both partners to deal with stress that may impact their relationship. It contains six subscales that ask each person to reflect on how they communicate stress to their partner, how their partner responds, how their partner communicates they are

stressed, how they react to their partner's stress, how they behave when both partners are stressed, and how they cope as a couple. For example, 'When my partner feels he/she has too much to do, I help him/her out', 'When my partner is stressed, I tend to withdraw' then each statement is given a score between 1 (Very rarely) and 4 (Very often). Higher scores indicate higher dyadic coping for each of the subscales.

2.8.7 Ways of Coping Checklist (WCCL)

It was derived from Lazarus' transactional model of stress. It is a 68- item tool that requires the respondent to focus on a current stressor and how they dealt with it. Like many other tools, it focuses on two broader categories, problem focused coping and emotion focused coping which has 6 strategies making a total of 7 scales. These include; problem focused, wishful thinking, growth, minimize threat, seek social support, avoidance and self-blame. These scales are then rated at a 4-score level.

2.8.8 Coping Responses Inventory (CRI)

This tool was developed by Rudolf H. Moos in 1993 with an aim of assessing cognitive and behavioural responses of an individual towards a stressful situation. It has two versions; CRI-Adult for clients older than 18 years and CRI-Youth for clients aged 12 to 18 years and preferred for clinical assessments. It entails eight scales covering coping styles such as Logical Analysis, Positive Reappraisal, Seeking Guidance and Support, Problem Solving as well as avoidant coping styles such as Cognitive Avoidance, Acceptance or Resignation, Seeking Alternative Rewards, and Emotional Discharge. Each scale has 6 items that totals to 48 items which are rated on a 4-point scale, from 0 (not at all) to 4 (fairly often) depending on reliance on each of the statements listed.

2.8.9 Jalowiec Coping Scale (JCS)

This is a 60 item scale designed by Jalowiec in 1987 aimed at identifying specific cognitive and behavioural coping strategies to a specified stressor. The scale contains 8 coping styles including: confrontive style, where one faces up to the problem and tries to figure out how to handle the situation; evasive style where the stressor is avoided and one tries to keep it out of mind; optimistic style with positive thinking about good things in ones' life; Fatalistic, which is a pessimistic attitude and one feels hopeless about a situation; Emotive style means that one projects their emotions on other people or objects; Palliative style which one makes themselves feel better by taking medications to reduce tension; Supportant style uses the support systems available especially social support; Self-reliant style means that one works out of the stressor by themselves by assuming responsibility.

In part 1, the coping strategy cues will be listed and the patient will rate the degree of use of each strategy measured on a 4point scale as: never used, seldom used, sometimes used, or often used. Part 2 of the scale will be aimed at identifying the effectiveness of the coping strategy in coping with the IDE rated as: not helpful slightly helpful, fairly helpful, or very helpful. Assistance offered by health professional in the unit towards coping to an IDE will also be rated in this section using Likert's scale of 0 to 3; 0 representing not helpful and 3 being very helpful. There is also a provision for the participant to list other strategies they have used and not found on the scale.

This tool has been used in both general and clinical population although it was ideally made to use in clinical area. Reliability of this tool in terms of Cronbach alphas are 0.88 for use and 0.91 for effectiveness. Validity index for all the scales has been rated by medical professionals at 0.85 meaning that items on each subscale were relevant (Jalowiec, 2019). Availability of reliability,

validity scores and the fact that this tool has been used in various clinical studies successfully makes it suitable for this study. For example;

- Parvan et al., (2015) used this tool to assess coping mechanisms among patients on HD and peritoneal dialysis.
- Rafiya, suttharangsee and sangchan (2011) used this scale to assess coping strategies for caregivers of patients with schizophrenia.
- Scott et al. (2019) used the scale to determine coping in African Americans with inflammatory bowel syndrome.
- Sharour et al. (2020) used the scale to determine coping strategies among colorectal cancer.

Scores for each of the eight coping styles can be expressed as either raw scores or individualized adjusted scores. Individualized adjusted scores adjust for the fact that each person uses a different number of coping methods, not all the coping methods listed on the JCS. Raw scores can be used when comparing the same coping style between subjects or groups. However, mean item scores or subscale percentage scores should be used when comparing different coping styles between subjects or groups. In addition, mean item scores and subscale percentage scores can also be used any time raw scores are appropriate.

2.9 Theoretical Framework

This study is based on **transactional model of stress and coping** developed by Dr. Richard Lazarus and Dr. Susan Folkman in 1984. It is transactional in that it involves a flow of events where one action leads to a reaction in a constantly changing environment. It basically brings out the relationship between person and environment, cognitive appraisal of events and coping with stress. It suggests stress is perceived in form of thoughts, feelings, emotions and behaviour and

results from ones' perception of a situation as harmful or a threat to ones' well-being. Once an event has been marked as stressful then an individual develops a coping strategy to adapt to the situation.

This model uses various concepts that include; cognitive appraisal, primary appraisal, secondary appraisal, coping strategies and cognitive behaviour therapy. These concepts are discussed in subsequent subsections.

2.9.1 Stress

Lazarus and Folkman (1984) defines stress as an emotional response experienced when an event or a stimulus both internal and external is perceived by an individual as exceeding their resources. The level of stress experienced is mainly affected by the degree at which the outcome of the event is rated. Meaning that if an outcome is irrelevant to the person, then there will be no stress experienced. On the other hand, if the events' outcome poses a threat to the individual, then stress is perceived and a reaction is initiated. This study takes IDEs as the stressful event that patients on HD experience.

People experience stress differently as this is influenced by factors such as personal characteristics, societal influences, gender, race, socioeconomic and marital status. This explains why some people may perceive the same situation differently. Lazarus (1993) states that the stressful event triggers a cognitive process where one evaluates whether the situation poses a threat and ones' ability to cope with it.

2.9.2 Cognitive appraisal

It is the process of an individual's assessment of a situation and categorizing it in reference to implications and significance to the persons' relationship with the environment. People differ in terms of type and degree of reaction to an event, their vulnerability and interpretation of an

event. The significance of an events' outcome is highly depended on ones' personal beliefs, commitments and goals. Park & Folkman (1997) suggests that same event may be interpreted differently by an individual when they occur in different times.

There are two types of appraisals according to this model; primary and secondary. These two are interdependent and primary appraisal precedes secondary appraisal. In primary appraisal, an individual identifies the situation as either irrelevant, benign-positive or stressful. An event is taken as irrelevant if the outcome has no impact on the persons' well-being whereas in benign-positive, the outcome is pleasurable. Secondary appraisal involves evaluating ones' ability to cope with the stressful situation identified as well as exploring the actions to be taken to manage the situation with an expected outcome. An individual assesses the available resources to improve the situation and how much control they feel they have over the situation. If one believes that they are capable of handling an event, they are likely to take alarming events as challenging rather than stressful. However, if one perceives that their resources cannot meet the demands of the situation, then an emotional reaction is initiated.

Lazarus and Folkman (1984) concluded that the way a person perceives an event directly affects the coping process and their emotional involvement, emphasizing that cognitive appraisal is crucial in eliciting thoughts, feelings and action and is key in choosing among various coping styles.

2.9.3 Coping and coping strategies

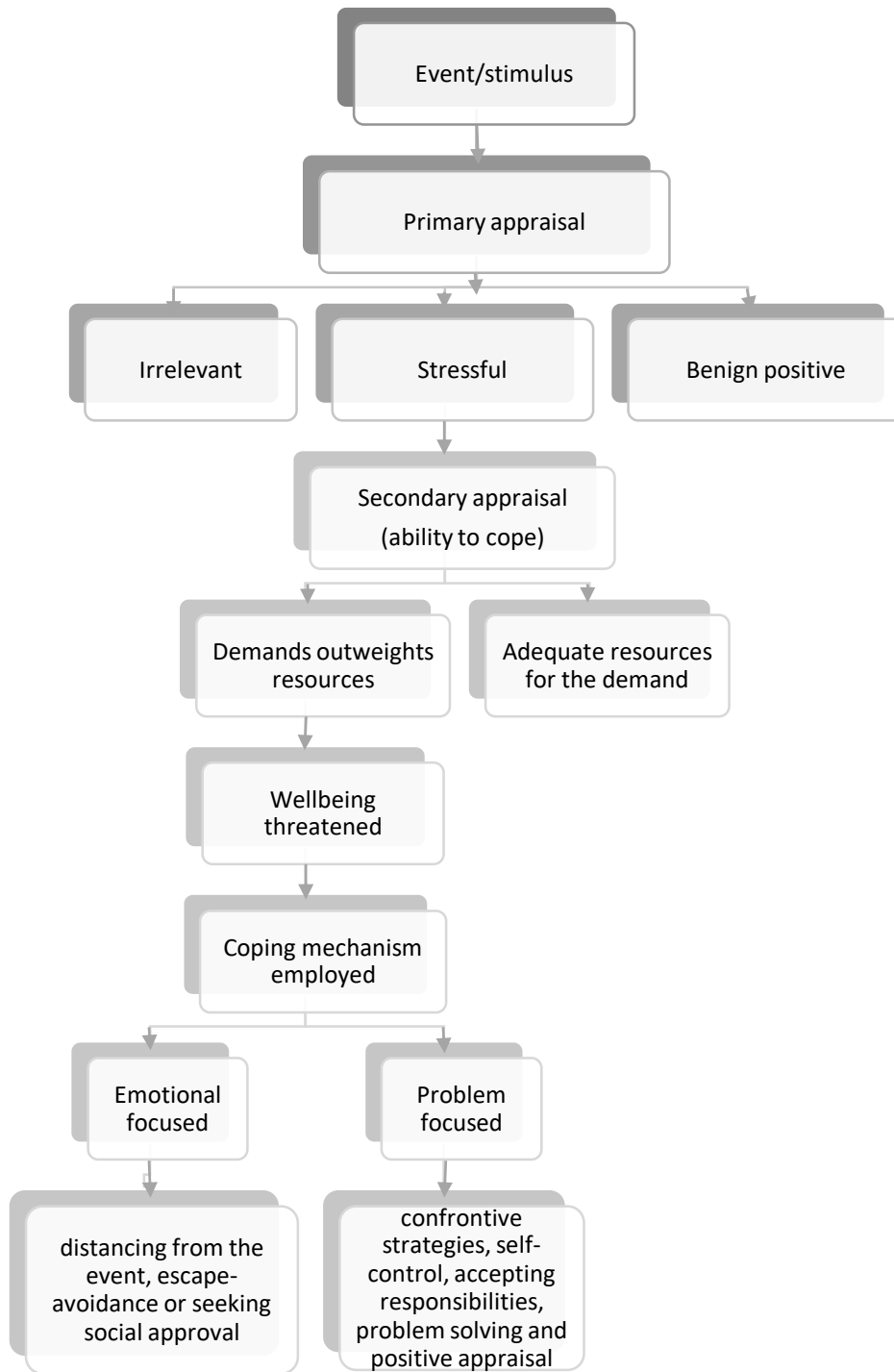
Coping is defined as cognitive and behavioural actions and adjustments put in place after one appraises a situation as exceeding available resources and resulting in a threat to ones' environment (Lazarus & Folkman 1987). It is majorly aimed at relieving the tension resulting from the identified stressor. This model identifies two major coping strategies that people

majorly use to deal with stressful situations; problem focused and emotion focused. Problem focused strategy aims at altering the person-environment relationship by either focusing on the person or the environment. It results in coming up with a solution to the stressful situation by applying strategies like confrontive strategies, self-control, accepting responsibilities, problem solving and positive appraisal which have shown to give satisfactory outcomes (Lazarus, 1993). Emotion focused coping strategies on the contrary focuses on altering the persons' perception of the stressor or the significance of the event outcome. It however does not encourage identification of a solution to the specific stressor which often in the long run results in negative emotions. Lazarus (1993) identified various factors that could influence the coping, namely; individual personality, level of stress and social environment.

2.9.4 Cognitive behaviour therapy

This is a type of therapy that recognizes the close interrelation between cognitive appraisal, stress and coping and uses this concept to facilitate choosing of appropriate coping strategies through favorable appraisals (Lazarus & Folkman, 1984; Mehta et al., 2011). It uses both cognitive and behavioral concepts to alter ones' perception on stressful events and change of behavior. This model recognizes that no one solution is fit for all the stressors but some of the therapies included in cognitive behavior therapy include exposure therapy, relaxation training, meditation, mindfulness and yoga.

Figure 3. Transactional model of stress and coping.



Source: Adapted from transactional theory of **stress and coping** (Lazarus and Folkman 1984; Park & Folkman 1997)

2.9.5 Relevance of the model to this study

Transactional model of stress and coping is relevant to this study in that, it forms a basis for understanding how stress develops and the various ways of coping. It also supports the idea that people cope differently. In addition, it provides the researcher with some of the variables studied as well as helping the researcher understand the study better by explaining the interrelation between stress and coping.

2.9.6 Limitations of transactional model of stress and coping on this study

The applicability of this model in this study is however faced with some challenges. For instance, the model does not give details on how cognitive behaviour therapy can be used to influence choice of coping strategy. It has emphasized on two major coping strategies and leaves no room for other coping strategies that an individual could use. It also excludes the methods of assessing levels of stress as well as coping mechanisms although it was derived by the author of 'ways of coping checklist'.

2.10 Literature review Summary

Concisely, CKD prevalence is high affecting mostly developing countries with diabetes and hypertension being the major cause. HD is the renal replacement therapy used by most developing countries for patients with ESRD including Kenya. It is aimed at improving quality of life for these patients. It however has complications that range from mild to severe even death. These complications could be intradialytic or interdialytic. Occurrence of complications vary among patients but the common IDEs are hypotension, hypertension, muscle cramps, fever, chills, nausea, vomiting, hypoglycaemia, headaches, chest pains and hemorrhage. Some of the factors that influence occurrence of IDEs highlighted are age, comorbidities, UF volume required, length of HD session, residual kidney function and the venous access in use. These

IDEs are stressful to the patient and may lead to anxiety, depression, non-adherence and consequently low quality of life, increased risk for morbidity and mortality.

Stress is common for patients undergoing hemodialysis secondary to the therapy or disease process. The level of stress experienced is influenced by age, gender, type of stressor, cultural practices as well as social support systems available. Patients tend to use coping strategies to deal with stressful events. Coping mechanisms can either be problem oriented or emotion oriented. Most patients on HD have been noted to use emotion oriented strategies which have shown poor health outcome. The coping strategy used by an individual is influenced by age, gender, underlying comorbidities, personal experiences, social support systems available and genetic background.

Coping and stress management trainings have been shown to help patients cope better with stresses related to terminal illnesses resulting in better health outcomes and quality of life. In our set up, studies on coping strategies has not been explored and this study seeks to fill that gap and provide information on how our patients cope, which will help in formulating care plans to help them cope better.

CHAPTER 3: METHODOLOGY

This chapter highlights the methods used to achieve the objectives of this study. This will include study design, site, population, sampling, sample size calculation, inclusion/exclusion criteria, data collection, cleaning and analysis. Ethical considerations, result dissemination and study limitations will also be highlighted in this section.

3.1 Study Design

A quantitative cross-sectional descriptive design was used to achieve the objectives of this study. Quantitative method was appropriate because the researcher used numerical comparisons and statistical methods to analyse data obtained in this study. Data collection was done at one point in time to describe the coping mechanism used by the patients and assess the level of stress, no follow up was done. The variables identified in this study were not manipulated by the researcher.

3.2 Study Site

The study was conducted at the renal unit, Kenyatta national hospital (KNH). KNH is the largest teaching and referral hospital in Kenya located 3.5 Km west of Nairobi's Central Business District, the capital city of Kenya. It has a bed capacity of 1800 but sometimes can hold upto 3000 patients due to various challenges experienced by the country's health sector. The renal unit has a total of 25 HD machines and 2 CRRT machines. An average of 50 sessions of hemodialysis sessions are done daily. This unit serves both inpatient and outpatients from different parts of the country but majorly from Nairobi county. The Kenya national hospital insurance fund pays for 2 sessions/week for their members while the non-members pay out of pocket. Most patients receive HD therapy twice weekly.

3.3 Study Population

The study targeted all the patients on HD at renal unit, KNH. This unit has 156 regular patients as recorded by health information department, KNH. It also serves a varying number of inpatient cases that range from 100 to 200 patients monthly who are either newly diagnosed or from other centres admitted for various reasons like insertion of a permanent venous access and assessment for kidney transplant. These patients dialyze at the unit for a few sessions then referred back to centres near their residential areas after they have been stabilized.

3.4 Sampling Method

Simple random sampling was used to obtain a study sample from the study population. All the patients had equal chances to participate in the study. Sampling was done on the patients that were undergoing HD until the desired number of participants was achieved.

3.5 Sample Size Calculation.

Cochran's formula was used to calculate for the sample size with an adjustment done for a smaller population.

The formula states that:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Whereby:

n_0 is the recommended sample size

Z is the area under the normal curve representing 95% of the population taken as 1.96

e is the desired level of precision also known as the margin of error, in this case 0.05

p is the (estimated) proportion of the population which has the attribute in question taken to be half the population (0.5)

q is 1 – p. (1-0.5)

The sample size is calculated as:

$$n_0 = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2} = 384$$

384 is the sample size for infinite population of more than 10,000. For this study, the study population is less than 10,000 requiring for adjustment.

The adjusted formula will therefore be:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where n is the sample size for finite population, 384

N is the population size in this study, 156.

n₀ is calculated sample size for infinite population

$$\text{Therefore } n = \frac{384}{1 + \frac{(384-1)}{156}} = 111$$

The intended sample size for the study was 111 participants.

3.6 Inclusion – Exclusion Criteria

Inclusion criteria

Participants that were interviewed were those who;

- I. Were stable to participate in the interview.

- II. Gave verbal and written consent to participate in the study.
- III. Were 18 years and above which is the cut off age for adulthood in the country above which one can give consent.
- IV. Had been on hemodialysis for more than 3 months to allow for adjustments of treatment therapy and past the acute stage of the disease.
- V. Had experienced an IDE within 3 months to ensure better retrieval of information.

Exclusion criteria

- I. Participants who experienced IDEs in other Renal units and have since been referred to KNH.
- II. Participants with an active psychiatric disorder.

3.7 Data Collection Procedure

An interviewer - administered questionnaire was administered to the participants. Data collection was done daily until no more participants could be recruited. The interviewer approached the participants already undergoing their HD session, introduced themselves and the study then sought both verbal and written consent where the participant signed a consent form. After giving consent, the client was assessed if they meet all the inclusion criteria requirements after which the interview was done. The interview took approximately 30 mins and was done as the participant continued with their treatment to avoid inconveniencing them. The interviewer made a separate list of the participants to ensure that she didn't interview a participant more than once. This list of participant was discarded once data collection exercise was complete.

3.8 Data Collection Tools

A multiple choice questionnaire was used to collect data. The tool had different sections namely; hemodialysis demographic form, Jaloweic coping scale and stress visual analog scale.

The demographic form composed of questions on gender, age, marital status, education level, occupation status, housing, comorbidities, duration the patient has been on HD, HD prescription, and the type of IDEs experienced.

Coping mechanisms was assessed using Jaloweic coping scale which has items in part 1(frequency of use of listed cues) and part 2 (the effectiveness on coping with stress). Permission to use this scale was granted by the author (email dated 18th Jan 2020, Appendix 9).

The Stress visual analog scale was used to determine the level of stress the patients had towards HD. This scale is represented by a line with calibrations that represent varying intensity of stress that a patient identifies with. One end of the line representing absence of stress while the other end symbolizing intense stress as experienced by the patient after an IDE and generally towards HD.

3.9 Pretesting

The questionnaire was pretested at KNH hospital renal medical ward (7A) to check for the effectiveness of the study tool. Time required to complete the questionnaire was also identified during pre-test. Participants admitted in the ward and were undergoing HD were interviewed. The recommended number of participants is 10% of sample size (111), which computes to 11. Therefore, 11 patients participated in the pretesting exercise. Convenience method was used to recruit the 11 participants. The pre-test showed that the questions were easy to understand and there were no ambiguous statements that would distort the information obtained. The questionnaire was found to be long by some of the participants although they were able to fill it within 30 minutes. No adjustments were required for the questionnaire before the study.

3.8 Data cleaning.

Any outliers in the data collected were scrutinized for any statistical significance before being discarded. Incorrect values for various variables and data that meets exclusion criteria was not used to generate the results of this study.

3.9 Data analysis

Data collected was entered in Microsoft excel and analysed using Statistical package for social sciences (SPSS) version 23. Descriptive analysis was used to present patients' demographic characteristics, level of stress and coping mechanism used then presented in terms of percentages, means, modes and standard deviations. Multi-linear regression was used to assess the relationship between various demographic characteristics of the patients and coping mechanisms. ANOVA was used to analyse the relationship between level of stress and type of coping mechanisms using a 5% significance level.

3. 10 Ethical considerations

Approval to conduct the study was sought from KNH- UON Ethics and Research committee, referenced P74/02/2020 dated 6th May 2020. Further approval was sort from KNH research and program department as well as the head of department, renal unit. All respondents gave an informed consent both verbal and written to participate in the study. The respondents were free to withdraw from the study at any point although none of them dropped out of the interview. Delivery of services was not compromised for the respondents who did not consent to participate in the study. No favours or monetary token were given to the respondents. All respondents were treated the same, whether they participated in the study or not.

Anonymity was assured by ensuring that the names of the respondents did not appear anywhere in the study tools. All the information obtained in this study remained confidential, only

accessible to the principal researcher and the statistician. The filled questionnaires were stored in a cabinet under lock and key accessible to the researcher and the statistician. After data analysis, the tool will be preserved for 5 years accessible to the researcher. The data entered into the software was protected using a password only accessible to the researcher and statistician. The analysed data will only be used for the purpose of this study and will be published with permission from the participants who will be de-identified.

The study did not involve any invasive procedures that could physically or emotionally harm the participant. No questions that were found intrusive and no participants that were overwhelmed during the interview.

3.11 Dissemination of Findings

The results of this study will be published in a peer reviewed journal, presented to the staff in Continuous Medical Education programs and patients at the renal unit, as well as in scientific conferences. A copy of this thesis will be presented to KNH research and resource centre to be used for future references.

3.12 Study Limitations

- I. Recall bias could have affected the responses given by the respondents as the tool required them to remember how they dealt with a past event. The respondents were allowed to take their time and remember the events well to allow retrieval of maximum information.
- II. Inadequate representation: This study may not be a representative of the whole country since it was conducted in one renal unit despite being a national referral hospital. More studies are recommended in other parts of the country or with a larger sample size.

III. Limited literature related to the study: Studies on coping mechanisms have not been previously done in the country, even on other chronic illnesses. This posed a challenge to the researcher as there was paucity of data to refer to or compare with. Literature from other countries (both developing and developed) was used.

CHAPTER 4: RESULTS

The study was conducted in renal unit, Kenyatta National Hospital in Nairobi County, Kenya.

The objective of the study was to investigate the coping strategies utilized to deal with stress related to intradialytic events by patients on hemodialysis at the renal unit, Kenyatta National Hospital. To achieve the highlighted objective, data was organized, coded, analysed and converted into quantitative summary reports. This chapter will report the findings of the study.

The researcher recruited 96 respondents of the intended sample of 111 representing 86.5% response rate. These are the respondents that met the inclusion criteria and were in stable condition to participate in the study. This was as a result of patients transferring to dialysis centres near their residential areas with the wake of COVID 19 pandemic that reduced the number of respondents available for the study.

4.1 Sociodemographic Characteristics

This section will show the distribution of sociodemographic characteristics of the respondents including age, gender, marital status, religion, highest education level, employment status, monthly income, and the social support available in terms of who stays with the respondents.

Many of the respondents were aged between 40 years to 49 years 32 (33.3%), majority being male 59 (61.5%) and were married 56 (58.3%). Christianity is practiced by majority of the respondents 87 (90.6%) as demonstrated in Table 1 and the highest level of education represented was secondary school 54 (59.4%). Majority of the respondents lived with 3 to 5 people n=56 (58.3%), most of them being nuclear family members 72 (77.4%).

Table 1. Sociodemographic characteristics of the respondents

Characteristic	Frequency [n, (%)]	
Age	18 - 29	11(11.5)
	30 - 39	30(31.3)
	40 - 49	32(33.3)
	50 - 59	19(19.8)
	60 and above	4(4.2)
Sex	Male	59(61.5)
	Female	37(38.5)
Marital status	Married	56(58.3)
	Single	27(28.1)
	Widow/ Widower	7(7.3)
	Separated	6(6.3)
Religion	Christian	87(90.6)
	Muslim	6(6.3)
	Hindu	3(3.1)
Highest education level	None	1(1)
	Primary	26(27.1)
	Secondary	57(59.4)
	Tertiary	12(12.5)
Employment status	Employed(formal)	20(21.1)
	Self-employed	50(52.6)
	Unemployed	25(26.3)
Monthly income	Less than 10000	17(17.9)
	10000 - 20000	17(17.9)
	20000 - 50000	34(35.8)
	Above 50000	27(28.4)
Number of people staying with the patient	None (stay alone)	3(3.1)
	Less than 3 people	27(28.1)
	3 to 5 people	56(58.3)
	More than 5 people	10(10.4)
Relationship to the patient	Nuclear family relatives	72(77.4)
	Extended family relatives	20(21.5)
	Friends	1(1.1)

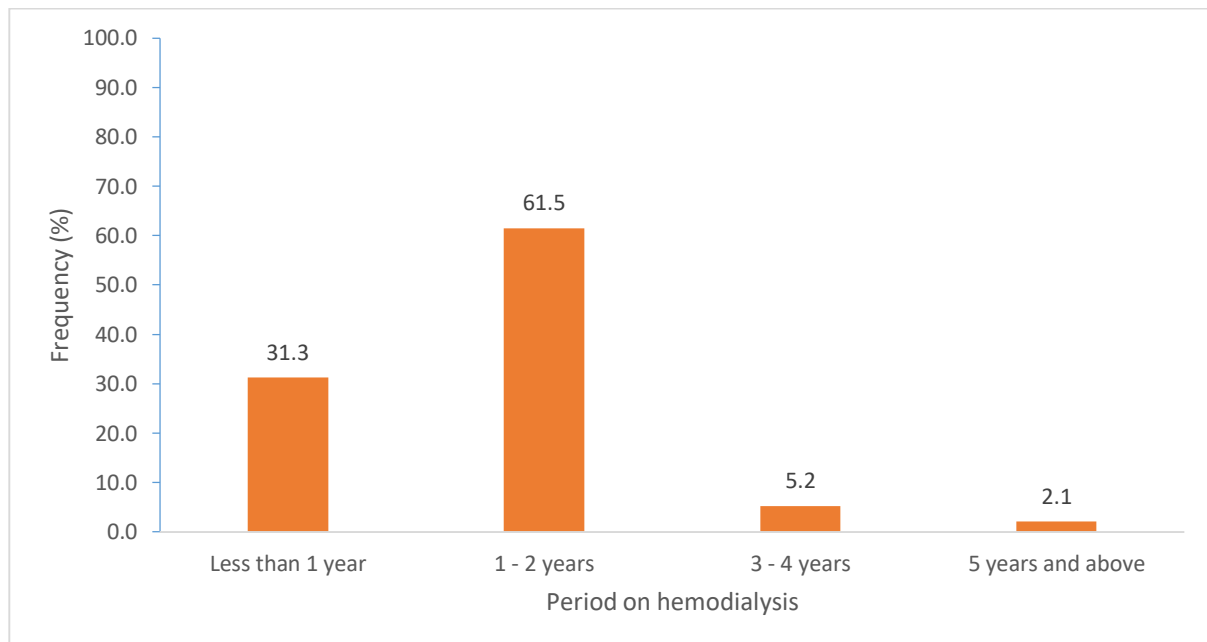
4.2 Clinical characteristics of the respondents

The variables studied under this section were the duration a respondent has been doing HD, frequency of HD per week, vascular access used for HD, length of each HD session, average blood flow rate, average UF (ultrafiltration) per session, underlying diseases and intradialytic complications experienced. This information was obtained from both interviewing the patient and also referring to the HD file documentation especially for average blood flow rate and amount of UF done.

4.2.1 Duration respondents have been on hemodialysis

This refers to the time the respondent has been on HD therapy. Majority of the respondents 59 (61.5 %) reported that they had been on maintenance hemodialysis for a period of 1 to 2 years as demonstrated in figure 4.

Figure 4. The period respondents have been on hemodialysis



4.2.2 Comorbidities in respondents undergoing hemodialysis at KNH

The underlying diseases that could have caused renal failure was identified from the interview. It was noted that 61 (63.3%) of the respondents had hypertension, 34 (35.2%) had diabetes and 2 (1.6%) had other comorbidities like HIV and polycystic kidney disease. Multi-linear regression done to predict the relationship between comorbidities and the level of stress experienced was not statistically significance ($p \geq 0.05$). Multiple regression was also done to predict the use of coping strategies based on the comorbidities and did not show any statistical significance ($p \geq 0.05$).

4.2.3 Vascular Access used by respondents at renal unit, KNH

The type of vascular access used by the responds for HD was assessed. It was noted that 75 (78.1%) respondents used central venous catheter both tunnelled and non-tunnelled, while the rest used AV fistula. None of the respondents had an AV graft.

4.2.4 Frequency and length of hemodialysis sessions

Depending on the clinical status and renal markers, hemodialysis is prescribed in terms of weekly sessions and each session should last a prescribed number of hours. It was identified that 89 (92.7%) respondents do HD twice a week and 99% of the sessions lasted 4 hours.

4.2.5. Hemodialysis blood flow rate and ultrafiltration achieved.

The hemodialysis machine is set at desired speeds which determines the blood flow rate during dialysis session. This was determined by getting an average rate achieved in the previous 3 sessions as recorded in the respondents' dialysis sheet. 73 (76.0%) respondents achieved a blood flow rate of 260 to 300 ml/min as shown in table 2.

The ultrafiltration volume was assessed by taking an average of UF achieved in 3 dialysis sessions as documented in the dialysis sheets of the respondents. It was noted that 49 (51%) respondents achieved a UF of 2.1 to 3 litres.

Table 2. Blood flow rates and ultrafiltration achieved

Variable		Frequency	Percentage
Average blood flow	200 - 250	8	8.3
	260 - 300	73	76.0
	310 - 350	15	15.6
Average ultrafiltration volume/ session	0.1 litre	5	5.2
	1.1 litre	37	38.5
	2.1 to 3 litres	49	51.0
	3.1 to 4 litres	5	5.2

4.2.6 Intradialytic events experienced.

Intradialytic events were identified by asking the respondents about the different complications they experienced during HD over a period of three months. Some reported more than one complication. 55 (20.7%) respondents reported experiencing muscle cramps. The occurrence of IDEs experienced are shown in table 3. Multiple regression done to predict the relationship between occurrence of IDEs and the level of stress experienced showed statistical significance ($p < 0.05$).

A complication may lead to termination of a dialysis session depending on assessment of the renal team. This study showed that 12 (12.5%) respondents had their dialysis session discontinued as a result of a complication experienced. In addition, 86 (89.6%) respondents reported to have experienced IDEs more than once in the past 3 months.

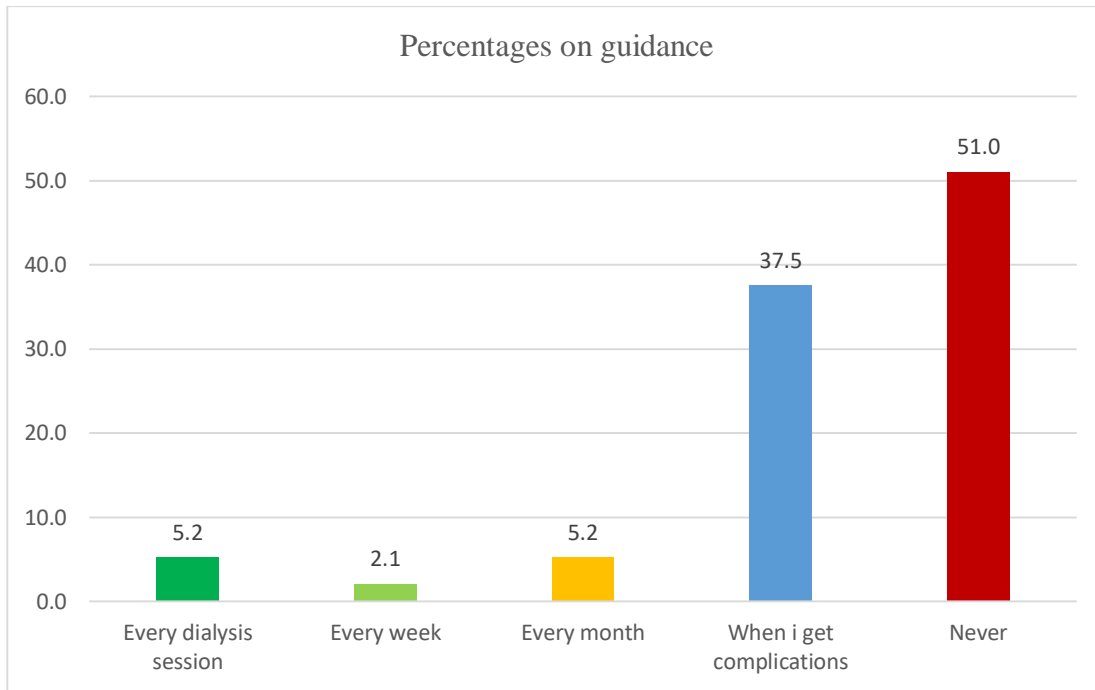
Table 3. Intradialytic complications experienced by respondents at renal unit, KNH in the past 3 months

Intradialytic complications	Frequency	Percentage
Muscle cramps	55	20.7
Headache	54	20.3
Hypertension	47	17.7
Nausea	27	10.2
Fever and chills	21	7.9
Vomiting	20	7.5
Chest pain	17	6.4
Hypoglycemia	14	5.3
Hypotension	10	3.8

4.2.7 Respondents' guidance on ways of coping with stress by healthcare professionals in the renal unit, KNH

This was aimed at identifying how frequent the renal team (doctors, nurses, counsellors, nutritionists) guided the respondents on ways to cope with the IDEs. Respondents were asked on how many times a health worker talked to them about IDEs as well as coping strategies. As demonstrated in figure 5, 50 (51%) respondents reported that they had never been guided on ways of coping with stress related to IDEs. Multiple regression done to determine the relationship between the rate of guidance and coping strategy used showed statistical significance ($p < 0.05$) for optimistic coping strategy.

Figure 5. Frequency of guidance on coping with IDEs given to the respondents by the renal team



4.3 The level of stress associated with HD

The level of stress experienced was assessed by noting the frequency at which the respondent felt nervous about HD in the past one month and by rating using an analogue stress scale which required the respondent to rate their level of stress between 0 and 10; 0 representing absence of stress and 10 being the highest level of stress possible.

Table 4 demonstrates responses on how frequent the respondent felt nervous and stressed about HD. Only 2 (2.1%) of the respondents never felt nervous or stressed about HD. The average level of stress experienced by the respondents was found to be 5.13(\pm 2.105), minimum being 0 and level 10 being maximum.

Table 4. Responses on how frequent the respondents felt nervous and stressed about HD in the past one month

Feeling nervous and stressed about by respondents about HD	Frequency	Percentage
Sometimes	46	47.9
Fairly often	30	31.3
Almost never	9	9.4
Very often	9	9.4
Never	2	2.1

4.4 Strategies utilized by the respondents to cope with stress related to intradialytic events

Coping strategies utilized by the respondents was assessed using Jalowiec Coping Scale which consists of a set of activities done when faced by a stressful event. The respondents rated the activities in terms of frequency of use and level of usefulness in dealing with a stressful event, in this case, intradialytic event. The activities were then grouped in 8 strategies that will be discussed in this section.

4.4.1 Coping strategies used

Regarding the rate of use of the 8 coping strategies, it was found that respondents who utilized supportive strategy most often and sometimes 46 (48%) were more than those who used the other strategies. Palliative strategy on the other hand was never used by 31 (32%) of the respondents as demonstrated in table 5.

Table 5. Coping strategies utilized by respondents to deal with stress related to intradialytic events

Coping style for handling stress	Response (%)			
	Never used	Seldom used	Sometimes used	Often used
Confrontive	24	31	29	16
Evasive	25	32	27	16
Optimistic	28	33	25	14
Fatalistic	28	26	28	18
Emotive	30	33	26	11
Palliative	32	29	26	13
Supportant	26	26	28	20
Self-reliant	27	31	26	16

4.4.2 Helpfulness of coping strategy

The respondents were asked to rate how helpful the strategy used was. As illustrated in table 6, 37 (38%) of the respondents that used fatalistic strategy found it unhelpful while 15 (16%) found palliative strategy very helpful.

Table 6. Level of helpfulness of the coping strategies

Coping style for helpfulness	Response (%)			
	Not helpful	Slightly helpful	Fairly helpful	Very helpful
Confrontive	32	28	25	15
Evasive	31	31	24	14
Optimistic	35	27	25	13
Fatalistic	38	27	23	12
Emotive	38	25	27	10
Palliative	33	27	24	16
Supportant	29	30	26	15
Self-reliant	30	29	26	15

4.5 Relationship between the level of stress experienced towards HD and use of a coping style among respondents

A multiple regression was calculated to predict the use of coping style based on the level of stress experienced during hemodialysis session. A significant regression equation was found ($F(1, 95) = 22.094, p \leq 0.05$) with an R^2 of .663 meaning that the model explained 66.3% of the variance in the coping style used. This is summarized in table 7.

Table 7. Effect of level of stress on coping style used.

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.781 ^a	.663	.563	.13764		
a. Predictors: (Constant), the level of stress experienced towards HD in a scale of 1 to 10						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	96.088	1	96.088	22.094	.0133 ^a
	Residual	413.179	95	4.349		
	Total	509.267	96			
^a . significant values ANOVA (Analysis of variance) Dependent Variable: Use of coping style						
Predictors: (Constant), Rate the level of stress experienced towards HD in a scale of 1 to 10						

A multiple linear regression was calculated to predict the effect of level of stress to each of the coping styles used. Statistical significance was identified for confrontive coping style ($p \leq 0.05, \beta$ value 0.732), evasive coping style ($p \leq 0.05, \beta$ value 0.657), fatalistic ($p \leq 0.05, \beta$ value 0.217), emotive ($p \leq 0.05, \beta$ value -.069) and palliative coping style ($p \leq 0.05, \beta$ value 0.136). As shown in table 8, a unit increase in the level of stress led to a 6.9% less likelihood of using emotive coping strategy and 6.5% less likelihood of using supportant strategy.

Table 8. Coefficients of level of stress on 8 coping strategies

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.210	.102		41.275	.000
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against confrontive coping style	.145	.018	.732	8.056	.0252 ^a
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against evasive coping style	.187	.019	.675	2.997	.0323 ^a
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against optimistic coping style	.138	.014	.657	1.768	.0683
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against fatalistic coping style	.044	.020	.217	2.145	.035 ^a
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against emotive coping style	-.020	.030	-.069	-3.214	.0073 ^a
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against palliative coping style	.238	.029	.136	1.321	.0190 ^a
	Rate the level of stress experienced towards HD in a scale of 1 to 10 against supportant coping style	-.070	.027	-.065	3.056	.0476 ^a
8	Rate the level of stress experienced towards HD in a scale of 1 to 10 against self-reliant coping style	-.013	.024	-.058	2.056	.0573
^a . significant values						

4.6 Relationship between sociodemographic and confrontive coping styles

A multiple linear regression was calculated to predict the use of coping style based on the marital status, sex, religion, employment status, monthly income, and level of education. These variables statistically significantly predicted coping style ($F(7, 89) = 8.647$, $p \leq .005$, $R^2 = .424$). With the exception of marital status, the other variables added statistically significantly to the prediction, $p \leq 0.05$. As demonstrated in table 9, an increase in age led to a 4.3% less likelihood of using confrontive coping style.

Table 9. Effect of sociodemographic characteristics on use of confrontive coping style

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model Summary	.604 ^a	.424	.380	.11677		
a. Predictors: (Constant), Monthly income, Marital status, Religion, Age, Gender, Highest education level, Employment status						
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.246	7	3.035	8.647	.0022 ^a
	Residual	31.241	89	.351		
	Total	52.487	96			
a. Dependent Variable: Stress coping style						
b. Predictors: (Constant), Monthly income, Marital status, Religion, Age, Gender, Highest education level, Employment status						
ANOVA (Analysis of variance)						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.673	.392		1.718	.090 ^a
	Age	-.021	.016	-.043	13.125	.006 ^a
	Sex	-.092	.086	-.117	1.064	.290
	Marital status	.021	.047	-.005	.433	.666
	Religion	-.098	.095	-.011	1.026	.308
	Highest education level	.270	.070	.037	10.286	.018 ^a
	Employment status	.112	.013	.021	8.615	.027 ^a
	Monthly income	.082	.042	.023	21.936	.000 ^a
a. significant values						
Dependent Variable: Confrontive Stress coping style						

4.7 Relationship between use of evasive coping style and sociodemographic characteristics

A multiple linear regression was calculated to predict the use of evasive coping style based on the marital status, religion, employment status, monthly income, and level of education. These variables did not contribute to the overall significance ($p \geq 0.05$). However, with the exception of

marital status and sex, the other variables added statistically significantly to the prediction ($p \leq 0.05$) of use of evasive coping strategy. An increase in age led to a 2% less likelihood of using evasive strategy as demonstrated in figure 9.

Table 9. Coefficients of socio-demographics on evasive coping strategy

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.620	0.513		1.209	.041 ^a
	Age	-0.009	0.056	-0.020	-0.168	.016 ^a
	Sex	0.032	0.113	0.032	0.284	.235
	Marital status	-0.011	0.062	-0.020	-0.174	.666
	Religion	0.046	0.125	0.040	0.367	.021 ^a
	Highest education level	0.058	0.091	0.075	0.632	.047 ^a
	Employment status	0.130	0.087	0.185	1.495	.011 ^a
	Monthly income	0.056	0.055	0.123	1.015	.031 ^a
^a . significant values						
Dependent Variable: Evasive stress coping style						

4.8 Socio-demographic factors' prediction of use of optimistic coping style

A multiple linear regression was calculated to predict the use of optimistic coping style based on the marital status, sex, religion, employment status, monthly income, and level of education.

These variables contributed to the overall significance ($p \leq 0.05$). Age, marital status, and gender variables did not statistically predict the use of optimistic coping style ($p \geq 0.05$). This can be seen in Table 10. A unit increase in monthly income led to a 3.7% less likelihood of using optimistic coping strategy.

Table 10. Variation between sociodemographic factors and the use of optimistic coping style

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.528	0.513		2.979	.015 ^a
	Age	-0.045	0.056	-0.098	-0.805	.061
	Gender	0.010	0.113	0.010	0.086	.412
	Marital status	-0.021	0.062	-0.039	-0.341	.231
	Religion	-0.021	0.125	-0.018	-0.165	.006 ^a
	Highest education level	0.019	0.091	0.025	0.209	.044 ^a
	Employment status	-0.006	0.087	-0.009	-0.068	.034 ^a
	Monthly income	-0.017	0.055	-0.037	-0.300	.010 ^a
^a . significant values						
Dependent Variable: Optimistic Stress coping style						

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

Stress and coping is a field that has not been extensively studied in Kenyan set up. It is however a critical area if wholesome care is to be offered to the patient. This chapter discusses the findings of this study, conclusions, and recommendations derived from the study.

5.2 Discussion

5.2.1 Socio-Demographic Characteristics

This study has revealed that majority of the patients undergoing HD at KNH are aged between the ages of 40-49 years which compares to a study done in the same unit in 2018 showing a median age of 40 years (Mwenda et al., 2019). This also concurs with a study done in Nigeria that showed a mean age of 48 years (Adejumo et al., 2015) but differs with a study done in Iran where majority of the patients were aged above 50 years (Moattari et al., 2012) and in UK the mean age for patients on HD is 62.7 years (Fotheringham et al., 2015). This differences could be due to proactive management of comorbidities causing a delay in kidney disease in the developed countries (Poorgholami et al., 2016). Although female patients are generally more in East Africa (Muiru et al., 2020), male patients are the majority at KNH, the same was identified in patients in Asia, Brazil as well as in Europe (Ferris et al., 2016). In contrast, in Nigeria most patients on HD are female (Okpa et al., 2019).

5.2.2 Hemodialysis frequency and duration.

Regarding the frequency and length of each HD session, majority of the patients at KNH are on HD twice weekly with each session lasting for 4 hours. This totals to 8 hrs of HD weekly which is lower than the recommended minimum of 12 hours/week to attain HD adequacy. Economic challenges contribute to this situation as the national insurance caters for only two HD sessions

weekly regardless of whether the patient requires more sessions. Raja and Seyoum (2020) reported that in Eritrea, most patients do twice weekly sessions of 4hours whereas in Iran, most patients do three sessions weekly as reported by Moattari et al., (2012).

KNH being a referral hospital receives patients from all over the country. Once patients are diagnosed with ESRD requiring HD, they are commenced on RRT then later referred to dialysis centres in the counties to ease congestion. There are however some patients who choose to dialyse at KNH. This could explain why most of the patients have been on HD for less than 2 years. A few patients have however been on HD for more than 10 years. This is supported by a study done in UK by Fotheringham et al. (2015) that showed majority of patients had been on HD for less than 1 year but differs with a study done in Brazil by Ferreira & Silva (2011) whose patients have been on HD for more than 5 years.

5.2.3 Comorbidities

Diabetes Mellitus (DM) is the major cause of CKD globally followed by hypertension (Ferris et al., 2016). This has been reflected in some countries like Asia, North America, Eritrea, Ethiopia and Nigeria (Okpa et al., 2019; Raja & Seyoum, 2020). In Kenyan setup however, hypertension is the leading cause of CKD followed by DM which concurs with the East Africa population of CKD patients (Muiru et al., 2020). This finding compares with studies done in Brazil (Ferreira & Silva, 2011) and Iran (Moattari et al., 2012) where hypertension is the main cause of CKD. On the contrary, chronic glomerulonephritis is the second leading cause of CKD after DM in Taiwan (Ferris et al., 2016) hypertension being the third most common cause of CKD.

5.2.4 Venous access used for hemodialysis and blood flow rate

A venous access is crucial for patients on HD and best planned earlier before the patient gets to ESRD stage. Arteriovenous fistula is a long-term venous access that is recommended by many

organizations as it has various advantages to the patient including less risk for infections and better blood flow rates. It however takes 6-8 weeks for it to mature and hence not ideal for emergency dialysis. The KDIGO recommends that a patient can commence HD using a central catheter in case of an emergency but shift to AVF soonest possible (Chan et al., 2019). This is not the case with KNH as majority of the patients still use central venous catheters even more than a year after initiating HD. This could be due to resource limitations, lack of knowledge on the benefits of having an AVF or misconceptions that discourage the patients from having AVF. In addition, most the patients are diagnosed with CKD when they are already at ESRD and requiring emergency dialysis giving the renal team no options but to use temporary catheters for a start. A study done in Brazil by Fram et al. (2015) showed similar results that majority of the patients on HD used tunnelled central venous catheters with a few using AVF and none using an AV graft. Adejumo et al. (2015) reported that in Nigeria, most patients also used femoral or internal jugular central venous accesses for HD. They also reported that patients using CVCs experienced more complications than those that used AVF. This contributes to inadequate dialysis hence the reduced QOL and higher mortality rates among these patients. Use of CVCs may lead to early exhaustion of venous accesses for these patients and could be detrimental. In Eritrea however, more than half of the patients use AVF (Raja & Seyoum, 2020). This differs with Kenyan set up where majority of the patients use central venous catheters.

Venous access patency affects the blood flow rate achieved during HD among other factors like hemodynamic stability and age (Chang et al., 2016). This is the rate at which blood passes through the dialyzer in millilitres/minute. With all factors considered, a higher blood flow rate is recommended to ensure higher clearance rate and dialysis adequacy. In KNH, majority of the patients achieve a BFR of 260 -300 ml/min during HD. This could have been due to use of CVCs

with poor patency as well as patients' clinical status that could not support higher blood flow rates. Patients who dialyze with Lower BFR (less than 200ml/min) have been shown to have lower Kt/V levels and higher mortality rates among Japan population although majority of the patients in Japan achieve a BFR of more than 250ml/min (Chang et al., 2016). Blood flow rates above 250ml/min have also been observed among patients in Canada, Europe, Eritrea and Nigeria (Poorgholami et al., 2016; Adejumo et al., 2015; Raja & Seyoum 2020).

5.2.5 Ultrafiltration volume achieved

Ultrafiltration volume achieved during a HD session is determined by various factors like interdialytic weight gain of the patient, residual kidney function, urine output and to some extent, the underlying comorbidities. As much as this should be individualized, UF rates of more than 13ml/hr/kg has been shown to increase the risk for mortality by 59% and risk for cardiovascular diseases increases by 71% (Nakai et al., 2018). Another study also found a UF rate of more than 10ml/hr/kg to have higher risk for mortality and intradialytic complications like muscle cramps and hypotension (Assimon & Flythe, 2015). Taking a 10ml/hr/kg rate for an average person of 60kg would translate to 2.4 litres in 4 hours. At KNH, majority of the patients achieve a UF volume of 2.1-3 litres in 4 hours which has also been observed in Eritrea and Nigeria where most patients achieve an average of 2.5 litres in 4 hours. In a case where a patient requires high amounts of UF volume, it is advised to either increase the treatment time or increase the frequency of HD. Such patients should be advised on salt and fluid intake restrictions and probably put them on diuretics.

5.2.6 Intradialytic complications and stress experienced

Muscle cramps, headaches and hypertension were some of the intradialytic complications that were mostly experienced by patients at KNH. In other places like Lagos, hypotension is

experienced by most patients followed by hypertension and hypoglycemia (Bello, Oyedeji, & Buraimo, 2017). In Eritrea, hypotension was commonly experienced followed by nausea and vomiting which is thought to have been as a result of the hypotension (Raja & Seyoum, 2020). Hypertension and muscle cramps have also been report among these patients. Intradialytic events have been reported to have both physiological and psychological effect on patients (Comelis, 2016). As much as majority of HD sessions were not terminated due to a complication, these IDEs are stressful to the patients.

More than half of the patients on HD at KNH had not been informed about possible complications that could occur during HD therapy, neither were they informed on how to cope with such complications when they experience them. This could explain why some patients experienced nervousness and stress towards HD. Bukhary et al., (2013) reported that majority of patients on HD had moderate level of stress while a few of them suffered a severe level of stress. Folkman, (2011) suggested that stress can negatively affect therapy outcome, QOL, treatment adherence and disease progression. It is therefore critical for these patients to be given adequate information or taken through training on how to manage stressful events emerging from the disease process or therapy. Folkman also stated that chronic diseases expose patients to psychosocial stresses and more so with the aged patients. Moattari et al., (2012) developed a happiness training program that was guided by both behavioural and cognitive principals to help patients cope with stressors. This resulted in a significance reduction in the reported levels of stress, anxiety and depression among the patients that underwent that training. Unlike in our setting, there are no programs or trainings established to help these patients manage stress which could lead to despair and low QOL. These trainings increase patients' sense of responsibility, self-efficacy and hope which improves their emotional and psychological states. These has been

identified in studies done in Boston and Iran (Benedict 2013). Trainings may include patients, family members and health care providers to ensure inclusive patient participation in their therapy plans.

5.2.7 Coping strategies utilized to cope with stress

Use and helpfulness of the coping strategies was fairly distributed among the patients although those that used confrontive, fatalistic and supportant were slightly more. In confrontive strategy, the user employs problem solving methods to face and get a solution for the stressor while in fatalistic, the user is hopeless and pessimistic about the stressful event. With supportant strategy, one maximizes on support systems available whether personal, professional or spiritual. Supportant and self-reliant was found to be more helpful by some of the patients. Some of the factors that were found to significantly influence the choice of coping strategy among the patients were age, education level, employment status and monthly income. Level of stress was found to affect the choice of confrontive and evasive coping strategies.

Folkman (2011) stated that coping abilities were influenced by biological and social factors. She suggested that the older one gets the less the likelihood of utilizing negative strategies like avoidance and wishful thinking and higher chances of one using problem solving style. The results of this study contradicts conclusions made by Thomsen et al., (2010) who found that most cancer patients used emotion focused strategies to cope with stresses related to the disease and this was related to physical deterioration and poor outcome. Moattari et al., (2012) also reported that most patients on hemodialysis used emotion oriented, supportant (relying on religion) and they found it slightly helpful. Those that used problem oriented strategy were few but found it more helpful. This is compares to another study done by Comelis (2016) which showed that most patients on hemodialysis used emotion focused strategies and there was a greater coping scores

amongst diabetic patients. These studies contradict the findings of this study and this could be due to different patient exposure and other factors like age and availability of resources like counselling services.

5.3 Conclusion

Based on the findings of this study, it is concluded that hypertension is the leading cause of CKD among patients on hemodialysis at KNH. The main venous access is CVCs and the most occurring intradialytic complications are muscle cramps, hypertension and headaches. Patients are not aware of possible intradialytic complications until they occur neither are they informed on how to cope with such complications. The patients experience moderate level of stress and majority employ problem oriented coping strategy (confrontive and supportant) to cope with stress related to intradialytic complications. There are no stress management training programs nor counselling sessions done in regards to stress management to the patients. Significant relationship was found between the level of stress experienced by the patients and the tendency to use confrontive and evasive coping style.

5.4 Recommendations

- ❖ There is need to enhance tailored counselling services at the renal unit especially on stress management as well as emphasis on problem oriented coping strategies to be done by the renal team.
- ❖ There is need for provision of more information to the patients especially on HD therapy, complications that could occur and how to prevent them.
- ❖ Further studies on the impact of coping mechanisms utilized by the patients should be done to provide more information.
- ❖ Comparison between level of stress, coping strategies and compliance to HD therapy should be done.
- ❖ Policies to facilitate use of AVF for HD needs to be formulated
- ❖ There is need for establishment of stress management training programs for the patients undergoing hemodialysis at KNH.

REFERENCES

- Abdelwahab, H.H. and Shigidi, M.M., 2015. Barriers to adequate urea clearance among hemodialysis patients in developing countries: an example from the Sudan. *Saudi Journal of Kidney Diseases and Transplantation*, 26(1)
- Abe, M., Hamano, T., Wada, A., Nakai, S. and Masakane, I., 2017. Renal Data Registry Committee. Effect of dialyzer membrane materials on survival in chronic hemodialysis patients: results from the annual survey of the Japanese Nationwide Dialysis Registry. *PLoS One*, 12(9)
- Adejumo, O. A., Okaka, E. I., Madumezia, G., Okwuonu, C. G., & Ojogwu, L. I. (2015). Assessment of some cardiovascular risk factors in predialysis chronic kidney disease patients in Southern Nigeria. *Nigerian medical journal: journal of the Nigeria Medical Association*, 56(6), 394.
- Ahadi, H., Delavar, A. and Rostami, A.M., 2014. Comparing coping styles in cancer patients and healthy subjects. *Procedia-Social and Behavioral Sciences*, 116
- Ahmad, M.M. and Al Nazly, E.K., 2015. Hemodialysis: Stressors and coping strategies. *Psychology, health & medicine*, 20(4).
- Amira, C.O., Braimoh, R.W. and Bello, B.T., 2012. Pattern of intradialytic complications at the Lagos University Teaching Hospital. *African journal of medicine and medical sciences*, 41(4)
- Assimon, M. M., & Flythe, J. E. (2015). Rapid ultrafiltration rates and outcomes among hemodialysis patients: re-examining the evidence base. *Current opinion in nephrology and hypertension*, 24(6), 525.

- Assimon, M.M., Wenger, J.B., Wang, L. and Flythe, J.E. (2016) Ultrafiltration rate and mortality in maintenance haemodialysis patients. *American Journal of Kidney Diseases*, 26(16), 30308–30300.
- Balaban, Ö.D., Aydin, E., Keyvan, A., Yazar, M.S., Tuna, Ö. and Özgüven, H.D., 2017. Psychiatric comorbidity, sexual dysfunction, and quality of life in patients undergoing hemodialysis: A case-control study. *Archives of Neuropsychiatry*, 54(2)
- Bartaula, B., Subedi, M., Kumar, M.M., Shrestha, M., Bichha, N. and Mudbhari, B., 2019. Spectrum of complications in chronic kidney disease patients undergoing maintenance hemodialysis: An experience of a tertiary care center in Nepal. *Saudi Journal of Kidney Diseases and Transplantation*, 30(1)
- Bayoumi, M., Al Harbi, A., Al Suwaida, A., Al Ghonaim, M., Al Wakeel, J. and Mishkiry, A., 2013. Predictors of quality of life in hemodialysis patients. *Saudi Journal of Kidney Diseases and Transplantation*, 24(2)
- Bello, B. T., Oyedeji, O. A., & Buraimo, O. O. (2017). Haemodialysis at a Privately-run, Stand-alone Dialysis Unit: A One-year Retrospective Review of the Clinical and Laboratory Parameters of Incident Patients. *Tropical Journal of Nephrology*, 12(1).
- Benedict C., Penedo F.J. (2013) Psychosocial Interventions in Cancer. In: Carr B., STEEL J. (eds) Psychological Aspects of Cancer. Springer, Boston, MA.
- Bodenmann, G., 2008. *Dyadisches coping Inventar: DCI; Manual*. Huber.

- Borzou, S. R., Mahdipour, F., Oshvandi, K., Salavati, M., & Alimohammadi, N. (2016). Effect of Mealtime During Hemodialysis on Patients' Complications. *Journal of caring sciences*, 5(4), 277–286. <https://doi.org/10.15171/jcs.2016.029>
- Bujang, M. A., Musa, R., Liu, W. J., Chew, T. F., Lim, C. T., & Morad, Z. (2015). Depression, anxiety and stress among patients with dialysis and the association with quality of life. *Asian journal of psychiatry*, 18, 49-52.
- Bukhary, F., Sayied, N., Abo-El-Magd, M., & Saber, E. (2013). Psychological Stress and Coping strategies among chronic hemodialysis patients at el-Minia University Hospital. *AAMJ*, 11(3)
- Carver, C.S., Scheier, M.F. and Weintraub, J.K., 1989. Assessing coping strategies: a theoretically based approach. *Journal of personality and social psychology*, 56(2)
- Cavalli, A., Del Vecchio, L., Manzoni, C., Locatelli, F. and Del Vecchio, L., 2010. Hemodialysis: yesterday, today and tomorrow. *Minerva Urol Nefrol*, 62(1)
- Chan, C. T., Blankestijn, P. J., Dember, L. M., Gallieni, M., Harris, D. C., Lok, C. E., ... & Wheeler, D. C. (2019). Dialysis initiation, modality choice, access, and prescription: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference. *Kidney international*, 96(1).
- Chang, K. Y., Kim, S. H., Kim, Y. O., Jin, D. C., Song, H. C., Choi, E. J., ... & Yang, C. W. (2016). The impact of blood flow rate during hemodialysis on all-cause mortality. *The Korean journal of internal medicine*, 31(6), 1131.

- Chesney, M.A., Neilands, T.B., Chambers, D.B., Taylor, J.M. and Folkman, S., 2006. A validity and reliability study of the coping self-efficacy scale. *British journal of health psychology*, 11(3)
- Chironda, G. and Bhengu, B., 2016. Contributing factors to non-adherence among chronic kidney disease (CKD) patients: a systematic review of literature. *Medical & Clinical Reviews*, 2(4)
- Comelis-Bertolin, D. (2016). Clinical variables, lifestyle and coping in hemodialysis. *Research and education in nursing*, 34 (3).
- Compas, B.E., Jaser, S.S., Dunn, M.J. and Rodriguez, E.M., 2012. Coping with chronic illness in childhood and adolescence. *Annual review of clinical psychology*, 8
- Costa, R.H.S., de Medeiros Dantas, A.L., Leite, É.M.D., de Carvalho Lira, A.L.B., Vitor, A.F. and da Silva, R.A.R., 2015. Complications in renal patients during hemodialysis sessions and nursing interventions. *Revista de Pesquisa: Cuidado é Fundamental Online*, 7(1)
- D'Onofrio, G., Simeoni, M., Rizza, P., Caroleo, M., Capria, M., Mazzitello, G., Sacco, T., Mazzuca, E., Panzino, M.T., Cerantonio, A. and Segura-Garcia, C., 2017. Quality of life, clinical outcome, personality and coping in chronic hemodialysis patients. *Renal failure*.
- Dehkordi, L.M. and Shahgholian, N., 2013. An investigation of coping styles of hemodialysis patients. *Iranian journal of nursing and midwifery research*, 18(1)
- Delles, C. and Vanholder, R., 2017. Chronic kidney disease. *Clinical science*, 131(3)
- Endler, N.S. and Parker, J.D., 1990. State and trait anxiety, depression and coping styles. *Australian Journal of Psychology*, 42(2)

- Ferreira, R. C., & Silva Filho, C. R. D. (2011). Quality of life of chronic renal patients on hemodialysis in Marília, SP, Brazil. *Brazilian Journal of Nephrology*, 33(2).
- Ferris, M., Gibson, K., Plattner, B., Gipson, D. S., Kotanko, P., Marcelli, D., ... & Xu, X. (2016). Hemodialysis outcomes in a global sample of children and young adult hemodialysis patients: the PICCOLO MONDO cohort. *Clinical Kidney Journal*, 9(2).
- Folkman, S. (Ed.) (2011). *The Oxford handbook of stress, health, and coping*. Oxford University Press.
- Folkman, S., & Lazarus, R. S. (1990). Coping and emotion. *Psychological and biological approaches to emotion*, 313-332.
- Folkman, S., & Lazarus, R. S. 1984. *Stress, appraisal, and coping* (pp. 150-153). New York: Springer Publishing Company.
- Fotheringham, J., Fogarty, D. G., El Nahas, M., Campbell, M. J., & Farrington, K. (2015). The mortality and hospitalization rates associated with the long interdialytic gap in thrice-weekly hemodialysis patients. *Kidney international*, 88(3).
- Fram, D., Okuno, M. F. P., Taminato, M., Ponzio, V., Manfredi, S. R., Grothe, C., ... & Barbosa, D. (2015). Risk factors for bloodstream infection in patients at a Brazilian hemodialysis center: a case–control study. *BMC infectious diseases*, 15(1), 158.
- Fysaraki, M., Samonis, G., Valachis, A., Daphnis, E., Karageorgopoulos, D. E., Falagas, M. E., ... & Kofteridis, D. P. (2013). Incidence, clinical, microbiological features and outcome of bloodstream infections in patients undergoing hemodialysis. *International journal of medical sciences*, 10(12), 1632.

- Gerogianni, G.K. and Babatsikou, F.P., 2013. Identification of stress in chronic haemodialysis. *Health Science Journal*, 7(2)
- Goudarzian, A.H., Sharif Nia, H., Okamoto, Y., M Rhee, C., McFarlane, P. and Ghorban Nejad, F., 2015. Adverse effects of hemodialysis on kidney patients: how good the evidence is. *International Journal of Medical Investigation*, 4(4)
- Graven, L.J. and Grant, J.S., 2013. Coping and health-related quality of life in individuals with heart failure: an integrative review. *Heart & Lung*, 42(3)
- Greenglass, E., Schwarzer, R. and Taubert, S., 1998. The proactive coping inventory (PCI). *Advances in health psychology research (Vols. CD-ROM)*. Berlin: Free university of Berlin
- Grothe, C., Belasco, A. G. D. S., Bittencourt, A. R. D. C., Vianna, L. A. C., Sesso, R. D. C. C., & Barbosa, D. A. (2010). Incidence of bloodstream infection among patients on hemodialysis by central venous catheter. *Revista latino-americana de enfermagem*, 18(1), 73-80.
- Gurkan, A., r Pakyuz, S.Ç. and Demir, T., 2015, June. Stress coping strategies in hemodialysis and kidney transplant patients. *In Transplantation proceedings*, 47.
- Halle, M. P., Hilaire, D., Francois, K. F., Denis, T., Hermine, F., & Gloria, A. E. (2020). Intradialytic hypotension and associated factors among patients on maintenance hemodialysis: A single-center study in cameroon. *Saudi Journal of Kidney Diseases and Transplantation*, 31(1), 215.

- Hodel, N.C., Hamad, A., Praehauser, C., Mwangoka, G., Kasella, I.M., Reither, K., Abdulla, S., Hatz, C.F. and Mayr, M., 2018. The epidemiology of chronic kidney disease and the association with non-communicable and communicable disorders in a population of sub-Saharan Africa. *PloS one*, 13(10).
- Hwang, H.C., Kim, H.R., Han, D.H., Hong, J.S., Jeong, S.H., Shin, J.H., Kim, S.H., Hwang, J.H. and Kim, S.M., 2018. Influence of major coping strategies on treatment non-adherence and severity of comorbid conditions in hemodialysis patients. *Journal of Korean Medical Science*, 33(20).
- Jalowiec, A., 1987. The Jalowiec coping scale. *Measurement of nursing outcomes*, 3.
- Johnson, S., Crane, P.B., Neil, J. and Christiano, C., 2019. Coping with Intradialytic Events and Stress Associated with Hemodialysis. *Nephrology Nursing Journal*, 46(1)
- Kabinga, S.K., McLigeyo, S.O., Twahir, A., Ngigi, J.N., Wangombe, N.N., Nyarera, D.K., Ngaruiya, G.W., Chege, R.K., Ogutu, M.O. and Moturi, G.M., 2019. Community Screening for Diabetes, Hypertension, Nutrition, and Kidney Disease Among Kenyans. *Kidney international reports*, 4(10)
- Kamau, E., Kayima, J. and Otieno, C.F., 2014. The determinants of health related quality of life of patients on maintenance haemodialysis at Kenyatta National Hospital, Kenya. *East African medical journal*, 91(10)
- Karkar, A., 2012. Modalities of hemodialysis: quality improvement. *Saudi journal of kidney diseases and transplantation*, 23(6)

- Khattak, M.I., Abrar, S., Khan, G., Khattak, S.N., Abbas, M. and Islam, F., 2019. Frequencies of various factors causing early sign off and no shows during dialysis. *Pakistan Armed Forces Medical Journal*, 69(3)
- Kidney, D., Improving, G.O.K.C.M. and Work, G., 2017. KDIGO 2017 Clinical Practice Guideline Update for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease-Mineral and Bone Disorder (CKD-MBD). *Kidney international supplements*, 7(1).
- Kim, J., Han, J.Y., Shaw, B., McTavish, F. and Gustafson, D., 2010. The roles of social support and coping strategies in predicting breast cancer patients' emotional well-being: testing mediation and moderation models. *Journal of health psychology*, 15(4)
- Kipturgo, V 2016, 'Psycho-dietary adaptation among end stage renal disease clients on hemodialysis at Kenyatta National Hospital', Masters' thesis, University of Nairobi, Nairobi.
- Lazarus, R.S. and Folkman, S., 1987. Transactional theory and research on emotions and coping. *European Journal of personality*, 1(3)
- Lazarus, R.S., 1993. Coping theory and research: Past, present, and future. *Fifty years of the research and theory of RS Lazarus: An analysis of historical and perennial issues*.
- Levy, J., Brown, E. and Lawrence, A., 2016. *Oxford handbook of dialysis 4th edition*. Oxford University Press.

- Lin, C. J., Chen, C. Y., Wu, P. C., Pan, C. F., Shih, H. M., Huang, M. Y., ... & Wu, C. J. (2018). Intelligent system to predict intradialytic hypotension in chronic hemodialysis. *Journal of the Formosan Medical Association*, *117*(10), 888-893.
- Mahmood, A., Aziz, K., Ahmed, S., Baig, Z.F., Muhammad, W.W. and Rahman, M.K., 2018. Frequency of acute complications of hemodialysis in adult age group at a tertiary care center. *Pakistan Armed Forces Medical Journal*, *68*(5)
- Mehrabi, Y., Ghazavi, Z., & Shahgholian, N. (2017). Effect of fordyce's happiness program on stress, anxiety, and depression among the patients undergoing hemodialysis. *Iranian journal of nursing and midwifery research*, *22*(3), 190.
- Mehta, S., Orenczuk, S., Hansen, K.T., Aubut, J.A.L., Hitzig, S.L., Legassic, M. and Teasell, R.W., 2011. An evidence-based review of the effectiveness of cognitive behavioral therapy for psychosocial issues post-spinal cord injury. *Rehabilitation Psychology*, *56*(1)
- Moattari, M., Ebrahimi, M., Sharifi, N., & Rouzbeh, J. (2012). The effect of empowerment on the self-efficacy, quality of life and clinical and laboratory indicators of patients treated with hemodialysis: a randomized controlled trial. *Health and quality of life outcomes*, *10*(1), 115.
- Moos, R.H. and Schaefer, J.A., 1993. Coping resources and processes: Current concepts and measures.
- Muiru, A. N., Charlebois, E. D., Balzer, L. B., Kwarisiima, D., Elly, A., Black, D., ... & Petersen, M. (2020). The epidemiology of chronic kidney disease (CKD) in rural East Africa: A population-based study. *PloS one*, *15*(3).

- Mwenda, V., Githuku, J., Gathecha, G., Wambugu, B. M., Roka, Z. G., & Ong'or, W. O. (2019). Prevalence and factors associated with chronic kidney disease among medical inpatients at the Kenyatta National Hospital, Kenya, 2018: a cross-sectional study. *The Pan African Medical Journal*, 33.
- Nakai, S., Wakai, K., Kanda, E., Kawaguchi, K., Sakai, K., & Kitaguchi, N. (2018). Is hemodialysis itself a risk factor for dementia? An analysis of nationwide registry data of patients on maintenance hemodialysis in Japan. *Renal Replacement Therapy*, 4(1), 12.
- Naseem, Z. and Khalid, R., 2010. Positive Thinking in Coping with Stress and Health outcomes: Literature Review. *Journal of Research & Reflections in Education (JRRE)*, 4(1).
- Nasiri, M., Kheirkhah, F., Rahimiyan, B., Ahmadzadeh, B., Hasannejad, H. and Mohamad, J.R., 2013. Stressful factors, coping mechanisms and quality of life in hemodialysis patients.
- Niihata, K., Fukuma, S., Akizawa, T. and Fukuhara, S., 2017. Association of coping strategies with mortality and health-related quality of life in hemodialysis patients: The Japan Dialysis Outcomes and Practice Patterns Study. *PloS one*, 12(7)
- Norton, J. M., Ketchum, C. J., Narva, A. S., Star, R. A., & Rodgers, G. P. (2017). Complementary initiatives from the NIDDK to advance kidney health. *Clinical Journal of the American Society of Nephrology*, 12(9), 1544-1547.
- Okpa, H. O., Effa, E. E., Oparah, S. K., Chikezie, J. A., Bisong, E. M., Mbu, P. N., & Otokpa, D. E. (2019). Intradialytic blood pressure changes among chronic kidney disease patients on maintenance haemodialysis in a tertiary hospital south-south Nigeria: a 2-year retrospective study. *The Pan African Medical Journal*, 33.

- Olivier, J., Tsimpo, C., Gemignani, R., Shojo, M., Coulombe, H., Dimmock, F., Nguyen, M.C., Hines, H., Mills, E.J., Dieleman, J.L. and Haakenstad, A., 2015. Understanding the roles of faith-based health-care providers in Africa: review of the evidence with a focus on magnitude, reach, cost, and satisfaction. *The Lancet*, 386(10005)
- Park, C.L. and Folkman, S., 1997. Meaning in the context of stress and coping. *Review of general psychology*, 1(2).
- Parvan, K., Ahangar, R., Hosseini, F. A., Abdollahzadeh, F., Ghojazadeh, M., & Jasemi, M. (2015). Coping methods to stress among patients on hemodialysis and peritoneal dialysis. *Saudi Journal of Kidney Diseases and Transplantation*, 26(2), 255.
- Parvan, K., Ahangar, R., Hosseini, F.A., Abdollahzadeh, F., Ghojazadeh, M. and Jasemi, M., 2015. Coping methods to stress among patients on hemodialysis and peritoneal dialysis. *Saudi Journal of Kidney Diseases and Transplantation*, 26(2).
- Penley, J.A., Tomaka, J. and Wiebe, J.S., 2002. The association of coping to physical and psychological health outcomes: A meta-analytic review. *Journal of behavioral medicine*, 25(6)
- Piccoli, G. B., Richiero, G., & Jaar, B. G. (2018). The pioneers of nephrology—professor Gabriel Richet:“I will maintain”. *BMC nephrology*, 19(1), 1-6.
- Polly G, 2018. ‘evaluation of therapy adherence among patients with end stage renal disease at Kenyatta National Hospital’, Masters’ thesis, University of Nairobi, Nairobi

- Poorgholami, F., Abdollahifard, S., Zamani, M., Jahromi, M. K., & Jahromi, Z. B. (2016). The effect of stress management training on hope in hemodialysis patients. *Global journal of health science*, 8(7), 165.
- Rafiyah, I., Suttharangsee, W., and Sangchan, H., 2011. Social Support and Coping of Indonesian Family Caregivers Caring for Persons with Schizophrenia. *Nurse Media Journal of Nursing*, [Online] Volume 1(2)
- Raja, S. M., & Seyoum, Y. (2020). Intradialytic complications among patients on twice-weekly maintenance hemodialysis: an experience from a hemodialysis center in Eritrea. *BMC nephrology*, 21, 1-6.
- Razmaria, A.A., 2016. Chronic kidney disease. *Jama*, 315(20)
- Rojas, J.N., 2017. Stress and Coping Mechanisms among Hemodialysis Patients in the Gulf and Neighboring Countries: A Systematic Review. *International Journal of Advancements in Research and Technology*, 6(4)
- Scott, P.D., Lockhart, J.S., Jakub, K.E., Zoucha, R. and Nguyen, G.C., 2019. Coping in African Americans with Inflammatory Bowel Disease: An Integrative Review of the Literature. *Gastroenterology Nursing*, 42(4)
- Shafipour, V., Alhani, F. and Kazemnejad, A., 2015. A survey of the quality of life in patients undergoing hemodialysis and its association with depression, anxiety and stress. *Journal of Nursing and Midwifery Sciences*, 2(2)
- Shahrokhi, Z., Rayyani, M., Sabzevari, S. and Haghdoost, A.A., 2014. Stressors and Coping strategies of dialysis patients. *J Crit Care Nurs*, 6(4)

- Sharour, L.A., Omari, O.A., Malak, M.Z., Salameh, A.B., Yehia, D., Subih, M. and Alrshoud, M., 2020. Using Mixed-Methods Research to Study Coping Strategies among Colorectal Cancer Patients. *Asia-Pacific Journal of Oncology Nursing*, 7(1)
- Shinde, M., & Mane, S. P. (2014). Stressors and the coping strategies among patients undergoing hemodialysis. *International Journal of Science and Research (IJSR)*, 3(2), 266-276.
- Sinclair, V.G. and Wallston, K.A., 2004. The development and psychometric evaluation of the Brief Resilient Coping Scale. *Assessment*, 11(1)
- Singh, R.G., Singh, S., Rathore, S.S. and Choudhary, T.A., 2015. Prabhakar. Spectrum of intradialytic complications during hemodialysis and its management: *A single-center experience. Saudi J Kidney Dis Transplant*, 26
- Sokwala A.,2018. 'kidney disease cases increasing at alarming rate', *business daily*, 7 march, viewed 5 Feb 2020, <https://www.businessdailyafrica.com/lifestyle/fitness/Kidney-disease-cases-increasing-at-alarming-rate/4258372-4331672-8il4ns/index.html>
- Stanifer, J.W., Muiru, A., Jafar, T.H. and Patel, U.D., 2016. Chronic kidney disease in low-and middle-income countries. *Nephrology Dialysis Transplantation*, 31(6)
- Tchape M, Odette, Tchapouga B, Catherine A, Gunilla P, Samuel N.C, 2018. Physiological and psychosocial stressors among hemodialysis patients in the Buea Regional Hospital, Cameroon. *The Pan African Medical Journal*, 30(49).
- Thomsen, T. G., Rydahl-Hansen, S., & Wagner, L. (2010). A review of potential factors relevant to coping in patients with advanced cancer. *Journal of clinical nursing*, 19(23-24), 3410-3426.

- Thongdee, C., Phinyo, P., Patumanond, J., Satirapoj, B., Spilles, N., Laonapaporn, B., ... & Tasanarong, A. (2020). Ultrafiltration rates and intradialytic hypotension: A case–control sampling of pooled haemodialysis data. *Journal of Renal Care*.
- Vida Shafipour, Hedayat Jafari, Lila Shafipour and Ebrahim Nasiri, 2010. Assessment of the Relationship Between Quality of Life and Stress in the Hemodialysis Patients in 2008. *Pakistan Journal of Biological Sciences*, 13
- Wachterman, M. W., Marcantonio, E. R., Davis, R. B., Cohen, R. A., Waikar, S. S., Phillips, R. S., & McCarthy, E. P. (2013). Relationship between the prognostic expectations of seriously ill patients undergoing hemodialysis and their nephrologists. *JAMA internal medicine*, 173(13), 1206-1214.
- Ware, T., 2018. Chronic kidney disease. *InnovAiT*, 11(1)

APPENDICES

Appendix 1: Research Budget

Component	Unit of measure	Number/duration	Cost per unit (ksh)	Total amount
<u>Printing</u>				
Proposal draft	10	50	10	5,000.00
Proposal presentation	5	60	10	3,000.00
Consent form	1	2	10	20.00
Questionnaire	1	7	10	70.00
ERC application form	1	6	10	60.00
Final report	1	100	10	1000.00
<u>Photocopying</u>				
Proposal	4	60	5	1,200.00
Questionnaires	155	7	5	5,425.00
Consent forms	155	2	5	1,550.00
ERC application form	2	6	5	60.00
Final report	6	100	5	3,000.00
<u>Binding</u>				
Proposal	4	1	100	400.00
Final report	6	1	500	3,000.00
Statistician	1	21	1500	31,500.00
<u>Other costs</u>				
Purchase of JCS				8,500.00
ERC fees				2,000.00
Records access fees	1	10	250	1500.00
Transport to collect data				2,500.00
Report dissemination fee				50,000.00
Researcher allowance				50,000.00
Subtotal				138,285.00
Miscellaneous (10% of subtotal)				13,829.00
Grand total				152,114.00

Appendix 2: Justification of the research budget

Printing and photocopying – this amount will facilitate printing of the proposal draft during consultation with the supervisors, presentation to the faculty and to the ERC. It will also cater for printing of the questionnaires and the report.

ERC fee- the amount will be paid to KNH/UON ERC to facilitate approval of research proposal

Data access fee- amount paid to KNH to be allowed access patient information as required by KNH policy

Purchase of Jalowiec Coping Scale - This amount was sent to the author of JCS to acquire the tool.

Researcher's allowance- cater for researcher's needs during study period and provision of internet services.

Statistician fee- this fee will be paid to facilitate data entry and analysis

Miscellaneous - will cater for any unforeseen expenses

Appendix 3: Work plan Gantt chart

TIMELINE ACTIVITY	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	April 2020	May 2020	June 2020	July 2020	August 2020	Sept 2020
Proposal writing											
Approval by ERC											
Pretesting and correction of tool											
Data collection											
Data analysis											
Report writing											
Project report defense.											
Report dissemination											

Appendix 4: Informed Consent (English Version)

STUDY TITLE: COPING WITH STRESS RELATED TO INTRADIALYTIC EVENTS
AMONG PATIENTS ON HEMODIALYSIS AT THE RENAL UNIT, KNH

Introduction to study and researcher

My name is Lydia Ndanu, a student at the university of Nairobi pursuing a master of science in nephrology nursing degree. I'm conducting a study to assess the coping strategies used by patients to cope with stress related to intradialytic events at the renal unit, KNH.

To complete this study, I request your participation through completing a questionnaire which will be given and read out to you. You will be required to tick on the most appropriate response to the best of your knowledge especially in regards to how you coped with stress that resulted from experiencing an intradialytic complication. Your honesty will be critical in identifying the coping strategy. You will also be asked to fill out your data and rate your level of stress related to the complication experienced.

Confidentiality

All the information you will provide in this questionnaire will be highly confidential and will not be shared with anyone. You will not be required to indicate your name in any of the questionnaires given to ensure that your information remains anonymous. An identification number only known to the researcher will be allocated for accountability of the questionnaires administered.

Your Rights

You have a right to voluntarily participate in this study or withdraw at any point of the study without any penalization. Provision of services in the unit will not be affected in case you decide

not to participate in this study. Kindly note that no monetary benefits will be availed for participating in this study.

Benefits and risks of the study

Identification of how you cope to stress related to intradialytic complications will form a basis on which you could be assisted to cope with such stressors. The policy makers will be informed of the results of this study to consider having training programs on coping as well as provision of protocols for the same. The study findings will also be referred to in future research in related studies.

This study does not involve any invasive procedures and may not have any physical risks. You may however experience a sense of vulnerability when answering these questions. In case you realize that this feeling is affecting your responses, kindly get in touch with the researcher on the contacts provided.

Duration of the study

The questionnaire will take you approximately 30 minutes to fill and the researcher will be available to guide you through if needed. The questionnaire will be administered while you continue with hemodialysis treatment to minimize inconveniencing you. There will be no follow-up interviews after filling the questionnaire.

Contact information

For any clarifications concerning this study, feel free to contact the following;

Lydia Ndanu (principal researcher)

Phone number: 0737 732 490

Email: ndanulydia@gmail.com

The supervisors;

1. Dr. Dorcas Maina

Email: mainad@uonbi.ac.ke

Phone number: 0724 440 843

2. Dr. Samuel Kimani

Email: tkimani@uonbi.ac.ke

Phone number: 0722 384 917.

You can also contact the secretariat, KNH-UON Ethics and Research Committee which is responsible for regulating research, approve research proposals, ensure ethical principles are adhered to as well as curbing plagiarism of research to promote integrity of the research conducted.

The Secretariat,

KNH-UoN Ethics and Research Committee

P. O. Box 19676 Code 00202 Nairobi

Tel. (254-020) 2726300-9 Ext 44355

E-mail: uonknh_erc@uonbi.ac.ke

Consent form

This is a declaration that the details of this study have been explained to me and volunteer to participate. I hereby give my consent to participate by providing the information required.

Participants' signature/ thumb mark _____

Date _____

Investigator's statement

I confirm that I have clearly explained to the participant the nature of the study and the content of this consent form in detail and the participant has decided to participate voluntarily without any coercion or undue pressure. I will ensure that all the principles of ethics are considered during this study and the statements in this consent document are fulfilled.

Researchers' signature _____

Date _____

Appendix 5: Informed Consent (Kiswahili Version)

Karatasi ya habari ya utafiti kwa mshiriki na ridhaa ya kushiriki kwenye utafiti

Mada ya utafiti: Kukabiliana na mafadhaiko yanayohusiana na matukio ya ndani wakati wa tiba ya hemodialysis kwenye kitengo figo, hospitali ya taifa ya Kenyatta.

Maelezo ya mtafiti na utafiti kamili

Jina langu ni Lydia Ndanu, mwanafunzi wa shahada ya uzamili wa magonjwa ya figo kwenye shule ya uuguzi, chuo kikuu cha Nairobi. Ninafanya utafiti wa kutathmini mbinu za kukabiliana na mafadhaiko yanayohusiana na matukio ya ndani wakati wa tiba ya hemodialysis kwenye hospitali kuu ya Kenyatta.

Ili kuweza kutekeleza utafiti uu, ningeomba kushiriki kwako kwa njia ya kukamilisha dodoso utakalopewa na kusomewa. Utahitajika kuchagua jibu lililo sahihi kwa kadri ya ufahamu wako kuhusiana na mbinu unazotumia kukabiliana na mafadhaiko yaliyotajwa. Uaminifu wako katika majibu utakuwa kimkakati kwenye utafiti uu. Utahitajika kujanza taarifa kukuhusu wewe na kiwango cha dhiki ulichohisi wakati ulipata shida ukioshwa damu.

Usiri wa majibu yako

Unahakikishiwa kuwa taarifa zozote unatakazozitoa kwa utafiti uu zitawekwa siri. Usiandike jina lako kwenye dodoso. Kutakuwa na nambari ya dodoso itakayotumika na mtafiti kwa kusudio ya uwajibikaji kwa mtafiti pekee.

Haki za mshiriki

Una haki ya kushiriki kwa hiari katika utafiti huu au kujiondoa katika hatua yoyote ya utafiti bila adhabu yoyote. Utoaji wa huduma kwenye kitengo cha kuoshwa damu haitaathiriwa ikiwa

utaamua kutoshiriki katika utafiti huu. Kwaheri, kumbuka kuwa hakuna faida za kifedha zitakazopatikana kwa kushiriki katika utafiti huu.

Faida na hatari ya utafiti

Utambulisho wa jinsi unavyoweza kukabiliana na mafadhaiko yanayohusiana na shida za kutafakari yataunda msingi ambao unaweza kusaidiwa kukabiliana na mafadhaiko kama haya.

Watengenezaji wa sera watajulishwa juu ya matokeo ya utafiti huu kuzingatia kuwa na programu za mafunzo juu ya kukabiliana na pia utoaji wa itifaki kwa hiyo. Matokeo ya utafiti pia yataajwa katika utafiti ujao katika masomo yanayohusiana.

Utafiti huu hauhusiani na mifumo yoyote ya uvamizi na inaweza kuwa haina hatari yoyote ya mwili. Unaweza kupata uzoefu wa hatari wakati wa kujibu maswali haya. Ikiwa utagundua kuwa hisia hii inaathiri majibu yako, wasiliana na mtaftaji kwa anwani zilizopewa.

Muda wa utafiti

Dodoso litakuchukua takriban dakika 30 kujaza na mtafiti atapatikana kukuongoza kupitia ikiwa inahitajika. Dodoso litajazwa wakati unaendelea na matibabu ya hemodialysis ili kupunguza usumbufu. Hakutakuwa na mahojiano yatakayofuata baada ya kujaza dodoso hilo.

Habari ya mawasiliano

Kwa ufafanuzi wowote kuhusu utafiti huu, jisikie huru kuwasiliana na;

Lydia Ndanu (mtafiti mkuu)

Namba ya simu: 0737 732 490

Barua pepe: ndanulydia@gmail.com

Wasimamizi;

1. Daktari Dorcus Maina

Barua pepe : mainad@uonbi.ac.ke

Namba ya simu: 0724 440 843

2. Daktari Samuel Kimani

Barua pepe: tkimani@uonbi.ac.ke

Namba ya simu: 0722 384 917.

Unaweza pia kuwasiliana na Sekretarieti ya Maadili na Kamati ya Utafiti ya KNH-UON ambayo inawajibika katika kudhibiti utafiti, kupitisha mapendekezo ya utafiti, hakikisha kanuni maadili zinazingatiwa na vile vile kuzuia upotoshaji wa utafiti ili kukuza uaminifu wa utafiti uliofanywa.

The Secretariat,

KNH-UoN Ethics and Research Committee

Sanduku La Posta 19676-00202 Nairobi

Simu, (254-020) 2726300-9 Ext 44355

Barua pepe: uonknh_erc@uonbi.ac.ke

Fomu ya idhini

Hii ni tamko kwamba maelezo ya utafiti huu yameelezwa kwangu na kujitolea kushiriki. Kwa hivyo natoa idhini yangu ya kushiriki kwa kutoa habari inayohitajika.

Sahihi ya mshiriki / alama ya kidole _____

Tarehe _____

Taarifa ya mpelelezi

Ninathibitisha kwamba nimeelezea wazi kwa mshiriki asili ya utafiti na yaliyomo katika fomu hii ya ridhaa kwa undani na mshiriki ameamua kushiriki kwa hiari bila kulazimishwa au shinikizo lisilostahili. Nitahakikisha kuwa kanuni zote za maadili zinazingatiwa wakati wa uchunguzi huu na taarifa zilizo katika hati hii ya idhini zinatimizwa.

Sahihi ya mtafiti _____

Tarehe _____

Appendix 6: Research questionnaire

Topic: Coping with stress related to intradialytic events among patients on hemodialysis at the renal unit, Kenyatta National Hospital

Questionnaire number _____

Instructions:

1. Do not indicate your name on this questionnaire.
2. This questionnaire consists of 3 sections. In each section choose the most appropriate.

Section 1: Hemodialysis demographic form

1. Age in years : 18 -29 30-39 40- 49 50-59 60 and above
2. Sex : male female
3. Marital status : married single widow/widower separated
4. Religion : Christian Muslim Hindu Pagan Others
5. Highest education level: none primary level Secondary level tertiary
6. Employment status: Employed self-employed unemployed other (specify)_____
7. Monthly income (Ksh):
 - a. less than 10,000
 - b. 10,000 – 20,000
 - c. 20,000 – 50,000
 - d. above 50,000
8. Number of people in your household:

- a. None (stay alone)
- b. less than 3 people
- c. 3 to 5 people
- d. more than 5 people

9. How are you related to the people you stay with? Question exempted to patients that stay alone.

- a. Nuclear family relatives
- b. Extended family relatives
- c. Friends
- d. Caregiver

10. How long have you been on hemodialysis?

- a. Less than 1 year
- b. 1-2 years
- c. 3-4 years
- d. 5 years and above

11. Comorbidities:

- a. Diabetes mellitus
- b. Hypertension
- c. HIV
- d. others (specify)_____

12. Vascular access: Central venous catheter AV fistula AV graft

13. HD Frequency: once weekly twice weekly thrice weekly

14. Duration per HD session:

Less than 3hrs 3hrs 4hrs 5hrs 6hrs above 6hrs

15. Average Blood flow rate: 200 – 250 260-300 310- 350 above 350

16. Average ultrafiltration volume/ session

0-1litre 1.1 to 2litres 2.1 to 3 litres 3.1 – 4litres , above 4litres

17. Which complication have you experienced recently? Tick as many

- a. Muscle cramps
- b. Hypotension
- c. Hypertension
- d. Nausea
- e. Vomiting
- f. Headache
- g. fever and chills
- h. chest pain
- i. hypoglycemia
- j. others (specify) _____

18. Was your session terminated because of the complication?

Yes

No

19. Was this the first time for you to experience an intradialytic complication?

Yes

No

20. How often do the medical professionals (doctor, nurse, counsellor, nutritionist or any other medical staff) in the renal unit talk to you on ways of coping with stress?

a. Every dialysis session

b. every week

c. every month

d. when I get complications

e. never

f. others(specify)_____

Section 2: stress - visual analogue scale

I. How often have you felt nervous and stressed about HD in the past one month?

a. Never

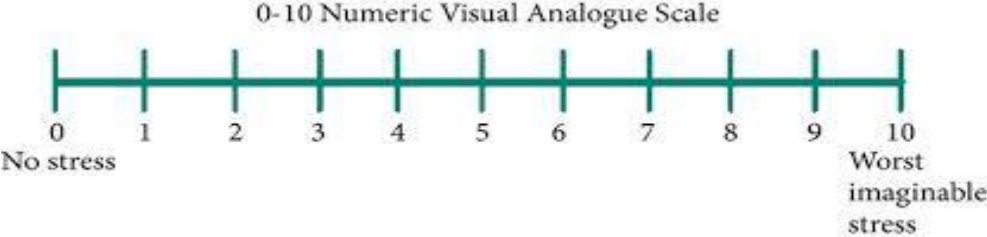
b. Almost never

c. Sometimes

d. Fairly often

e. Very often

II. In the scale provided below, rate the level of stress experienced towards HD in a scale of 1 to 10



Appendix 7: Dodoso la utafiti

Mada: Kukabiliana na mafadhaiko yanayohusiana na matukio ya ndani wakati wa tiba ya Hemodialysis kwenye kitengo figo, Hospitali kuu ya Kenyatta.

Nambari ya dodoso _____

Maagizo:

1. Usiandike jina lako kwenye dodoso hili.
2. Dodoso hili lina sehemu tatu, Katika kila sehemu chagua inayofaa Zaidi ukifuata maagizo yaliyopo.

Sehemu ya kwanza: Fomu ya habari kuhusu mshiriki.

1. Umri wako kwa miaka: 18 -29 30-39 40- 49 50-59 60 na zaidi
2. Jinsia: kiume kike
3. Hali ya ndoa: umeoa/kuolewa mjane umetengwa/talaka
4. Dini: Mkristo Muislamu Mhindi Pagan Wengine
5. Kiwango cha juu cha elimu: shule ya msingi shule ya Sekondari kiwango cha juu
6. Hali ya Ajira: Umeajiriwa umejiajiri bila ajira wengineo (taja) _____
7. Mapato ya kila mwezi (Ksh):
 - a. chini ya 10,000
 - b. 10,000 - 20,000

c. 20,000 - 50,000

d. zaidi ya 50,000

8. Idadi ya watu katika nyumba unayoishi:

a. Hakuna (unakaa peke yako)

b. chini ya watu 3

c. Watu 3 hadi 5

d. zaidi ya watu 5

9. Una uhusiano gani na watu unaoishi nao? Swali si la washiriki wanaokaa peke yao.

a. Jamaa wako

b. Jamaa wa ukoo wako

c. Marafiki

d. Mlezi

10. Je! Umekuwa kwenye hemodialysis kwa muda gani?

a. Chini ya mwaka mmoja

b. Miaka 1-2

c. Miaka 3-4

d. miaka 5 na Zaidi

11. Magonjwa mengine:

a. Ugonjwa wa kisukari

b. Shinikizo la damu

c. Ukimwi

d. Mengine (taja) _____

12. Ufikiaji wa mishipa: Central venous catheter AV fistula AV graft

13. Idadi ya matibabu ya HD kwa wiki:

a. mara moja kwa wiki

b. mara mbili kwa wiki

c. mara tatu kwa wiki

d. Zaidi ya mara tatu kwa wiki

14. Muda wa tiba ya HD:

a. Chini ya masaa 3

b. Masaa 3

c. Masaa 4

d. Masaa 5

e. Masaa 6 na Zaidi

15. Kiwango cha mtiririko wa Damu: 200 - 250 260-300 310- 350 juu ya 350

16. Kiwango cha maji yanayotolewa:

Chini ya lita moja Lita 1.1 - 2 Lita 2.1-3 lita 3.1 - 4 Zaidi ya lita 4

17. Je! Umepata shida gani hivi karibuni wakati wa matibabu ya HD?

a. Misuli kuuma

b. msukumo wa damu kuwa chini sana

c. Shinikizo la damu kupanda

d. Kichefuchefu

e. Kuacha

f. Maumivu ya kichwa

g. homa na baridi

h. maumivu ya kifua

i. sukari kwa damu kushuka

j. mengine (taja) _____

18. Je! matibabu yako yalisitishwa kwa sababu ya hiyo shida?

Ndio

Hapana

19. Je! Hii ilikuwa mara ya kwanza kwako kupata shida ya usumbufu?

Ndio

Hapana

20. Je! Ni mara ngapi wataalamu wa matibabu (daktari, muuguzi, mshauri wa lische au mfanyikazi mwingine yeyote) kwenye kitengo cha figo huongea na wewe juu ya njia za kukabiliana na mafadhaiko hayo?

a. Kila mara nikiwa kwa HD

b. kila wiki

c. kila mwezi

d. wakati napata matatizo

e. kamwe

Sehemu ya pili: kifaa cha analog cha kupima dhiki

21. Je! Ni mara ngapi umekuwa na wasiwasi na kusisitiza juu ya HD katika mwezi mmoja uliopita?

a. Kamwe

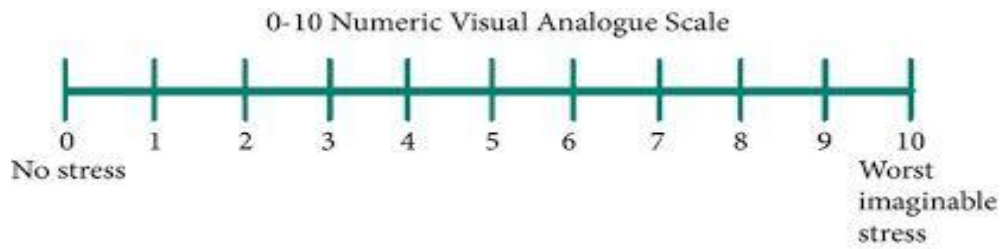
b. Karibu kamwe

c. Wakati mwingine

d. Kwa haki mara nyingi

e. Mara nyingi sana

22. Katika kiwango kilichotolewa hapa chini, onyesha kiwango cha mfadhaiko unaopata kwa sababu ya HD kwenye kiwango cha 1 hadi 10.



Appendix 8: Jalowiec Coping Scale

This section is about how you cope with stress and tension, and what you do to handle stressful situations. In particular, I am interested in how you have coped with the stress of:

This questionnaire lists many different ways of coping with stress. Some people use a lot of different coping methods; some people use only a few.

You will be asked two questions about each different way of coping with stress:

Part A

How often have you used that coping method to handle the stress listed above?

For each coping method listed, circle one number in Part A to show how often you have used that method to cope with the stress listed above. The meaning of the numbers in Part A is as follows: 0 = never used 1 = rarely used 2 = sometimes used 3 = often used

Part B

If you have used that coping method, how helpful was it in dealing with that stress?

For each coping method that you have used, circle a number in Part B to show how helpful that method was in coping with the stress listed above. The meaning of the numbers in Part B is as follows: 0 = not helpful 1 = slightly helpful 2 = fairly helpful 3 = very helpful If you did not use a particular coping method, then do not circle any number in Part B for that coping method.

Appendix 9: Letter of approval to use Jalowiec Coping Scale

The screenshot shows a web browser window displaying a Gmail email. The browser's address bar shows the URL: mail.google.com/mail/u/0/#search/ajalowiec%40yahoo.com/FMfcgwxGCtDLvpzNwDXhbfBRfnCVdLSJ. The browser's bookmark bar includes links to Google, New Tab, google scholar - Go..., Google Scholar, Android Apps on G..., Ben And Holly's Litt..., and Other bookmarks. The Gmail interface shows the search bar with the text "Search mail". The email header indicates it is from Anne Jalowiec <ajalowiec@yahoo.com> to me, dated Sat, Jan 18, 8:31 AM. The email body contains the following text:

1-17-2020

Permission is granted to Lydia Ndanu to use the Jalowiec Coping Scale for her research project on hemodialysis patients in Kenya.

Dr Anne Jalowiec, RN, PHD
Loyola University of Chicago
USA

Appendix 10: Approval to collect data



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P O BOX 19676 Code 00202
Telegrams: varsity
Tel: (254-020) 2726300 Ext 44355

KNH-UoN ERC
Email: uonknh_erc@uonbi.ac.ke
Website: <http://www.erc.uonbi.ac.ke>
Facebook: <https://www.facebook.com/uonknh.erc>
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC



KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/141

6th May 2020

Lydia Ndanu Muthoka
Reg. No.H56/11883/2018
School of Nursing Sciences
College of Health Sciences
University of Nairobi

Dear Lydia

RESEARCH PROPOSAL – STRATEGIES OF COPING WITH STRESS RELATED TO INTRADIALYTIC EVENTS UTILIZED BY PATIENTS ON HEMODIALYSIS AT THE RENAL UNIT, KENYATTA NATIONAL HOSPITAL (P74/02/2020)

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and **approved** your above research proposal. The approval period is 6th May 2020 – 5th May 2021.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc.) are submitted for review and approval by KNH-UoN ERC before implementation.
- Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. *(Attach a comprehensive progress report to support the renewal)*

- Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

Protect to discover

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,

PROF. M. L. CHINDIA
SECRETARY, KNH-UoN ERC

- c.c. The Principal, College of Health Sciences, UoN
The Director, CS, KNH
The Chairperson, KNH- UoN ERC
The Assistant Director, Health Information, KNH
The Director, School of Nursing Sciences, UoN
Supervisors: Dr. Dorcas Maina (UoN), Dr. Samuel Kimani (UoN)