

**DETERMINANTS OF DIET AND FLUID ADHERENCE AMONG END
STAGE RENAL DISEASE PATIENTS UNDERGOING HAEMODIALYSIS
AT MOI TEACHING AND REFERRAL HOSPITAL, UASIN GISHU
COUNTY, KENYA**

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A Thesis submitted in partial fulfillment of the requirements for the Degree of
Masters of Science in Advanced Nursing Practice (Medical Surgical Nursing)
Masinde Muliro University of Science and Technology

November, 2020

DECLARATION

This thesis is my original work prepared with no other than the indicated sources and support and has not been presented elsewhere for a degree or any other award.

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Date_____

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance of Masinde Muliro University of Science and Technology a thesis entitled, **“Determinants of Diet and Fluid Adherence among End Stage Renal Disease patients undergoing haemodialysis at Moi Teaching and Referral Hospital, Uasin Gishu County, Kenya”**.

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DEDICATION

I dedicate this research to patients suffering from any degree of renal failure particularly those who undergo regular hemodialysis at Moi teaching and referral hospital (MTRH) regardless of financial and disease burden.

ACKNOWLEDGEMENT

The realization of this thesis has been possible with the guidance and support of key people in my life that I should mention. Firstly, I would like to acknowledge my principle supervisor Professor James A. Oloo (School of Medicine) Masinde Muliro University Science and Technology for his availability and acceptance to guide me in writing this research. His dynamism, vision, sincerity and motivation have deeply inspired me throughout the research period. I am also most grateful to my 2nd supervisor Mr. John Arudo (School of Nursing, Midwifery and Paramedical Sciences) Masinde Muliro University Science and Technology for his immense support to make this thesis to be meaningful. His constructive criticism has made me more critical in putting down ideas in the right direction. I'm also indebted to my family for their prayers and support they accorded me. Finally, I would like to appreciate everybody who contributed in one way or another for me to complete this research.

God bless you all.

ABSTRACT

End Stage Renal Disease (ESRD) is a global public health problem. Moi Teaching and Referral Hospital (MTRH) has over 200 hemodialysis patients with nearly 2/3rd struggling with dietary and fluid adherence. This study assessed determinants of diet and fluid adherence among ESRD undergoing hemodialysis at MTRH. A quantitative cross-sectional study design was conducted from 1st April to 16th May 2018. A sample size of 145 participants who were on HD twice weekly were conveniently recruited using Fisher's formula. End stage renal disease adherence questionnaire (ESRD-AQ) was used for data collection. Chi-square (χ^2) was used to test statistical significance. Frequency tables and bar graphs were used for data presentation. SPSS version 22.0 was used for data analysis. The study revealed that, low level of knowledge on fluid adherence was marginally associated with dietary adherence and fluid adherence. Most participants (71.9%) who were aware of limiting fluid intake to keep their body healthy practiced fluid intake ($p=0.07$). A smaller proportion of participants (62.5%) adhered to diet if they practiced fluid restrictions all the time ($p=0.003$). (61.3%) practiced dietary restriction if they received a health talk every dialysis treatment or every week ($p < 0.0001$). Majority (80%) who had no difficulty in keeping dietary recommendations practiced fluid adherence ($p=0.003$). Patients who received social support practiced dietary adherence with significantly higher mean of 5.6 (95% CI = 5.5 – 5.6). Most patients (83.3%) who used bus for transport practiced dietary adherence ($p=0.02$). Majority (84.6%) who earned less than KSh. 30,000 observed dietary guidelines ($p=0.006$): A smaller proportion (68.8%) who claimed treatment cost was expensive adhered to diet ($p=0.007$): Those who accessed material support that helps in dietary adherence, a smaller proportion (69.8%) adhered to diet ($p=0.003$): Those who claimed lack of transport was the main reason for missing dialysis treatment, a significantly smaller proportion (44%) adhered to fluid restriction ($p=0.01$). The study concluded that, low level of knowledge on fluid adherence had positive outcome on dietary adherence and negative outcome on fluid adherence. Limiting fluids intake and taking proper diet positively influenced fluid adherence. Following fluid restrictions all the time and health education conducted by renal staff on importance of following a proper diet did not translate into dietary adherence. Patients who practiced dietary recommendations were also fluid adherent. Social support is important towards dietary and fluid adherence. Use of bus for transport and income of less than KSh. 30,000 were associated with dietary adherence. Lack of transport as a reason for missing dialysis was negatively associated with fluid adherence. Renal patients on HD should be educated on the importance of limiting fluids and taking proper diet. Social support should be offered to HD patients to boost dietary and fluid adherence. The national and county governments should decentralize management of hemodialysis patients to sub-county hospitals to minimize adherence challenges.

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LIST OF ABBREVIATIONS AND ACRONYMS

AKI	Acute Kidney Injury
CVI	Content Validity Index
ESRD	End Stage Renal Disease
HD	Hemodialysis
IDWG	Inter-dialytic Weight Gain
KHH	Kenyatta National Hospital
LBM	Lean Body Mass
MTRH	Moi Teaching and Referral Hospital
NASCOSTI	National Commission for Science Technology and Innovation
NCD	Non-communicable diseases
NHIF	National Hospital Insurance Fund
RRT	Renal Replacement Therapy
SPSS	Statistical Package for Social Sciences
USA	United State of America

CHAPTER ONE

1.1 Overview

This chapter introduces the background of the study. It also highlights the problem statement, justification, as well as general and specific objectives.

1.2 Background to the Study

End Stage Renal Disease (ESRD) is a global public health concern Yuen, *et al.*, (2016). It's one of the emerging burdens of non-communicable diseases (NCD), warranting renal replacement therapy (RRT) in order to survive Liyanage T, Ninomiya T, Jha V, Neal B, Patrice HM, Okpechi I, *et al.*, (2015). Patients with ESRD require strict adherence with diet, fluids, use of medications and hemodialysis in order to improve their clinical outcomes (Sanders, Whited, & Martino, 2013). There are notable adherence challenges particularly dietary restrictions where about half of adult patients do not observe dietary prescriptions Cupisti *et al.*, (2018). Despite concerted efforts being made in the treatment and management of kidney diseases, non- adherence to medication, fluid intake, dietary, and dialysis remain a major obstacle in hemodialysis patients (Chironda *et al.*, 2017; Naalweh *et al.*, 2017) A good outcome in this category of patients requires high motivation and self-care from patients in terms of energy and time (Bonner *et al.*, 2014). Past studies have assessed factors affecting adherence with diet, fluids, medication use and hemodialysis among renal patients.

A study published in the USA to assess factors to non- compliance in CKD population on dialysis found out socioeconomic, psychological, therapy related, pathophysiological related and health care system related factors were associated with non-adherence (Chironda, *et al.*, 2016). The study pointed out that Non-

adherence remains a major problem towards effective care of CKD population. It further indicated the need for collaborative approach to outdo contributing factors to non-adherence in CKD patients. A different study done in Malaysia to establish determinants of compliance trends among hemodialysis patients established that patients comply differently with diet, fluid, medication and dialysis. Poor knowledge, negative self-efficacy skills, economical setbacks were associated with non-adherence to fluid, dietary, medication and dialysis, respectively (Chan, *et al.* 2012). The study concluded that Healthcare professionals should recognize factors related to non-adherence from the patients' perspective as they assist them cope up with new integrated restrictive orders while on hemodialysis.

Hong, Wang, Chan, Mohamed, and Chen (2017) identified the need to survive and meet the expectations of loved ones as a motivator to dietary and fluid restrictions among renal patients on hemodialysis. The study concluded that; the imposed dietary and fluid restriction is a constant struggle and a cause of suffering among hemodialysis patients in Singapore. In Kenya, documented evidence on adherence to overall prescriptions among adult renal patients on hemodialysis is either under-researched, non-existent or, non-accessible. Opiyo *et al.*, (2019) in their study to determine factors associated with adherence to renal dietary prescriptions among adult patients with CKD on hemodialysis in National Referral Hospitals (KNH, MTRH), found out that overall, adherence to diet prescription was low among patients who were all aware of the recommended foods for their health condition. It further recommended an understanding of patients' adherence to fluid restriction.

Moi Teaching and Referral Hospital (MTRH) is the second largest referral hospital in Kenya. It caters for a large volume of patients from entire north-rift, parts of western Kenya and neighboring countries like Uganda and South Sudan. Over 200

patients diagnosed with chronic kidney disease annually are recruited for hemodialysis. Most of them do struggle with integrated adherence orders. There is limited information on, and understanding of, determinants of diet and fluid adherence among hemodialysis at MTRH. It was on this basis that the study focused on determinants of diet and fluid adherence among ESRD patients undergoing hemodialysis.

1.3 Statement of the Problem

End Stage Renal Disease (ESRD) is a global public health problem (Yuen *et al.*, 2016). In Kenya, over 10,000 cases of CKD are diagnosed annually with an estimated 4.8 million Kenyans projected to suffer from kidney disease by 2030 (Sokwala, 2018). The high prevalence of CKD/ESRD in Kenya is proportionally associated with increased prevalence of non-communicable diseases like diabetes mellitus, hypertension and other related kidney disorders (Sigamani, 2012). Renal patients on dialysis are faced with adherence challenges arising from strict regimens of medication, fluid, diet, and dialysis (Chironda *et al.*, 2017). MTRH receives over 200 new cases of renal patients annually with most of them being recruited for hemodialysis. There is apparent adherence challenges encountered by these patients with over 2/3rd of all patients on hemodialysis at MTRH experiencing difficulties in adhering to diet and fluid orders with increase in morbidity and mortality cases. There is limited information on, and understanding of, determinants of diet and fluid adherence among hemodialysis at MTRH.

The researcher believes that variables such as knowledge and practices, provision of social support and perhaps economic stability are necessary in averting adherence obstacles encountered by ESRD patients on hemodialysis at MTRH. The purpose of this study therefore was to establish determinants of dietary and fluid adherence

among ESRD undergoing hemodialysis at Moi Teaching and Referral Hospital Uasin- Gishu County.

1.4 Justification of the Study

Non-adherence with dietary & fluid regimens among renal patients on hemodialysis can result into undesired complications that increase morbidity and mortality rates. Failure to follow the prescribed fluid intake and dietary orders is seen to be a major challenge in management of renal patients on dialysis. Uncontrolled fluid intake for instance causes increased inter-dialytic weight gain (IDWG) with the risk of cardio-pulmonary overload causing shortness of breath, muscle cramping, dizziness, anxiety, panic, lung edema and risk of death. On the other hand, non- adherence to food regimens causes raised serum potassium and phosphorous levels that lead to bone disorders, cardiac arrest and death.

Determinants of adherence to diet and fluid among end stage renal disease patients (ESRD) on hemodialysis at MTRH have not been established, in spite of increasing number of cases of non-adherence mentioned above. It's hoped that the findings of this study will inform policy makers (MOH) on designing appropriate interventions in addressing adherence challenges among ESRD on hemodialysis and improve on knowledge and practices that can address adherence challenges. Therefore, this study aimed at assessing determinants of dietary & fluid adherence among patients on hemodialysis at MTRH.

1.5 Main Objective

To examine the determinants of diet and fluid adherence among end-stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital.

1.6 Specific Objectives

- i. To establish knowledge and practices of diet and fluid adherence among End stage renal disease patients on hemodialysis at Moi Teaching and Referral Hospital.
- ii. To examine social support structures on diet and fluid adherence among end stage renal disease patients on hemodialysis at Moi Teaching and Referral Hospital.
- iii. To determine the influence of economic status on diet and fluid adherence among end stage renal disease patients on hemodialysis at Moi Teaching and Referral Hospital.

1.7 Research Questions

- i. How does knowledge and practices affect adherence with diet and fluid among End stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital?
- ii. Does social support help to improve diet and fluid adherence among end stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital?
- iii. How does economic status influence diet and fluid adherence among end stage renal disease patients on hemodialysis at Moi Teaching and Referral Hospital?

1.8 Limitations of the study

This study was conducted in a single dialysis unit at MTRH limiting the generalization of its results to other studies. The study also used non probability sampling method (convenience) rather than probability limiting the representations of the findings especially if you need to extrapolate to the target population.

1.9 Conceptual Framework

To address the various components of this study the aspect of adherence to fluid and dietary adherence among ESRD patients undergoing hemodialysis were examined as shown below.

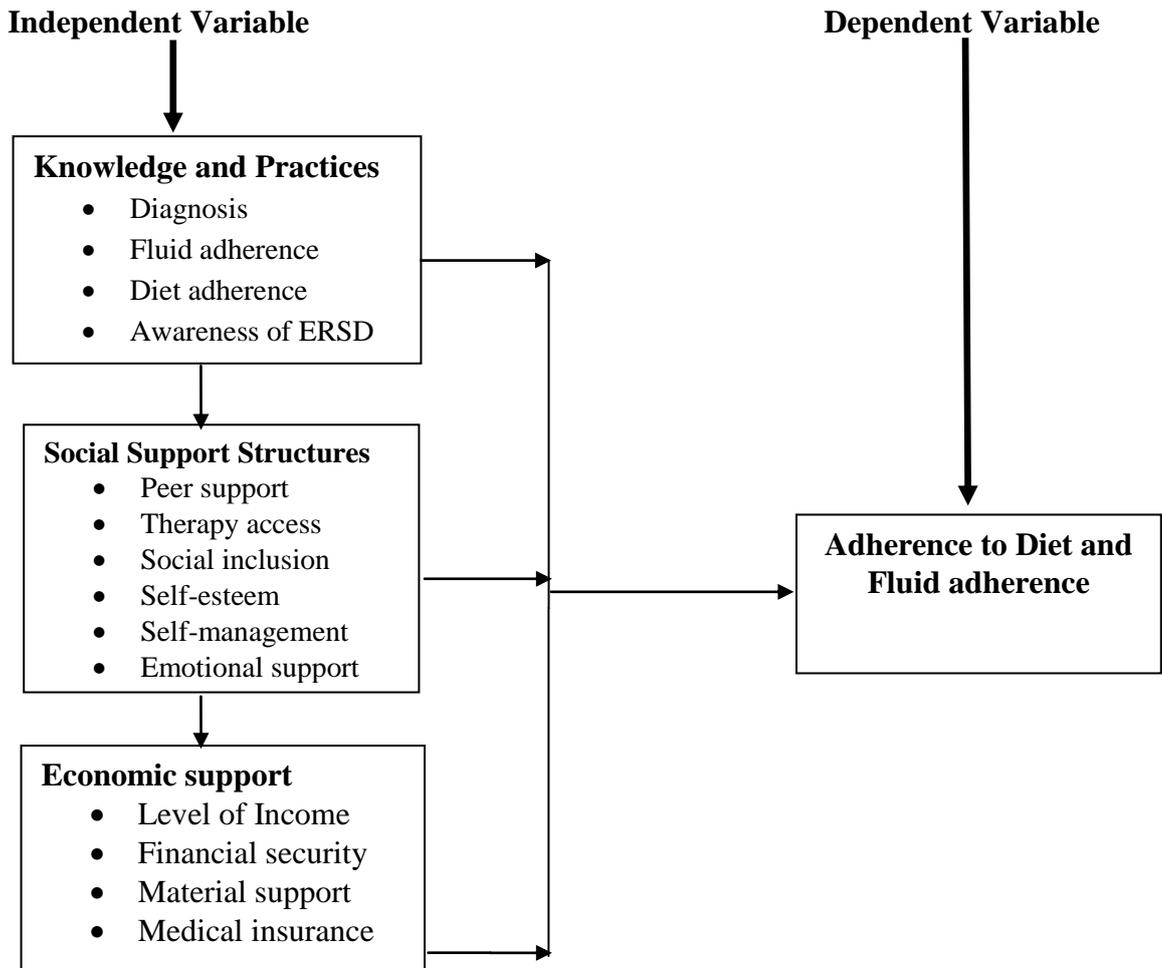


Figure 1.1 Conceptual Framework

From figure 1.1 above, determinants of diet and fluid adherence among end stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital include knowledge and practices, social support structures and economic support. Knowledge and practice aspect is influenced by diagnosis, fluid adherence, diet adherence and awareness of ESRD. Social support structures are influenced by, peer support, therapy access, social inclusion, self-esteem, self-management,

emotional support both in the health facility and at home. Whereas, economic support is influenced by level of income, financial security and material support.

1.8 Operational Definition of Terms

Adherence: The extent to which a person's behavior in taking medication, following a diet, and/or executing lifestyle changes corresponds with agreed recommendations for their disease condition. (WHO 2003). In this context adherence to food and fluid among ESRD patients at MTRH is the main subject under investigation.

End Stage Renal Disease: End-stage renal disease (ESRD) is defined as irreversible state of kidney functionality severe enough to be fatal without dialysis or transplantation. It's the last stage of kidney disease (stage 5) where the estimated glomerular filtration rate is less than 15 mL per minute per 1.73 m² body surface area (Makhele *et al.*, 2019). In this study ESRD is seen as a center of foci in looking at determinants of dietary and fluid adherence.

Hemodialysis: Hemodialysis is a method that is used to achieve the extracorporeal removal of waste products such as creatinine, urea and excess water from the blood when the kidneys are in a state of renal failure (Goswami, Bhowmick, Majumdar, Sikdar, & CN S, 2014). In this study, hemodialysis is one of the treatment modalities that is used to remove excess products of metabolism and fluids.

Knowledge: Refers to the correct response of patients undergoing hemodialysis regarding their recommended regimens included in the structured questionnaire.

Practice: Refers to the dietary intake of patients in terms of number of times, the food taken, the food item consumed, source of food and amount of fluid consumed, as expressed by them and measured by interview schedule and quantified as dietary practice scores.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter gives a detailed description of literature review on knowledge and practices, the contribution of social support and financial implication on adherence to diet and fluids adherence among end stage renal disease (ESRD) patients on hemodialysis.

2.2 Knowledge and Practices among End Stage Renal Disease Patients Undergoing Hemodialysis

End stage renal disease (ESRD) is a global public health concern (Yuen, *et al.*, 2016). It's the final stage of kidney failure (stage 5) where there is permanent loss of kidney function warranting renal replacement therapy (Ramspek, Nacak & Van Diepen, 2017). ESRD patients are faced with adherence challenges arising from strict orders not limited to dialysis program, medication use, fluids and dietary control (Deif, Elsawi, Selim, & NasrAllah, 2015). Knowledge and practices among ESRD patients on dialysis has been seen to influence outcome of renal patients. A study conducted by Chan *et al.*, (2012) to assess the knowledgeableability of renal patients regarding their dietary and fluid restrictions including consequences of poor adherence found out that; high percentage of participants (86.2%) admitted difficulty in following fluid restriction while 72.9% reported difficulty following their dietary prescription. Patients who were not knowledgeable and lacked information regarding fluid information and complexity were not compliant to fluid restrictions. It further revealed that patient's knowledge on potassium and phosphorus had no association to dietary adherence ($r = 20.345$). These findings suggest that higher knowledge on dietary/fluid aspects may not necessarily be associated with better adherence rates.

Smith K, *et al.*, (2010) argues that patient's knowledge on the illness increases self-efficacy towards fluid adherence. A low level of health literacy has been associated with difficulty in following restriction orders such as taking medicines (James, 2013). Berkman *et al.*, (2011) found out that poor health literacy leads to frequent hospitalizations, high use of emergency services and non-adherence to treatment plans. Barnett (2012) analyzed the Effectiveness of an educational program in fluid adherence in renal patients. The results revealed that women had poor adherence to fluids without any correlation found between adherence and other demographic characteristics.

Although a considerable number of articles on ESRD have been published, few studies, particularly in Kenya, have examined knowledge and practices regarding diet and fluid adherence. Furthermore, most studies have produced mixed findings. Consequently, the assessment of the current issue needs to be better understood and addressed fully in ESRD patients. One of the objectives of this study is to investigate the knowledge and practices of ESRD patients undergoing HD.

2.3 Social Support Structures of End Stage Renal Disease Patients Undergoing Hemodialysis

ESRD patients on sustenance hemodialysis experience tremendous psychosocial burden, mainly attributed to the limitations imposed by the disease including fluid and diet restrictions. Non-adherence to prescribed regimens like control of fluid intake and food restrictions leads to complications like increased inter-dialytic weight gain (IDWG), respiratory distress, and electrolyte imbalances with possible fatality. Access to adequate social support can improve treatment outcomes among patients with chronic conditions like chronic renal disease (Ahrari, Moshki & Bahrami 2014). Family members, friends, health caregivers and significant others

have been noted to motivate renal patients on hemodialysis to co-operate and adhere to recommended prescriptions (Ghimire, Castelino, Jose, & Zaidi, 2017). Maxia et al. (2016) points out the importance of involving family support as a way of attaining and improving adherence among patients with CKD. Tannor, Archer, Kapembwa, Van Schalkwyk, and Davids (2017) and Wood (2014) argued that general support from the renal-care team and fellow patients, helps to decrease uncertainty regarding treatment and disease progression, while the patients take control of their kidney condition. Although support has been implicated as a motivator, some studies have not fully acknowledged social support as an important motivator in the management of the CKD population (Lilympaki *et al.*, 2016). Other studies have reported that certain supportive behaviors do not contribute to patients' well-being, and instead can also damage it in some ways (Pourghane et al. 2014). ESRD patients visiting MTRH dialysis Centre are almost obvious that they be accompanied by a family member, relative or a Friend. More so, there is regular interaction with the renal team staff during dialysis treatment creating a conducive environment to evaluate the importance of social support towards adherence of prescribed orders. One of the objectives of this study was to assess the contribution of social support among ESRD patients on sustenance hemodialysis at MTRH.

2.4 Economic influence on adherence to diet and fluids among End Stage Renal Disease Patients Undergoing Hemodialysis

End-stage renal disease (ESRD) imposes significant economic burdens among patients and healthcare systems. Management of renal patients is seen to be costly owing to modalities surrounding it like transportation to the dialysis center, purchase of dialysis consumables, and cost of medications among others. The economic burden in low and middle-income countries is extremely high and may force patients

to skip or abandon important regimens like dialysis, diet and fluid restriction (Mushi *et al.*, 2015). Hemodialysis for instance is one of the most effective renal replacement therapy for patients with ESRD prior to renal transplantation, but is expensive and burdensome (Demir, Ercan, Karakas, Ulas & Buyukhatipoglu 2014).

Majority of patients with ESRD in low and middle income countries live in the rural setup where hemodialysis services are limited forcing them to move to urban setups in search of such services at their own expenses. Poor economic stability is seen to create negative patient outcomes, increased health care expenses as well heightened workload at dialysis centers as a result of non-adherence behaviors (Chironda & Bhengu 2016). In Palestine for instance, patients with ESRD are treated as chronic HD patients and are catered for by the government causing a lot of financial constraints (Zyoud *et al.*, 2016). Scarce economic resources particularly in developing countries result in reduced frequency of dialysis, poor drug compliance, non-adherence to diet and fluid orders (James, 2013).

Majority of renal patients attending hemodialysis at MTRH do not have financial security as well as comprehensive medical covers such as National Insurance Health Fund (NHIF). Almost three quarters of these patients live in the rural set up and must travel to the hospital for dialysis services increasing their daily expenses. It's of thought that management of ESRD does not surround dietary and fluid control alone but instead it carries many other aspects that requires economic stability in order to achieve better outcomes. The researcher believes economic status of ESRD patients at MTRH may influence their dietary and fluid adherence as they undergo routine hemodialysis. No study has examined economic influence on dietary and fluid adherence among ESRD patients attending hemodialysis in the study area, hence the need for this study.

2.5 Summary of Literature Review

In summary, the study points out that Knowledge and practices among ESRD patients on dialysis is seen to influence adherence practices. In this context, appropriate knowledge and practices of hemodialysis patients is important in diet and fluid adherence. Chan *et al.*, (2012) argues that the renal patients who were knowledgeable and lacked information regarding fluid information and complexity were not compliant to fluid restrictions. Smith K, *et al.*, (2010) argues that patient's knowledge on the illness increases self-efficacy towards fluid adherence. Low level health literacy has been associated with difficulty in following restriction orders such as taking medicines (James, 2013). It also to frequent hospitalizations, high use of emergency services and non- adherence to treatment plans (Berkman *et al.*, 2011). Few studies, in Kenya, have examined knowledge and practices regarding diet and fluid adherence. Furthermore, most studies have produced mixed findings. One of the objectives of this study is to investigate the knowledge and practices of ESRD patients undergoing HD.

Additionally, social support to hemodialysis patients has been associated with better outcomes (Ahrari, Moshki & Bahrami 2014). Family members, friends, health caregivers and significant others have been noted to motivate renal patients on hemodialysis to co-operate and adhere to recommended prescriptions (Ghimire, Castelino, Jose, & Zaidi, 2017). Tannor, Archer, Kapembwa, Van Schalkwyk, and Davids (2017) and Wood (2014) argued that general support from the renal- care team and fellow patients, helps to decrease uncertainty regarding treatment and disease progression, while the patients take control of their kidney condition. ESRD patients visiting MTRH dialysis Centre are almost obvious that they be accompanied by a family member, relative or a Friend. More so, there is regular interaction with

the renal team staff during dialysis treatment creating a conducive environment to evaluate the importance of social support towards adherence of prescribed orders. One of the objectives of this study was to assess the contribution of social support among ESRD patients on sustenance hemodialysis at MTRH.

Management of renal patients is seen to be costly owing to modalities surrounding it like transportation to the dialysis center, purchase of dialysis consumables, and cost of medications among others. Hemodialysis for instance is one of the most effective renal replacement therapy for patients with ESRD prior to renal transplantation, but is expensive and burdensome (Demir, Ercan, Karakas, Ulas & Buyukhatipoglu 2014). Poor economic stability is seen to create negative patient outcomes, increased health care expenses as well heightened workload at dialysis centers as a result of non-adherence behaviors (Chironda & Bhengu 2016). Majority of renal patients attending hemodialysis at MTRH do not have financial security as well as comprehensive medical covers such as National Insurance Health Fund (NHIF). Almost three quarters of these patients live in the rural set up and must travel to the hospital for dialysis services increasing their daily expenses. The researcher believes economic status of ESRD patients at MTRH may influence their dietary and fluid adherence as they undergo routine hemodialysis. No study has examined economic influence on dietary and fluid adherence among ESRD patients attending hemodialysis in the study area, hence the need for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

This chapter presents the study design, study area, the study population, data collection procedures and development of research instruments. It also explains how ethical considerations were adhered to during the study and how dissemination of results will be done.

3.2. Study Design

This was a quantitative cross-sectional study conducted for a period of six weeks from April 1st to 15th may 2018.

3.3 Study Area

This study was carried out at Moi Teaching and Referral Hospital (MTRH). This is the second largest National Referral Hospital in Kenya after Kenyatta National Hospital (KNH). The Hospital is located along Nandi Road in Eldoret town (310 kilometers Northwest of Nairobi the capital city of Kenya), Uasin Gishu County. The study site is selected because it caters for a high turnover of renal patients from the larger Rift valley province, Nyanza and western regions who come for dialysis treatment. The hospital is also equipped with modern machines to ease procedures and diagnoses for various conditions including renal failure. MTRH boasts of highly specialized trained personnel in various fields of medical, surgical and nursing care making it a teaching and a referral center for various diseases.

3.4 Study Population

Patients with ESRD and on sustained hemodialysis for more than a month were recruited for this study.

3.5 Sampling technique

The study applied purposive sampling technique whereby one hundred and forty five (145) patients undergoing haemodialysis twice weekly were recruited from the hospital

3.6 Inclusion Criteria

Participants who were 18 years and above, diagnosed with ESRD and on sustained haemodialysis for more than a month, as well as participants who consented for the study.

3.7 Exclusion criteria

Patients with acute illness or those with psychological or cognitive disorders or physical limitations

3.8 Sample Size Determination

Fisher's formula was used to calculate sample size as represented by the equation below.

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

Where

n = sample size;

N = population size which was taken to be 200 as number seen per year

n_0 = taken to be 384 from the formula where Z^2pq/e^2 where p and e are maximized to 50% and 5%, respectively

Substituting these values in the equation, estimated sample size (n) were:

$$n = \frac{384}{1 + (384 - 1) / 200}$$

n = 145.

3.9 Data collection approaches

Modified end stage renal disease adherence questionnaire (ESRD-AQ) was administered by the researcher to elicit participant's responds on adherence with diet and fluids while undergoing hemodialysis. The questionnaire covered a wide range of interrogations regarding adherence behaviors. Information on socioeconomic dynamics of the participants was also included in the collecting tool. This was presented in a 5 likard scale point that covered variables such as: - I strongly agree, I agree, neutral, I disagree and strongly disagree.

For the purpose of this study, the instrument was modified to cover dietary and fluid structures excluding hemodialysis and medication models of dialysis. The tool has been extensively used to measure adherence among renal patients with acceptable validity and reliability.

3.9.1 Data Analysis and Presentation

Data was analyzed using SPSS computer software version 22. Descriptive statistics (frequencies) were computed for each variable. Data on knowledge, practice and adherence to dietary and fluid intake were compared using a three-way contingency tables and Chi-square (χ^2) used to test associations between variables tested. A two-sample t-test was used to compare two independent groups based on their social support and adherence to diet and fluid restrictions using social support Likert Scale domain. A null hypothesis of no difference between the means of the compared

groups on outcome variable (assessed domains) was rejected where $p \geq 0.05$. Presentations of data was mainly through tables and bar graphs.

3.9.2 Dissemination of Research Findings

The university is to retain a copy of approved dissertation for academic reference and the researcher will likewise retain a copy for future application. The findings of this study will also be published in a reputable public health journals for scholarly purposes.

3.9.3 Ethical Considerations

To ensure that the study complied with the ethical issues pertaining research undertaking, a permission to conduct the research was sought from Moi University and Moi-Teaching and Referral Hospital regulatory and Institutional Ethics Review committee (IERC). A full disclosure of all the activities concerning the study was explained to the authorities and this involved the study intention which was only for academic purposes. A letter of introduction was obtained from Masinde University of Science and Technology to serve as evidence of the purpose of the study. Research authorization and permit was obtained from National Commission for Science, Technology and Innovation (NACOSTI). Respondents participated voluntarily and were free to withdraw from the study any time for any reason without any penalties.

CHAPTER FOUR

RESULTS

4.1 Response Rate

A total of 145 patients on hemodialysis were interviewed. All participated in the study and all responded to the researcher administered questionnaire with a response rate of 100%.

4.2 Demographic characteristics of the Respondents

Table 4.1 shows socio-demographic characteristics of study participants. Most of the participants were females (57.9%) while 42.1% were males. Nearly two-thirds (65.5%) were aged 40 years and above. Sixty-five percent had at least attained secondary level of education. Most were married (66.2%) with majority being Christians (95.9%). Forty-five percent were engaged in agricultural sectors while 22.8% were in private business.

Table 4.1 Socio-demographic characteristics

Variable	Response	n =145	%
Gender	Male	84	57.9
	Female	61	42.1
Age group in years	18 - 25	5	3.4
	26 - 32	24	16.6
	33 - 39	21	14.5
	40 - 46	27	18.6
	47 - 53	33	22.8
	≥54	35	24.1
	Level of education	Primary	51
Secondary		72	49.7
Tertiary		22	15.2
Marital status	Single	49	33.8
	Married	96	66.2
Religion	Christianity	139	95.9
	Islam	3	2.1
	Traditional	3	2.1
Occupation	Business	33	22.8
	Formal employment	24	16.6
	Agriculture	65	44.8
	Other	23	15.9

4.3 Association between knowledge and diet and fluid adherence

Low level of knowledge of fluid adherence was marginally statistically associated with dietary adherence ($p=0.07$) and fluid adherence ($p=0.06$). Whereas a higher proportion of those with low level of knowledge with fluid adherence (83.6%) adhered to diet, a relatively smaller proportion of participants in the same category (58.9%) were compliant with fluid intake. Over two thirds of patients (71.9%) who were aware that they should limit fluid intake to keep their body healthy adhered to fluid intake ($p=0.07$). Again, a similar proportion of patients (71.9%) who were aware of the importance of taking proper diet adhered to fluid intake ($p=0.07$) with marginally statistically significant results. Borderline significant results could be attributed to smaller sample. A multisite study in future with a large sample study may produce statistically significant results

Table 4.2 Association between knowledge and diet and fluid adherence

Explanatory variables	Category	Dietary adherence		P value	Fluid Adherence		p value
		n=112	n=33		n=96	n=49	
		Yes	No		Yes	No	
When diagnosed	< 6 months ago	73.9	26.1	0.2*	67.4	32.6	0.7
	≥6 months	83.0	17.0		64.2	35.8	
Number of times patient weighs self	At the hospital	75.0	25.0	0.1	66.4	33.6	0.9
	Different times	94.1	5.9		64.7	35.3	
Low level of knowledge on diet adherence	Low	73.1	26.9	0.1	62.4	37.6	0.2
	Average or high	84.6	15.4		73.1	26.9	
Low level of knowledge on fluid adherence	Low	83.6	16.4	0.07	58.9	41.1	0.06
	Average or high	70.8	29.2		73.6	26.4	
Sources for information about diet and fluid	Yes	72.7	27.3	0.6	63.6	36.4	0.8
	No	78.1	21.9		66.7	33.3	
Importance of limiting fluid intake	Because of kidney and to keep body healthy	75.3	24.7	0.5	71.9	28.1	0.07
	Health staff told me to do so or I got sick	80.4	19.6		57.1	42.9	
Importance of taking proper diet	To keep body healthy	75.3	24.7	0.5	71.9	28.1	0.07
	I would get sick if I don't	80.4	19.6		57.1	42.9	

*Fishers Exact Test

4.4 Association between practice and diet and fluid adherence

Table 4.3 shows the association between practice factors and diet and fluid adherence. The practice factors that had significant relationship with dietary adherence were the frequency of adhering to fluid restrictions all the time (p=0.003) where by a smaller proportion of this category adhered to diet (62.5%) against a

higher proportion (84.5%) who did not adhere to dietary requirements. It's also noted that the frequency in which health staff talked about importance of following proper diet Every dialysis treatment or every week produced statistically significant results ($p < 0.0001$). A similar trend was seen where a smaller proportion of participants (61.3%) practiced dietary restriction verses (94.3%) who didn't.

The study also found that those who had no difficulty in keeping dietary recommendations practiced fluid adherence ($p=0.003$). Most of such participants (80%) practiced dietary adherence as compared to (56.5%) who had some difficulty: in keeping dietary recommendations

Table 4.3 Association between practice and diet and fluid adherence

Explanatory variables	Category	Dietary adherence		p value	Fluid Adherence		p value
		n=112	n=33		n=96	n=49	
		Yes	No		Yes	No	
Last time talked to health professional about fluid restrictions	This week or last week	72.9	27.1	0.2	67.1	32.9	0.8
	≥ 1 month	81.3	18.7		65.3	34.7	
How often follows fluid restrictions	All of the time	62.5	37.5	0.003	66.7	33.3	0.9
	Most often or less	84.5	15.5		66.0	34.0	
How often health staff talk about importance of following a proper diet	Every dialysis treatment or every week	61.3	38.7	<0.0001	64.0	36.0	0.6
		94.3	5.7		68.6	31.4	
How difficult it is to follow dietary recommendations	A little difficult	78.1	21.9	0.8	71.2	28.8	0.2
	Difficult	76.4	23.6		61.1	38.9	
Difficulty experienced in keeping dietary recommendations	No difficulty	73.3	26.7	0.3	80.0	20.0	0.003
	Some difficulty	80.0	20.0		56.5	43.5	

4.4 Comparison between social support and economic dimensions and diet adherence

Findings on two-sided t –test on the relationship between social support and economic alterations and dietary adherence is presented in Table 4.4. There was a significant association between social support dimension that helps patient cope and practice dietary adherence. Patients who agreed that various social support aspects improves depression, self-esteem, self-management and who adhered to diet scored a significantly higher mean of 5.6 (95% CI = 5.5 – 5.6). The non-adherent counterparts had a mean of 5.5 (p = 0.0006) suggesting social support had a positive influence on adherence to dietary restrictions. Again, participants who agreed that economic alterations affect diet adherence scored a marginally significant higher mean of 5.4 (95% CI = 5.3 – 5.5) in contrast to non-adherent colleagues who had a mean of 5.2 (p = 0.06). This implies that economic changes affect diet adherence. The results however did not show a positive influence of socioeconomic dimensions on fluid adherence (p> 0.05).

Table 4.4 Comparison between social support and economic dimensions and diet adherence

Dimensions	Category	N	Mea n	SD	df	t-test	95% CI	p value
Feelings about support from others	Diet adherent	112	4.6	0.8	143	-0.71	4.6 – 4.8	0.5
	Diet non-adherent	33	4.7	4.7			4.5 – 3.0	
Feelings about support from family	Diet adherent	112	5.5	0.3	143	-0.89	5.4 – 5.6	0.4
	Diet non-adherent	33	5.4	0.6			5.2 – 5.5	
Social support that helps cope with adherence to diet	Diet adherent	112	5.6	0.1	143	-3.50	5.5 – 5.6	0.0006
	Diet non-adherent	33	5.5	0.2			5.4 – 5.5	
Economic alterations affect diet adherence	Diet adherent	112	5.4	0.4	143	-1.93	5.3 – 5.5	0.06
	Diet non-adherent	33	5.2	0.5			5.1 – 5.4	

4.5 Association between economic status and adherence to diet and fluid

Among the economic factors with statistical significant with diet adherence were; use of bus for transport ($p=0.02$). A higher proportion of such participants (83.3%) followed their dietary orders in contrast to (67.3%) in the same category who did not. The study established that; those who earned income of less than KSH 30,000 per month practiced dietary adherence ($p=0.006$). Most patients in this category (84.6%) followed their dietary orders against (64.8%) who failed to follow such orders.

Again, those who claimed that the overall cost of managing ESRD was expensive, a lesser proportion (68.8%) practiced dietary adherence as compared to (87.7%) who did not ($p=0.007$).

Participants who accessed material support from any source also practiced dietary adherence ($p=0.003$). A lesser proportion of such participants (69.8%) observed food adherence as compared to (91.8%) who failed to do so. With regard to economic status factors influencing fluid adherence, only one factor produced significant results. Those who claimed that lack of transport was the main reason for missing dialysis treatment, a significantly smaller proportion (44%) adhered to fluid restriction ($p=0.01$) in comparison to 70.8% who had transport and were non-adherent.

Table 4.5 Association between economic status and adherence to diet and fluid

Explanatory variables	Category	Dietary adherence		P value	Fluid Adherence		p value
		n=112	n=33		n=96	n=49	
		Yes	No		Yes	No	
Misses dialysis	Yes	70.5	29.5	0.1	60.7	39.3	0.2
	No	82.1	17.9		70.2	29.8	
Reason for missing dialysis is lack of transport	Yes	80.0	20.0	0.7	44.0	56.0	0.01
	No	76.7	23.3		70.8	29.2	
Uses bus for transport	Yes	83.3	16.7	0.02	67.8	32.2	0.6
	No	67.3	32.7		63.6	36.4	
Income (KSh. Per month)	<30,000	84.6	15.4	0.006	67.0	33.0	0.8
	≥30,000	64.8	35.2		64.8	35.2	
Income affects diet and fluid adherence	Yes	80.6	19.4	0.3	59.7	40.3	0.1
	No	74.0	26.0		72.6	27.4	
Treatment cost	Expensive	68.8	31.2	0.007	67.5	32.5	0.7
	Very expensive	87.7	12.3		64.6	35.4	
Able to access material support that helps in adherence	Yes	69.8	30.2	0.003	70.8	29.2	0.1
	No	91.8	8.2		57.1	42.9	

CHAPTER FIVE

DISCUSSION

5.1 Overview

The study assessed determinants of diet and fluid adherence among end stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital-Uasin- Gishu County. This section presents the discussion of results.

5.2 Association between knowledge and diet and fluid adherence

Patient's knowledge about their disease process is of great importance because it enables them to process and understand basic health information and services needed for appropriate health behavior. Renal patients in particular should be knowledgeable of their condition and more so their management plans for better outcomes. One of the specific objectives of this study was to understand knowledge factors associated with diet and fluid adherence among ESRD patients undergoing hemodialysis at MTRH.

Overall, nutritional knowledge among patients undergoing HD at MTRH was not predictive of either dietary or fluid adherence with results being marginally statistically important ($p>0.05$). Whereas a higher proportion of those with low level of knowledge with fluid adherence (83.6%) adhered to diet, a relatively smaller proportion of participants in the same category (58.9%) were compliant with fluid intake. Participants who knew the importance of following proper dietary orders as well as controlling their fluid intake, did not reciprocate appropriately. Similar are the findings of Opiyo *et al.*, (2019) who found out that adherence to diet prescription was low among hemodialysis patients who were all aware of the recommended foods for their health condition. Again Beerendrakumar *et al.*, (2018) established that in spite of the dietary counseling, considerable number of the patients were non -

adherent to the diet and fluid restrictions. Patients with low nutritional knowledge as seen in the findings of this study are noted to be struggling with dietary and fluids plans. This is notable in terms of increased IDWG and deranged electrolyte levels increasing both morbidity and mortality rates. Non-adherence in this category could be attributed to many factors like the language used during counselling sessions or even the level of education together with the social support received.

Past studies points out the importance of nutritional health literacy particularly among patients on HD indicating that accurate nutrition knowledge may be particularly important when individuals are ready to make dietary changes. (Smith *et al.*, 2010) pointed out that Knowledge is the chief facilitator of positive adherence to fluid restriction, with accurate self-assessment. Non-adherence is an indicator of client's incapability not to incorporate the treatment strategies into their desired lifestyle. The clinical outcomes on poor adherence with fluid and diet leads to increased inter-dialytic weight gain (IDWG), cardiovascular disorders, frequent hospitalization and increased volume removal during hemodialysis. It's also associated with elevated risk for mortality Olone, Visser, Finney, *et al.*, (2014) & Michelle *et al.* (2017). On the other hand poor adherence to dietary restrictions leads to elevated serum phosphorous causing greater risk of death in hemodialysis patients. Serum potassium levels of above 5.5mEq/L for instance leads to ventricular arrhythmias and death McDonald, Oram, & Vaidya (2015). The findings of this study concluded that low level of knowledge on fluid adherence had positive outcome on dietary adherence and negative outcome on fluid adherence. The study emphasizes continued nutritional counselling by the renal team as well as social support from the family members or significant others.

5.3 Association between practice and diet and fluid adherence

Optimal outcome of renal patients on hemodialysis results from strict practice of what is instructed to them by the health care givers. This study sought to establish practice factors associated with diet and fluid adherence. A significant statistical association was noted with dietary adherence where a smaller proportions of participants (62.5%) practiced fluid restrictions all the time as compared to (84.5%) who did not practice fluid restrictions ($p=0.003$). A similar trend was also noted among participants who had no difficulty in keeping dietary recommendations whereby most of them (80%) practiced fluid adherence against (56.5%) who experienced some difficulty in keeping dietary recommendations ($p=0.003$). Our findings may imply that participants who practice fluid adherence all the time may also do dietary adherence and vice versa. A significant statistical results was also seen on the frequency in which health staff talk about importance of following proper diet every dialysis treatment or every week even though a smaller proportion (61.3%) practiced dietary adherence ($p < 0.0001$). Past studies demonstrate that health care professional engagement with renal patients help improve self- care and treatment. Luhr, Holmefur, Theander, & Eldh (2018) argues that mutual dialogue with patients is not only a route to shared decision making and self- care, but constitutes participation in itself. It's noted that effective collaboration and dialogue in exchange of information leads to mutual understanding between Health care professionals and patients promoting patient participation suitable for dialysis care (Hakansson Eklund, Holmstrom, Kumlin, *et al.*, 2019).

In this study, participants who received a health talk at every dialysis session or every week regarding dietary and fluid adherence had a positive outcome towards dietary adherence. Continued nutritional counselling among Patients with ESRD

helps them to be acquainted with their disease, symptoms, self-care treatment as well providing opportunities for the HCPs to support and appreciate the patient's competence and knowledge. This patient engagement leads to exchange of ideas and experiences with staff and fellow patients, thereby improving their own care. It's argued that health care professionals (HCPs) in dialysis care can recognize patient's experience and priorities that can enable them facilitate patient's active involvement in their own care and preferences (Asplin, Carlsson, Ziden, Kjellby-Wendt, 2017).

Although HCP's involvement can promote positive patient participation and change of behavior towards correct dietary and fluid adherence, clinical tools to support consensus patient participation in dialysis care are warranted for the sake of the individual's health and autonomy (Nolte, Merkur & Anell (2019). Incompetence among HCP's in promoting patient's engagement in daily live activities are seen to be barriers for patient participation. On the other hand, increased knowledge and education promotes patient participation, particularly in terms of self-care Ramezani, Sharifirad, Rajati & Mohebi (2019).

5.4 A comparison between social support and economic dimensions and diet adherence

Findings on two-sided t-test revealed a significant association between social supports that helps patient cope with dietary restrictions. Patients who agreed that various social support aspects improve depression, self-esteem, self-management, etc and who adhered to diet scored a significantly higher mean of 5.6 (95% CI = 5.5 – 5.6). The non-adherent counterparts had a mean of 5.5 (p = 0.0006) suggesting social support had a positive influence on adherence to dietary restrictions.

The treatment regimens of CKD is complex and demanding with negative impact on patient's life. The disease is known to restrict daily activities, employment, family life, and social relationships. Social support of friends, family and renal health professionals as well as family dynamics have been found to positively influence adherence among chronic kidney failure (Ghimire, Castelino, Jose, & Zaidi, 2017). In this study, patients who agreed that various social support aspects improves depression, self-esteem, self-management, etc and who adhered to diet scored a significantly higher mean as compared to non-adherent counterparts suggesting social support had a positive influence on adherence to dietary restrictions. Purves (2015) in his qualitative study to establish experience with home hemodialysis found out that emotionally and genetically related family members or patients can have significance influence on the patient's engagement on their own. Excellence in care requires more than just the best care in diagnosis and treatment; it also requires care that addresses every aspect of patient's experience. Ramirez, *et al.*, (2012) argues that social support and coping strategies are known to reduce distresses and improve patient outcomes. Clarke, *et al.*, (2015) points out that social support of friends, family and renal health professionals' as well family dynamics have been found to improve adherence among CKD patients. Enormous literature have pointed out the importance of social support in patients with chronic diseases however it has been noted that the practice is not guaranteed in some cultures whereby patients perceive lack of support by their own networks is caused by discrimination related to their illness causing negative effects like depression and self-isolation BPD, Schwartz & Beuter *et al.*, (2015). Similar are the findings of Pourghane *et al.*, (2014) who reported that certain supportive behaviors do not contribute to patients' well-being, and instead can also damage it in some ways.

In regard to economic factors associated with diet and fluid adherence. The study found out that economic alterations affect diet adherence as observed in participants who scored a marginally higher mean of 5.4 (95% CI = 5.3 – 5.5) in contrast to non-adherent colleagues who had a mean of 5.2 ($p = 0.06$). This implies that economic changes affect diet adherence. Overall management of renal patients is costly owing to modalities surrounding it like transportation to the dialysis center, purchase of dialysis consumables, and cost of medications among others. Most participants in this study were covered by National Hospital Insurance Fund (NHIF) which was limited to dialysis alone. Finances to buy medications, travel to the hospital, or buy the right food was met by the patients themselves. Economic hardship in low and middle income countries is particularly high and may force patients to skip or abandon important management regimens (Mushi *et al.*, 2015). This study also found out that a higher proportion of participants (83.3%) who used bus as a means of transport to dialysis center practiced dietary adherence as compared to those who used alternative means of transport ($p=0.02$). The implication here is that participants using public means of transport to dialysis center may have saved their money in order to purchase food or medications that help them to stick with adherence orders. Again patients who accessed economic support that help in dietary adherence demonstrated better compliance to food although on a smaller scale ($p=0.003$). Lack of economic access or stability leads to reduced frequency of dialysis and eventually of therapy James (2013).

CHAPTE SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Overview

This chapter presents the summary of the findings according to the objectives of the study. It also points out recommendations and suggestions for further studies.

6.2 Knowledge and Practice of Diet and Fluid adherence among End Stage Renal Disease Patient undergoing HD at MTRH Eldoret

This study sought to establish knowledge factors related to dietary and fluid adherence. It found out that low level of knowledge with fluid adherence was marginally associated with dietary adherence ($p=0.07$) and fluid adherence ($p=0.06$). Whereas a higher proportion of those with low level of knowledge with fluid adherence (83.6%) adhered to diet, a relatively smaller proportion of participants in the same category (58.9%) were compliant with fluid intake. Over two thirds of patients (71.9%) who were aware that they should limit fluid intake to keep their body healthy adhered to fluid intake ($p=0.07$). Again, a similar proportion of patients (71.9%) who were aware of the importance of taking proper diet adhered to fluid intake ($p=0.07$) with marginally statistically significant results.

Among the practice factors that had significant relationship with dietary adherence were the frequency of adhering to fluid restrictions all the time ($p=0.003$) where by a smaller proportion of participants in this category adhered to diet (62.5%) against a higher proportion (84.5%) who did not adhere at all. It's also noted that the frequency in which health staff talked about importance of following proper diet every dialysis treatment or every week produced statistically significant results ($p < 0.0001$). A similar trend was again seen where a smaller proportion of participants (61.3%) practiced dietary restriction verses (94.3%) who didn't.

The study also found that those who had no difficulty in keeping dietary recommendations practiced fluid adherence ($p=0.003$). Most participants in this category (80%) practiced dietary adherence as compared to (56.5%) who had some difficulty in keeping dietary recommendations

6.3 The contribution of social support aspects on dietary and fluid adherence among ESRD undergoing HD at MTRH- Uasin- Gishu County

The study assessed the contribution of social support and adherent to dietary and fluid among patients receiving HD. The findings revealed a significant association between social supports that helps patients cope up with dietary adherence. Those who agreed that various social support from family, friends and medical professionals helped them to adhere to their diet and fluid recommendations scored a significantly a higher mean of 5.6 (95% CI = 5.5 – 5.6) in contrast to non-adherent counterparts who had a mean of 5.5 ($p = 0.0006$) suggesting that social support had a positive influence on adherence to dietary restrictions.

6.4 Impact of Economic Status on Diet and Fluid Adherence among End Stage Renal Disease Patients on Hemodialysis at MTRH

Participants who agreed that economic alterations affect diet adherence scored a marginally significant higher mean of 5.4 (95% CI = 5.3 – 5.5) in contrast to non-adherent colleagues who had a mean of 5.2 ($p = 0.06$). This implies that economic changes affect diet adherence. The results however did not show a positive influence of socioeconomic dimensions with fluid adherence ($p > 0.05$). Other economic factors with statistical significant with diet adherence were; use of bus for transport ($p=0.02$) whereby a higher proportion of such participants (83.3%) followed their dietary orders in contrast to (67.3%) in the same category who did not.

The study also established that participants who earned income of less than KSH 30,000 per month practiced dietary adherence ($p=0.006$). Most patients in this category (84.6%) followed their dietary orders against (64.8%) who failed to follow such orders. Again, those who claimed that the overall cost of managing ESRD was expensive, a lesser proportion of participants (68.8%) practiced dietary adherence as compared to (87.7%) who did not ($p=0.007$).

Participants who accessed material support from any source also practiced dietary adherence ($p=0.003$). A lesser proportion of such participants (69.8%) observed food adherence as compared to (91.8%) who failed to do so. In regard to fluid adherence, only one factor produced significant results. Those who claimed that lack of transport was the main reason for missing dialysis treatment, a significantly smaller proportion (44%) adhered to fluid restriction ($p=0.01$) in comparison to 70.8% who had transport and were non-adherent.

6.5 Conclusion

The study concluded that low level of knowledge with fluid adherence had positive outcome on dietary adherence and negative outcome on fluid adherence. The importance of limiting fluid intake and taking proper diet positively influenced fluid adherence whereas following fluid restrictions all the time and health education conducted by staff on importance of following a proper diet did not translate into dietary adherence. The study found out that patients who had no difficulty in keeping dietary recommendations were more adherent to fluid restrictions. Provision of social support among ESRD patients on hemodialysis had a positive association towards dietary adherence.

In regard to economic aspects, the study concludes that; use of bus for transport and income of less than KSh. 30,000 were positively associated with dietary adherence.

Participants who cited the cost of treatment being expensive of and accessed material support that helps in adherence negatively influenced dietary adherence. On the other hand, lack of transport as a reason for missing dialysis is negatively associated with fluid adherence.

6.6 Recommendations

The study, recommends that the renal team should educate patients on the importance of limiting fluid intake and taking proper diet. It also points out renal nutritionist should follow up on patients who experience difficulty in keeping dietary recommendations as they are more likely to be non-adherent to fluid restrictions. The study emphasizes the need for social support from the relatives and the renal team throughout patient's dialysis sessions. Due to high cost of dialysis and expenses that patients incur, the national and county governments should decentralize management of hemodialysis patients to sub-county hospitals to minimize adherence challenges due to transport and other costs

6.7 Suggestions for Further Studies

- Further research on determinants of adherence among ESRD patients on HD at MTRH covering the four aspects surrounding renal patients (hemodialysis, treatment, dietary, and fluid orders) should be conducted in order to produce generalized results.
- New research of this nature should be conducted to evaluate socio-behavioral changes among ESRD patients on hemodialysis maintenance.

REFERENCES

- Abbate R, Mannucci E, & Cioni G, (2012). Diabetes and sex: from pathophysiology to personalized medicine. *Intern Emerg Med*; 7 suppl 3:S215–S219
- Ahrari, S., Moshki, M., & Bahrami, M. (2014). The relationship between social support and adherence of dietary and fluids restrictions among hemodialysis patients in Iran. *Journal of Caring Sciences* 3(1), 11-19
- Alpers, D. H. (2002). *Manual of nutritional therapeutics*, 4th ed. Philadelphia, Lippincott, Williams and Wilkins.
- Alnazly E. (2016). Coping strategies and socio-demographic characteristics among Jordanian caregivers of patients receiving hemodialysis. *Saudi journal of kidney diseases and transplantation* 27(1), 101-106
- Asplin G, Carlsson G, Ziden L, Kjellby- Wendt G (2017). Early coordinated rehabilitation in acute phase after hip fracture — a model for increased patient participation. *BMC Geriatr.* ; 17:240.
- Beerendrakumar N, Ramamoorthy L, Haridasan S. (2018). Dietary and fluid regime adherence in chronic kidney disease patients. *J Caring Sci.*;7(1):17 –20.
- Berkman, N. D. Sheridan S.L, Donahue K.E, Halpern D. J & Crotty K. (2011). Low health literacy and health outcomes: an updated systematic review. *Annals of internal medicine*; 155(2):97-107
- BPd S, Schwartz E, Beuter M, et al (2015). Consequences attributed to kidney transplantation: *critical incident technique*. 24:748–55.
- Brega, A.G, Ang A, Vega W, Jiang L, Beals J & Mitchell C.M, (2012). Mechanism underlying the relationship between health literacy and glycemic control in American Indians and Alaska Center for Disease Control and Prevention; *Patient Education and Counseling*, 88(1), 61-68.
- Browne T, Merighi J. R. (2010). Barriers to adult hemodialysis patients' self-management of oral medications; *American journal of kidney diseases*; 56(3): 547-57
- Bonner, A., Havas, K., Douglas, C., Thepha, T., Bennett, P., & Clark, R. (2014). Self- management programmes in stages 1–4 chronic kidney disease: A literature review. *Journal of Renal Care*, 40(3), 194–204.
- Clarke, A.L, Young, H.M, Hull, K.L, Hudson, N, & Burton, J.O, (2015). Motivations and barriers to exercise in chronic kidney disease: a qualitative study. *Nephrol Dialysis Transplant* 30: 1885-1892.
- Chan Y. M, Zalilah MS, & Hii S. Z. (2012) Determinants of Compliance Behaviours among Patients Undergoing Hemodialysis in Malaysia; *PLoS ONE* 7(8): e41362.
- Chironda G, Bhengu B. (2016) Contributing Factors to Non-Adherence among Chronic Kidney Disease (CKD) patients: A Systematic Review of Literature. *Med Clin Rev.*, 2:4.

- Chironda, G., Bhengu, B., & Manwere, A. (2017). Adherence of adult chronic kidney disease patients with regard to their dialysis, medication, dietary and fluid restriction. *Research Journal of Health Sciences*, 5(1), 3–17.
- Cupisti A, Brunori G, Di Iorio BR, D'Alessandro C, Pasticci F, &Cosola C, (2018) Nutritional diet therapy in the management of the patient with chronic kidney disease in advanced phase to delay the beginning and reduce the frequency of dialysis. An option also in the pre-emptive transplant program. *G Ital Nefrol.*;35:5
- Deif, H. I. K. Elsawi, M. Selim, & NasrAllah, M.M.M. (2015) “Effect of an educational program on adherence to therapeutic regimen among chronic kidney disease stage5 (CKD5) patients under maintenance hemodialysis,” *Journal of Education and Practice*, 6 (5)21–33
- Demir ME, Ercan Z, Karakas EY, Ulas T, &Buyukhatipoglu H. (2014) chronic kidney disease: recurrent acute kidney failure in a patient with Crohn's disease. *N Am J Med Sci.*; 6(12):648–9. doi: 10.4103/1947-2714.147983.
- Elmas A, Erbay Saral E, Tugrul A, Sengül E, &Bülbül, F (2012) The Relationship between the level of nutritional education and clinical and laboratory findings in Hemodialysis Patients. *Medical Journal of Kocaeli* 3: 23-26.
- Gellad, W.F. Grenard J. L & Marcum Z. A. (2011). A systematic review of barriers to Medication adherence in the elderly: looking beyond cost and regimen complexity. *The American journal of geriatric pharmacology*; 9(1):11-23
- Ghimire, S., Castelino, R. L., Jose, M. D., & Zaidi, S. T. R. (2017). Medication adherence perspectives in haemodialysis patients: *A qualitative study. BMC Nephrology*, 18(1), 167.
- Goswami S., Bhowmick S., Majumdar A., Sikdar S., C.T. CN S (2014). Appropriateness and efficacy of the use of erythropoietin in hemodialysis patients in an Eastern Indian population. *History*, 17 pp. 15-22
- Hakansson Eklund J, Holmstrom IK, &Kumlin T, (2019) "Same same or different?" A review of reviews of person- centered and patient- centered care. *Patient Educ Couns.* ; **102:3-** 11.
- James, J.A. (2013) patient Engagement: People actively involved in their health and health care tend to have better Outcomes– and, some evidence suggests, lower costs. Project HOPE.
- Kayikcioglu, M, Tumuklu M, Ozkahya M, Ozdogan O, Asci G,&Duman S, (2009)The benefit of salt adherence in the treatment of end-stage renal disease by haemodialysis. *Nephrology Dialysis Transplantation*; 24(3):956-62
- Lilympaki, I., Makri, A., Vlantousi, K., Koutelekos, I., Babatsikou, F., & Polikandrioti, M. (2016). Effect of perceived social support on the levels of anxiety and depression of haemodialysis patients. *Materia Sociomed*, 28(5), 361–365.

- Liyanage T, Ninomiya T, Jha V, Neal B, Patrice HM, Okpechi I, (2015) Worldwide access to treatment for end-stage kidney disease: a systematic review. *Lancet*. 2015; 385: 1975–82. Pmid: 25777665
- McDonald TJ, Oram RA, Vaidya B. (2015). Investigating hyperkalaemia in adults. *BMJ*: 351 h4762.
- Marie Claire Mukakarangwa, Geldine Chironda, Busisiwe Bhengu, & Godfrey Katende (2018) “Adherence to Hemodialysis and Associated Factors among End Stage Renal Disease Patients at Selected Nephrology Units in Rwanda ;*Nursing Research and Practice Volume 2018, Article ID 4372716,*
- Maxia, S., Loi, V., Capizzi, I., Piccoli, G. B., Cabiddu, G., & Pani, A. (2016). Compliance, illiteracy and low-protein diet: Multiple challenges in CKD and a case of self-empowerment. *BMC Nephrology*, 17(1), 138.
- Mushi L., Marschall P., Fleßa S.(2015) The cost of dialysis in low and middle-income countries: A systematic review. *BMC Health Services Research*. 2015;15(1, article no. 506)
- Naalweh, K. S., Barakat, M. A., Sweileh, M. W., Sa'ed, H. Z., Al- Jabi, S. W., & Sweileh, W. M. (2017). Treatment adherence and perception in patients on maintenance haemodialysis: A cross- sectional study from Palestine. *BMC Nephrology*, 18(1), 178.
- National Kidney Foundation. Kidney Disease Quality Outcomes Initiative (K/DOQI). (2010)
- Neri, L, Brancaccio, D, Rocca Rey LA, Rossa F, &Martini A, (2011) Social support from health care providers is associated with reduced illness intrusiveness in hemodialysis patients; *Clinical nephrology* ; 75(2):125-34.
- Nolte E, Merkur S, Anell A.(2019). Achieving person- centred health systems: Trends, strategies and challenges. European Observatory on Health Systems and Policies & Vårdanalys .[in progress; manuscript for expert review].
- Luhr K, Holmefur M, Theander K, Eldh AC (2018). Patient participation during and after a self- management programme in primary healthcare – The experience of patients with chronic obstructive pulmonary disease or chronic heart failure. *Patient Educ Couns*;101:1137- 1142.
- Mitch, W.E. (2007) Chronic kidney disease. Cecil Medicine (23rd edn.) Philadelphia, Pa: Saunders Elsevier.
- Naderifar M, Zagheri Tafreshi M, Ilkhani M, Reza Akbarizadeh M.(2019) Correlation between quality of life and adherence to treatment in hemodialysis patients; *Journal of Renal Injury Prevention* 8(1):22-27.
- Opiyo, R.O., Nyasulu, P.S., &Olenja, J. (2019) Factors associated with adherence to dietary prescription among adult patients with chronic kidney disease on hemodialysis in national referral hospitals in Kenya: a mixed-methods survey. *Ren Replace Ther* 5, 41.

- Olone EL, Visser A, &Finney H, (2014). Clinical significance of multi-frequency bioimpedance spectroscopy in peritoneal dialysis patients: independent predictor of patient survival. *Nephrol Dial Transplant*. 29: 1430–1437.
- Plantinga, L. C., Fink, N. E., Harrington-Levey, R., Finkelstein, F. O., Hebah, N., & Powe, N. R., (2010). Association of Social Support with Outcomes in Incident Dialysis Patients. *Clinical Journal of the American Society of Nephrology*, 5(8), 1480-1488
- Pourghane P, Hosseini M, Mohammadi F, Ahmadi F, Tabari R. (2014). Living within limits: Unpleasant experiences from the perspective of patients after cardiac surgery, a content analysis study. *Joundishapur J Chronic Dis Care.*; 3(3):1–9.
- Shahgholian, N, &Yousefi H. (2015) Supporting hemodialysis patients: A phenomenological study. *Iranian journal of nursing and midwifery*; 20(5):626-33
- Sokwala A. (2018.) Kidney disease cases increasing at alarming rate. Business Daily March 7. 2018; Sect. *Health and Fitness*.
- Quinlan, P. Price K.O, Magid S.K, Lyman S, Mandl L.A, & Stone P.W. (2013) The relationship among health literacy, health knowledge, and adherence to treating patients with rheumatoid arthritis. *HSS journal: the musculoskeletal journal of hospital for special surgery*; 9(1):42-9
- Rambod M, Peyravi H, Shokrpour N, Sareban MT (2010) Dietary and fluid adherence in Iranian haemodialysis patients. *The Health Care Manager* 29: 359-364
- Ramezani T, Sharifirad G, Rajati M, &Mohebi S (2019). Effect of educational intervention on promoting self- care in hemodialysis patients: Applying the self- efficacy theory. *J Educ Health Promot.* ; 8:65.
- Purves, C.S (2015) patient’s experience with home hemodialysis: a qualitative study. University of Ontario institute of Technology
- Sigamani, A. (2012). Prevalence, risk factors and awareness of hypertension in India: A systematic review. *Journal of Human Hypertension* 27:281–287
- Sanders, K. A., Whited, A., & Martino, S. (2013). Motivational interviewing for patients with chronic kidney disease. *In Seminars in Dialysis (Vol. 26, No. 2, pp. 175–179)*. Bethesda, USA: Blackwell Publishing.
- Smith K, Coston M, Glock K, Elasy TA, &Wallston KA, (2010) Patient perspectives on fluid management in chronic haemodialysis. *J Renal Nutri* 20: 334-341
- Tannor, E. K., Archer, E., Kapembwa, K., Van Schalkwyk, S. C., & Davids, M. R. (2017). Quality of life in patients on chronic dialysis in South Africa: A comparative mixed methods study. *BMC Nephrology*, 18(1), 4.
- Vasilopoulou C, Bourtsi E, Giaple S, Koutelekos I, Theofilou P, &Polikandrioti M. (2015). The Impact of anxiety and depression on the quality of life of hemodialysis patients: *Global journal of health science*; 8(1):45-55

- Viswanathan, M., Golin C.E., Jones, C.D., Ashok, M., Blalock, S.J, &Wines, R.C, (2012). Interventions to improve adherence to self-administered medications for chronic diseases in the United States: a systematic review. *Annals of internal medicine* 157(11):785-95
- Wood, E. (2014). Patient- to- patient peer support in renal care: What, why and how? *Journal of Renal Nursing*, 6(5), 239–243.
- World Health Organization (2010). Global status report on non-communicable diseases, WHO Library Cataloguing-in-Publication.
- Yang W, Xie D, &Anderson AH, (2014). Association of kidney disease outcomes with risk factors for CKD: findings from the Chronic Renal Insufficiency Cohort (CRIC) study. *Am J Kidney Dis*; 63:236–243.
- Yuen S.-K., Suen H. P., Kwok O.-L., Yong S.-P., &Tse M.-W.(2016). Advance care planning for 600 Chinese patients with end-stage renal disease. *Hong Kong Journal of Nephrology*; 19:19–27.
- Zyoud SH, Daraghmeh DN, Mezyed DO, Khdeir RL, Sawafta MN, Ayaseh NA, Tabeeb GH, Sweileh WM, Awang R, Al-Jabi SW (2016). Factors affecting quality of life in patients on haemodialysis: a cross-sectional study from Palestine. *BMC Nephrol*. 17(1):44.

APPENDICES

APPENDIX I: INFORMED CONSENT FORM

Greetings! My name is John K. Toroitich, an MSc nursing student at Masinde Muliro University of science and technology. I am conducting a research as part of the requirement for the award of master's degree in nursing. The research is seeking to establish **determinants of dietary and fluid adherence among end stage renal disease patients undergoing hemodialysis at Moi-Teaching and Referral Hospital**. It is of concern that most patients on hemodialysis still encounter poor dietary and fluid adherence as required in their management regimens. The understanding of this may help in putting right measures and policies in place so that better patient outcome can be realised. I do invite you therefore to respond voluntarily to the questions on the self-administered questionnaire which will take you about 30 minutes to complete it. You will be then required to return it to the researcher after signing for the purpose of statistical analysis.

The study does not require you to be subjected into laboratory investigations or any vigorous exercise in order to generate information and thus it poses no potential risk at all. Your participation does not earn you any benefit at all except the information that may be disseminated back to you after the research. All data collected from you will be coded with a unique number in order to protect your identity so that there will be no way to connect your name with your data. You are free to withdraw from participating in this study any time for any reason if you feel so without any coercing or disservice of any kind. A copy of the study results may be obtained upon your request by conducting the following.

1. Moi-Teaching and Referral Hospital P.o Box 3 Eldoret.
2. John K. Toroitich (principle investigator) through the mobile number **0722261199** or email at **john_toro2006@yahoo.com**

If you are comfortable with above information and wish to participate voluntarily in this study, kindly append your signature or your thumb print upon explanation by the investigator or an interpreter you trust.

Participant signature Date

Participant thumb print Date

(If cannot sign)

Investigator signature Date

APPENDIX II QUESTIONNAIRE –adapted from ESRD -AQ

Eligible participants are patients undergoing hemodialysis at Moi Teaching and referral Hospital – Eldoret

Purpose of Research

The purpose of this study is to investigate: “**Determinants of diet and fluid adherence among end stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital-Eldoret, Kenya**”. This survey asks for your opinion about how well you follow your dialysis treatment schedule and about medical recommendations related to medication, diet, and fluid intake. This information will help us to understand if you have difficulty following your dialysis treatment, medication regimen, fluid adherence, and recommended diet. Please answer every question by marking the appropriate box. If you are unsure about how to answer, please choose one best answer that applies to you. Information collected will be confidential and used only for this study. Do not indicate your name anywhere.

Identification

Identifier	Details e.g	Actual Details	ID Code
Initials of the Researcher			
County			
Name of Sub-County			
Name of the Hospital			
Responded Number			

FOR DATA ENTRY: Overall Household Questionnaire NO: _____ OF

100 Questionnaires

SECTION A: CLINICAL and DEMOGRAPHIC CHARACTERISTICS				
No.	Questions	Responses	Codes	Skips
1.	Gender	Male Female	1 2	
2.	Please indicate which age bracket-How old are you in years?	Age Brackets (in years): 18-25 26-32 33-39 40-46 47-53 54 and above	1 2 3 4 5 6	
3	What is your highest level of education?	Never attended school Vocational training only Primary Secondary Tertiary Other (specify):_____	1 2 3 4 5 99	
4	What is your occupation?	Business Formally employed Agriculture Other (specify):_____	1 2 3 99	
5	What is your current marital status?	Single Married Divorced / Separated Widowed Living together / living in communion Other (specify):_____	1 2 3 4 5 6 99	
6	What is your religion?	Christianity Islam Traditional None Other (specify):_____	1 2 3 4 99	
7	What was the stage of your kidney disease when you were diagnosed?	Acute Chronic Other specify.....	1 2 99	
8	If Acute, Please state/highlight the services you received in the hospital	Acute	Service	Duration
		Medication		
		Conservative management		
		Dialysis		
		Referred		
9	If chronic, Please State/Highlight the services you	Chronic	Service	Duration

	received in the hospital	Medication		
		Conservative		
		Dialysis		
		Referred		
10	What was your primary diagnosis of renal disease?	Hypertension Diabetes mellitus Glomerulonephritis Other Specify_____	1 2 3 99	
SECTION B: Knowledge and Practice of Diet and Fluid adherence in End Stage Renal Disease Patient				
11	When were you diagnosed with End Stage renal disease?	3 Months ago 6 Months ago 12 Months ago Over one year Other Specify_____	1 2 3 4 99	
12	When did you start dialysis?	Beginning Date Month/year Restarting Date Month/Year	_____ _____	
13	How many times do you attend dialysis in a month?	Once Twice Thrice More than Thrice	1 2 3 4	
14	How many times do you weigh yourself?	Daily Weekly Monthly When I come to the hospital Never Other_____	1 2 3 4 5 99	
15	Has anyone in your family suffered kidney disease?	Yes No No Response	1 2 99	
16	On a scale of (1=very low; 2=low; 3=average; 4=high; 5=very high), Rate your knowledge of adherence to diet in management of your current kidney condition.	Very Low Low Average High Very High No response	1 2 3 4 5 99	
17	On a scale of (1=very low; 2=low; 3=average; 4=high; 5=very high), Rate your knowledge of adherence to fluid intake in managing your current health situation	Very Low Low Average High Very High No Response	1 2 3 4 5 99	
18	Do you source for more information about your diet and fluid intake from other sources?	Yes No No response	1 2 99	

19	If Yes please indicate the sources		
20	How often does a medical professional (your doctor, nurse, dietician or other medical staff) talk to you about the importance of taking fluids as prescribed?	Every dialysis treatment Every week Every month Every 2-3 months When my condition get worse Rarely Never Other_____ (please specify)	1 2 3 4 5 6 7 99
21	How often does a medical professional (your doctor, nurse, dietician or other medical staff) talk to you about the importance of taking diet as prescribed?	Every dialysis treatment Every week Every month Every 2-3 months When my condition get worse Rarely Never Other_____ (please specify)	1 2 3 4 5 6 7 99
22	Why do you think it is important to limit your fluid intake?	Because I fully understand that my kidney condition requires limiting fluid intake Because limiting fluid intake is important to keep my body healthy Because a medical professional (my doctor, nurse, dietician, or other medical staff) told me to do so Because I got sick after I drank lots of fluid Because I got sick after I drank lots of fluid I don't think limiting fluid is very important to me Others	1 2 3 4 5 6 99
23	Why do you think it is important to take proper diet?	Because I fully understand that my kidney condition requires proper diet intake Because proper diet intake is important to keep my body healthy Because a medical professional (my doctor, nurse, dietician, or other medical staff) told me to do so Because I got sick after I took improper diet Because I got sick after I took improper diet I don't think proper diet is very important to me Others_____ (Specify)	1 2 3 4 5 6 99
24	How much difficulty have you had following your dietary recommendations?	No difficulty A little difficulty Moderate difficulty A lot of difficulty	1 2 3 4 5 99

		I was unable to follow any recommendations at all Other _____(Specify)																																																																																							
25	How much difficulty have you had following your fluids recommendations?	No difficulty A little difficulty Moderate difficulty A lot of difficulty I was unable to follow any recommendations at all Other _____(Specify)	1 2 3 4 5 99																																																																																						
26	What type of difficulty have you had keeping your dietary recommendations?	Not applicable: No difficulty I was not willing to control what I want to eat I was unable to avoid certain recommended food I don't understand what type of diet to follow Other (Specify).....	1 2 3 4 99																																																																																						
SECTION C: SOCIAL SUPPORT STRUCTURES ON DIET AND FLUID ADHERENCE IN END STAGE RENAL DISEASE																																																																																									
27	Who accompanies you to the dialysis center	Myself Parents Spouse Child Others _____(Please specify)	1 2 3 4 99																																																																																						
28	I am interested in how you feel about the following statements. Indicate using the numbers below on how you feel 1= Strongly disagree 2=Somewhat disagree 3=Disagree 4=Neutral 5=agree 6=somewhat disagree 7=strongly agree	<table border="1"> <thead> <tr> <th>STATEMENT</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> </tr> </thead> <tbody> <tr> <td>There is a special person who is around when I am in need.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>There is a special person whom I share my medical secrets with</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>My family really tries to help me</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>I can talk about my problems with my family</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>I can count on my friends in case of any problem</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>There is a special person in my life who cares about my diet and fluids practices.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>My family ensures that I get the recommended diet</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>I have a person who helps me track my diet and fluids requirements</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Hospital staff I relate with are very</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	STATEMENT	1	2	3	4	5	6	7	There is a special person who is around when I am in need.								There is a special person whom I share my medical secrets with								My family really tries to help me								I can talk about my problems with my family								I can count on my friends in case of any problem								There is a special person in my life who cares about my diet and fluids practices.								My family ensures that I get the recommended diet								I have a person who helps me track my diet and fluids requirements								Hospital staff I relate with are very														
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		supportive and encouraging in management of my renal disease.								
		I am able to talk with my friend about my diet and fluid problems								
29	I am interested to know whether the following social support aspects help you to cope up/adhere to diets and fluid's recommendations. Indicate using the numbers on how you feel 1= Strongly disagree 2=Somewhat disagree 3=Disagree 4=Neutral 5=Agree 6=Somewhat disagree 7=Strongly agree	STATEMENT	1	2	3	4	5	6	7	
		Improves depression								
		Social inclusion								
		Improves Self-esteem								
		Improve Self-management								
		Share experiences and feelings								
		Emotional support								
		Expected life duration increases								
		The quality of life increases								
		Accept the changes in lifestyle								
		Material support								
		Knowledge/Informational support								
		Interpersonal relationships								
		Occupational performance								
		Behavioral compliance								
		Social eating occasions								
		Personal beliefs								
30	In your opinion, generally, do you feel social support from family and friends/significant others help you to adhere to your diet and fluid recommendations?	Yes					1			
		No					2			
		No response					99			
31	Please give reasons for your answer above	<u>Yes</u>							
									
									
		<u>No</u>							
									
									
32	Do you feel social support from your medical professionals (Nurse, Nutritionist, Physician) helps you adhere to your diet and fluid recommendations?	Yes					1			
		No					2			
33	Please give reasons for your answer above	<u>Yes</u>							
									

		<u>No</u>							
34	What other social support do you feel you require in order to manage your kidney condition better							
35	Does culture affect your adherence to your diet and fluids recommendation?	Yes	1						
		No	2						
36	If Yes from above, please explain								
SECTION D: INFLUENCE OF ECONOMIC STATUS ON DIET AND FLUID ADEHERENCE AMONG END STAGE RENAL DISEASE PATIENTS ON HEMODIALYSIS									
37	Do you miss dialysis sessions sometimes?	Yes	1						
		No	2						
38	What reasons make you miss dialysis sessions	I had transport problems	1						
		I was busy with other things	2						
		Haemodialysis access	3						
		Physician was not available	4						
		I had to go to emergency	5						
		I Forgot	6						
		I Didn't want to go	7						
		Not Applicable(I never missed)	8						
		Others (please specify)	99						
39	What is your estimated range of monthly income	Less 10, 000	1						
		10,000 - 30,000	2						
		30000 - 50000	3						
		50,000 - 10,000	4						
		More than 100,000	5						
40	Does your monthly income affect your diet and fluid adherence	Yes	1						
		No	2						
		No Response	99						
41	If yes, please explain how your monthly income affect your diet and fluid adherence (<i>Please explain</i>)							
42	Who caters for your treatment services including dialysis, medication and other special needs?	Myself	1						
		Medical Insurance	2						
		My institution	3						
		Other_____ (Please Specify)	99						
43	How do you rate your treatment costs?	Affordable	1						
		Expensive	2						
		Very Expensive	3						
		Other_____ (Please Specify)	99						
44	Do you access material support to help you adhere to the recommended diet and fluid?	Yes	1						
		No	2						
		No Response	99						
45	If No Please explain how you survive							
46	I am interested to know whether economic status alterations affect your adherence to diet and fluid recommendations. Indicate	STATEMENT	1	2	3	4	5	6	7
		Role reversal							

	using the numbers on how you feel 1= Strongly disagree 2=Somewhat disagree 3=Disagree 4=Neutral 5=Agree 6=Somewhat disagree 7=Strongly agree	Inconsistency adherence/ Degree of compliancy							
		Material support							
		Loss of financial security							
		Low Productivity							
		Peer support							
		Therapy access							
47	Do you have economic strategies you employ to ensure you adhere to the recommended diet and fluid?	Yes No	1 2						
48	Please explain the strategies you use							

Thank you for your time and responses. Do you have anything to add?

Date _____ **Time** _____

Sign (Research Assistant) _____ **Contact no:** _____

APPENDIX III: ETHICAL APPROVAL TO CONDUCT RESEARCH-MTRH



INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MO TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471/2/3



MOI UNIVERSITY
SCHOOL OF MEDICINE
P.O. BOX 4606
ELDORET
Tel: 33471/2/3
19th May, 2017

Reference IREC/2016/135
Approval Number: 0001659

Mr. John K. Toroitich
Masinde Muliro University of Science & Technology,
School of 190-50100,
KAKAMEGA-KENYA.



Dear Mr. Toroitich,

RE: APPROVAL OF AMENDMENT

The Institutional Research and Ethics Committee has reviewed the amendment made to your proposal titled:-

"Determinants of Dietary and Fluid Restrictions in ESRD Patients Undergoing Hemodialysis at MTRH - Eldoret".

We note that you are seeking to make an amendment as follows:-

1. To change the title to above from ***"Adherence of Dietary and Fluid Restrictions in ESRD Patients Undergoing Hemodialysis at Moi Teaching and Referral Hospital"***.

The amendment has been approved on 19th May, 2017 according to SOP's of IREC. You are therefore permitted to continue with your research.

You are required to submit progress(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change(s) or amendment(s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,

PROF. E. WERE
CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc:	CEO - MTRH	Dean - SPH	Dean - SOM
	Principal - CHS	Dean - SOD	Dean - SON

**APPENDIX IV: AUTHORIZATION TO CARRY OUT RESEARCH –
NACOSTI**



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No: **NACOSTI/P/17/18924/17771**

Date: **3rd August, 2017**

John Kipsirem Toroitich
Masinde Muliro University of
Science and Technology
P.O. Box 190-50100
KAKAMEGA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Determinants of diet and fluid adherence in end stage renal disease patients undergoing hemodialysis at Moi Teaching and Referral Hospital Eldoret,”* I am pleased to inform you that you have been authorized to undertake research in **Uasin Gishu County** for the period ending **3rd August, 2018.**

You are advised to report to **the Chief Executive Officer, Moi Teaching and Referral Hospital, the County Commissioner and the County Director of Education, Uasin Gishu County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a **copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The Chief Executive Officer
Moi Teaching and Referral Hospital.

APPENDIX V: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:

**MR. JOHN KIPSEREM TOROITICH
of MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY, 0-30100
ELDORET, has been permitted to conduct
research in Uasin-Gishu County**

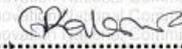
**on the topic: DETERMINANTS OF DIET
AND FLUID ADHERENCE IN END STAGE
RENAL DISEASE PATIENTS UNDERGOING
HEMODIALYSIS AT MOI TEACHING AND
REFERRAL HOSPITAL ELDORET**

**for the period ending:
3rd August, 2018**



**Applicant's
Signature**

**Permit No : NACOSTI/P/17/18924/17771
Date Of Issue : 3rd August, 2017
Fee Received :Ksh 1000**



**Director General
National Commission for Science,
Technology & Innovation**

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.



REPUBLIC OF KENYA



**National Commission for Science,
Technology and Innovation**

**RESEARCH CLEARANCE
PERMIT**

Serial No.A 15258

CONDITIONS: see back page

APPENDIX VI: MAP OF STUDY AREA

