PREVALENCE AND RISK FACTORS OF CHRONIC KIDNEY DISEASE IN KERICHO COUNTY, KENYA

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(Community Health)

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APPROVAL SHEET

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ABSTRACT

There is rising number of reported cases of kidney diseases from Kericho County. The number of patients attending the local hospitals' hemodialysis has increased in the recent past. From the reports at MTRH, most patients attending dialysis come from Kericho County. Approximately seven out ten patients attending hemodialysis are from Kericho County. This was a mixed methodology research. The prevalence of Chronic Kidney Disease (CKD) was determined by reviewing admission data of adult medical patients in the years 2013, 2014 and 2015. The risk factors profile of CKD patients was assessed using a cross-sectional study design. The study population included doctors, nurses and patients. The study used questionnaires, document analysis and interview schedule as the main data collection instruments. The study adopted both the qualitative and quantitative analysis in order to achieve the objectives of the study. Content analysis was used to analyse both secondary and qualitative data. The study found out that 57.0% (13) of patients with CKD had used traditional medicines prior to onset of the disease. Doctors and nurses agreed that herbal concoctions might lead to CKD. Physical inactivity leads to increased prevalence of CKD due to the development of obesity, hypertension and diabetes. Tobacco smoking, Alcohol abuse and use of over the counter NSAIDs might have lead to increased prevalence of CKD in this region. The 3-year average prevalence of CKD was 0.41%, with 78.3% being less than 50 years of age, and 91% having low to medium income ratings. The doctors and nurses were in agreement that exposure to agrochemicals; physical inactivity and herbal medication could be risk factors for CKD. The study concluded that there was an increasing prevalence of CKD in Kericho County with the presence of associated risk factors such as occupational, lifestyle, dietary and cultural factors.

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS AND ACRONYMS

AHM – African Herbal Medicine

BMI – Body Mass Index

CKD – Chronic Kidney Diseases

CVD – Cardiovascular Disease

DASH-Dietary Approaches to stop Hypertension

ESRD – End Stage Renal Disease

GFR – Glomerular Filtration Rate

HIV – Human immunodeficiency virus

LBW – Low Birth Weight

LMIC – Low and Middle Income Countries

LPD – Low Protein Diet

MTRH – Moi Teaching and Referral Hospital

SSA-Sub-Saharan   Africa

TCHM - Traditional Chinese Herbal Medications

WHO – World Health Organization

CHAPTER ONE

INTRODUCTION

Background of the Study

The prevalence of chronic kidney disease is on the increase globally, and currently estimated at 10% of the world population, and responsible for 1 million deaths annually. Chronic kidney disease shifted from position 27 in 1990 to position 18 in 2010 on the global list of leading causes of mortality (Jha et al., 2013). The increasing disease burden will result in a greater strain on limited healthcare resources, negatively impacting on the economy, especially in low and middle-income countries (LMIC). The estimated overall prevalence of CKD in sub-Saharan Africa (SSA) is 13.9%, with insignificant difference between the rural (16.5%) and urban (12.4%) communities (Alice, 2016).

Chronic kidney disease (CKD) is a spectrum, ranging from mild stage 1 disease to severe stage 5 diseases End Stage Renal Disease (ESRD), which requires renal replacement therapy in form of hemodialysis or renal transplant. Management of ESRD is very costly to families and the society at large, and is associated with very high morbidity and mortality (El Nahas, 2005). The risk factors for CKD in SSA are broadly due to communicable and non-communicable diseases. The major communicable disease contributing to CKD in SSA is Human Immune deficiency Virus (HIV) epidemic, with the prevalence of HIV associated CKD estimated at 25% in infected patients in Kenya. The chronic non-communicable conditions escalating the prevalence of CKD include diabetes and hypertension, whose prevalence is increasing in line with global trends due to epidemiological transition in SSA (Malindisa, 2016).

Globally, over 2 million people require renal replacement therapy to be alive, yet this number may only represent 10% of people who actually need treatment to live. The majority of the 2 million people reside in 5 affluent countries; – the United States, Japan, Germany, Brazil (LMIC), and Italy. These five countries represent only 12% of the world population. The major barrier to accessing care is the prohibitive cost required to sustain treatment (Liyanage *et al*., 2015). In the LMIC early diagnosis and treatment of early renal disease due to hypertension and diabetes can reduce progression to end stage renal disease and will be cost effective. Unfortunately many patients present late with complications (Chertow *et al*., 2004.)

In India, the burden of CKD has significantly increased, although exact figures vary from region to region. The increase is attributed to the increasing prevalence of diabetes, hypertension and ischemic heart disease in tandem with the global trends. The awareness level among the people is poor. At least 70% of the people live in rural areas with limited access to health care services with the result that CKD is often diagnosed in advanced stages (Plattner, 2013).

In sub-Saharan Africa, the statistics come mainly from urban and peri-urban populations. In 2009 Afolabi and his colleagues put the prevalence among Nigerians in a family practice population at 10.7% (Plattner, 2013). The prevalence of CKD in Ghana has varied over the years; from 1.6% per million people to 4% among hypertensive patients in the Greater Accra region (Agarwal, 2009). Recently, a prevalence of 46.9% has been recorded among hypertensive in Ghana (Osafo, 2011). In sub-Saharan Africa, just like in many LMIC, CKD affects mainly young adults in their productive years and is a significant cause of death in the young adults (Stanifer *et al.*, 2016). A Tanzanian study found the prevalence of ESRD to be 75 patients per million populations. In another cohort study of 26 patients, the main risk factors for

ESRD were hypertension (30.8%), chronic glomerulonephritis (23.8%), nephritic syndrome (15.4 %), obstructive uropathy (7.7%), and polycystic kidney (3.9%) and underdetermined (15.4%). Early diagnosis and treatment of the underlying risk factors, avoidance of primary kidney insults and institution of secondary preventive measures is imperative in primary prevention or delaying, or possibly halting progression of chronic kidney disease (Dickstein et al., 2008).

In Kenya, there is increased prevalence of CKD, which is partly explained by high risk factors such as lifestyle factors and demographic factors. The increasing life-style related diseases include hypertension, diabetes and metabolic syndrome, in both urban and rural populations (Sigamani, 2012). The level of awareness of CKD and the lifestyle related disease is low and hence the late presentation of patients with complications. Cost of treatment of advanced CKD is substantial. Less than 10% of end stage renal disease patients have access to any kind of renal replacement therapy. There is limited data on CKD to aid in planning interventional measures among the rural and peri-urban communities of Rift Valley and Western Kenya. In the absence of data to highlight the seriousness of this unfolding global epidemic (Johansen *et al*., 2012), government, communities, patients and healthcare givers will not institute preventive measures, which are known to slow or even stop progression of early stages of CKD. The largest proportion of the Kenyan population (76%), just like in many other LMIC, lives in the rural areas (Kenya demographic profile, 2014.) Other LMIC are experiencing a similar rise in the prevalence of CKD as illustrated below.

In a country with limited resources, it is only appropriate that efforts are directed toward prevention of CKD by targeting the already known risk factors rather than focusing on treatment of those with ESRD. High-risk characteristics that are associated with CKD prevalence can be modified, slowing and even arresting further

decline of renal function (Almeida, 2012). The causal roles of kidney specific risk factors such as non-steroidal anti-inflammatory drugs use, lifestyle illnesses, herbal medicine and environmental toxins are well documented and efforts to document their association with CKD will improve health promotion (Chertow et al., 2011). Kidney disease results in the loss or reduction of functioning nephrons. There are also several complications associated with the increased prevalence of CKD. These are anemia, mineral and bone disorders, cardiovascular risks and dyslipidemia (Johansen, 2004).

Statement of the Problem

Globally and in Kenya, the data suggest increasing mortality attributable to chronic kidney disease. The prevalence and risk factors for chronic kidney disease in Kericho County is unknown. The financial cost of doing dialysis is very high, estimated at ksh;1 6,000 per week (Ksh; 64,000 per month) and renal transplant isn't easily available for most patients. The post transplant patients still require about Ksh; 50,000 to take anti-graft rejection medicine. The best strategy in addressing CKD will be primary prevention, which requires thorough knowledge of the risk factors.

Determination of the prevalence and identification of risk factors for CKD will provide the much-needed information for primary prevention, planning and advocacy to combat this pandemic locally and at the national level. The study sought to establish the prevalence and risk factors for chronic kidney diseases in Kericho County.

Research Objectives

Broad Objective

To establish prevalence and risk factors for chronic kidney Disease in Kericho County, Kenya

Specific Objectives

i.   To determine the prevalence of Chronic Kidney Disease in Kericho county among adult inpatients.

ii. To identify occupational exposures among patients with chronic kidney diseases in Kericho County.

iii. To assess cultural, lifestyle and dietary factors among patients with chronic kidney diseases in Kericho County.

Significance of the Study

The study will be the first to document prevalence of Chronic Kidney Disease and risk factor profiles of adult medical patients with CKD in Kericho County. Various stakeholders will utilize the data generated for prevention, advocacy and planning.

The Local Community

The study will be of significance to the local people in that the documentation of risk factors for chronic kidney diseases will enable them to avoid the risk factors and probably reduce the prevalence of chronic kidney diseases. The increased sensitization on CKD will help improve early health seeking behaviors.

The Government

The government especially the county government of Kericho will get knowledge of the prevalence and these factors and will in turn put up measures to

combat CKD. The ministry of health in the county will benefit from the study in that it will help in coming up will policies on health management and promotions.

Future Planning

This Study will be useful in planning future therapeutic interventions to combat this disease.

Decision and Policy Makers

The study will also provide decision-making and policy formulation in both public and private health facilities in the country since they will be able to understand the major risk factors associated with kidney diseases.

Future Researchers and Scholars

The study is also of significance in that; it forms a useful foundation against which future studies can be undertaken by other researchers taking into account the suggestions for further studies.

Justification of the Study

According to White (2009) the incidence and prevalence of CKD has increased in recent years in both developed and developing countries including sub Saharan Africa (SSA) In SSA, CKD affects mainly young adults in their productive years and is a significant cause of death. A study conducted in Tanzania revealed that the prevalence of ESRD is estimated to be 75patients per million populations. Studies follow-up of 26 patients; the main primary cause of ESRD was hypertension (30.8%) chronic glomerulonephritis (23.8%), nephritic syndrome (15.4 %), and obstructive uropathy (7.7%), polycystic kidney (3.9%) and underdetermined (15.4%). Early diagnosis and treatment of the underlying cause and of secondary preventive measures is imperative in patients with chronic kidney disease, as it may delay, or possibly halt progression (Agarwal, 2009).

There is no local data on CKD prevalence, however regionally a study done in Nigeria reports a prevalence of 12.4%. Early identification and management of CKD has been shown to reduce the adverse outcomes, which include kidney failure and cardiovascular disease. This review reveals that 4 million Kenyans are living with CKD and no study has been conducted in Kenya and that little is known on the prevalence and risk factors to CKD in Kericho County.

Theoretical Framework

The study adopted the PRECEDE – PROCEED model which was first developed and introduced in the 1970s by Green and colleagues. PRECEDE is based on the premise that, just as a medical diagnosis precedes a treatment plan, an educational diagnosis of the problem is very essential before developing and implementing the intervention plan. Predisposing factors include knowledge, attitudes, beliefs, personal preferences, existing skills, and self-efficacy towards the desired behavior change. Reinforcing factors include factors that reward or reinforce the desired behavior change, including social support, economic rewards, and changing social norms. Enabling factors are skills or physical factors such as availability and accessibility of resources, or services that facilitate achievement of motivation to change behavior (Gielen, 2008).

In 1991, PROCEED was added to the framework in consideration of the growing recognition of the expansion of health education to encompass policy, regulatory and related ecological/environmental factors in determining health and health behaviors. As health-related behaviors such as smoking and alcohol abuse increased or became more resistant to change, so did the recognition that these behaviors are influenced by factors such as the media, politics, and businesses, which are outside the direct control of the individuals. Hence more "ecological" methods

were needed to identify and influence these environmental and social determinants of health behaviors. With the emergence and rapid growth in the field of genetics, the Precede-Proceed model was also revised also in 2005 to include and address the growing knowledge in this field.

The Precede-Proceed planning model consists of four planning phases, one implementation phase, and 3 evaluation phases.

a) **Planning phase** deals with identifying and evaluating the social problems that have an impact on the quality of life of a population of interest. Social assessment is the "application, through broad participation, of multiple sources of information, both objective and subjective, designed to expand the mutual understanding of people regarding their aspirations for the common good". During this stage, the program planners try to gain an understanding of the social problems that affects the quality of life of the community and its members, their strengths, weaknesses, and resources; and their readiness to change. This is done through various activities such as developing a planning committee, holding community forums, and conducting focus groups, surveys, and/or interviews. These activities will engage the audience in the planning process and the planners will be able to see the issues just as the community sees those problems (Green, 2008).

b) **Epidemiological diagnosis**; epidemiological assessment deals with determining and focusing on specific health issue(s) of the community, and the behavioral and environmental factors related to prioritized health needs of the community. Based on these priorities, achievable program goals and objectives for the program being developed are then established. Epidemiological assessment may include secondary data analysis or original data collection. Examples of epidemiological data include vital statistics, state and national health surveys, medical and administrative records

etc. Genetic factors, although not directly changeable through a health promotion program, are becoming increasingly important in understanding health problems and counseling people with genetic risks, or may be useful in identifying high-risk groups for intervention.

c) **Behavioral diagnosis**; this is the analysis of behavioral links to the goals or problems that are identified in the social or epidemiological diagnosis. The behavioral ascertainment of a health issue is understood firstly through those behaviors that exemplify the severity of the disease (e.g. tobacco use among teenagers). Secondly, through the behavior of the individuals who directly affect the individual at risk for example parents of the teenagers who keep cigarettes at home. Thirdly, through the actions of the decision-makers that affect the environment of the individuals at risk, such as law enforcement actions that restrict the teen's access to cigarettes. Once behavioral diagnosis is completed for each health problem identified, the planner is able to develop more specific and effective interventions.

d) **Environmental diagnosis**; this is a parallel analysis of social and physical environmental factors other than specific actions that could be linked to behaviors. In this assessment, environmental factors beyond the control of the individual are modified to influence the health outcome. For example, poor nutritional status among school children may be due to the availability of unhealthful foods in school. This may require not only educational interventions, but also additional strategies such as influencing the behaviors of the school's food service managers.

Educational and ecological diagnosis; Once the behavioral and environmental factors are identified and interventions are selected, planners can start to work on selecting factors that if modified will be most likely to result in behavior change, and can sustain this change process. These factors are classified as

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predisposing factors, enabling factors, and reinforcing factors. Predisposing factors are any characteristics of a person or population that motivates behavior prior to or during the occurrence of that behavior. They include an individual's knowledge, beliefs, values, and attitudes. Enabling factors are those characteristics of the environment that facilitate action and any skill or resource required to attain specific behavior. They include programs, services, availability and accessibility of resources, or new skills required to enable behavior change.

Reinforcing factors are rewards or punishments following or anticipated as a consequence of a behavior. They serve to strengthen the motivation for behavior. Some of the reinforcing factors include social support, peer support, etc. Administrative and policy diagnosis focuses on the administrative and organizational concerns, which must be addressed prior to program implementation. This includes assessment of resources, development and allocation of budget, looking at organizational barriers, and coordination of the program with all other departments, including external organizations and the community (Green, 2005).

Administrative diagnosis assesses policies, resources, circumstances, prevailing organizational situations that could hinder or facilitate the development of the health program. Policy diagnosis assesses the compatibility of the program goals and objectives with those of the organization and its administration. This evaluates whether the program goals fit into the mission statements, rules and regulations that are needed for the implementation and sustainability of the program. Process evaluation is used to evaluate the process by which the program is being implemented. This phase determines whether the program is being implemented according to the protocol, and determines whether the objectives of the program are being met. It also helps identify modifications that may be needed to improve the

program. Impact evaluation measures the effectiveness of the program with regards to the intermediate objectives as well as the changes in predisposing, enabling, and reinforcing factors. Often this phase is used to evaluate the performance of educators. Outcome evaluation measures change in terms of overall objectives and changes in health and social benefits or the quality of life. That is, it determines the effect the program had in the health and quality of life of the community

      This model was relevant to the study because it was a **participatory model** for creating successful community health promotion and other public health interventions. It is based on the premise that behavior change is by and large voluntary, and that health programs are more likely to be effective if they are planned and evaluated with the active participation of those people who will have to implement them, and those who are affected by them. Thus health and other issues must be looked at in the context of the community.

Conceptual Framework

      This conceptual framework attempted to examine and explain the factors contributing to prevalence of chronic kidney diseases.

Independent Variables   **Dependent Variable**

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┌─────────────────────────────┐
│ Cultural factors            │
│   • Herbal medicines        │
│   • Beverage intake         │
│   • Cultural roles          │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Occupational exposures      │
│   • Use of fertilizers      │
│   • Pesticide application   │
│   • Use of metals           │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Lifestyle factors           │
│   • Physical inactivity     │
│   • Tobacco smoking         │
│   • Excessive alcohol       │
│   • Overweight              │
│   • Illicit drug use        │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Practices and diet          │
│   • Soda consumption        │
│   • Beverage                │
│     consumption             │
│   • Intake of proteins      │
│   • High salt intake        │
└─────────────────────────────┘
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┌─────────────────────────────┐
│ Prevalence of Chronic       │
│ Kidney Diseases             │
│                             │
│   • Number of patients      │
│     with CKD                │
│   • Diagnosed cases of      │
│     CKD                     │
└─────────────────────────────┘
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Figure 1. Conceptual framework.

White (2009) noted that cultural practices influence the prevalence of CKDS.
They reported adverse drug reactions of herbal remedies are often lead to increased
cases of CKDs due to lack of understanding of their preparation and appropriate use.
Wilund and Cheema (2007) noted that there is an association between occupational
heat stress and self-reported doctor-diagnosed kidney disease. Their results indicated
a need for occupational health interventions for heat stress among workers in tropical
climates. It is thus essential to identify specific occupations associated with CKD for

the further understanding of the mechanism of how these occupations increase CKD risk.

Stack (2001) noted that low socio-economic status is associated with an increased risk of chronic renal failure. Smoking may also cause renal damage in healthy individuals, independent of other factors according to experimental studies and population based epidemiological studies. Smoking in diabetes has been linked to increased risks and development, accelerated progression of manifest renal failure. Pan (2007) noted that a low protein diet (LPD) could be a triggering factor for renal function in patients with CKD. Sigamani (2007) also noted that intakes of energy, carbohydrates, protein, fat and cholesterol was all significantly related to prevalence of CKD especially when taken in excess.

Scope of the Study

The study focused on the prevalence and risk factors of chronic kidney diseases in Kericho County. Kericho County is one of the newly created 47 counties in Kenya (Constitution of Kenya, 2010). The study was conducted between May 2015and May 2017.The independent variables were cultural factors, occupational exposures, lifestyle factors and practices and diet while the dependent variable was prevalence of Chronic Kidney Diseases.

Operational Definition of Terms

Cultural factors are established beliefs, values, traditions, laws and norms of the people. They may include the artistic values, customs and religious beliefs that are indigenous to a particular region. Such as herbal medications use and cultural roles.

Diet is the sum total of food consumed by a person in his/her daily life like use of tea, high salt and soda.

Lifestyle factors refers to what people usually do in their everyday life including exercise, a well-balanced diet, and maintaining a healthy body weight which may reduce the risk of poor health. This include; Tobacco, Alcohol use and physical inactivity.

Occupational exposures are the occurrences that get in to contact with a person during performance of an occupation that may place a worker at a risk of infection such as use of pesticides and Agrochemicals.

Practices imply what people have individualized and do it regularly in order to maintain or achieve a life goal use of tea and sodas.

Prevalence it is the number of people in a population in a given region having a specific condition in this case is chronic kidney disease.

CHAPTER TWO

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter reviewed factors contributing to prevalence of chronic kidney diseases. A review of the literature was conducted to determine the existing body of knowledge on the research topic and to identify any possible commonalities or differences that exist in the searched literature. This enabled the researcher to provide a framework for the study by placing it in the context of current knowledge on prevalence of chronic kidney diseases.

Prevalence of Chronic Kidney Diseases

Kidney diseases are a global public health problem (Levey et al., 2007). Sub-Saharan African countries have an increasing burden of chronic kidney renal disease. For instance, Agarwal (2009) found that the prevalence of chronic kidney disease (CKD) among Congolese study subjects was 36%. In Kenya, patients with reduced renal function are often encountered in clinical practice. Decreased renal function affects the pharmacokinetic disposition as well as the pharmacodynamics effects of drugs. Careful dose adjustment and therapeutic drug monitoring are essential in patients with renal insufficiency to prevent accumulation of administered drugs and/or toxic metabolites. Appropriate dose adjustment reduces the incidence of adverse drug reaction, improves treatment success and reduces hospital admission and even mortality. It reduces costs associated with drug related toxicity and resultant increased hospital stay (Sigamani, 2012).

A study by Plattner (2013) revealed that the prevalence of CKD in ambulatory type 2 diabetes patients was found to be 54.5%, 45% were found to have diabetic glomerulopathy. 78.5% of the patients were found to have low- to moderate risk of

adverse cardiovascular outcome. 21.5% of the patients were found to have a high to very-high risk of adverse cardiovascular outcomes. Age and systolic BP were significantly related to CKD. Over 20% of type 2 diabetes patients with CKD are at a high or very high risk of adverse cardiovascular outcomes. Hypertension is the most important modifiable risk factor for patients with CKD. Risk stratification of patients is important and should be part of routine care to facilitate interventions to mitigate adverse outcomes.

In a recent cross-sectional study of 369 patients with diabetes conducted at Bugando Medical Centre in Tanzania, the prevalence of CKD was found to be 83.7%.(94) The Tanzanian study reported a very high prevalence of CKD in their study patients who included patients with type 1 diabetes although they were a minority and albuminuria was assessed using a non-quantitative test. Also the study did not determine non-diabetic causes of renal disease, which may have led to a higher prevalence of CKD. The use of Cochroft-Gault equation for estimation of GFR could also have led to an underestimation of GFR and thus a higher prevalence of CKD. This large disparity in the prevalence of CKD could also represent differences in the quality of care or genetic make-up of the population. A cross-sectional study done in 3071 Japanese patients with type 2diabetes found a 46% prevalence of CKD (Hsu *et al.,* 2014).

In a cross-sectional analysis of data, the prevalence of CKD in patients with type 2 diabetes was found to be 39.7% (Wilund, 2007). The lower prevalence of CKD in these non-African populations is not unusual as there have been studies that have shown an increased risk of diabetic renal disease in African than in Caucasian populations (Delanaye *et al.,* 2011). All the patients included in this study were asymptomatic for CKD. This means that clinicians in the diabetes outpatient clinics

need to be aware of the high prevalence of CKD and referral made to nephrologists as early as possible.

Risk Factors for Chronic Kidney Failure

Cultural Factors

White (2009) conducted a study on the role of a complex web of traditional risk factors and nontraditional risk factors that interact to affect CKD progression and complications. This was a cross sectional study that was conducted at the University Teaching Hospital Lusaka, Zambia. Enrolment of all eligible participants started from August 2010 to October 2010. Inclusion criteria were hospitalized patients aged 16years and above who consented to the study. Qualified HIV counselors were used to counsel the patients. After obtaining demographic information, study participants were screened for HIV upon their consenting for the test. Study physicians did a full clinical history and examination to determine the factors associated with renal dysfunction.

Traditional Chinese herbal medications (TCHM) are frequently used in conjunction with western pharmacotherapy for treatment of chronic kidney diseases (CKD) in China and many other Asian countries. The practice of traditional Chinese medicine is guided by cumulative empiric experience. Recent in vitro and animal studies have confirmed the biological activity and therapeutic effects of several TCHM in CKD. However, the level of evidence supporting TCHM is limited to small, non-randomized trials. Due to variations in the prescription pattern of TCHM and the need for frequent dosage adjustment, which are inherent to the practice of traditional Chinese medicine, it has been challenging to design and implement large randomized clinical trials of TCHM. Several TCHM are associated with significant adverse effects, including nephrotoxicity. However, reporting of adverse effects associated

with TCHM has been inadequate. To fully realize the therapeutic use of TCHM in CKD we need molecular studies to identify active ingredients of TCHM and their mechanism of action, rigorous pharmacologic studies to determine the safety and meet regulatory standards required for clinical therapeutic agents, and well-designed clinical trials to provide evidence-based support of their safety and efficacy.

The study concluded that large randomized clinical trials are urgently needed to validate these therapies. Many promising therapeutic compounds could be identified from herbal decoctions and developed as anti-inflammation, anti-oxidative, or immunomodulatory pharmaceutical agents. More detailed mechanistic studies using modern scientific methodology and approaches are needed to elucidate the therapeutic potential of TCHM for CKD. Clinicians who practice TCM should be aware of the limitations of TCHM as well as their toxicity profile. The reporting system for TCHM toxicity need to be improved and pharmacologic studies are required to assess the safety profile of TCHM. The combined wisdom of modern and traditional medical physicians will be needed to develop a new strategy to assess the efficacy and the safety of traditional Chinese herbal medications in patients with CKD.

Study conducted by White (2012) was particularly interested in the way that the use of very well-known and highly valued plants is linked to the observation of adverse drug reactions in African countries. We investigated, through a literature review and using the Internet (with a semantic search strategy), some well-known or popular medicinal plants used in African herbal medicine (AHM). Other information on the properties related to use, and characteristics of medicinal plants was complemented by some interviews with stakeholders.

Although substantial progress has been made in elucidating the mechanisms of action of many drugs, the pharmacological actions of many medicinal plants are generally not well understood. The results of a literature review suggest that the reported adverse drug reactions of herbal remedies are often due to a lack of understanding of their preparation and appropriate use. The results of stakeholders' interviews suggest that there is a growing need to provide patients with correct information about the herbal medicines they consume.

An important aspect of herbal medicine is the correct, timely, and integrated communication of emerging data on risk as an essential part of pharmacovigilance, which could actually improve the health and safety of patients. This calls for improved collaboration between traditional practitioners and modern healthcare professionals, researchers, and drug regulatory authorities. In addition, there is a need for an adverse drug reaction reporting system to facilitate the collection, monitoring, and evaluation of adverse drug events.

Occupational Exposures

Wilund (2007) conducted a study on occupational exposure to silica whether associated with chronic kidney disease (CKD). Cases were hospital patients with newly diagnosed CKD and community controls were selected using random digit dialing and frequency matched by age, gender, race and proximity to the hospital.

The study found that any silica exposure was associated with a 40% increased risk of CKD (OR=1.40, 95% confidence interval (CI): 1.04, 1.89) in a multivariable adjusted model. The mean cumulative duration of silica exposure was significantly higher in exposed cases than in exposed controls (33.4 vs. 24.8 years, respectively). Overall, compared to non-exposed participants, the ORs (95% CI) for those below and above the median duration of silica exposure were 1.20 (95% CI: 0.77, 1.86) and

1.76 (95% CI: 1.14, 2.71), respectively. It was reported that of all occupation-related CKD deaths, about 8.2%–14.5% are attributable to silica, organic solvents, lead, and cadmium exposures. Occupations such as cashier, sales representative, carpenter, and manager have been found to be associated with the increased mortality risk for CKD. The study concluded that there is positive relationship between occupational silica exposure and CKD, with strong specific association with renal insufficiency with a dose-response trend. These results provide confirmatory evidence of the relationship between occupational silica exposure and CKD and, additionally, suggest that exposure to silica may be associated with earlier stages of the kidney disease. Several occupational exposures were accused of impairing renal function and causing CKD. Exposure to organic solvents has predominantly been linked to the appearance and exacerbation of glomerulonephritis. Previous literature has suggested an adverse renal effect from silica and several heavy metals such as cadmium, chromium and lead. The most persuasive evidence exists for cadmium; which has been known to cause proteinuria and has been linked to increased risk of CKD.

Cheema (2007) examined the relationship between self-reported occupational heat stress and incidence of self-reported doctor-diagnosed kidney disease in Thai workers. Data were derived from baseline (2005) and follow-up (2009) self-report questionnaires from a large national Thai Cohort Study (TCS). Analysis was restricted to full-time workers (n = 17 402 men and 20 414 women) without known kidney disease at baseline.

The study findings revealed exposure to heat stress was more common in men than in women (22% vs. 15%). A significant association between heat stress and incident kidney disease was observed in men (adjusted odds ratio [OR] = 1.48, 95% CI: 1.01–2.16). The risk of kidney disease was higher among workers reporting

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workplace heat stress in both 2005 and 2009. Among men exposed to prolonged heat stress, the odds of developing kidney disease were 2.22 times that of men without such exposure (95% CI 1.48–3.35, P-trend <0.001). The incidence of kidney disease was even higher among men aged 35 years or older in a physical job: 2.2% exposed to prolonged heat stress developed kidney disease compared with 0.4% with no heat exposure (adjusted OR = 5.30, 95% CI 1.17–24.13).

The study concluded that there is an association between self-reported occupational heat stress and self-reported doctor-diagnosed kidney disease in Thailand. The results indicate a need for occupational health interventions for heat stress among workers in tropical climates. It is thus essential to identify specific occupations associated with CKD for the further understanding of the mechanism of how these occupations increase CKD risk.

Wimalawansa and Wimalawansa (2014) noted that non-harmonious and unsustainable agricultural practices have major impact on the environment, causing animal and human diseases. Excessive use of agrochemicals and irresponsible and harmful agricultural habits cause soil and water pollution, and secondary contamination of human food chain. Contamination of soil and water with toxic agrochemicals (e.g., phosphate fertilizer contaminated with heavy metals, pesticides and herbicides etc.) is a particular concern.

According to White (2009) an escalating incidence of chronic kidney disease (CKD) of an unusual nature has manifested in agricultural dry-zonal areas in several tropical countries, including Sri Lanka, but no specific cause has been determined to-date. However, current evidence suggests that more than one component is involved in this geo-water-related preventable health epidemic; hence using the terminology, CKD of multi-factorial origin (CKD-mfo). Detrimental agricultural habits, including

excessive and indiscriminate use of toxic agrochemicals, not using protective gear when using Agrochemicals, drinking contaminated water from paddy fields and from contaminated shallow dug wells, and allowing continued environmental contamination, have led to the escalation of this deadly disease in these regions. The epidemic has detrimental effects not only on affected families, but also on the socio economic aspects of villages, the region, and the entire country. While providing clean water to villages, enhancing awareness and education, and preventing environmental pollution, each country that is affected with CKD must seek to identify and eliminate the root causes of the disease to prevent its progress, with a specific action plan to eliminate it. Unless corrective steps are taken in a timely and effective manner, the situation is likely to worsen drastically damaging their economies and the humanity (White, 2009).

In addition to the above, the agricultural sector is one of the main culprits polluting the environment (soil and water) through Agrochemical pollution, particularly by indiscriminate and over usage of chemical fertilizers, herbicides, and pesticides, and through poor animal husbandry practices. The overuse of pesticides has led to virtually no living creatures in paddy fields. Agrochemicals continue leaching out to streams and shallow wells, contaminating drinking water sources in the areas affected by chronic kidney disease of multifactorial origin (White, 2009). Approximately 90% of the population in this region relies on wells and streams for drinking water.

Lifestyle Factors

Stack (2005) conducted a study to determine that low socio-economic status is associated with the occurrence of several different chronic diseases, but evidence regarding renal disease is scant. To explore whether the risk of chronic renal failure

varies by socio-economic status, the study performed a population based case control study in Sweden. All native residents from May 2006 to May 2008, aged 18–74 years, formed the source population. Cases (n=926) were incident patients with chronic renal failure in a pre-uraemic stage. Control subjects (n=998) were randomly selected within the source population. Exposures were assessed at personal interviews and relative risks were estimated by odds ratios (OR) in logistic regression models, with adjustment for age, sex, body mass index (BMI), smoking, alcohol consumption and regular analgesics use.

The study results revealed that in families with unskilled workers only, the risk of chronic renal failure was increased by 110% [OR=2.1; 95% confidence interval (CI), 1.1–4.0] and 60% (OR=1.6; 95% CI, 1.0–2.6) among women and men, respectively, relative to subjects living in families in which at least one member was a professional. Subjects with 9 years or less of schooling had a 30% (OR=1.3; 95% CI, 1.0–1.7) higher risk compared with those with a university education. The excess risk was of similar magnitude regardless of underlying renal disease.

The study concluded that low socio-economic status is associated with an increased risk of chronic renal failure. The moderate excess was not explained by age, sex, BMI, smoking, alcohol or analgesic intake. Thus, socio-economic status appears to be an independent risk indicator for chronic renal failure in Sweden. Tobacco smoking is considered to be the most identifiable cause of adult death in the developed countries, with the exception of hypertension. Evidence suggests that smoking has a detrimental effect on kidneys in diabetics and in individuals with hypertension and pre- existing renal disease. Smoking may also cause renal damage in healthy individuals, independent of other factors according to experimental studies

and population based epidemiological studies. Smoking in diabetes has been linked to increased risks and development or accelerated progression of renal failure.

Chronic kidney disease (CKD) is a growing worldwide problem that is increasingly shown to be interwoven with cardiovascular disease (CVD) and smoking. The prevalence of CKD in Western populations is high, and the number of patients with ESRD has increased dramatically in the past few decades. This rise is expected to continue, particularly in developing countries, where smoking and other cardiovascular risk factors are increasing substantially, and will be paralleled by rising CKD- and ESRD-related costs.

A tight relationship between CKD and CVD has become apparent: On the one hand, CKD and its epiphenomena increase the risk for CVD; on the other hand, CVD accounts for the majority of morbidity and mortality in patients with CKD. Diabetes and hypertension are widely acknowledged risk factors for kidney damage, and data increasingly indicate that smoking can have a negative effect on the kidney. The consequences of cigarette smoking for patients with CKD could be severe, affecting both the progression of CKD and CVD; however, this is not sufficiently acknowledged by physicians and patients with CKD (White, 2009).

Dietary Practices

Sigamani (2007) did a study on Association between the dietary factors and metabolic syndrome with chronic kidney disease in Chinese adults. The aim of study was to examine the relationship between the dietary nutrition and the prevalence and risk of renal damage in patients with metabolic syndrome. Methods: 260 patients with metabolic syndrome and chronic renal disease meeting criterion were recruited in this cross-sectional study. Metabolic syndrome was defined according to NCEP-ATPIII guidelines. Food-frequency questionnaire was performed to collect the information on

dietary nutrition. Anthropometric measurements, including body weight, height and waist circumference were collected. Blood pressure, triglyceride, cholesterol, high-density lipoprotein-cholesterol and fasting plasma glucose, renal function and 24-hour urine protein were measured. The correlations between GFR and actual nutrient intakes of participants were examined.

The study results revealed that, actual in takes of energy, carbohydrates, protein, fat and cholesterol was all significantly higher than recommended nutrient intakes/adequate intakes of Chinese Dietary Reference Intakes. GFR was significantly inversely correlated with energy, protein intake, cholesterol intake, carbohydrates intake, sodium intake, calcium intake and actual protein/energy ratio. Logistic regression analyses showed that actual protein intakes/recommended protein intakes (APIs/RPIs) were significant independent predictors of GFR < 60 ml/min 1.73 m^2.

The study concluded that dietary nutrition is closely correlated with kidney damage in patients with metabolic syndrome. High protein intakes may be one of the risk factors of renal damage. The findings demonstrated that not only gender, age, MS components, waist circumference and urinary protein are a risk factor of GFR decline in MS patients with renal impairment, but also dietary nutrition is closely correlated with kidney damage. High protein intakes may be one of the risk factors of renal damage. Therefore, low-protein diets are nutritionally safe and may as a therapeutic measure in CKD patients. Dietary manipulation should be an integral part of the therapy for patients with progressive CKD. Dietary factors such as reducing the intake of salt, alcohol, and animal proteins may be important for preserving renal health. Salt intake may be directly and indirectly linked to renal function. Indirectly, excessive salt intake is a known risk factor for hypertension.

The dietary approach to stop hypertension (DASH) Sodium trial showed that reducing sodium intake decreased blood pressure in individuals with and without hypertension. A few studies have also highlighted direct links between salt intake and renal health. In animal models, high salt diets lead to increased renal fibrosis in normal and hypertensive rats (Cheema, 2007).

An important new finding has been reported from the Nurses Health study, which revealed that drinking lots of Cola or carbonated soft drinks affects the kidney function. Compared with those who did not drink soda, soda-drinking women had 30% greater reduction in glomerular filtration rate (an important measure of the kidney function) (NKF, 2017).

Another study on Tea consumption and renal function in a Metropolitan Chinese population: The Guangzhou Bio bank cohort study where by renal function was assessed using regression analyses to adjust for confounding factors. This study revealed that 8872 participants drank one type of tea.in men, blank tea was positively associated with eGFR coefficient of -0.037,p=0.013 but in women p=0.865.This study concluded that there was no clear evidence to suggest any associations between renal function and tea consumption in this large population (van, 2014).

In another study at central Arkansas veterans healthcare system doctors discovered that a patients kidneys were failing. After questioning the patient, they learned that he drank 16- 8 ounces glass of iced tea daily, which is about 1 gallon. Iced tea is full of oxalic acid, which when taken in excess, deposits in your kidneys mucks up the work of removing wastes from the blood says Scott Youngquist, M D., an emergency physician at the university of Utah Healthcare. The study concluded that black tea taken in excess causes damage to the kidney function (Youngquist, 2015)

Alcohol intake may be another important dietary factor for preserving renal health. While moderate alcohol consumption may have beneficial effects, such as increased cholesterol, excessive alcohol intake may lead to renal damage. The AusDiab study reported an increase risk for albuminuria in individuals who self-reported heavy alcohol consumption during the five years of study follow-up. In addition, alcohol intake is a potent risk factor for hypertension

In individuals with pre-dialysis CKD, reducing animal protein intake may slow the progression of CKD. The study examined the effects of a two-three year protein restricted diet and the risk of developing renal failure or all-cause mortality. After six years of follow-up there was no benefit of protein restriction. A significant limitation of the study was the lack of dietary information during follow-up. A meta-analysis by Pedrini examined the relationship between dietary protein intake and renal function in diabetic and non-diabetic CKD. In individuals with non-diabetic CKD, a low protein diet was associated with a reduced risk for renal failure and death compared to individuals with a normal protein diet. In individuals with diabetic CKD, a low protein diet was associated with a reduced risk for renal functioning (Wilund, 2007).

El Nahas and Bello (2005) conducted a study on the effect of diet on the prevalence of CKD among patients. A cross sectional descriptive study design was conducted amongst 133 healthcare workers in renal units at Muhimbili national hospital, Regency medical center and the Aga Khan Hospitals. Hospitals were purposively selected based on the availability of renal care services in the facility. Study subjects were conveniently selected from the three hospitals.

The study found out that a low protein diet (LPD) could preserve renal function in patients with CKD. Addis hypothesized that a LPD would reduce the

workload of surviving nephrons in diseased kidneys and thus minimizes further loss of renal function. The study extended this view and postulated the hyper-filtration theory based on animal studies. The study suggested that sustained excesses of dietary protein cause increases in renal blood flow and glomerular filtration rate that lead to intrarenal hypertension, ultimately resulting in progressive sclerosis and deterioration of renal function. Whether or not an excessive protein intake can be detrimental in subjects without kidney disease has not been thoroughly evaluated.

Obesity, a component of the metabolic syndrome, has become a key worldwide problem. Although this phenomenon may result from altered dietary patterns and a sedentary lifestyle among people in developed countries, it is now a rapidly emerging problem in developing countries. Worldwide obesity has increased 3-fold since 2000 and according to reports from the World Health Organization (WHO) over one billion adults are overweight with at least 300 million being obese. There are further, great concerns about the rising prevalence of overweight and obesity among adolescents and children of school going age. Obesity contributes significantly to the burden of chronic diseases such as cardiovascular disease, cancers, type 2diabetes, and hypertension, among others.

The alarming increment of obesity worldwide has been paralleled by a steadily increasing incidence of CKD as a result of type 2 diabetes and hypertension (USRD, 2004). Unquestionably, much of the excess risk for CKD observed among people with obesity is linked to the increased prevalence of hypertension and/or type II diabetes. However, it also appears that obese individuals diagnosed with hypertension and diabetes are at a higher risk of developing nephropathy, compared with leaner subjects with these conditions, independent of blood glucose concentration and other

factors. In epidemiological studies, a high BMI was independently linked to proteinuria among diabetics and hypertensive subjects (Green, 2005).

Obesity may also aggravate existing nephropathies and is also associated with increased risk of graft failure after renal transplantation. Further evidence for a link between obesity and kidney damage is provided by the fact that weight loss in the obese reduces proteinuria and hyper-filtration (Cheema, 2007).

There are reports that low birth weight (LBW) is associated with increased risk of death from ischemic heart disease (Tanaka, 2007). The elevated risk appears to be limited to those who had low birth weight as a result of growth retardation, rather than to those born prematurely. A considerable number of reports are now published relating intrauterine malnutrition to a number of diseases in adult life including cardiovascular disease (CVD), hypertension, diabetes and renal disease (Green, 2005). The kidneys appear to be particularly sensitive to an unfavourable prenatal environment. Studies of human fetuses and neonates have demonstrated an association between intrauterine growth retardation and nephron number and reduced renal volumes. Oligonephropathy or small number of nephrons may result in hyper-filtration and glomerular hypertension, which might lead to increase future risks of glomerulosclerosis, hypertension and renal failure. Two previous case controlled studies from the United States found that a birth weight below 2.5 kg was independently linked to an increased risk of ESKD among whites. Besides low birth weight, short stature has also been associated with unfavourable intra uterine development. In cross sectional studies short stature has been linked with a degree of albuminuria in both diabetics and non-diabetic. It has also been associated with an increased rate of nephropathy among type 1 diabetics (Tanaka, 2007).

Summary of the Research Gap

From the review of the above literature, it is evident that there are risk factors related to the prevalence of CKD. Studies revealed factors associated with prevalence of chronic kidney diseases among people in different areas. Studies by White (2009) and Tanaka (2007) on occupational exposures did not look at variables such as herbal medicine use and cultural practices. Wilund (2007) conducted a study on occupational exposure to silica on CKD and Cheema (2007) in the same year conducted a study on the effect of exposure to heat on CKD.

On the effect of occupational exposures on CKD, a study looking at the effect of pesticides and fertilizers was not found. White (2009) conducted a study on the effect of agricultural practices on the prevalence of CKD, study by him look at Agricultural practices in general. Study by Stack (2005) on effect of low economic status did not look at variables such as illicit drug abuse and tobacco smoking while a study by Sigamani (2007) on dietary practices did not look at the effect of soda and tea drinking and protein intake. From the literature there is a research gap in terms of the variables the studies looked at and also the studies reviewed revealed that no such study has been done in Kenya since studies reviewed were done in Zambia, Nigeria and overseas countries. This reveals a geographical gap for this study.

CHAPTER THREE

RESEARCH METHODOLOGY

Research Design

This study adopted a cross-sectional survey research design. Cross-sectional studies involve data collected at a defined time. They are often used to assess the prevalence of acute or chronic conditions, or to answer questions about the causes of disease or the results of intervention. They illustrated issues as they exist in the current situation; they may be used to describe some feature of the population, such as prevalence of an illness, or they may support inferences of cause and effect (Ott & Longnecker, 2015). This design was adopted to illustrate the prevalence and risk factors to chronic kidney diseases in Kericho County.

Population and Sampling Techniques

According to Mugenda (2009), target population is a population to which a researcher would like to generalize the result of the study. The study targeted doctors, nurses and patients at Kericho District Hospital. The total population for the study was 97.

Table 1

Target Population

Strata	Target population
Doctors	15
Nurses	59
Patients	23
Total	97

Source (Kericho County Website, 2015)

This population was considered because the doctors and nurses understand the major factors contributing to the prevalence of chronic kidney diseases. The patients were considered for the study because they understand their background and mostly interact with the factors, which could contribute to prevalence of chronic kidney diseases. Census was employed such that all the 15 doctors and 59 nurses participated in the study. Purposive sampling was used to select the patients with CKD (23 patients).

Research Instruments

The study adopted the use of questionnaires, document analysis and interview schedule as the main data collection instrument.

Questionnaire

Questionnaires were used to collect the required information from the study population. These were both close-ended and open-ended questionnaires. By using self-administered questionnaires information about the factors contributing to prevalence of chronic kidney diseases and other related data was obtained. The questionnaire consisted of the respondents' background information, respondents' perception on the factors contributing to prevalence of chronic kidney diseases guided by the research questions. The instrument also ensured anonymity of respondents as their identities were not requested for. Other notable strengths include: simplicity in testing for reliability and validity (Wyatt, 2016). The questionnaire was developed based on the literature review and reference was also made to the problem identified and objectives set. Questionnaires were administered to nurses and CKD patients.

Document Analysis

Document analysis is the systematic examination of instructional documents. The focus of the analysis should be a critical examination, rather than a mere

description of the documents. Secondary data is data that has been collected by individuals or agencies for purposes other than those of our particular research study. Documents are an important source of data in any area of investigation. Review of the documents showed that the researcher was aware of the available functions of research. Documents generally provide a source of data, which is permanent and available in a form that can be checked by others. Secondary data may be available which is entirely appropriate and wholly adequate to draw conclusions and answer the question or solve the problem. Secondary sources of information can yield more accurate data than that obtained through primary research. In this regard, the researcher obtained secondary data mainly through existing patients' records to ascertain the prevalence of CKD.

Interview Schedule

An interview schedule is a set of questions with structured answers to guide interviewer. The study also employed interview schedules to collect data on the risk factors contributing to prevalence of chronic kidney diseases. The researcher made appointments to conduct interviews with doctors in Kericho District Hospital. The questions on the interview schedule were guided by the research questions of the study.

Validity of the Questionnaire

Validity is the ability of an instrument to measure a concept under study and to be able to measure it accurately so that any observed differences are true and not the result of random or constant errors. Instrument validity determines whether an instrument accurately measures that which it is supposed to measure (Wyatt, 2016). For the content validity of this instrument, proper conceptualization and operationalization of the variables under consideration was done through review of

literature. The researcher consulted her supervisors and other experts and specialists in this area for expert validation.

Reliability of the Questionnaire

Reliability refers to the extent to which an instrument yields similar results each time it is administered by independent persons under comparable conditions (Csikszentmihalyi & Larson, 2014). The researcher took much care to ensure that the research procedure was the same at each of the respondents included in the study population. An environment was created where the respondents were able to honestly complete the questionnaire. The study used internal consistency to ensure that different subsections of a measure answer the same question. The study used the Cronbach's Coefficient Alpha to establish the reliability of each section of the questionnaires. A Cronbach's alpha of 0.60, though minimally reliable, is an acceptable value and this was considered as a cut-off point.

A pilot study was done at Longisa county Referral Hospital. Thirty (30) respondents participated in the pilot study. The Cronbach's alpha coefficients obtained were as follows: 0.842 for Occupational exposures on prevalence of chronic kidney diseases, 0.782 for Lifestyle factors on prevalence of chronic kidney diseases, and 0.610 for Dietary practices on the prevalence of chronic kidney diseases, after one statement was improved.

Data Gathering Procedures

Data collection involves selecting subjects and gathering information from them. The process delineates the steps involved in data collection with regard to a specific study and depending on the research design and method of measurement (Suen & Ary, 2014).

The researcher sought an introductory letter from the University of Eastern Africa Baraton and a permission from the management of Kericho District Hospital to carry out the study. During the data collection process, the researcher visited the hospital and made appointments for data collection. The researcher personally distributed the questionnaires and collected them. The respondents were informed of the purpose of the study and given an information leaflet, which was on the front page of the questionnaire. They read the contents on the leaflet and decided whether or not to participate. The researcher used face-to-face interviews as a data collection tool. The aim of this approach is to ensure that each interview is presented with exactly the same questions in the same order. The semi-structured interviews were conducted with the goal to see the research topic from the perspective of the interviewee. The researcher interviewed the doctors during the visit to the hospital. A few Doctors however preferred telephone interviews. All the patients who were admitted in the medical wards at KDH in 2013, 2014 and 2015 were listed and those diagnosed with CKD identified. The risk factors for CKD were documented in Kericho County through in depth interviews of Doctors and from patients and Nurses.

Statistical Treatment of Data

Data analysis is the process of creating order, structure and meaning to the mass of information collected (Mugenda, 2012). The data collected was analyzed using mainly descriptive statistics. The study adopted both the qualitative and quantitative analysis in order to achieve the objectives (prevalence of CKD patients; occupational exposures among patients; cultural, lifestyle and dietary factors among patients with chronic kidney diseases) of the study. Content analysis was used to analyse both secondary and qualitative data. Aim of content analysis is to make sense of the data collected and to highlight important massages, features or findings. Data

from the interview schedules was organized, coded and overarching themes in the data were build; reliability and validity in the data analysis was ensured and lastly finding possible and plausible explanations for findings. Analysis was done using SPSS (Version 20) a computerized statistical package by encoding responses from questionnaires and providing understandable descriptive results.

Ethical Considerations

To ensure that the study complied with the ethical issues pertaining research undertaking, a permission to conduct the research was sought from the respective authorities. 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 learning purposes. A high level of confidentiality and privacy was observed and the findings of the study were only submitted to the University and the Kericho District Hospital.

A letter of introduction was also obtained from the University to serve as evidence of the purpose of the study. In respect for the informants and in order to protect them from abuse resulting from the data they gave for the research, data was presented in such a way that it does not link to individuals who gave it except by the researcher who might need to seek clarification during analysis of data. Participation in the study by the respondents was free and voluntary in that they could withdraw at any time of the study. The study is beneficial to the community because it will enlighten them on the risk factors of CKDs hence enable them to avoid the risk factors and reduce the prevalence of chronic kidney diseases.

CHAPTER FOUR

PRESENTATION OF FINDINGS, ANALYSIS AND INTERPRETATION

The purpose of this study was to determine prevalence and risk factors for chronic kidney failure in Kericho County, Kenya. The objectives of the study were prevalence of CKD patients; occupational exposures among patients; cultural, lifestyle and dietary factors among patients with chronic kidney diseases. The study targeted doctors, nurses and patients. The study population was 97 respondents and the study collected data from all the respondents. This chapter presents, analyzes and interprets the findings.

Demographic Characteristics of the Respondents

The study sought to establish the demographic characteristics of the respondents including gender, age, education level, income and occupation of the patients. The study results were as follows:

Table 2

Gender of the Respondents

	Patients	
Gender	Frequency	Percent
Male	13	56.5
Female	10	43.5
Total	**23**	**100**

Fifty-six point five (56.5) % of the respondents with CKD were males while 43.5% were female. This may suggest a higher prevalence of CKD in males compared to the females, or it could have been a coincidence that many males attended the

hospital at the time of the interview. Surprisingly, all the doctors interviewed were of the opinion that CKD was common in males than females.

Table 3

Age of the Respondents

Patients with CKD

Age bracket	Frequency	Percent
Below 30 Years	4	17.4
31-40 Years	7	30.4
41-50 Years	7	30.4
Over 50 Years	5	21.7
Total	**23**	**100**

The majority (78.3%) of the subjects with CKD were below the age of 50 years, which represents the young adults who are economically productive. The age of onset of CKD may be important in next research, since the disease appear early in our setup. According to the doctors interviewed, majority of CKD patients are adults and rarely children.
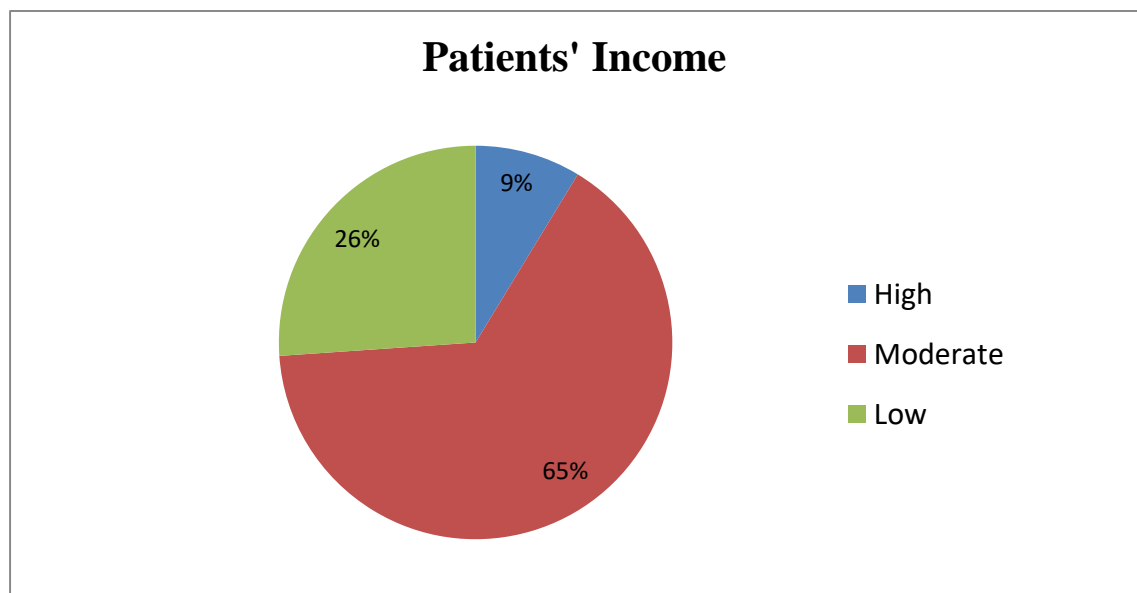
Figure 3. Income of the patients.

The study results on the income of the patient respondents indicated that 9.0% rated their income as high, 65.0% rated their income as moderate whereas 26.0%

rated their income as low. Therefore, majority of CKD patients had moderate to low income. During the interview of doctors, they suggested that low to moderate income played a role in delayed diagnosis and proper management of CKD, and that patients may resort to herbal remedies which worsen their condition. On the other hand, the high-income group is prone to diseases of lifestyle such as hypertension and diabetes, which leads to CKD (The basis for the classification of income was as suggested by Yusuf et al., 2011).
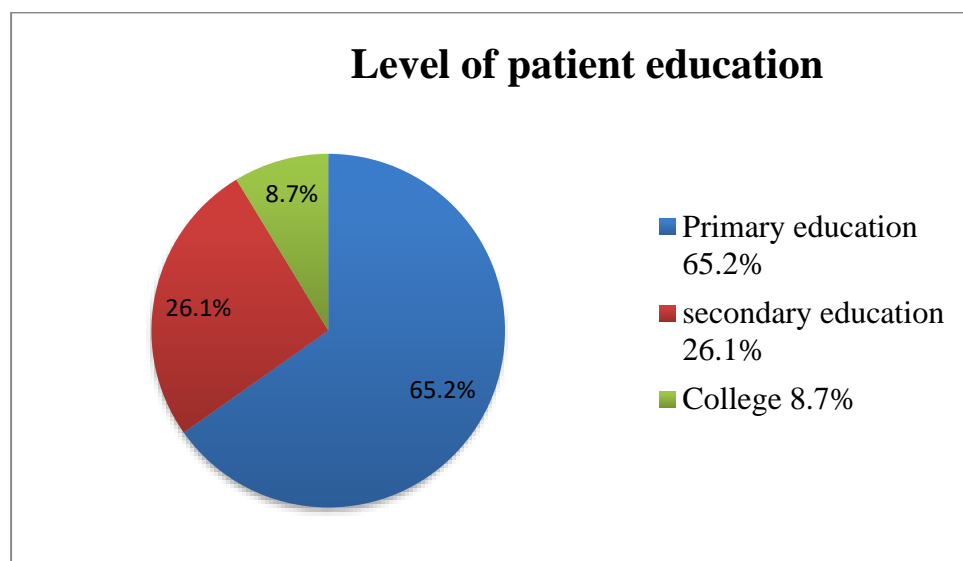
Figure 4. Level of patient education.

Majority of patients (65.2%) had a low level of education (primary school), with 8.7% only having attended college level education. On the influence of education, majority of the doctors were in agreement with the possibility that low level of education may cause delay in seeking appropriate medical treatment, while those with a higher level of education may seek treatment early, and may be aware of the risk factors of CKD.

Prevalence of Chronic Kidney Diseases

The clinical and epidemiological studies show a clear relationship between numerous risk factors and the initiation and progression of CKD. Although kidney function declines with age and exhibits considerable individual variation among healthy subjects, indications are that environmental, lifestyle factors and relevant genetic milieu accelerate the disease progression (Sigamani, 2012).

The study sought to establish the prevalence of CKD among adult medical patients admitted in Kericho District Hospital. The study used document analysis to analyze this objective and records of between 2013 and 2015 were used. The study results were as follows:

Table 4

Prevalence of Chronic Kidney Diseases

Year	Total No of Patients Admitted	Total with CKD	Percent
2015	6040	28	0.46
2014	5571	22	0.39
2013	4248	13	0.31
Total	15859	63	0.40

The study results on the prevalence of CKD indicated that in 2015 out of 6040 patients admitted, 28 (0.46%) had chronic kidney disease, in 2014 out of 5571 patients admitted 22 (0.39%) had chronic kidney disease, in 2013 out of 4248 patients admitted 13 (0.31%) had chronic kidney disease. The results indicate a progressive increase in the frequency of patients diagnosed with chronic kidney diseases at Kericho county referral hospital.

The prevalence of chronic kidney disease among hospital admissions at Kericho county hospital ranged from 0.31, 0.39 and 0.46% in the year 2013, 2014 and 2015 respectively, with an average of 0.41% (41 people per 10,000 population). This

average is below the estimated Kenya national prevalence of about 10 % (1000 per 10,000), which is based on the global estimates of CKD (Levey, 2007) The possible explanation for this difference could be explained by the fact that only patients referred for dialysis (i.e. those with end stage renal disease) were captured in the hospital statistics, whereas the national figure encompasses patients with all stages of CKD, probably over a longer period of time. The average is also lower than the estimated prevalence in sub-Saharan Africa of 13.9% (Stanifer *et al*., 2014) because of the same reason. However, when compared to studies that have specified the prevalence of end stage renal disease, this average prevalence is twice as high than what's reported in literature. In an international study comparing the relationship of CKD prevalence and ESRD, the prevalence of ESRD was 0.2% (Steiner *et al*., 2006). In another study of the United States of America (USA) population, the prevalence of stage 5 was again 0.2%, with the majority of the patients (51.8%) being females.

Majority of the study patients (78.3%) were below the age 50 years, with the male predominance of 56.5%, and a combined low to moderate income rating of 91%. Low socio-economic status is associated with an increased risk of chronic renal failure (Stack, 2007.) In contrast to the findings in the study, most of the CKD patients tend to be older, with studies in the literature review indicating a median age of 83 (range 18 – 103) years with a female predominance of 58.2%. The increasing trends of CKD is in keeping with global trends, where CKD has become an important cause of mortality, shifting from position 27 in the year 1990 to position 18 in 2010 globally (Jha *et al*., 2013). There are no studies indicating CKD trends in Kenya or sub-Saharan Africa in literature. However, the Kericho county hospital has started capturing all stages of CKD using the international classification of disease, Revision 10 (ICDC-10) coding system.

Occupational Exposures among Patients with Chronic Kidney Diseases

The study sought to determine the influence of occupational exposures on the prevalence of chronic kidney diseases. The study findings were as follows:

Table 5

Occupation of the Patients

Occupation	Frequency	Percent
Farming	13	56.5
Business	7	30.4
Employed	3	13.0
Total	**23**	**100**

The study findings on the occupation of the respondents indicated that 56.5% of the patients were engaged in farming, 30.4% were engaged in business activities while 13.0% were employed. This shows that majority of the patients were engaged in farming activities. All the doctors interviewed agreed that some occupations might influence the development of chronic kidney disease in the region.
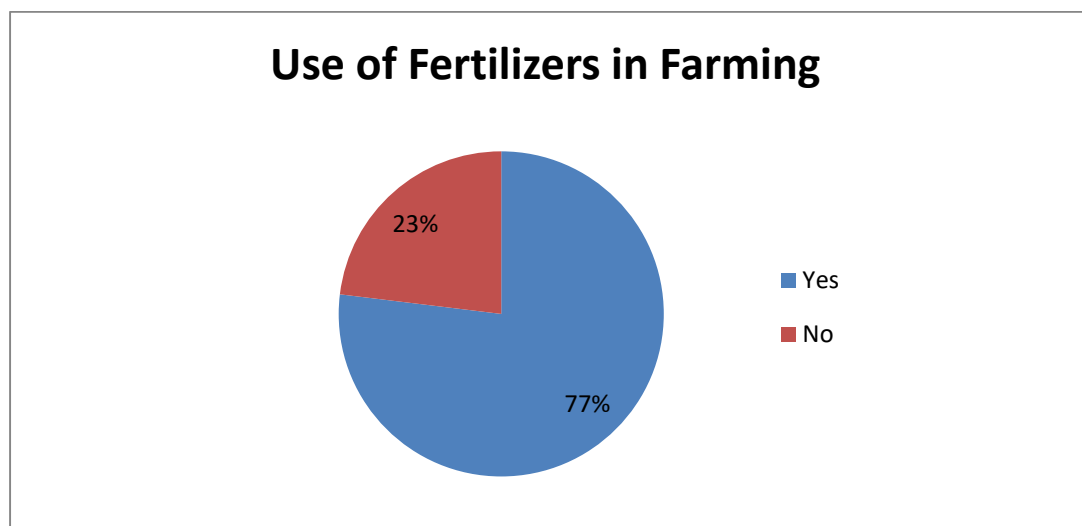
Figure 5. Use of fertilizers in farming.

The study results on the use of fertilizers in farming indicated that 23.0% of the patients did not use fertilizers and agrochemicals when planting before being diagnosed with CKD while 77.0% used fertilizers and agrochemicals when planting before diagnosis of CKD. This may suggest an association between use of fertilizer and agrochemicals, and development of CKD.

Among those who used fertilizers and agrochemicals when planting before being diagnosed of CKD majority reported to have used CAN and DAP fertilizers during planting. Exposure to these agricultural fertilizers contaminates soils and water sources used, which can lead to chronic kidney diseases. Majority (90%) of the doctors interviewed noted that agricultural practices have an influence on chronic kidney diseases.

The study sought to establish the opinion of the nurses on the influence of occupational exposures on prevalence of CKD. The findings were was follows:

Table 6

Occupational Exposures and Prevalence of CKD

Statements		D	TD	TA	A	TOTAL	MEAN
The use of agrochemicals is associated with prevalence of CKD	F	0	0	20	39	59	3.66
	%	0	0	33.9	66.1	100	
The continued and frequent use of agrochemicals increases the risk of CKD	F	0	0	29	30	59	3.51
	%	0	0	49.2	50.8	100	
The use of pesticides contributes to prevalence of CKD	F	0	0	28	31	59	3.53
	%	0	0	47.5	52.5	100	
The kind of fertilizers used by the residents contributes to prevalence of CKD	F	0	0	23	36	59	3.61
	%	0	0	39.0	61.0	100	

KEY: F-Frequency; D-Disagree; TD-Tend to Disagree, TA-Tend to Agree; A-Agree

The results indicate that nurses were of the view that use of agrochemicals is associated with an increased prevalence to CKD (mean of 3.66) and agreed that the continued and frequent use of agrochemicals increases the risk of CKD with a mean

of 3.51. When asked if the type of fertilizer influenced the development of CKD, a majority of the nurses were of the view that the type of fertilizers used by the residents did contribute to high prevalence of CKD (mean of 3.61). With regard to use of pesticides, most nurses agreed that use of pesticides contributes to prevalence of CKD as revealed by a mean of 3.53. The study findings indicated that majority of the respondents were of the view that use of agrochemicals, pesticides and fertilizers is associated with increased prevalence of CKD in the region. All the doctors interviewed indicated that use of agrochemicals is linked to the development of chronic kidney, especially if the people don't use protective gear.

The occupation of the CKD patients was mainly farming (56.5%), and even those who were employed (13%) or doing non-agricultural businesses (30.4%) did engage in small-scale farming, utilizing agrochemicals. The use of agrochemical was common at a rate of 77% prior to development of CKD among the patients. Use of agrochemicals such as phosphate fertilizer, which are contaminated with heavy metals, pesticides and herbicides cause soil and water pollution, secondarily contaminating the human food chain (Robinson, 2014). Analysis of artificial fertilizers such as calcium ammonium nitrate (CAN) and di-ammonium phosphate (DAP) indicates that 70% of the fertilizer content is filler material derived from toxic industrial wastes or sludge, with the remaining 30% being the necessary elements of potassium, phosphate and nitrates. The filler material contains heavy metals like, mercury, lead, and cadmium, arsenic and nickel, to mention but a few. Consumption cadmium, lead or mercury in contaminated agricultural products and water may result in escalation of multiple diseases, including CKD. Cadmium specifically leads to proteinuria, glomerular and tubular damage, and was associated with a disease referred to *itai itai* in Japanese farmers (Robinson, 2014).

Cultural Factors on Prevalence of Chronic Kidney Diseases

The study sought to determine the influence of cultural factors on the prevalence of chronic kidney diseases. The study findings were as follows:
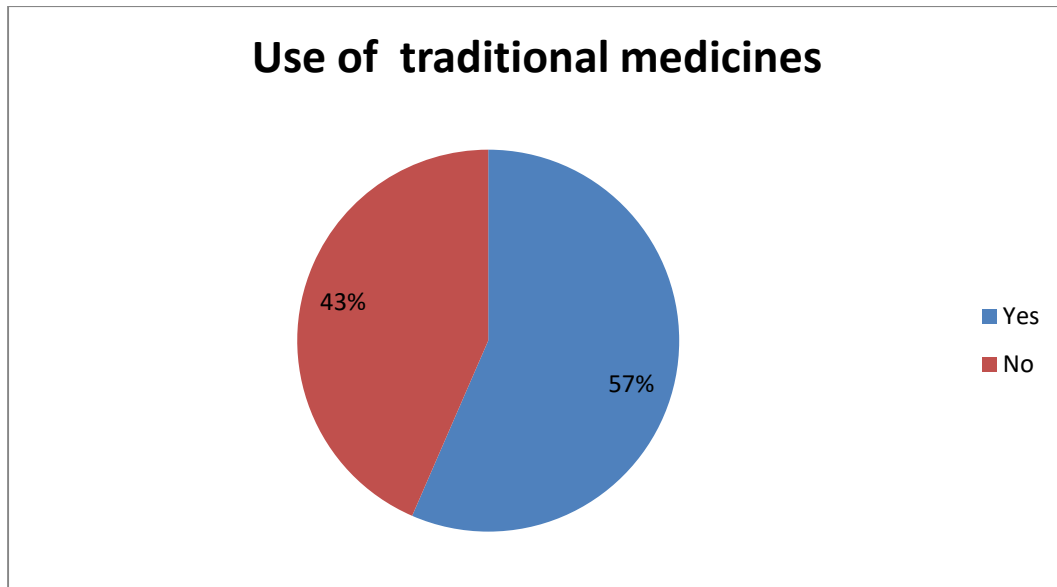
Figure 6. Patients' use of traditional medicines.

The study results on patients' use of traditional medicines indicate that 43.0% did not use traditional medicines while 57.0% used traditional medicines. This shows that majority of the patients interviewed used traditional medicines to cure ailments before diagnosis of chronic kidney disease.

As regards whether the patients have ever heard someone who used traditional medicines and got more ill, 43.0% noted that they have not heard someone who used traditional medicines and got more ill while 57.0% had heard of someone who used traditional medicines and got more ill. This shows that majority of the respondents had heard of someone who used traditional medicines and got more ill. This further indicates that use of traditional medicines could have an influence on the prevalence of CKD.

Use Traditional Medicines

43%

57%

- Yes
- No
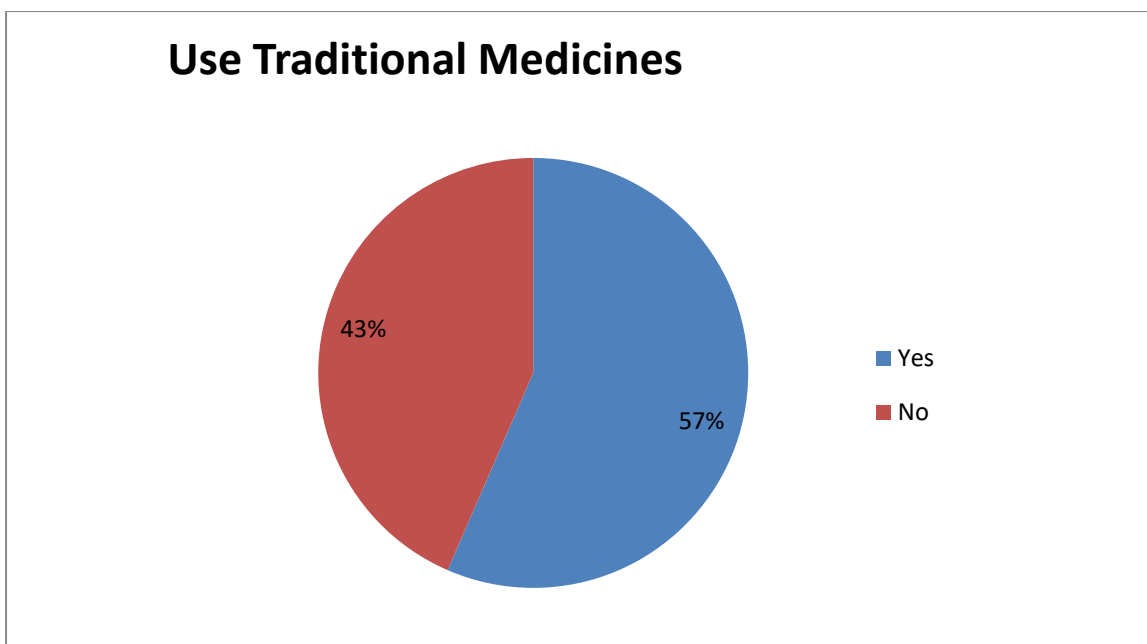
Figure 7. Patients' Heard Someone Use Traditional Medicines.

Table 7

Traditional Medicines and Prevalence of CKD

		Frequency	Percent
Patients reported Use of traditional Medicines	Yes	42	71.2
	No	17	28.8
	Total	59	100
Nurses heard of patient using traditional Medicines	Yes	30	50.8
	No	29	49.2
	Total	59	100

Most of the nurses (71.2%) noted that patients reported use of traditional medicines for ailments before being diagnosed of CKD while the remainder (28.8%) didn't. When nurses were asked about hearing of patients using herbal medicines prior to development of kidney disease, 50.8% of them reported having heard someone use traditional medicines and gotten ill, while 49.2% said they've never heard someone used traditional medicines and get ill.

Doctors on the other hand agreed that use of herbs is hazardous to health, causing damage to the kidney since the dosage isn't clear. They added that culture might promote practices that put males at a higher risk of developing CKD. For example, it's the males who spray the cows and crops in general.

It's culturally accepted to seek herbal treatments for many ailments in the African communities. The study found that 57.0% of patients with CKD had used traditional medicines prior to onset of the disease. A similar percentage (57%) had heard of people falling ill after use of traditional medicines. A clue on how cultural practices may interact with both traditional and non-traditional risk factors and influence progression, and prevalence of CKD in SSA is provided in a study done on a hospitalized Zambian population. Patients reporting use of herbal remedies had adverse drug reactions that could promote renal injury and increase cases of CKDs. The major drawback of the local remedies was lack of standardized dosing protocols and poor understanding of their side effects. Sometimes side effects are misinterpreted or perceived to be beneficial effect of the remedies (White, 2009.) Subsequent literature review on use of African herbal medicine (AHM), labeled as "popular medicinal plants " and how they are linked with observed adverse drug reactions in African countries confirmed inadequate information on indications, dosage and contraindications of these preparations (White, 2012.) Herbal preparations from other continents, especially Asia, have existed for a long time and the use in certain medical conditions is well documented. The most common Asian preparations are those from China, collectively referred to as Traditional Chinese herbal medications (TCHM). Their use is slowly increasing and we currently have Chinese clinics in some parts of the country, including Eldoret in the rift valley. The TCHM are frequently used in conjunction with western pharmacotherapy for treatment of chronic kidney diseases

(CKD) in China and many other Asian countries, and locals may use them in a similar way or alone. Several TCHM are associated with significant adverse effects, including nephrotoxicity. However, reporting of adverse effects associated with TCHM has been inadequate.

Lifestyle Factors on Prevalence of Chronic Kidney Diseases

The study sought to establish the influence of lifestyle factors on the prevalence of chronic kidney diseases. The study results were as follows;
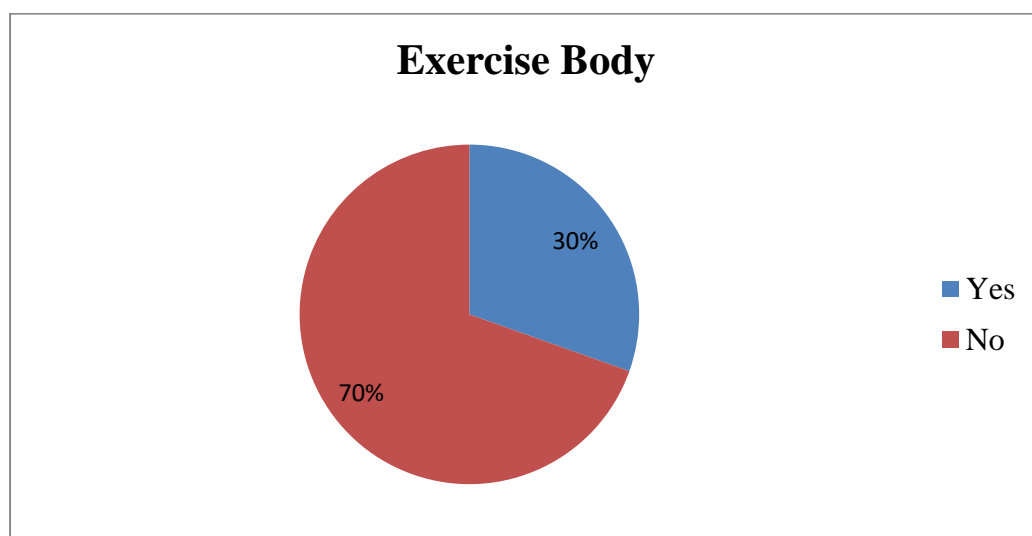
Figure 8. Exercise body before diagnosed of CKD.

The study results on whether the patients frequently exercised their bodies before diagnosis of CKD indicated that 30.0% frequently exercised their bodies while 70.0% of the patients did not. The majority (70%) who didn't exercise mentioned that body exercise and play was meant for children. The Doctors too agreed that physical inactivity influences development of CKD by contributing to overweight, which may lead to hypertension and diabetes.
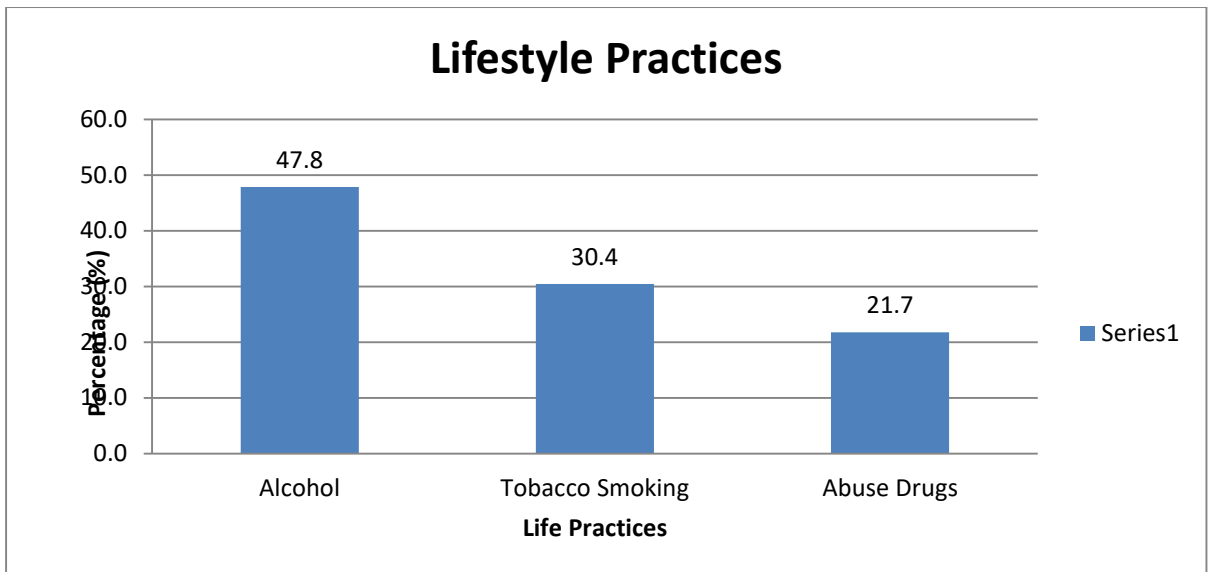
Figure 9. Lifestyle practices before diagnosis.

The study findings further on lifestyle practices indicated that 47.8% took alcohol before diagnosed of CKD, 30.4% of the patients smoked tobacco before diagnosed of CKD while 21.7% of the respondents abused over the counter drugs before diagnosed of CKD. Four patients (17.4%) didn't use alcohol, tobacco or over the counter drugs in the period before onset of chronic kidney disease.

The patients who took alcohol said that they did so because alcohol intake was part and parcel of life in the area. Those who used over the counter drugs did so because it was cheaper, easily accessible and didn't need a prescription.

Table 8

Lifestyle Factors and Prevalence of CKD

Statements		D	TD	TA	A	TOTAL	MEAN
Lack of physical exercise has an	F	0	0	24	35	59	3.59
impact on prevalence of CKD	%	0	0	40.7	59.3	100	
There is relationship between the	F	0	0	30	20	59	3.61
weight of a person and the	%	0	0	50.8	33.9	100	
prevalence of CKD							
Alcohol drinking contributes to	F	0	0	22	37	59	3.47
majority of the cases of CKD in	%	0	0	37.3	62.7	100	
the area.							
Smoking contributes to	F	0	0	27	32	59	3.42
prevalence of CKD among most	%	0	0	45.8	54.2	100	
people in the area							

KEY: F-Frequency; D-Disagree; TD-Tend to Disagree, TA-Tend to Agree; A-Agree

The study findings indicated that nurses were of the view that physical

inactivity has an impact on the prevalence of CKD (mean of 3.59) and when asked

whether there is relationship between the weight of a person and the prevalence of

CKD they agreed with a mean 3.61. When asked if alcohol contributes to majority of

CKD, a mean of 3.47 were affirmative. The nurses also concurred that smoking

contributes to prevalence of CKD amongst the people in the area with mean of 3.42.

These views of nurses suggest a general agreement amongst them pointing to a

relationship between physical inactivity, the weight of a person and smoking with, the

prevalence of CKD in the county.

According to the doctors, over the counter drugs are harmful to one's health

especially prolonged use of paracetamol and NSAIDs. Physical inactivity is harmful

and may lead to diabetes and eventually CKD. As regards smoking and drinking of

alcohol, majority of the doctors interviewed agreed that they can damage the kidneys,

eventually leading to CKD.

The majority (70%) of CKD patients didn't exercise and mentioned that body

exercise or play was meant for children. The study findings further on lifestyle

practices indicated that before diagnosed of CKD 47.8% of the patients took alcohol, 30.4% smoked tobacco while 21.7% abused over the counter drugs.

In epidemiological studies, overweight and obesity, which are a consequence of physical inactivity, are independently linked to proteinuria among diabetics (Hall *et al.*, 2014), and hypertensive subjects. Obesity may also aggravate existing nephropathies and is also associated with increased risk of graft failure after renal transplantation. Further evidence for a link between obesity and kidney damage is provided by the fact that weight loss in the obese reduces proteinuria and hyper-filtration (Cheema, 2007). The patients with obesity have high prevalence of other lifestyle diseases (diabetes, hypertension), which interact with genetics, environment and other bad lifestyle habits like smoking in initiating and progression of CKD. Unquestionably, much of the excess risk for CKD observed among people with obesity is linked to the increased prevalence of hypertension and/or type II diabetes. However, it also appears that obese individuals diagnosed with hypertension and diabetes are at a higher risk of developing nephropathy, compared with leaner subjects with these conditions, independent of blood glucose control and other factors. The health worker's opinion supported the above lifestyle relationships with CKD.

The majority (89.8%) of the nurses were of the opinion that low levels of body exercise (physical inactivity) may be associated with increased prevalence of CKD, while 90.3% believed that overweight and obesity increase the prevalence of CKD. With regard to alcohol intake and tobacco smoking, 86.8% and 85.5% respectively were of the view that these two habits contribute to development of CKD in the region.

According to the doctors, over the counter drugs are harmful to one's health especially prolonged use of paracetamol and NSAIDs. Physical inactivity is harmful

and may lead to diabetes and eventually CKD. As regards smoking and drinking of alcohol, majority of the doctors interviewed noted that smoking and alcohol lead to CKD.

These findings were supported by Wimalawansa & Wimalawansa (2014) who noted that Obesity contributes significantly to the burden of chronic diseases such as cardiovascular disease, cancers, type II diabetes, and hypertension, among others. The alarming increment of obesity worldwide has been paralleled by a steadily increasing incidence of CKD as a result of type II diabetes and hypertension. Much of the excess risk for CKD observed among people with obesity is associated with increased prevalence of hypertension and/or type II diabetes. It also appears that obese individuals diagnosed with hypertension and diabetes are at a higher risk of developing nephropathy, compared with leaner subjects with these conditions, independent of blood glucose concentration and other factors. Obesity may also aggravate existing nephropathies and is also associated with increased risk of graft failure after renal transplantation.
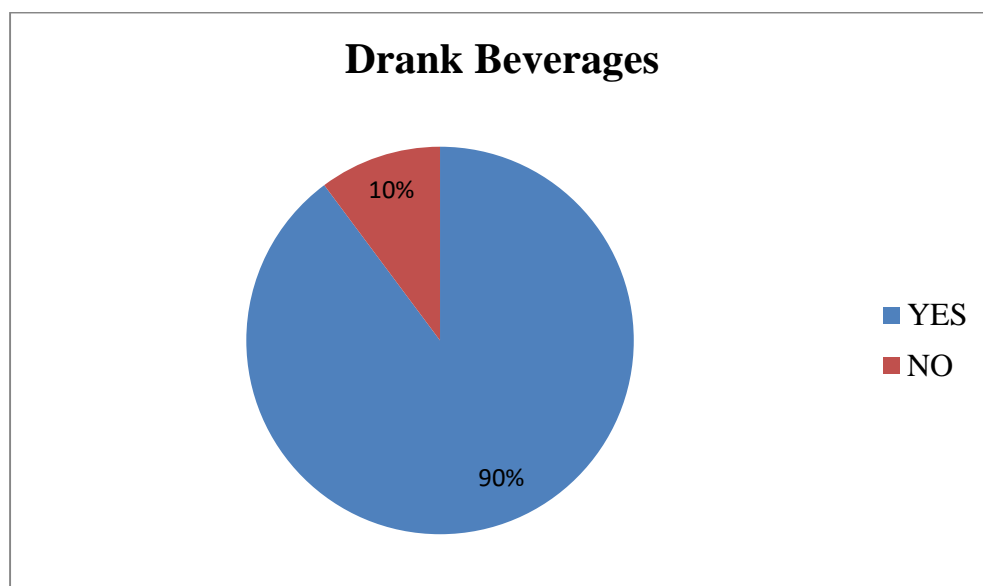
Figure 10. Drank beverages before diagnosis.

The question on whether the patients drank beverages (tea) prior to development of CKD found that only 10.0% did not drink beverages (tea) while 90.0% drank beverages (tea). This shows that majority of the patients drank beverages (tea) before diagnosed of chronic kidney diseases.

Frequency of drinking Beverages

Frequency	Percentage
Daily	93.7
Twice a Week	4.5
Three Times a Week	1.8

(Y-axis: Perentage, values 0 to 100; X-axis: Frequency of drinking)
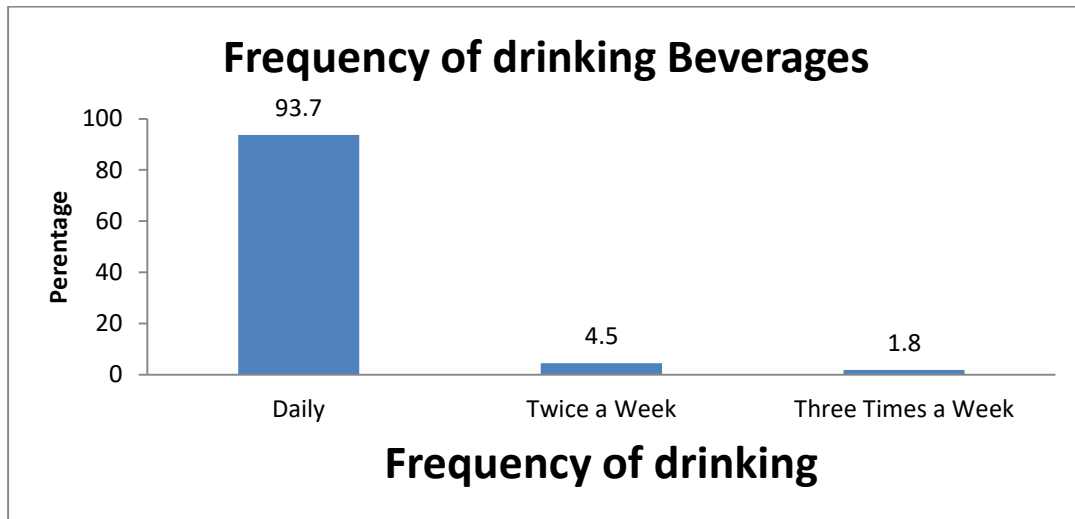
Figure 11. Frequency of drinking beverages.

As regards the frequency of drinking beverages (tea), 93.7% of the patients reported that they drank beverages (tea) on daily basis, while 6.3% drank tea twice or thrice a week. This shows majority of the respondent drank beverages (tea) on daily basis. The reason for the high intake of tea by the patients was due to the fact that tea is a major cash crop in the area, it is sold cheaply to farmers and sometimes given free to those working in the factories. The patients have grown taking tea and love it, and cant imagine going a day without a cup, according to their own words during the interview
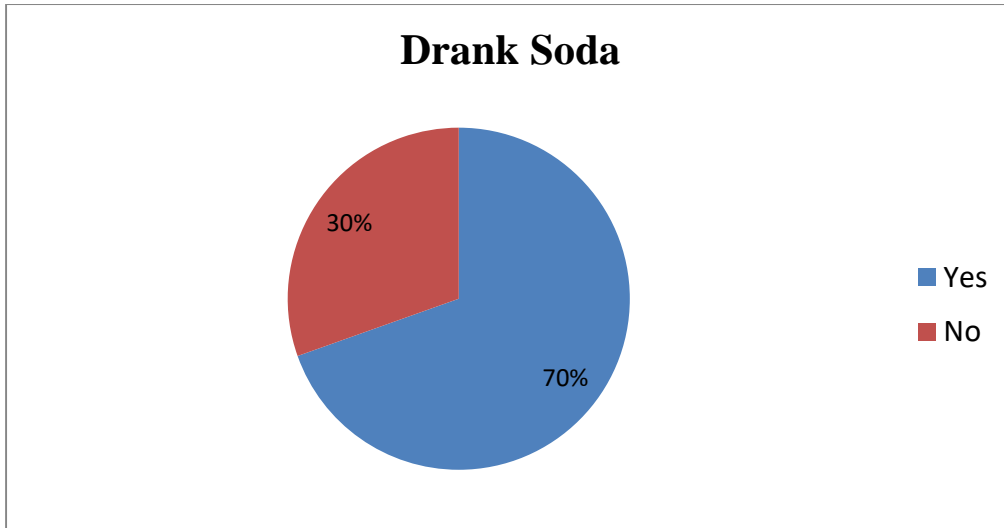
Figure 12. Drinking of cold beverages.

The study results indicated that 30.0% of the patients did not drink soda before being diagnosed of CKD whereas 70.0% did drink soda. This gives the impression that majority of the patients drank soda before being diagnosed of chronic kidney disease.

As regards the level of salt intake before diagnosis of CKD, majority of the patients said that they added table salt frequently to their food because it made food taste better.

Table 9

Drinking of Cold Beverages

Nurses Responses	Frequency	Percent
Yes	20	33.9
No	39	66.1
Total	59	100

The study findings indicated that 33.9% of the nurses agreed that cold beverages may contribute to CKD while 66.1% disagreed..

The study sought to confirm the influence of dietary practices on prevalence of chronic kidney diseases; the responses were based on the following statements and the study results were as follows;

Table 10

Dietary Practices and Prevalence of CKD

Statements		D	TD	TA	A	TOTAL	MEAN
Beverage(tea) intake contributes to the prevalence of CKD	F	0	7	33	19	59	3.20
	F %	0	11.9	55.9	32.2	100	
The continued and frequent intake of beverages(tea) increases the risk of CKD	F	0	9	30	20	59	3.19
	%	0	15.3	50.8	33.9	100	
High salt intake contributes to the risk of CKD	F	0	0	22	37	59	3.63
	%	0	0	37.3	62.7	100	
Soda consumption is associated with majority of the CKD cases in the area	F	0	0	27	32	59	3.54
	%	0	0	45.8	54.2	100	

KEY: F-Frequency; D-Disagree; TD-Tend to Disagree, TA-Tend to Agree; A-Agree

The study results indicated that nurses were of the view that beverage (tea) intake contributes to the prevalence of CKD (mean=3.20); Nurses were of the view that continued and frequent intake of beverages (tea) increases the risk of CKD with a mean of 3.19; when asked whether high salt intake contributes to the risk of CKD they agreed with a mean of 3.63 whereas on their view that soda consumption is associated with majority of the CKD cases in the area they agreed with a mean of 3.54. This study results indicated that majority of the nurses were of the opinion that high salt intake, tea and soda may contributes to the risk of chronic kidney diseases among patients in this locality. The doctors were in agreement that increased salt intake might cause kidney damage by overworking it or by predisposing the person to develop hypertension.

The study found that majority of the CKD patients (90%) drank beverages, mainly tea. Among those drinking tea, 93.7% drunk 1-2 cups once a day, 4.5% twice

a week and 1.8% drunk tea thrice a week. The other beverage commonly consumed by the patients with CKD was soft drinks (soda). The study results indicated that 70.0% of the respondents did drink soda before diagnosed of CKD whereas 30.0% of the patients didn't. The majority of the nurses (66.1%) didn't believe intake of cold beverages might contribute to development of CKD through obesity and its related complications of hypertension and diabetes.

Majority of the patients confirmed that they liberally took salt, adding it every meal (table salt) before the diagnosed of CKD. Though majority had reduced intake, they complained that food was tasteless in its absence and not enjoyable. The relationship between dietary factors and chronic kidney disease is complex and may be indirectly related via predisposition to lifestyle related illness.

A cross sectional Chinese study looked at the association between the dietary factors and chronic kidney disease based on estimated glomerular filtration rate (eGFR) in adults with metabolic syndrome. The study found a significantly inverse correlation between eGFR and nutrient intake (energy, protein intake, cholesterol intake, carbohydrates intake, sodium intake, calcium intake and actual protein/energy ratio.) Logistic regression analyses showed that actual protein intakes/recommended protein intakes (APIs/RPIs) were significant independent predictors of eGFR < 60-ml/min•1.73 m^2 (Sigamani, 2007).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND

RECOMMENDATIONS

Summary

The purpose of this study was to determine prevalence and risk factors for chronic kidney failure in Kericho County, Kenya. The objectives of the study were to determine the prevalence of CKD among inpatients and assess occupational exposures, cultural, lifestyle and dietary factors among medical patients with chronic kidney diseases. The study adopted the PRECEDE – PROCEED model as the theoretical framework. The study reviewed factors contributing to prevalence of chronic kidney diseases. A review of the literature was conducted to determine the existing body of knowledge on the research topic and to identify any possible commonalities or differences that exist in the searched literature. This study was conducted through a cross-sectional survey research design. The study targeted doctors, nurses and patients. The study population was 97 respondents and the study collected data from all the respondents.

The study used questionnaires, document analysis and interview schedule as the main data collection instruments. To check validity of the instruments, the researcher consulted the supervisors and other experts and specialists in this area for expert validation. The study used the Cronbach's Coefficient Alpha of 0.70 to test for the reliability of the questionnaires. The data collected was analyzed using descriptive statistics. The study adopted both the qualitative and quantitative analysis in order to achieve the objectives (prevalence of CKD patients; occupational exposures among patients; cultural, lifestyle and dietary factors among patients with chronic kidney

diseases) of the study. Content analysis was used to analyse both secondary and qualitative data. Data from the interview schedules was organized, coded and overarching themes in the data were built; reliability and validity in the data analysis was ensured and lastly finding possible and plausible explanations for findings.

Summary of Findings

1. The study results indicated that there was a progressive increase in the number of patients who were referred for dialysis due to CKD, with a three-year average prevalence of 0.4%. Majority of patients (78.3%) were below the age of 50 years and 91% were of low to medium income rating.

2. Farming was the major occupation among CKD patients (56.5%), with exposure to agrochemicals being common at 77%. Fifty seven (57) percent of the patients had used herbal medication prior to onset of CKD. Physical inactivity among CKD patients was prevalent at 70%, with the majority (90%) of patients taking tea and 70% taking soda. Salt intake was common prior to development of CKD

3. The doctors and nurses were in agreement that exposure to agrochemicals, physical inactivity, some diets and herbal medication could be risk factors for CKD.

Conclusions

1.   The average prevalence of CKD over 3 years was at least twice as high (0.41% compared to 0.2% in literature). Many of the ESRD patients in the study were much younger compared to those reported in literature, meaning the disease affected a population that is economically active. There was male predominance, which may be due to gender roles and the males using alcohol and smoking mostly.

2. Farming was the main occupational exposure. Majority of these patients were exposed to use of agrochemicals, mainly phosphate fertilizers and pesticide which may contaminate soils and water, causing kidney disease.

3. Culture, lifestyle and diet also affect one's health negatively. Patients with CKD had used traditional medicines prior to onset of the disease. Herbal concoctions may lead to kidney injury directly or indirectly through other side effects that cause dehydration. The cultural role that allocates certain responsibilities to a certain gender, like spraying agrochemicals being a chore done mainly by males, as a risk factor for CKD in males.

Physical inactivity was common at a level of 70% among patients with CKD. The doctors and nurses agreed that physical inactivity leads to increased prevalence of CKD via development of obesity, hypertension and diabetes. These may explain the increased prevalence of CKD in non-farming patients.

The healthcare providers also agreed that tobacco smoking, alcohol abuse and use of over the counter NSAIDs could lead to increased prevalence of CKD in the region. Alcohol and tobacco use is common male population in this region.

Intake of beverages such as Tea may have adverse effects on the kidney. The doctors and nurses however agreed that addition of table salt, which was a common practice by most patients prior to development of CKD, could lead to CKD. Many said that salt reduction has made their food tasteless and not enjoyable, indicating the difficulty in changing the habit.

Recommendations

The study made recommendations for policy, practice and research as follows:

For Practice

  i.   Educate people on the need and importance of physical fitness

  ii.   People should take precautions when handling agrochemicals

  iii.   Reduce intake of alcohol, tea, sodas, over the counter medications and avoid smoking.

  iv.   Avoid use of herbal medications

For Policy

  i.   The government should have a policy where all foods are well labeled to show the quantity of sodium

  ii.   The government should abolish smoking and put in place measures that make smoking, alcohol, tea and soda intake expensive.

  iii.   The county hospital and administration should put in place preventive measures to reduce prevalence of CKD; these would include patient education, posters on CKD and information through the media (e.g. radio).

  iv.   The government should insist on proper documentation of diseases in order to have reliable records for planning purposes.

For Research

  i.   Further research using different study designs like case-control or cohort studies or experimental studies should be done to show association of the various risk factors and CKD.

  ii.   Improved case definition of CKD is needed at the county hospital and countrywide in order to document all cases of CKD, not just those requiring hemodialysis.

iii. A study on factors associated with late health seeking behaviour of CKD patients should be done in order to design strategies to improve early diagnosis and referral.

iv. A study showing reasons for male gender prevalence of CKD in Kenya should to be done.

REFERENCES

Agarwal, S. K. (2009). *Chronic kidney disease in India: Challenges and solutions*. Nephron Clinical Practical. Mountain View, CA: Mayfield Publishing Company *hypertension.* Med Sci Sports Exercise.

Alice, T. (2016). *College Of Science* (Doctoral Dissertation, Kwame Nkrumah University of Science And Technology Kumasi).

Almeida, A.F. (2012). *What do we know about chronic kidney disease in India*: First report of the Indian CKD Registry.

Cheema, R.K., Chertow, G.M., Fan, D., McCulloch, C.E., Hsu, C.Y. (2004). *Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization* N England J Med 351:1296.

Constitution of Kenya (2010)

Corsh, J., Selvin, E., & Stevens, L.A. (2007). *Prevalence of chronic kidney disease in the United States*. JAMA; 298(17): 2038–2047.

Coresh, J., Stevens, L.A., & Levey, A.S. (2008). *Chronic kidney disease is common: what do we do next?* Nephrol Dial Transplant: *23*(4): 1122–1125.

Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experience-sampling method. In *Flow and the foundations of positive psychology* (pp. 35-54). Springer Netherlands.

Delanaye, P., Mariat, C., Maillard, N., Krzesinski, J. M., & Cavalier, E. (2011). Are the creatinine-based equations accurate to estimate glomerular filtration rate in African American populations? *Clinical Journal of the American Society of Nephrology*, 6(4), 906-912.

Dickstein, K., Cohen,Solal, A., Filippatos, G., McMurray, J. J., Ponikowski, P.Poole,Wilson P. A., ... & Keren, A. (2008). ESC guidelines for the diagnosis

and treatment of acute and chronic heart failure 2008. *European journal of heart failure, 10(*10), 933-989.

El Nahas, A. M., & Bello, A. K. (2005). Chronic kidney disease: the global challenge. *The Lancet*, *365*(9456), 331-340.

El Nahas, M. (2005). *The global challenge of chronic kidney disease*; Kidney International functional capacity and reduces proteinuria in chronic renal failure patients, *68*,2918-2929,

Gielen, A.C. (2008). Using the PRECEDE/PROCEED Model to Apply Health Behavior Theories. *Health Behavior and Health Education: Theory, Research and Practice*. 4th edition, San Francisco: Jossey-Bass; 407-433.

Green, L. K. M. (2005). *Health promotion planning: An educational and ecological approach*. 3rd edition. Mountain View, CA: Mayfield Publishing Company *hypertension:* Med Sci Sports Exercise, 2004. *36*(3): 533-553.

Hall, M. E., do Carmo, J. M., da Silva, A. A., Juncos, L. A., Wang, Z., & Hall, J. E. (2014). Obesity, hypertension, and chronic kidney disease. *Int J Nephrol Renovasc Dis*, *7*(2), 75-88.

Hsu, C. C., Jhang, H. R., Chang, W. T., Lin, C. H., Shin, S. J., Hwang, S. J., & Huang, M. C. (2014). Associations between dietary patterns and kidney function indicators in type 2 diabetes. *Clinical Nutrition*, *33*(1), 98-105.

Jha, V., Garcia-Garcia, G., Iseki, K., Li, Z., Naicker, S., Plattner, B., & Yang, C. W. (2013). Chronic kidney disease: global dimension and perspectives. *The Lancet*, *382*(9888), 260-272.

Johansen, K. (2012). United States Renal Data System 2011 Annual Data Report: Atlas of chronic kidney disease and end-stage renal disease in the United

States. (e1-420). *Am J Kidney Disease*; Kidney disease undergoing cardiac

rehabilitation. *Am Heart J*, 2005.

Kothari, C. R. (2004). *Research Methodology; Methods and techniques* (2nd ed.).

New Age International Publisher

Kouidi, E.J., Grekas, D. M. & Deligiannis, A.P. (2009). *Effects of exercise training*

on life indices in hemodialysis patients: Clinical Rehabilitation.

Levey, A. S., Atkins, R., Coresh, J., Cohen, E. P., Collins, A. J., Eckardt, K. U., ...

Powe, N. R. (2007). Chronic kidney disease as a global public health problem:

approaches and initiatives–a position statement from Kidney Disease

Improving Global Outcomes. *Kidney international*, *72*(3), 247-259.

Liyanage, T., Ninomiya, T., Jha, V., Neal, B., Patrice, H. M., Okpechi, I., ... Rodgers,

A. (2015). Worldwide access to treatment for end-stage kidney disease: a

systematic review. *The Lancet*, *385*(9981), 1975-1982.

Malindisa, S. T. (2016). *Genetic insights on the role of telomere dynamics in Chronic*

Kidney Disease (CKD) regardless of HIV status (Doctoral dissertation).

Mugenda, A. G., & Mugenda, M. O. (2009). *Research methods Quantitative and*

Qualitative Approaches: Nairobi: Acts Press

Mugenda, O. M., & Mugenda, A.G. (2012). R*esearch Methods: Quantitative &*

Qualitative Approaches. Nairobi: African Centre for Technology Studies Press

National kidney foundation (2017) 30 East 33rd street, New York, NY10016, 1-800-

622-9010.Principles of Health on the Net foundation.

O'Hare, A.M. (2012). Decreased survival among sedentary patients undergoing

dialysis: Results from the dialysis morbidity and mortality study wave 2.

American Journal of Kidney Diseases, *41*(2): 447-454.

Osafo, C., Mate-Kole, M., Affram, K., & Adu, D. (2011). Prevalence of chronic
 kidney disease in hypertensive patients in Ghana. *Renal failure*, *33*(4), 388-
 392.

Ott, R. L., & Longnecker, M. T. (2015). *An introduction to statistical methods and
 data analysis*. Nelson Education.

Pan American Health Organization (2014) *Resolution CD52.R1. Chronic kidney
 disease in agricultural communities in Central America*. Washington, D.C.

Plattner, B. (2013). Chronic kidney disease: Global dimension and perspectives.
 Lancet, population. *American Journal of Kidney Diseases,* 2005. *45*(4): 690-
 701.Progression of Nephropathy in Elderly Japanese NIDDM patients.
 Diabetes Care, 1998.*21*(1): 116-20.

Robinson, O. C. (2014). Sampling in interview-based qualitative research: A
 theoretical and practical guide. *Qualitative Research in Psychology*, *11*(1), 25-
 41.

Schmidt, C. O. & Kohlmann, T. (2008). When to use the odds ratio or the relative
 risk? *International Journal of Public Health, 53(*3), 165–167.

Sigamani, A. (2012). Prevalence, risk factors and awareness of hypertension in India:
 A Systematic Review. J Hum Hypertens, 33

Stack, A. G. (2001). Association of physical activity with mortality in the US dialysis
 subjects with impaired glucose tolerance. *N Engl J Med. 344*(18),

Steiner C, Glaser B, Teixeira W, Lehmann J, Blum, W., & Zech, W. (2008). Nitrogen
 Retention and Plant uptake on a Highly Weathered Central Amazonian
 Ferralsol Amended with Compost and Charcoal. *Journal of Plant Nutrition
 and Soil Science, 47*, 218.

Stanifer, J. W., Muiru, A., Jafar, T. H., & Patel, U. D. (2016). Chronic kidney disease in low-and middle-income countries. *Nephrology Dialysis Transplantation*, *31*(6), 868-874.

Suen, H. K., & Ary, D. (2014). *Analyzing quantitative behavioral observation data*. Psychology Press.

Tanaka, Y. (2007). Role of glycemic control and blood pressure in the development and target muscle wasting in ESRD: the Progressive Exercise for Anabolism in Kidney Disease (PEAK) study. *Am J Kidney Dis*, *50*(4), 574-584.

Tonelli, M. (2011). *The contribution of chronic kidney disease to the global burden of major non-communicable diseases*. Kidney Int.

USRDS (2008). Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States. Bethesda: US Renal Data System; 2008.

Van J. Tim (2014) *Effects of tea consumption on renal function in a metropolitan Chinese population*: cohort study.*24* (1) 26-31.Retrived from http://www.jnrjournal.org.

White, R. (2009). Prevalence of chronic kidney disease in the United States. *JAMA, 298*(17), 2038–2047.

Wilund, K. (2007). The contribution of chronic kidney disease to the global burden of major non-communicable diseases. *The Progressive Exercise for Anabolism in Kidney Disease (PEAK) study. Am J Kidney Dis* Kidney Int. 2011.

Wimalawansa, S. A., & Wimalawansa, S. J. (2014). Impact of changing agricultural practices on human health: chronic kidney disease of multi-factorial origin in Sri Lanka. *Wudpecker J Agric Res*, *3*(5), 110-124.

Wyatt, C. (2016). The Development and Validation of an Instrument to Measure Teachers' Perceptions of the Effect of Mobile Technology Initiatives on Classroom Climate.

Youngquist, T. S. (2015*). Iced Tea causes renal failure*. University of Utah Health feed.*23*(4)Retrieved from https://healthcare.utah.edu/042315doi801-581-2121.

Yusuf, S., Islam, S., Chow, C. K., Rangarajan, S., Dagenais, G., Diaz, R. & Kruger, A. (2011). Use of secondary prevention drugs for cardiovascular disease in the community in high-income, middle-income, and low-income countries (the PURE Study): a prospective epidemiological survey. *The Lancet*, *378*(9798), 1231-1243.

APPENDICES

APPENDIX I: INTRODUCTORY LETTER

I am a Masters student of UEAB. As a partial requirement of the coursework assessment, I am required to submit a research report on: **THE PREVALENCE AND RISK FACTORS FOR CHRONIC KIDNEY DISEASES IN KERICHO COUNTY.** I would highly appreciate if you could kindly complete the Questionnaire to assist me collect data. Your information alongside others will help me in my research and will be used strictly for academic purposes and will be treated as confidential, therefore, do not write your name on the questionnaire.

Thank you in advance,

Rotich Joyce Cherono

APPENDIX II: QUESTIONNAIRE FOR NURSES

Please give answers in the spaces provided and tick (.√) in the box that matches your responses to the questions where applicable.

PART A: Demographic and Respondents profile.

1. Gender (Tick as applicable)

   Male   ( )

   Female   ( )

2. What is your age bracket (Tick as applicable)

   a) Under 30years   ( )

   b) 31-40 years   ( )

   c) 41-50 years   ( )

   d) Over 50 years   ( )

Part B: Specific Information

Cultural factors on prevalence of chronic kidney diseases

3. Do patients report using traditional medicines to cure ailments before diagnosed of CKD? YES [ ] NO [ ]

If YES, How often do they use them? …………………………..

4. Have you heard someone who used traditional medicines and got more ill of CKD?

YES [ ] NO [ ]

5. Do you think drinking of cold beverages lead to CKDs? YES [ ] NO [ ]

6. Occupational exposures on prevalence of chronic kidney diseases

To what extent do you agree with the following statements regarding the effect of occupational exposures on prevalence of chronic kidney diseases?

Statement	D	TD	TA	A
The use of agrochemicals is associated with continues of prevalence of CKD	1	2	3	4
The continued and frequent use of agrichemicals increases the risk of CKD	1	2	3	4
The use of pesticides contributes to prevalence of CKD	1	2	3	4
The kind of fertilizers used by the residents contributes to prevalence of CKD	1	2	3	4

7. Lifestyle factors on prevalence of chronic kidney diseases

To what extent do you agree with the following statements regarding the effect of

lifestyle factors on prevalence of chronic kidney diseases?

KEY: 1 – DISAGREE (D)   2 - TEND TO DISAGREE (TD)3

          - TEND TO AGREE (TA)   4 – AGREE (A)

Statement	D	TD	TA	A
Lack of physical exercise has an impact on prevalence of CKD	1	2	3	4
There is relationship between the weight of a person and the prevalence of CKD	1	2	3	4
Alcohol drinking contributes to majority of the cases of CKD in the area.	1	2	3	4
Smoking contributes to prevalence of CKD among most people in the area	1	2	3	4

8. Dietary practices on the prevalence of chronic kidney diseases

To what extent do you agree with the following statements regarding the effect of

dietary practices on prevalence of chronic kidney diseases?

KEY: 1 – DISAGREE (D)   2 - TEND TO DISAGREE (TD)3

          - TEND TO AGREE (TA)   4 – AGREE (A)

Statement	D	TD	TA	A
Beverage intake contributes to the prevalence of CKD	1	2	3	4
The continued and frequent intake of beverages increases the risk of CKD	1	2	3	4
High salt intake contributes to the risk of CKD	1	2	3	4
Soda consumption is associated with majority of the CKD cases in the area	1	2	3	4

9. In your own opinion what are the other causes of CKD.

…………………………………………………………………………

…………………………………………………………………………

…………………………………………………………………………

………………………………………………………………………

APPENDIX III: INTERVIEW SCHEDULE FOR PATIENTS

Please give answers in the spaces provided and tick (.√) in the box that matches your responses to the questions where applicable.

1. Demographic and Respondents profile.

   a. What is your gender   Male ( )   Female ( )

   b. What is your age bracket?

         under 30

          31-40 years

          41-50 years

          Above 50

   c. What is your level of education?

         Primary ( ) Secondary ( ) College ( ) University ( )

   d. How can you rate your income compared to other people where you come from

         High ( ) Moderate ( ) Low( )

   e. What is your occupation?

         Farming ( ) Business ( ) Employed ( )

2. **Occupational exposures on prevalence of chronic kidney diseases**

a. If farming, did you usually use fertilizers and agrochemicals when planting before diagnosed of CKD?

YES ( )

NO ( )

If YES, which ones …………………………………………………………..

3. Cultural factors on prevalence of chronic kidney diseases

a. Did you use traditional medicines to cure ailments before diagnosed of CKD?

YES ( )   NO ( )

If YES, How often did you use them? …………………………..

Please explain why or why not ……………………………………………………

b. Have you heard someone who used traditional medicines and got more ill?

YES ( ) NO ( )

If yes explain

……………………………………………………………………………………………

…………………………………………………………………………………

4.Lifestyle factors on prevalence of chronic kidney diseases.

 a. Did you frequently exercise your body before diagnosed of CKD? YES ( ) NO ( )

        Explain why or why not ……………………………………………………

b. Did you practice any of the following before diagnosed of CKD?

Alcohol drinking ( )

Tobacco smoking ( )

Abusing drugs   ( )

         If yes Explain…………………………………………………………………..

        …………………………………………………………………………………

        If No explain why not………………………………………………………….

…………………………………………………………………………………**.**

5.Dietary practices on the prevalence of chronic kidney diseases

 a. Did you drink beverages (tea) before diagnosed of CKD?

YES ( )

NO ( )

If YES, how frequent did you drink them?

Daily ( )

Twice a week ( )

Three times a week ( )

　　　Explain further……………………………………………………

b. Did you drink soda before being diagnosed of CKD?

　　　YES ( )

　　　NO ( )

　　　If yes, how frequent did you drink them?

　　　Daily ( )

　　　Twice daily ( )

　　　Three times a week ( )

　　　Explain further…………………………………………………………..

c. How was your salt intake prior to being diagnosed with CKD?

　　　……………………………………………………………………………

　　　……………………………………………………………………………

　　　………………………………………

6. In your own opinion what must have caused your Kidney disease.?

　　　………………………………………………………………………

THANKS

APPENDIX IV: INTERVIEW SCHEDULE FOR DOCTORS

1. Level of income influences the prevalence of chronic kidney disease. Agree( )
   Disagree( )

explain……………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

2. Education level influence the prevalence of chronic kidney disease.
   Agree ( ) Disagree ( )

Explain……………………………………………………………………………………

………………………………………………………………………………………………

3. Age influence the prevalence of CKD. Agree ( ) disagree ( )

Explain……………………………………………………………………………………

………………………………………………………………………………………………

4. Gender influence the prevalence of CKD Agree ( ) Disagree ( )

Explain……………………………………………………………………………………

………………………………………………………………………………………………

5. Culture influences the prevalence of CKD. Agree ( ) Disagree ( )

Explain……………………………………………………………………………………

………………………………………………………………………………………………

6. Herbal medications have an influence on CKD. Agree ( ) Disagree ( )

Explain……………………………………………………………………………………

………………………………………………………………………………………………

7. Agrochemicals, pesticides and fertilizers influence the prevalence of CKD.

Agree ( ) Disagree ( )

Explain……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

8. Occupational risk factors influence the prevalence of CKD. Agree ( )   Disagree ( )

Explain……………………………………………………………………………

……………………………………………………………………………

9.Tobacco smoking influences the prevalence of the CKD. Agree ( ) Disagree( )

Explain……………………………………………………………………………

……………………………………………………………………………

10. Alcohol influence the prevalence of the CKD.Agree ( ) Disagree ( )

Explain……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

11. Self- medications (over the counter NSAIDS) influence the prevalence of the

CKD. Agree ( ) Disagree ( )

Explain……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

12. Physical inactivity influences the prevalence of the CKD. Agree ( ) Disagree( )

Explain……………………………………………………………………………

……………………………………………………………………………

………………………………………………………………………..

13Dietary practices contribute mostly to chronic kidney disease Agree ( ) Disagree ( )

Explain…………………………………………………………………………………

……………………………………………………………………………………………

14.In your own opinion what are the major risk factors to CKD?

……………………………………………………………………………………………

……………………………………………………………………………………………

……………………………………………………………………………………………

…………………………………………………………………………………………..

THANKS

APPENDIX V: PILOT STUDY LETTER

**OFFICE OF THE DIRECTOR OF GRADUATE
STUDIES AND RESEARCH**

UNIVERSITY OF EASTERN AFRICA, BARATON

P. O. Box 2500, Eldoret, Kenva

25 May 2016

TO WHOM IT MAY CONCERN:

Re: PILOT STUDY OF RESEARCH INSTRUMENT

Ms. Joyce Rotich is a graduate student pursuing the degree **Master of Science in Nursing (Community Health)** at the University of Eastern Africa, Baraton. She is currently writing her thesis entitled *Establishing the prevalence and risk factors for chronic kidney disease in Kericho County, Kenya.*

To establish the reliability of her research instrument, Joyce is conducting a pilot study. Kindly allow her to administer the questionnaires to selected nurses in your hospital.

Any assistance you will grant her will be greatly appreciated. May God richly bless you in all your undertakings.

Sincerely yours,

Prof. Elizabeth M. Role, PhD
Director

Cc: Dean, School of Nursing
        Office File

APPENDIX VI: ETHICS CLEARANCE LETTER

OFFICE OF THE RESEARCH AND GRADUATE STUDIES
RESEARCH ETHICS COMMITTEE

UNIVERSITY OF EASTERN AFRICA, BARATON

P. O. Box 2500-30100, Eldoret, Kenya, East Africa

June 8, 2016

Rotich Joyce Cherono
Department of Nursing
UEAB

Dear Joyce,

Re: ETHICS CLEARANCE FOR THESIS PROPOSAL (REC: UEAB/03/06/2016)

Your research proposal entitled *Establishing the Prevalence and Risk Factors for Chronic Kidney Disease in Kericho County, Kenya* was discussed by the Research Ethics Committee (REC) of the University and your request for ethics clearance was granted approval.

This approval is for one year effective June 8, 2016 until June 8, 2017. For any extension beyond this time period, you will need to apply to this committee one month prior to expiry date. Note that you will need a clearance from the study site before you start gathering your data.

We wish you success in your research.

Sincerely yours,

Dr. Jackie K. Obey
Chairperson, Research Ethics Committee

A SEVENTH-DAY ADVENTIST INSTITUTION OF H IGHER LEARNING
CHARTERED 1991

**OFFICE OF THE DIRECTOR OF GRADUATE
STUDIES AND RESEARCH**

UNIVERSITY OF EASTERN AFRICA, BARATON

P. O. Box 2500, Eldoret. Kenya

31 May 2016

The Medical Superintendent
Kericho County Referral Hospital
P. O. Box 3
Kericho

Re: **REQUEST FOR PERMISSION TO GATHER RESEARCH DATA**

Rotich Joyce Cherono is a graduate student pursuing the degree **Master of Science in Nursing (Community Health)** at the University of Eastern Africa, Baraton. She is currently writing her thesis entitled *Establishing the prevalence and risk factors for chronic kidney disease in Kericho County, Kenya.*

I request you to please allow her to administer her questionnaires to the nurses, to interview the doctors and selected patients, and to do a documentary analysis of the patients' records in your hospital. She will gather her research data this month of June 2016.

Any assistance you will grant her will be greatly appreciated. May God richly bless you in all your undertakings.

Sincerely yours,

Prof. Elizabeth M. Role, PhD
Director

Cc: Dean, School of Nursing
Office File

APPENDIX VIII: RESEARCH APPROVAL LETTER

COUNTY GOVERNMENT OF KERICHO

KERICHO DISTRICT HOSPITAL

Telegrams: "MEDICAL", Kericho
Telephone: Kericho (0734) 758102
e-mail: kerichodistricthospital@yahoo.com
When replying please quote
Ref: IREC/ 025/16

Medical Superintendent
Kericho District Hospital
P. O Box 11
KERICHO

08 TH JUNE 2016

Dear Rotich Joyce Cherono ,

RE: RESEARCH APPROVAL

Your letter dated 31st May 2016 requesting for permission to carry out a research in our facility refers:,

This is therefore to inform you that, your request to carry out a research entitled *"Establishing the Prevalence and Risk Factors for Chronic Kidney Disease in Kericho County, Kenya "* has been approved.

You are expected to observe Ethics during this process of data collection and ensure feedback on the results of the study is relayed back to the Research &Ethics Committee.

All concerned departments and individuals in the facility are requested to facilitate you in this process.

Thanks in advance

Yours Faithfully

D.K.LIMO

For, CHAIRMAN

RESEARCH & ETHICS COMMITTEE

KERICHO COUNTY REFERRAL HOSPITAL

APPENDIX IX: CURRICULUM VITAE

PERSONAL DETAILS

NAME: JOYCE CHERONO ROTICH

DOB: 16TH FEBRUARY 1977

P.0 BOX: 3181-30100

PHONE: 0738047943

EMAIL: joyrotich2013@gmail.com

SEX: FEMALE

LANGUAGE: FLUENT IN ENGLISH AND KISWAHILI

NATIONALITY: KENYAN

CAREER OBJECTIVES

- Seeking a challenging role as a community health nurse where knowledge will help me utilize my talent effectively in a professional environment

CAREER SUMMARY

- Fifteen years of experience as a community health nurse and registered and licensed by the nursing councils of Kenya

KEY STRENGHTS

- Dedicated, independent nursing competence

- Sound knowledge of community health nursing practices and theories

- Good knowledge of general nursing duties and community health science

- Ability to educate nursing staff, patients and families on various health issues

- Strong communication and organization skills

- Ability to act in emergency situations and show patience and tolerance in severe cases

PROFESSIONAL WORK EXPERIENCE

April 2001 – September 2007: Moi Teaching and Referral Hospital Worked in Pediatric Ward

Responsibilities

- Admission of sick children to the unit

- Monitoring of sick children

- Counseling and education of parents in relation to health issues

- Team leader, orientation and supervision of new staff in the unit

- Ensuring availability of supplies and equipment in the unit

October 2007 – September 2009: Moi Teaching and Referral Hospital Worked in Maternity Ward

Responsibilities

- Admission of mothers in to the ward

- Monitoring mothers throughout labour

- Ensuring safe delivery

- Education of mothers on the importance of child welfare clinic, family planning and exclusive breast feeding

- Supervision and instruction of students in the ward

- Ensuring availability of supplies in the unit

October 2009 – November 2011: Moi Teaching and Referral Hospital Worked in Newborn Unit

Responsibilities

- Admission of the neonate to the unit

- Perform a throughout first physical exam on the neonate

- Education to the mothers on the importance of hygiene and infection prevention

- Supervision and orientation of new staff and students

- Administer medications and monitoring

- Plan, implement and evaluate clinical programs

December 2011 – Date: Moi Teaching and Referral Hospital Worked in Medical Ward

Responsibilities

- Team leader and orientation of new staff in the unit

- Admission of new patients in the unit

- Plan, implement and evaluate clinical programs

- Care for the sick adults and participate and participate in the ward rounds

- Admission of medications and monitoring

- Ensuring availability of supplies in the ward

- Ensuring that equipment are in good working condition

- Education of patients and relatives on various health issues and compliance to treatment

- Supervision of new staff and students in the unit

OTHER TRAININGS

Operation smile - Moi Teaching and Referral Hospital – September 2002

Couple HIV counseling and testing - Moi Teaching and Referral Hospital – October 2008

Basic Pediatric Life Support – Moi Teaching and Referral Hospital – October 2007

Neonatal Nurse Training - Moi Teaching and Referral Hospital – August 2012

Patient Clinical Safety Training - Moi Teaching and Referral Hospital – May 2014

Basic Life Support - Moi Teaching and Referral Hospital – July 2015

Infection prevention- MTRH- Blood bank-August 2016

CONFERENCES

Kenya Renal Conference (2016) –Abstract presentation on the prevalence and Risk factor profile of chronic kidney disease in Kericho County

EDUCATIONAL BACKGROUND

2014 – To Date: Masters of Science in Nursing -Community Health Option: University of Eastern Africa Baraton.

2010 – 2013: Bachelor of Science in Nursing: University Of Eastern Africa Baraton

1999 – 2001: Diploma in Kenya Registered Community Health Nursing: Eldoret Medical Training College

1991 – 1995: Kenya Certificate Of Secondary Education; A level: St Mary's Girls Secondary School - Bomet

1982 – 1990: Kenya Certificate of Primary Education: Kapsabet Township Primary School – Nandi

HOBBIES

Travelling

Reading books

Swimming

Dancing

Appreciation to music

REFEREES

1. PROF.ELIZABETH ROLE

Director Research and Graduate Studies

P.O BOX 2500 KAPASABET

 EMAIL:bethrole@gmail.com

Tel; 0716508232

2.DR JOYCE OWINO

Dean of Nursing; University of Eastern Africa Baraton

P.O BOX 2500 KAPASABET

EMAIL: joyceowino@yahoo.com

Tel:0720387960

3.MR DUNCAN KAPKUSHA

Lecturer:Masinde Muliro University of Science and Technology

KAKAMEGA

TEL: 0706245310