KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,

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DEPARTMENT OF HEALTH POLICY, MANAGEMENT AND ECONOMICS

HOUSEHOLD COST OF CHRONIC KIDNEY DISEASE CARE AMONG PATIENTS SEEKING HEALTH CARE AT KOMFO ANOKYE TEACHING HOSPITAL

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By

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A THESIS SUBMITTED TO THE DEPARTMENT OF HEALTH POLICY, MANAGEMENT AND ECONOMICS KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN HEALTH SERVICES PLANNING AND MANAGEMENT

SEPTEMBER, 2019

DECLARATION

I hereby declare that excluding precise references which have been duly acknowledged, this submission is my own work towards the MPH and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University or elsewhere.

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DEDICATION

To my parents, wife, Dorothy and our boys Caleb and Michael

DEFINITION OF TERMS

Household cost: The complete cost borne by the client as they seek for healthcare.

Direct cost: The cost borne by the healthcare system, community, and patients'families which could be traced to efforts at addressing the illness.

Indirect cost: Cost which could not be directly traced to efforts at addressing the illness or productivity losses attributed to treatment of the illness.

Intangible cost: An unquantifiable non-monetary cost relating to an identifiable illness or disease. It represents expenses such as depression, stress and anxiety.

Lost productivity: A deficit in the average measure of the efficiency of production.

ACRONYMS AND ABBREVIATIONS

AKI	:	Acute Kidney Injury
CAD	:	Canadian dollar
CKD	:	Chronic Kidney Disease
ESRD	:	End Stage Renal Disease
GDP	:	Gross Domestic Product
GFR	:	Glomerular Filtration Rate
GH C	:	Ghana Cedis
HD	:	Hemodialysis
KATH	:	Komfo Anokye Teaching Hospital
MOH	:	Ministry of Health
NHIS	:	National Health Insurance Scheme
OPPE	:	Out of Pocket Payment Expenditure
PD	:	Peritoneal Dialysis
Rs	:	Indian rupee
SD	:	Standard Deviation
USD	:	United States Dollars
USRD	:	United States Renal Data system
WHO	:	World Health Organization
RRT	:	Renal Replacement Therapy
YLD	:	Years lived with disability

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background: Chronic Kidney Disease is currently pandemic. Across the globe, CKD has catastrophic effects not only on the sufferers of this medical condition but also on their households being it financially, socially and emotionally. The burdensome nature of the disease leave in its wake great deal of financial and psychological distress particularly at the household level. This study sought to estimate the household cost of chronic Kidney disease to enable relevant stakeholders manage the burden it places on patients, their caregivers and the society so as to improve their lives.

Methods: A cross-sectional study was conducted from 13th February 2019 to 21st of May 2019 among 224 people with Chronic Kidney Disease between the ages of 14 to 91 years who were receiving health care at the Komfo Anokye Teaching Hospital. Participants were interviewed using a structured questionnaire and secondary data obtained from hospital records. The variables were analyzed using STATA software. Sensitivity analyses was also done for cost estimates to determine the robustness of the data collected.

Results: The mean cost per person per month for patients with CKD Stage I-V excluding ESRD on dialysis are GH C 493.71(USD 94.04), GHC 485.42(USD 92.19), GHC 447.01(USD 85.14), GHC 547.57(USD 104.30), and GH C 763.88 (USD 145.50) respectively. For patients with ESRD on dialysis however, the mean cost per person per month was very substantial with an estimated cost of GH C 2882.84(USD 549.11).However, the overall household cost among CKD patients seeking care at KATH was GH C1121.42 (USD 213.60) with GHC 983; USD 187.32(87.70%) being for direct cost whilst GHC 137.98; USD

26.28(12.3%) accounted for overall indirect cost. Majority of patients (74.56%) had monthly income of not more than GH C1, 000(USD 190.50) but relative to the overall household cost of GH C1121.42 (USD 213.60), it implies that most patients incurred a cost of more than 100% of their monthly income to be able to seek CKD care. Patients spent averagely not less than 5.20 hours anytime they visit the hospital to receive CKD care and this contributes to loss of productive working hours.

Conclusions: The household cost of chronic kidney disease care was highest in patients with Stage V CKD especially for those on dialysis as compared to pre-dialysis patients. The household cost being it economic or social cost has significant implication on the health care and quality of life of patients living with CKD and their households. It is therefore suggested that all appropriate stakeholders be actively involved in the creation and execution of policies and cost-effective strategies to avoid and manage chronic kidney disease in our setting.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Chronic kidney disease (CKD) is a worldwide health burden with enormous financial costs f or health care systems, people and families.Chronic kidney disease (CKD) is now recognize d as a global public health priority *(Lozano et.al 2013).* This reality is re-emphasized in Health Day news 2018, as renal experts say kidney disease is a "hidden epidemic" affecting more than 850 million people worldwide. This estimated number is twice the number of diabetics (422 million) and more than 20 times the number of people with cancer (42 million) or HIV/AIDS (36.7 million).CKD has an estimated prevalence around the world of about 10.4% among men and 11.8% among women (Lancet2015).

CKD is frequently defined by a progressive loss of kidney function over time and is acknowl edged worldwide as a significant public health concern.According to the World Health Orga nization (WHO), CKD accounted for 1.5 per cent of all deaths globally and was ranked 14th among the major causes of death, accounting for 12 deaths per 100,000 population in the year 2012. According to *Wang et.al* (2015), chronic kidney disease was the 12th most common cause of death, representing 1.1 million deaths worldwide in 2015.

In the same research, it was found that general CKD mortality has risen by 31.7% over the la st 10 years.Overall, an approximately 510 million individuals die each year from renal illnes s (Global Disease Burden, 2015).

Mexico has the highest death rate of CKD in the world with over half of all cases of diabetes -related end-stage kidney disease.CKD affects between 5-15% of the adult population in the developed world (Coresh et.al, 2007).CKD has an overall estimated prevalence of 8-16%

worldwide (Jha et.al 2013).This is corroborated by estimates in 2015, where World Kidney Day revealed that 10% of the population worldwide have CKD as of the year 2015.

A research by Hill et al (2016) found that the largest prevalence of CKD is recorded in Latin America, Europe, East Asia and the Middle East, with roughly 12% of the population having CKD for each area. The prevalence of CKD was lowest in South Asia and SubSaharan Africa, at 7% and 8% respectively. However, in rural agricultural communities from Central America, Egypt, India and Sri Lanka, a high prevalence of CKD of unknown etiology has been reported (Almaguer et.al, 2014). In addition, a systematic review by Kaze et.al. (2018) reported a prevalence of 15.8% for CKD stages 1-5 in the general population of adults living on the African continent.

In the same study, Kaze et.al (2018) asserted that, the prevalence of CKD among the general adult population living in Northern Africa, Southern Africa, Eastern Africa, Middle Africa and Western Africa was 6.1%, 10.4%, 14.4%, 16.0% and 19.8% respectively.

The prevalence of chronic kidney disease in Ghana is currently unknown, but there is anecdotal evidence of widespread hospital admissions and mortality due to kidney disease in Ghana.

Plange-Rhule et.al revealed in their study done in 1999, that CKD accounts for 5 % of medical admissions in Ghana. The global increase in CKD incidence and prevalence is driven largely by the increase in the prevalence of type 2 diabetes mellitus (T2D), hypertension, obesity and ageing (Ayodele & Alebiosu 2010). People diagnosed with CKD may progress to end-stage renal disease, a condition that leads to disability, poor quality of life and significant social and financial costs, and ultimately premature death. CKD incidence is disproportionately higher among socially disadvantaged individuals, especially those with low socio-economic status

(Norris & Nissenson, 2008). CKD may have harmful impacts on the living circumstances of people and their families globally. CKD has a significant effect, both at the level of the patient, by reducing the quality of life and life expectancy, and at the level of the population, by raising health care expenses and by raising the demand for health services.

Individuals with end stage renal disease may need dialysis or renal transplantation. Globally, 2.6 million people received dialysis in 2010 and this is projected to increase to 5.4 million by 2030.

A systematic assessment for the 2013 Global Burden of Disease Study disclosed Years of Di sability (YLD) owing to Chronic Kidney Disease (CKD) rose 49.5 percent globally between 1990 and 2010.Expenditure on endstage renal disease in the United States was estimated at $28 billion in 2010. However, there is an increasing expenditure on ESRD in recent years.

According to the U.S. Renal Data System, total medical costs were $50.4 billion for CKD (excluding end-stage renal disease [ESRD]) and another $30.9 billion for the patient population of the ESRD in 2013 among Medicare fee-for-service patients.

The eroding nature of chronic renal disease can affect patients ' ability to work, leading to absenteeism and job loss.

Healthcare facilities in Ghana are characterized by limited resources, hence the need to estimate household costs of chronic kidney disease care to help policymakers decide on health policy strategies and resource allocation.

1.2 Problem Statement

The increasing prevalence and progression of chronic kidney disease (CKD) raises concerns about the capacity of health policymakers to manage their burden on patients, caregivers and

society. CKD treatment over time leads to loss in terms of health, wealth and status of both the patients and the family.

CKD has significant economic consequences for the direct loss of gross domestic product (due to ill health, household care financing, changes in patterns of consumption and welfare costs) and for the management of patients with CKD and ESRD. Chronic kidney disease is a major contributor to global health care spending. In developed countries with approximately 0.1% of the ESRD population, more than 1% of the total health budget is allocated to people with chronic kidney disease (Hossain et al 2009). Chronic kidney disease accounted for 1.7% of total health care expenditure ($898.7 million) in Australia in 2014/2015, according to the Australian Institute of Health and Welfare. The 2011 US Renal Data System also reported an annual Medicare cost of $20,432 per person for adults 65 years of age or older with all CKD stages.

In 2013, it was estimated that 12% of Morocco`s health expenditure was used for reimbursement of dialysis sessions (Maoujoud et.al 2017).

In addition to the health care costs incurred by people with chronic kidney disease and their families, they also undergo various forms of psychological and emotional stress due to chronic and disease-related complications.

According to Mate-Kole (2007:1), there is an epidemic of kidney disease in Ghana where increasing numbers of end-stage renal patients require hemodialysis. He further states that 10% of all medical admissions are due to Chronic Renal Failure. There are different treatment modalities for Chronic Kidney Disease depending on the stage of the disease. Renal Transplantation and Dialysis being it hemodialysis or peritoneal dialysis is the ultimate treatment for individuals with End stage renal disease. Records available at KorleBu Teaching

Hospital as of May 2008 showed that 65 patients with end-stage renal disease had hemodialysis compared to 48 patients in the previous year. This number has astronomically increased over the years as there are currently 200 patients with ESRD being treated as Korle Bu (Renal Unit Records 2018). However, Ghana has a number of patients with end-stage renal disease who need hemodialysis but are unable to afford it (Mate-Kole (2007:1). The country's high cost of hemodialysis puts it beyond the reach of many, except the very rich, and those working with reputable companies that belong to prepaid medical assistance schemes. This highlights the need to estimate the household costs associated with CKD care in order to help slow the progression of kidney disease and also to adopt policies to reduce the financial constraints associated with this disease

This study seeks to assess the cost of disease management for people with chronic kidney disease and their households and how it also affects their socio-economic well-being.

1.3 Rationale for the study

People living with CKD and their household are commonly affected by the disease's fiscal, psychosocial and emotional crises. Knowledge of the healthcare cost (direct, indirect and intangible) borne by CKD patients in the management of the disease is vital ingredient to aid improve the quality of the management of the disease. This same knowledge will also enable health policymakers design effective educational, preventive and disease management campaigns against CKD. This study will also help to use cost as a tool to advocate for increased financial access to patients with chronic kidney disease.

Poverty is one of the cardinal factors that can affect adherence to medical treatment and hence medical professionals need to be abreast with total healthcare cost for chronic kidney and its impact on the household management of the disease.

1.4 Conceptual Framework

The household cost involved in the management of chronic kidney disease consist of the direct cost, indirect cost and intangible cost. The direct cost consists of expenses made on drugs used in the management of CKD, laboratory investigations, out of pocket payment made by the patients and their household. The indirect cost assess the opportunity cost of time due to morbidity and the disability attributable to the disease. The intangible cost assess wellbeing losses due to physical pain, psychological pain and stress experienced by patients with chronic kidney disease and their household.

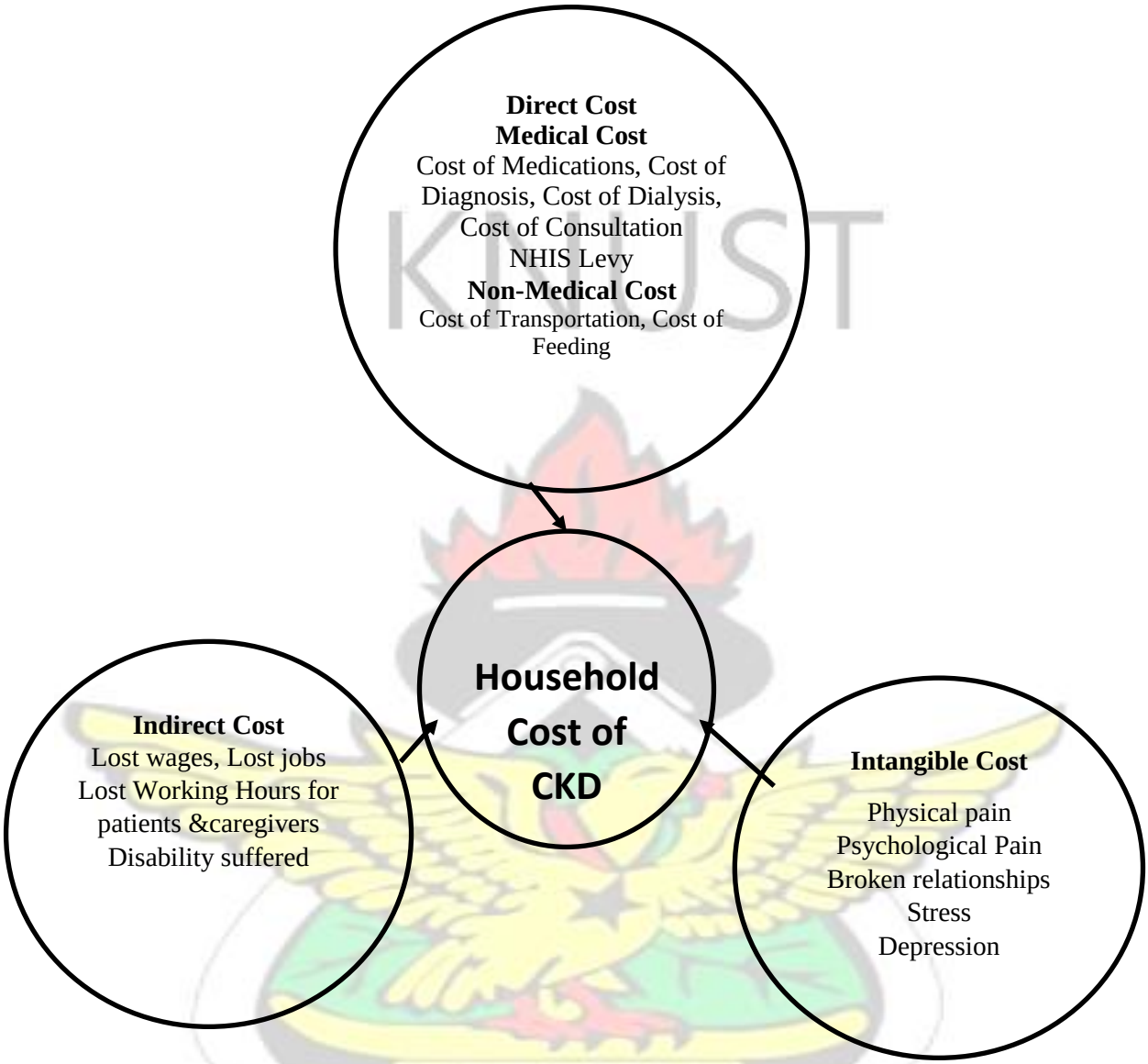


Figure 1: Conceptual Framework of the Household Cost of Seeking CKD Health Care

Author`s own construct

A diagrammatic Conceptual Framework of Household cost of Seeking CKD care

1.5 Research Questions

i. What is the direct healthcare cost of chronic kidney disease? ii. What is the indirect cost of chronic kidney disease care?

iii. What is the intangible cost of chronic kidney disease care?

1.6 Study Objective

1.6.1 General Objective

The general objective of the study is to determine the household cost of chronic kidney disease care among patients that receive care at the Komfo Anokye Teaching Hospital.

1.6.2 Specific Objectives

The specific objectives of this study is:

1. To determine the direct healthcare cost of chronic kidney disease
2. To determine the indirect cost of chronic kidney disease care
3. To determine the intangible cost of chronic kidney disease care

1.7 Scope of the study

The study focuses on the household cost of seeking chronic disease healthcare between the ages of 14 and 91 years. This class of people were selected to encompass both the working and the no-working class. The study focuses on the household cost of chronic kidney disease care from only the patient`s perspective and not that of the health care providers. This is due to the fact that the patient`s and his household are the ones suffering from consequences of the

medical condition and are able to truly tell the cost they incur when it comes to them seeking healthcare for their conditions.

1.8. Organization of Report

The thesis is organized into six chapters. The first chapter provides background information on chronic kidney disease care in the country together with the challenges that these patients and their household face in terms of cost when they seek care. Chapter one also deals with the problem statement, rationale of the study, study objectives and conceptual framework. Chapter two provides a critical analysis of existing literature on household cost of chronic kidney disease care in Africa and the world at large.

Chapter three lays emphasis on the methodology of the study. It deals with the study methods and design, data collection techniques and tools, study population, study area, sampling, techniques, ethical consideration and data analysis.

Chapter four presents findings of interviews from participants who had questionnaire administered to them on the household cost of chronic kidney disease.

Chapter five provides avenue for discussion of results and also compare with other similar study.

The sixth chapter helps to draw the conclusion from the study and also give the requisite recommendations based on the research findings.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter focuses centrally on the thematic areas of the study such as chronic kidney disease (CKD), (management of CKD, risk factors, complications and staging of the disease), the household cost of chronic kidney disease (direct, indirect and intangible cost) in Ghana.

2.2. Chronic Kidney Disease

Chronic kidney disease (CKD) is defined as kidney structure or function abnormalities that have been present for over 3 months with health implications. It is characterized by either decreased glomerular filtration rate (GFR) or albuminuria, or both, and carries a risk of cardiovascular morbidity and mortality and progression to end-stage renal disease (ESRD). Chronic kidney disease is considered to be a major public health issue with an estimated overall prevalence of 8%-16% (Jha et.al, 2013). In low- and middle-income countries, CKD affects 14.3% of the population and 13.4% of the global population (Ene-lodache et.al. 2016)

According to the US Renal Data System (USRDS 2016), the unadjusted prevalence of CKD stages 1-5 (not including ESRD) was estimated at 14.8 percent during 2011 through 2014, while stage 3 was the most prevalent stage. Similarly, a meta-analysis revealed that in the general population the overall prevalence was 15.8% for CKD stages 1–5 and 4.6% for CKD stages 3–5 (Arnaud et.al. 2018). The incidence rate of chronic kidney disease is estimated to be approximately four times higher in low- to middle-income countries than in developed

countries (Stanifer et.al, 2016). It is also estimated that in people aged 65 to 74 worldwide, one in five men and one in four women have CKD (World Kidney Day, 2015)

In addition, more than 70 per cent of patients worldwide with end-stage renal disease (ESRD) are projected to be in developing countries by 2030 unless key issues and concerns are addressed (Mushi, Krohn, & Flessa 2015). Poverty-related factors such as infectious diseases, mainly due to poor sanitation, inadequate supply of safe water, environmental pollutants and high levels of disease-transmitting contribute significantly to the development of CKD in developing countries. Other potential risk factors for CKD include: uncontrolled diabetes and hypertension, smoking, obesity, exposure to heavy metals such as lead or mercury, excessive alcohol consumption, smoking and the use of analgesic or pain killer drugs. Factors such as race, gender, age and family history are also critical risk factors for the development of CKD and ultimately ESRD. For example, being a decent AfricanAmerican, older, low birth weight, and family history of kidney disease is considered to be a strong risk factor for chronic kidney disease. Patients with Acute Kidney Injury (AKI), history of cardiovascular disease, hyperlipidemia, metabolic syndrome, hepatitis C virus, HIV infection and malignancy are at additional risk of developing CKD. Kidney disease is associated with an estimated 188 million cases of catastrophic health spending in low- and middle-income countries, according to Essue et.al (2018). The economic consequences of CKD can be in the form of a direct loss of gross domestic product due to ill health, losses due to household care financing, changes in consumption patterns and welfare costs, as well as financial costs incurred in the management of CKD and ESRD patients. A study conducted by Levey et al in 2007 discovered that 2-3 per cent of health care expenditure in developed countries is used for treatment of ESRD patients, despite the fact that they make up only 0.02-0.03 per cent of the total population. It is widely known that in 2006, 6.4% of the total US budget for Medicare was spent on ESRD, while in

Japan and South Korea, 4.1% and 3.24% were spent on the overall health care budget of these countries. According to data from the US Renal Data System, Medicare's expenditure for CKD patients amounted to more than $60 billion compared to $25 billion for ESRD in 2007. This suggests that the economic cost of milder CKD forms is even higher. Expenditure on treatment of ESRD in the USA has persistently being on the rise with the country spending $30.6 billion in treating people with ESRD in 2013 (US Renal Data System 2015). This US expenditure on endstage kidney disease treatment alone exceeds the total health budget of all but the world's 29 richest countries and closely matches the entire US$ 31.8 billion South African health budget for 2013 (World Bank Total Health Expenditure, 2015). A NHS Kidney Care report in England revealed that CKD costs more than the combination of breast, lung, colon and skin cancer (World Kidney Day 2015). In the US, CKD patients incur about $22,348/person / year in medical expenditure, which is nearly three times higher than non-CKD patients (USRDS 2013 Annual Data Report). The 1-year cost per patient for maintenance hemodialysis is more than US$ 52,000 and the cost of transplantation is approximately US$ 18,500 (USRDS, 2014). In addition, a latest research by Goncalves & Silva (2018) revealed that the cost of CKD and ESRD attributable to diabetes in the era 2010-2016 was USD 1.2 billion, with an annual price of USD 180 million. The same research also reported that diabetes accounted for 22 percent of the expenses of CKD and ESRD.

In a developing nation like Nigeria, a session of hemodialysis costs $100 which is twice the minimum monthly wage paid to federal government workers(Ayodele&Alebiosu,2010).This is in contrast with that of India where the cost varies from $20-60. In Iran, the estimated cost of each HD session is about $74 by with an annual cost of $11549 estimated for each patient (Arefzadeh, Lessanpezeshki& Seifi 2009).

Similarly, the cost of a session of dialysis in public-health sector centers in Cameroun since 2002 have been subsidized by the government and patients pay a fee of $ 8.5 per dialysis session (Halle et.al. 2017).

Low socio-economic status is one of the main risk factors for CKD. However, CKD is also known to have enormous effect on the social and financial well-being of patients who are unable to work, reduced quality of life, ranging from physical fatigue to emotional problems, including depression.

Chronic Kidney Disease (CKD), previously known as chronic renal failure, describes a medical condition where there is the gradual loss of kidney function. It is generally defined as persistent abnormality of the kidney more than three months and the kidney function measured by levels of the Glomerular Filtration Rate (GFR). There is said to be a chronic kidney disease when the estimated GFR is persistently lower than 60 ml/min/1.73m2

(K/DOQI, 2002) .

Using the GFR, CKD is divided into six stages of worsening progression (Levey& Coresh, 2012).The stages of CKD are:

Stage 1- GFR _>90 ml/min per 1.73 m2

Stage 2-GFR mildly decreased GFR of 60–89 ml/min per 1.73 m2

Stage 3a - Mildly to moderately decreased GFR of 45–59 ml/min per 1.73 m2

Stage 3b-Moderately to severely decreased GFR of 30–44 ml/min per 1.73 m2

Stage 4-Severely decreased GFR of 15–29 ml/min per 1.73 m2

Stage 5 Kidney failure with GFR <15 ml/min per 1.73 m2

Stage 1 of CKD is best described as the very early period of the disease where there is only minor kidney damage with GFR at a normal or high level greater than 90 ml/min. Clinical symptoms indicating the existence of kidney damage are usually absent at this point, hence

diagnosis at this stage is very difficult. Most people with Stage 1 CKD are picked up as incidental findings or health screening exercises. However, this is the ideal time to provide treatment for the underlying kidney disease, along with appropriate management of allied conditions like hypertension and diabetes.

Patients with Stage 2 CKD have a glomerular filtration rate of between 60 and 89 ml/min/1.73 m2 and tend to have a mild degree of kidney damage. Aggressive management of the underlying causes of the disease and emerging manifestations, for example, calcium and phosphate imbalance, hyperglycemia and anemia, are recommended (Silverberg et al., 2003).

Stage 3 CKD indicates a further decline in kidney function with possibly some clinical signs beginning to appear. Specialist treatment and follow up of these patients is essential to try and maintain kidney function and prevent such complications as cardiovascular disease, anemia, uremia and early bone disease.

Stage 4 of CKD implies that end stage failure is imminent and preparation for renal replacement therapy (dialysis or transplantation) is required.

Stage 5 CKD is defined as ESRD where the kidney has lost nearly all its ability to function and hence dialysis or kidney transplant is mandatory to be able to sustain life.

Some of the complications that may arise from chronic kidney disease are Congestive heart failure, Bone, joint, and muscle pain, Malnutrition ,Coronary artery disease, Hypertension, Peripheral Neuropathy, Dementia, Stroke ,Hyperkalemia, ,Seizures, Increased risk of infections, Anemia, Liver damage or failure, Miscarriages and infertility.

2.3 Direct Cost of Seeking Chronic Kidney Disease Care

CKD is a significant driver of health-related expenditure worldwide. A recent research indicates that a significant percentage of adolescents with moderate-to-severe CKD are living in relative poverty and many more will fall into poverty as their CKD progresses (Morton et.al, 2018). The growing prevalence of both diabetes and hypertension, which is essentially driven by aging populations and obesity, has resulted to an increase in CKD levels linked to hypertension or diabetes. The major concern of patients who are diagnosed of CKD is ability to meet the direct medical cost associated with therapy of the disease. This is ascribed to the reality that, the investigative process, medications and technologies involved in the treatment of CKD is financially demanding. Direct cost of illness basically describes the actual patient and household cost incurred in seeking treatment. Direct healthcare costs are the value of goods and services used to prevent and/or treat diseases that cannot be used for other purposes. This tend to involve all medical and non-medical costs. A study carried out in Germany revealed that the average annual direct medical costs per patient for moderate and severe CKD were EUR 3581 (Baumeister et. al, 2010). Hospitalization followed by drugs and medical visits were the main cost element of the total direct medical expense. Similar study in Italy also revealed an estimated direct medical annual cost of 890 euros for patients with stage 3 CKD, whilst 3,392 euros and 13,752 euros was the estimated direct medical cost in Stage 4 and 5 respectively (Di Micco et al, 2009).Furthermore, the presence of other comorbidities such as diabetes and cardiovascular diseases also tend to increase the cost of CKD (St Peter, 2004).

Furthermore, a study done in 2002 by Policy Research Division of the Strategic Policy Directorate in the Population and Public Health Branch of Health Canada showed that, the per

capita cost of ESRD was about $51 099 and this was significantly higher than that of care for all conditions which was about $3183.However, this has significantly over the years as the Canadian health care system spends nearly $2.5 billion annually caring for Canadians who are on dialysis (Canadian Institutes of Health Research 2018).The cost of dialysis per person per year as estimated by this same Canadian Institutes of Health Research (CIHR) stands from $60,000 to $100,000.Similarly,a study by Manns et.al.(2019) revealed that, care of people on dialysis costs nearly CAD 100,000 per year whist non-dialysis chronic kidney disease averages CAD 14634 per year and is even higher for patients with more comorbidity. Further extrapolation of this work estimated the annual cost of caring for nondialysis patients in Canada to be CAD 32 billion per year.

A cost analysis study in South Africa projected that, the average of seven medications per prescription for patients with ESRD on hemodialysis (HD) had an average cost of US$61.84. In the USA, CKD patients incur roughly $22,348/person/year in medical expenses, which is nearly three times as much as non-CKD patients (USRDS 2013). However, ESRD, on the other side, costs about $34.3 billion with an annual growth rate of 6–12 per cent. A further study by Amanda et.al (2013) among Medicare recipients also showed that the annual medical cost per person attributable to CKD is $1700 for stage 2, $3500 for stage 3 and

$12700 for stage 4.However, the total Medicare spending on both CKD and ESRD patients was in excess of $114 billion in 2016(USRDS 2018). Patients with attendant co-morbidities such as diabetes and heart failure always have their care costs compounded by making their therapy very costly.

According to the UK Department of Health, Consultation for CKD with a General practitioner in England is estimated to be 32 pounds whilst one with a nurse is about 10 pounds as of the

year 2009.The total cost of nephrology outpatient consultations was 53 million pounds with 50% of the outpatient consultations being for stage 3-5 CKD, and this excluded consultations for Renal replacement transplant.

In countries such as Mexico and India where government or private insurance coverage of ESKD treatment is limited, patients pay for some or all the following: vascular access, hospitalization, medical visits, hemodialysis sessions, medication, tests, prescribed food, transport and meals (Le et. al, 2016). A cross-sectional study in India estimating the direct cost of CKD in an outpatient setting reported that the cost of care was the highest for patients in stage 5 CKD compared to those in stage 2 to 4 CKD, as most patients in stage 5 CKD were on dialysis and needed erythropoietin in addition to other drugs (Ahlawat, Tiwari,& D'Cruz 2017). In the same research, the average annual therapy cost for patients on drugs alone and for patients on hemodialysis plus drugs was Rs 25,836 (US$ 386) and Rs 2,13,144 (US$ 3181) respectively (Rs = Indian rupee).

In addition, the Cohort study in Australia by Wyld et.al (2015) also discovered that CKD patients spend 85% more on health care and 50% more on public subsidies than non-CKD patients and that costs increase as the disease advances.

A multi-centre research conducted in Cameroon to assess the cost of care for patients with ESRD on hemodialysis reported that patients had an annual cost of $13,581.The cost of Outof-pocket payments per patient was $ 4 114 and this accounted for 30.3% of the total cost. Direct costs totaled $ 12 679 and indirect costs $ 902. The Direct medical costs accounted for 87.7% ($ 11 904) of the total costs, mainly due to the cost of dialysis consumables (59.8%, $ 8120). Direct non-medical costs accounted for 5.7% ($ 775) and indirect costs for 6.6% ($ 902) of the total cost (Halle et.al, 2017).

Furthermore, Halle et.al (2017) demonstrated in their global annual cost per patient on hemodialysis that, $208 and $ 122 representing 1.5% and 0.9% respectively were spent annually as direct non-medical cost on transportation and meals (feeding) by patients with ESRD on hemodialysis.

Additionally, a study in Rwanda among patient with ESRD undergoing dialysis revealed ,19% were self-sponsored, 15% were covered by private medical insurances and 10% of the participants were covered by the community based health insurance(Mukakarangwa et al.2018).These charges however, did not make immune to paying additional charges for hemodialysis treatment.

In Ghana however, not much studies have been done on the direct costs incurred by patients with CKD (all stage inclusive). Patients who suffer from Acute Kidney Injury and have to undergo acute hemodialysis is catered for under the National Health Insurance Scheme (NHIS) unlike others who have CKD. In Ghana, the NHIS caters for dialysis for patients with acute kidney injury with a flat fee of GHC 850 (∼ USD 265) for the full cost of acute dialysis (Antwi 2015). However, for patients with ESRD on chronic dialysis services, they would have to pay from their pockets or need to have other source of funding to be able to sustain them on the chronic dialysis.

The current cost of a session of dialysis at KATH is GHC 190 (~ USD 35) and this significantly differs for dialysis sessions at private hospitals in Kumasi where patients pay between GHC 260 to GHC 300 per session of hemodialysis. Patients with ESRD receiving treatment at KATH undergo an average of 8 sessions per month with the estimated cost of dialysis alone per month standing at GHC 1520(~USD 282). In addition, patients living with CKD and ESRD are also required to purchase their drugs such as certain classes of antdiabetics

and antihypertensive drugs, blood tonics, intravenous iron preparations and subcutaneous erythropoietin stimulation agents (ESAs) and also undergo periodic laboratory and diagnostic investigations to determine how their bodies respond to treatment.

2.4 Indirect Cost of Seeking Chronic Kidney Disease Care

Poverty and other socio-economic disadvantages, such as unemployment or bad living circumstances, are defining factors that influence the treatment of individuals with CKD or lead to interruption of care. Patients with kidney disease who are demographically and socio-economically disadvantaged may be at an enhanced danger of becoming unemployed (Klarenbach et.al, 2002).

Patients with chronic health diseases, such as advanced CKD, face a number of physical, psychosocial and employer-based difficulties that may make it hard to remain employed (Goldman 2017).These challenges according to another study by Jinnett et.al (2017) can make it difficult to remain employed. The unemployment rate in working-age patients with chronic kidney disease and ESRD is high compared to that of the general population

(Muehrer et al. 2011).

Indirect cost primarily refers to loss of productivity to either the patient or his main caregiver, the number of working days and hours lost due to the CKD.It also includes lost productivity due to premature mortality. Unemployment rates among patients with ESRD are at least twice the general population rate (Groothroff, 2005). Another study by Kaitelidou et.al (2007) also reported that, 60.2% of patients receiving dialysis in Greece were not able to keep their profession and 36.7% had to retire after the beginning of dialysis. According to Kidney Works, a patient advocacy program in the United States, 68,341 people with CKD lost their jobs in the 6 months prior to the development of ESRD between 2006 and 2014. Similarly, a cross-

section study conducted in the United Kingdom on the impact of End-Stage Kidney Disease on Academic Achievement and Young Adult Employment revealed that 85.7% of patients who had CKD felt that their employment or work had been adversely affected by their ESRD, either during current or prior employment or while seeking employment. A nationally representative online survey conducted in the US in 2009 among CKD patients to evaluate their loss of productivity and disability revealed that, on average, CKD patients reported absenteeism, presenteism and/or productivity loss rates as 18%, 29% and 35% respectively (Naim et.al., 2010).Additionally, 53% of the people suffering from CKD attested that they had had activity impairment in one form or the other irrespective of their employment status.

In a study by Kutner et.al (2008), employment rates among dialysis patients in the United States were reported to be as low as 18.9%. Recent Indian study, however, reported an employment rate of 29.9% among patients after dialysis initiation, with employment loss rates of 44% and 51% among patients initiating hemodialysis and peritoneal dialysis, respectively (Lakshmi et.al., 2017).

A Finnish report showed a low employment rate of 33% among patients with kidney disease from the Finnish Kidney Disease Registry (Helanterä et.al, 2012).Additionally, study by Erickson *et al.* (2018) in the US revealed that, employment rates remain 23%–24% among patients with incident ESRD. Vulnerable groups, including blacks, Hispanics, and patients residing in zip codes with low median income, have an even lower employment rate according to this study.

A study by Kishore et.al (2011) found that people living in low-income countries where treatment costs have to be paid directly by patients can cost up to 18 days ' wages for a month's supply of essential drugs for chronic kidney disease treatment. The situation is worse in South

Africa, where people with ESRD on dialysis have increased their financial burden because they cannot be employed while receiving dialysis or traveling to and from the provider (Moosa et.al 2016).

In a study in China among working elderly patients on maintenance hemodialysis, it was interesting to note that 50.65% of participants were employed one year before dialysis, while 49.35% were unemployed. Seventeen patients quit work before the onset of dialysis. Seventy-five patients quit work following the onset of dialysis, including 49 patients quit work immediately after the onset of dialysis, while 26 patients stopped working on average 12 months later. Among those who had quit their work, the majority of patients (87 per cent) indicated that they did not feel good enough to work, while 55 per cent claimed that dialysis time was a stumbling block(Huang et.al.2017).

Bailey et al. (2016) in their qualitative study entitled "Socioeconomic deprivation and barriers to live-donor kidney transplantation: a qualitative study of deceased-donor kidney transplant recipients" identified that patients with ESRD who were physically able to continue working often had informal or temporary work, with reduced income ; while others were forced into unemployment, leading to new financial problems.

According to a study in South Africa, there is a low rate of employment in the dialysis population in South Africa and could be due to job losses soon after receiving renal replacement therapy either because of the need for frequent HD sessions and absence from work or the need for frequent PD fluid exchanges at work (Okpechi, Nthite & Swanepoel 2013).This is confirmed by a patient survey of four hemodialysis centers in Shanghai, China, which concluded that working-age patients are at significant risk of losing their jobs, especially following the introduction of chronic dialysis therapy. The low level of employment

expectations among CKD patients, especially those with ESRD on dialysis, may be due to the societal perception that patients with ESRD cannot work. In addition, a

2012 study by Julian Mauro, Molinuevo Tobalina & Sánchez González entitled ' Employment in patients with chronic kidney disease related to renal replacement therapy ' revealed that only 33.3% of working-age RRT patients were employed. They subsequently concluded in their study that CKD and RRT are a major source of disability.

Patients with ESRD on dialysis typically spend four hours during the dialysis procedure and are required to do the dialysis at least twice a week to enable them to keep their bodies in optimum function. All these productive hours are lost at work whilst patients attend renal units to undergo dialysis.

A prospective cross-sectional study conducted in Ghana by Amoako et.al(2014) to determine the clinical and demographic characteristics of patients with chronic kidney disease revealed that about one-third of CKD patients, mostly under the age of 60, were unemployed. Aside this, not much has been looked into the lost jobs and wages among people suffering from CKD in Ghana.

2.5 Intangible Cost of Seeking Chronic Kidney Disease Care

Physical and emotional symptoms are important main manifestations of chronic disease and play a main role in patient experience with life-limiting disease. Financial problems, changes in social and marital relations are the most prevalent stressors for patients with CKD, particularly for ESRD patients undergoing hemodialysis (Leung, 2003). Cukor et al(2007), further acknowledged that frequent hospital admissions, inability to spend holidays, restrictions on leisure time, interactions with nursing employees and medical employees, fear

of disability or death, increased reliance on an artificial kidney machine, uncertainty about the future and physical fatigue are other stressors that CKD patients experience. In general, CKD patients are affected by a wide range of physical, psychological, economic and social problems that ultimately affect their quality of life (Tavallaii et al., 2009). Psychosocial factors, including depression, anxiety and lower social support, are common in patients with chronic kidney disease (CKD). The ability of people with ESRD to perform daily activities, including their paid work, is limited by diseaserelated symptoms and dialysis treatment, such as pain, fatigue, anxiety, depression and sexual problems (Tanyi et.al 2006). People with CKD and ESRD have poor health-related quality of life compared to the general population (Bele et al. 2012). Quality of life is an important criterion for the effectiveness of health care, health and well-being.

According to De Sousa (2008), depression is one of the psychiatric problems that occurs most in patients with CKD. Depression among CKD patients can be attributed to a number of factors, including the response to the diagnosis and the nature of the treatment that the patient will undergo for a lifetime and the impact of these long-term treatments, such as compromised quality of life, loss of work and financial burden on the patient and the family (Klaric&Klaric, 2012)

A descriptive cross-section study on the prevalence of depression among patients with renal failure and their caregivers in Saudi Arabia revealed that about 70% of patients with CKD had varying degrees of depression. The risk of depression among patients with end-stage renal disease (ESRD) was discovered to be four times greater than in the general population (Lopes et al., 2002). Similarly, a study by Abdel-kaber et al. (2009) recognized the prevalence of HD depression in ESRD and predialysis patients. Abdel-kaber et al (2009) noted that the incidence

of CKD among Stages 3, 4 and 5 was 10.5%, 13% and 33.3%, respectively, and therefore found that patients with ESRD on dialysis were more probable to be depressed than CKD predialysis patients.

A survey by Yeh et al. (2012) claimed that 12.3% of CKD patients were depressed and that their family members had assumed the function of main caregivers. The roles assumed by these main caregivers also influenced their domesticity and happy life at home.

A cross-sectional research in Nigeria to determine the prevalence of CKD depression also disclosed a prevalence of 23.7%, with dialysis patients more likely to be depressed than predialysis patients with a rate of depressive symptoms of 34.5% in dialysis patients compared to 13.3% in pre-dialysis patients (Amira, 2011).In contrast to this study, another study in India revealed that, pre dialysis patients of CKD were more depressed as compared to their dialysis counterpart(Thomas, Acharya & Shukl,2014) . Similarly, surveys have shown that patients with chronic kidney disease (CKD) who are not on dialysis have levels of depression up to 3 times greater than those in the general population (Palmer et.al 2013).The same research suggested that prevalence levels in ESRD were greater than in CKD when questionnaires were used to diagnose depression (39.3% vs. 26.5%).

Physical pain is not uncommon in patients with CKD. Sub-optimal pain control is connected with bad quality of life, depression and potentially long-term survival. The incidence of pain in patients with chronic renal illness (CKD) was revealed to be in the range of 40–60% for patients receiving renal substitute treatment (RRT), 60–70% for pre-stage renal illness (ESKD) and up to 100 per cent for hospitalized CKD patients. Musculoskeletal pain is predominant at 60–70% in both the general and CKD populations (Davison, 2014). Marital and family discord are frequently seen in ESRD patients and may have a negative effect on

the health-related quality of life (Steele et.al., 1996).Similarly, a cross-sectional research in India by Khaira et.al(2012) made the assertion that, marital stress was present in 36.7% patients with ESRD undergoing hemodialysis. Support from social networks, experts and other patients is critical to enhancing patient ability. Spirituality and church groups are important resources for disease management and therapy, as seen in a number of research. Engaging in leisure physical activity has shown to slow the rate of decline of eGFR among individuals who have moderate to severe CKD (Robinson-Cohen et.al. 2014). However, according to Johansen et.al (2010), patients with chronic kidney disease are less active than even sedentary people without chronic kidney disease. This fact is backed by a research by Rosa et.al.(2015) in which they discovered that only 27% of patients with hemodialysisrelated ESRD were involved in physical exercise at least once a week during their leisure time. Inability for patients with CKD to engage in leisure physical activity consequently implies rapid progression of the disease with its attendant cost that an individual and family has to deal with coupled with early mortality. Medication adherence is a main focal point of efficient disease management in chronic kidney disease (CKD) (Burnier et.al.2015). The cardinal principle of medicines is to slow disease progression and monitor and correct disease-associated complications and comorbidities while treating the underlying aetiology (Bartlett Ellis & Welch 2017). However, CKD patients are prescribed a multipharmacological regimen that includes, but is not restricted to, antihypertensive drugs, antidiabetics, phosphate binders, vitamin D preparations, calcimimetics, stimulant erythropoiesis and iron supplements. According to Burnier et.al (2015), this infers a heavy burden of pill consumption with sometimes > 20 pills per day. Managing medication cocktails, nutritional limitations, and numerous heath care appointments, including two or three dialysis sessions per week, may be

challenging for patients with CKD and ESRD. It is therefore not surprising that estimates of non-adherence to drugs differ from 17 to 74% for patients with CKD and from 3 to 80% for patients on hemodialysis (Burnier et.al.2015; Barlett Ellis and Welch 2017). This clearly threatens the development of the disease and also considerably increases the danger of CKD morbidity and mortality. In Ghana not much has been studied into the intangible cost of CKD. However, an article by Alex Ababio in 2013 titled ―Battling Chronic Kidney in Ghana‖ revealed that most patients with CKD face physical challenges such as sleep disturbances, fluid and diet restrictions, and problems accessing the treatment site. In this article he recalled his interview with 10 people suffering from CKD at the Dialysis Unit of KATH with varying physical symptoms including: weakness, loss of appetite, general bodily pains, dizziness, breathlessness and sexual weakness. One of the people he interviewed also revealed the cold attitude from some of the nurses at the dialysis unit which tend to affect them emotionally. In this same article, 8 out of the 10 people who were interviewed disclosed that their sexual life and activity has been affected by hemodialysis. Furthermore, the fluid restriction in people with CKD tends to be very difficult and tempting since patients are denied from taking their favorite drinks such as coke or Fanta.

A latest cross-sectional study undertaken by Tannor et.al (2018) at KATH's renal outpatient clinic revealed bad general quality of life in patients with moderate to advanced CKD.

2.6 Knowledge Gaps and Innovations

The strength of this study to the best of the researcher‘s knowledge is the first of its kind in Ghana to understudy the household cost of CKD taking into account all the clinical characteristics of the development of CKD (including all stages).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter provides a detailed description of the research methods used for this study. It discusses issues relating to the research design, study area, study variables, study population, sample size, sampling procedure, data collection techniques and tools. It also focuses on the ethical considerations, limitations and assumptions for the study.

3.2. Study Type, Design and Steps

A cross sectional study design was carried out from 13th February 2019 to 21st of May 2019 among people with Chronic Kidney Disease between the ages of 14 to 91 years who were receiving health care at the Komfo Anokye Teaching Hospital. It is the only government hospital in the Ashanti Region that has a dedicated renal clinic for patients suffering from CKD. The hospital also offers hemodialysis and acute peritoneal dialysis through its Dialysis Centre located at the Polyclinic of Komfo Anokye Teaching Hospital. The renal clinic provide services in the form of internal consultations for other directorates like Anesthesia and Intensive Care, Obstetrics and Gynecology, Surgery The study was conducted at the Komfo Anokye Teaching Hospital which is a major referral health Centre for the northern part of

Ghana and also a Centre noted for managing chronic conditions such as Chronic Kidney disease.

3.3 Profile of Study Area

The study was done at Komfo Anokye Teaching Hospital. It is a tertiary hospital with a 1000 bed capacity located in Kumasi, the capital of the Ashanti Region in Ghana. It is the second largest hospital in Ghana. The strategic location of the hospital is such that it enables it receive referrals from eight out of the ten regions in Ghana including private facilities. The facility also provides care for people from neighboring countries. Its catchment area has an estimated population of ten million people. The hospital has the following directorates: Obstetrics and Gynecology, Surgery, Child Health, Anesthesia and Intensive Care Unit,

Medicine, Eye, Ear, Nose & Throat, Diagnostic, Oncology, Accident and Emergency, Dental, Polyclinic, Technical Services, Domestic Services, Trauma &Orthopedics.

Komfo Anokye Teaching Hospital is in the Ashanti region which is also in the middle belt with capital Kumasi and has a population of 4,780,380 with a surface area of 24,389 km2. Komfo Anokye Teaching Hospital has a Dialysis Centre with 8 functional hemodialysis machines being manned by 3 Nephrologist and 2 physician specialist. It is the facility next to Korle Bu Teaching Hospital to the have the higher number of trained Nephrologist in the country, with 4 Nephrologists at Korle Bu Teaching Hospital. They are also able to perform acute peritoneal dialysis for children requiring acute dialysis too. The renal clinic for adults operates on Wednesdays and Thursdays whilst the Dialysis Center offers dialysis for patients with end stage renal disease and Acute Kidney injury daily. The renal clinic has an average weekly attendance of 40 patients per week.

3.4 Study Population

Patients with chronic kidney disease who receive health care at Komfo Anokye Teaching Hospital were used for the study.

3.4.1 Inclusion Criteria

i. Patients with any stage(stage I-V) of chronic kidney disease and receiving treatment at the renal unit within the Medicine Directorate of Komfo Anokye Teaching Hospital.

ii. Patients with chronic kidney disease and are receiving treatment for the at least three months were eligible to participate in the study. This criterion was used because these patients were the most appropriate people to tell how the household cost of seeking chronic kidney disease healthcare has impacted on their lives and that of their households.

iii. Patients with CKD between the ages of 14 and 91 were selected for the study. This was to encompass both working class (breadwinners) and the non-working class (those that depend on others for their livelihood).

3.4.2 Exclusion Criteria

i. Patients with CKD who were critically ill were excluded from the study as they were not able to fully participate in the study ii. Patients below the ages of 14 years were also not included in the study. They are considered as pediatric cases in terms of clinical care.

iii. Patients who also had acute kidney injury were also excluded from the research.

iv. Patients and caregivers who refused to consent to the research were also excluded from the research.

The household in this research was described as all individuals living in a specified home, namely: parents, kids and domestic servants, eating from a common bowl and sleeping under the same roof. This was intended to help tailor the study to assess the household cost of the disease to the CKD patient and his immediate family.

3.5 Sample size

The sample size is estimated based on the assumption that about 50% of people in Ashanti region who are diagnosed with various stages of chronic kidney disease receive treatment at Komfo Anokye Teaching Hospital. Using the formula: $n = z^2_a p(p_0.q_0)/d^2$ p:

estimated proportion of people with CKD receiving treatment at KATH=0.5 q

:(1-p) =0.5 d: deviation=0.05

n= $(1.962)^2 \times 0.5(0.5.0.5)/0.05^2$ n=192

Assuming 10% non-respondent rate, participants of the study will be 192 plus 19.

Hence, the sample size for the study is 211.

3.6 Sampling Technique

A simple random sampling technique was used to select study participants who were receiving treatment at the various stages of chronic kidney disease and had been scheduled for treatment each day. All patients who were seeking treatment for CKD and were willing to partake in the study were eligible for selection. Questionnaires were administered to participants/relatives accompanying relatives at the treatment center to collect data in addition to information that was gathered from participants folders.

3.7 Data collection technique and tools

Face-to-face interviews were conducted using structured questionnaires to gather information. The questionnaire had both open and closed ended questions covering relevant information on patients‘ demographic information, employment status, and occupation. Secondary information on the costs of medications, laboratory diagnostics, registration and consultations were obtained from the review of hospital records of the patients. Two interviewers were employed and trained to collect data. These interviewers were national service personnel within the medicine directorate. The interviewers who spoke fluent Twi and English were further trained to accurately translate the English questionnaire to Twi in order to elicit the appropriate responses from participants. The principal investigator was also engaged in the collection of data. The interviews conducted in either Twi or English lasted between 10-15 minutes per interview. The filled questionnaires returning from the field were checked at the close of day to ensure completeness and then processed for entry.

3.8 Study Variables

The variables used in the study were the total household cost, the direct cost, the indirect cost and the intangible cost of chronic kidney disease. The variables have been described further in the table below.

3.8.1 Dependent Variable

The household cost of chronic kidney disease was dependent variable in this study as it was the variable being tested in the study

3.8.2. Independent Variable

The independent variables selected in this study were the direct cost, the indirect cost and the intangible cost of chronic kidney disease as these variables were controlled to test their effects on the household costs of chronic kidney disease.

3.8.3 Study Variable Table

Table 1 gives a detailed description of the variables adopted in the study. It provides information on the type of cost, the category of cost and the description of the cost.

Table 1: Description of Study Variables

Type of Cost	Category of cost	Description of cost
Direct cost	Medical cost	1.Cost of medications 2.Cost of Diagnostics 3.Cost of Dialysis 4.Cost of Consultation 5. Cost of NHIS levy
	Non-medical cost	1.Cost of Transportation 2.Cost of feeding/diet
Indirect Cost	Cost of productivity	1.Lost Wages 2.Lost Jobs 3.Lost Working Hours
Intangible Cost	Intangible Burden	1.Physical Pain 2.Psychological Pain 3.Broken Relationships 4.Anxiety 5.Stress 6.Depresion

3.9 Pre testing

The questionnaires were pretested before the actual administration of the questionnaires was done. Pre-testing included patients with CKD and their household members who always accompanied them to the KATH for treatment. It lasted for a period of one week. This offered the chance to identify most of the problems and addressed them accordingly. The principal investigator held meetings daily with the research assistants to cross-check and validate all completed questionnaires and discussed matters that came up. This also helped in correcting errors and planning for the subsequent days. Research assistants were educated on how to manage questionnaires and maintain them confidential.

3.10 Data Handling

Each questionnaire was given a unique identity code and all the forms were arranged orderly in a file. Filled questionnaires returning from the field were entered weekly in Microsoft excel by a data entry clerk and exported to STATA software. Data were cleaned by the Biostatistician and then subsequently analyzed.

3.11 Data Analysis

Microsoft excel and Statistical software (STATA version 13) were used in the analysis of the data.

The various household cost incurred by CKD patients was estimated. The direct costs of seeking CKD healthcare were estimated as a total cost of all direct spending on CKD healthcare for all the stages of the disease. This included the cost of medical cost such as medications, OPD consultations, cost of dialysis other diagnostic investigations like laboratory investigations, Ultrasound and Computed Tomography request. The direct cost also

included non-medical cost such as cost of feeding, cost of transportation. The direct cost per each stage of the disease was estimated by summing up the medical cost and nonmedical cost component and the average cost computed for the stage. Similarly, the total direct cost estimated incurred by all the patients in the study were added and divided by the total number of respondents to obtain the average cost.

The human capital approach was employed in measuring the lost productivity for patients with CKD that were receiving health care. Hence the indirect cost was based on the total time lost to productivity. This assessment was based on the time the patient had to travel from his site of employment to the renal unit to seek healthcare and also the time he spends in accessing healthcare whilst at the hospital.

The current minimum wage is GH¢10.65 (Communique National Tripartite Committee, 2018) and the average working hours per day is 8 hours. This brings the cost of one working hour at GH¢ 1.33. The cost of one working hour was then multiplied by the total travelling hours and the number of hours a client spent at the hospital per visit to arrive at the cost of each visit per client. Based on the average number of visits per month, the indirect cost of CKD care was estimated. For clients who had relatives that were gainfully employed accompanying them, they also had their indirect cost computed per the number of hours they spent on taking of them. The mean total cost of seeking CKD health was computed as the sum of the mean total direct and indirect costs.

All costs were expressed in Ghana Cedis currency then converted to United States Dollars (US$) using the exchange rate (US$1.00 = GH C 5.25) at the time of study(Daily Interbank Forex Rate,2019).

A sensitivity analysis was further conducted to estimate the time values of the costs of CKD care, taking into consideration as assumed discount rate of 3%, 5% and 7% respectively, time period and the inflation rate of 9.4% (Ghana Statistical Service, 2019).This was done to assess the robustness of the study.

The cost estimates at time t, was based on the formula;

Estimated cost at time t = EC0 (1+r)t …… (1)

Where EC0 is the current estimated costs and r is the estimated discount rate and t is time period.

A real discount rate was deduced using the current inflation values based on the formula rtreal = (re – i)/ (1+i) …….. (2)

where rt is the real discount rate and i is the current inflation rate.

The estimation for the direct and indirect is summarized in the table 2 below

Table 2 Estimation of Direct Cost of each stage of CKD and all stages of CKD

No	Variable	Description of cost	Cost Estimation	Unit of measurement
1	Direct medical cost (Each Stage of CKD)	1.Cost of medications 2.Cost of Diagnostics 3.Cost of Dialysis 4.Costof Consultation 5. Cost of NHIS levy	The average cost of the direct medical cost were computed for each stage of the disease. For patients on dialsysis, the cost per month for dialysis was estimated by the cost of each session of dialysis multiplied by the average session of dialysis per month for patients with ERSD on dialysis	GH C
2	Total direct medical cost(All stages of CKD)	Total cost on all medications, diagnostics, consultations, dialysis and NHIS levy	Summation of the total direct medical cost of all the stages of the disease	GH C
3	Direct Non-medical cost(Each stage of CKD)	1.Cost of Transportation 2.Cost of feeding/diet	The total cost on feeding and transportation incurred by the patient and the accompanying relative if any, was multiplied by the number of times they visit the hospital per month.The average cost then computed for each stage	GHC
4	Total direct nonmedical cost(All stages of CKD)	Total cost on transportation and feeding for all the patients and their accompanying relatives if any	Summation of the total direct non-medical cost of all the stages of the disease	GHC

Estimation of indirect cost of CKD

No	Category	Cost Estimation
1	Days lost to patients	Number of days or times patient absents himself from work as a result of suffering from CKD for each stage was computed
2	Productivity loss to patients due to travelling and waiting times to access CKD care	The summation of the total number of hours spent by the patient and travelling time to seek treatment multiplied by the average number of visits per month for each stage of the disease
3	Days lost to caregivers	Number of times relatives accompany patient to hospital multiplied by the number of hours they spend in taking care of patients
4	Productivity loss to caregivers due to traveling and waiting times	The summation of the total number of hours spent by the relative/caregiver and travelling time to seek treatment multiplied by the average number of times he/she accompanies the patient per month
5	Indirect cost of each stage of CKD	Aggregation of the total valued productivity obtained by multiplying the total time spent and number of visits per month by the minimum daily wage.
6	Total Indirect cost for CKD(all stages inclusive)	Summation of all the indirect costs incurred for all the various stages of the disease

Estimation of Annual Cost of CKD

1	Estimated Annual cost for CKD	Estimated monthly cost for each stage multiplied by 12

3.12 Ethical Consideration

Ethical considerations have been critical throughout the research. Ethical approval was sought from the Ethical Committee on Human Research Publications and Ethics (CHRPE) of KNUST and Komfo Anokye Teaching Hospital prior to the start of the research. There was no harm inflicted on the respondents during the study. The participants were taken through the nature of the study and assured of no potential harm throughout the study. All participants involved in the study signed a consent letter and with the assurance that information gathered from them during the study were strictly confidential. They were told of their freedom to decline participation at any point in time of the study, with no consequences should they decide to do so. Guardians of participants below the ages of 18 were also made to sign a consent form. Participants too were also allowed to ask questions concerning the study and questions were readily answered. Filled questionnaires have been kept under lock and key to prevent unauthorized people from gaining access to them.

3.13 Assumptions of Study

The following assumptions were made throughout the study:

i. The study design is appropriate for the problem which was understudy. ii. That the respondents were truthful in the response throughout the study iii. Sensitivity analysis of the cost estimates were done using an assumptive

Discount rates of 3%, 5% and 7% respectively and an inflation rate of 9.4%

iv. The tools used to collect and analyze information were accurate.

v. Patients on hemodialysis, had averagely two dialysis sessions per week.

3.14 Limitations of the study

i. The study did not involve children under 14 years who have chronic kidney disease. This age group are considered pediatric in terms of clinical care.

ii. The study was done at only one public hospital and did not include any other private and public health facilities that attend to CKD patients within Ashanti Region.

iii. The intangible cost component could also not be quantified in monetary terms.

CHAPTER FOUR

4.0 RESULTS

Introduction

The chapter presents results on the cost of Chronic Kidney Disease (CKD) care among patients seeking health care at Komfo Anokye Teaching Hospital (KATH). Data from a total of 224 respondents were analyzed. A sensitivity analysis was conducted to estimate the time values of the costs estimates of Chronic Kidney Disease care.

4.1 Sociodemographic Characteristics of Patients

Table 4.1 presents results of the background characteristics of respondents involved in the study.

The sociodemographic of respondents covers age, gender, marital status, religion, educational background, employment status, number of people in household, region of residence, and breadwinner of the household, registered under NHIS, receive remittance and patient working in spite of CKD.

Out of the 224 respondents surveyed, majority 118 (52.68%) were males and 106 (47.32%) were females respectively. More than half 131 (28.48%) were married and few 7 (3.13%) had separated as a results of CKD. The age distribution of the 224 patients ranged from 14 years to 91 years with a mean and standard deviation of 49.62 and 15.37 years. Majority 55 (24.55%) of the patients fell in the 44 years to 53 years age group while few 2 (0.89%) fell in the 84 years to 93 years age group. With regards to religion, more than three quarters 194 (86.61%) of the patients were Christians whilst 28(12.50%) and 2 (0.89) were Muslims and Buddhist respectively.

79 (35.27%) had attained secondary level of education whilst 21 (9.38%), 48(21.43%),

53(23.66%) had attained primary, JHS and tertiary level of education respectively. However, 23(10.27%) had not acquired any formal education

.Majority (76.33%) were employed with almost half 102 (45.54%) being self-employed and 27 (12.05%) working in the public sector. For those that were gainfully employed, more than half 107(62.57%) were still working in spite of having CKD

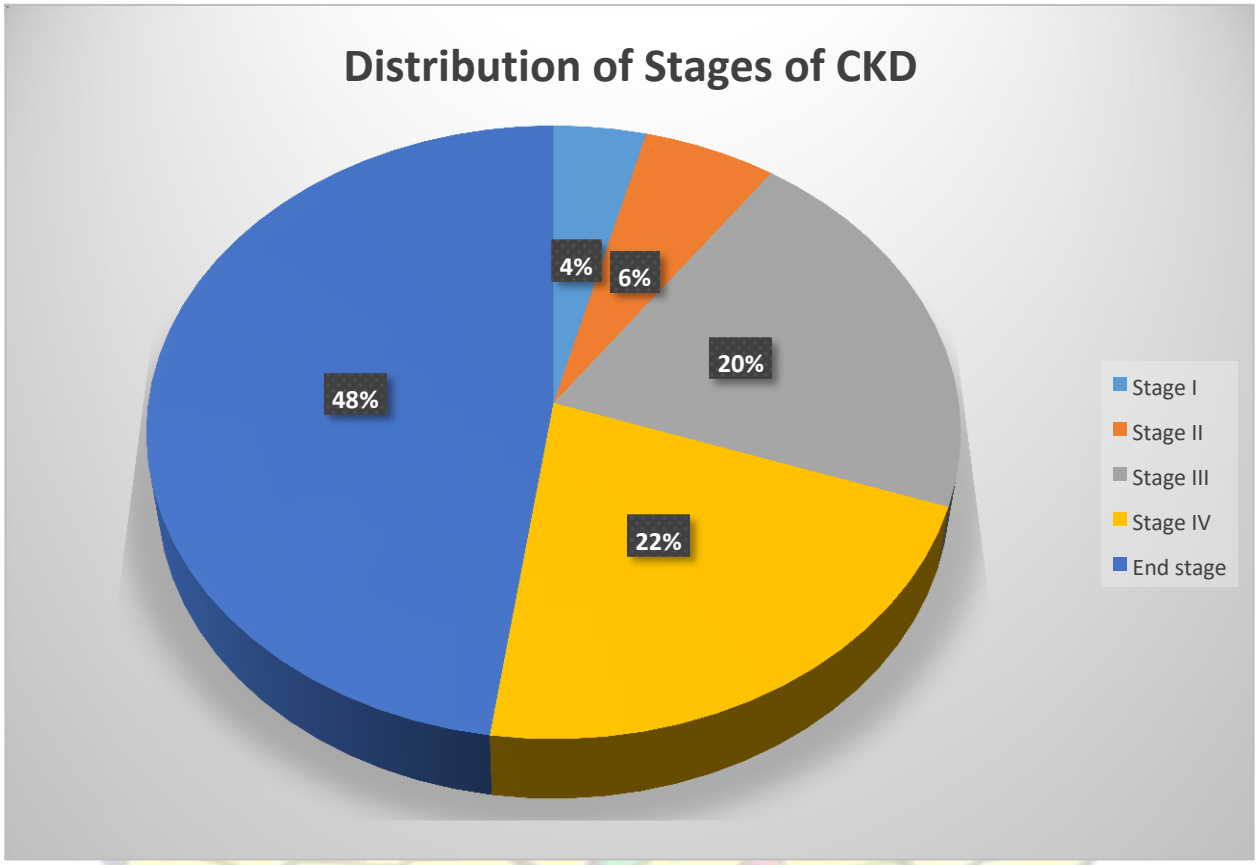
More than three quarters 188 (83.93%) of the respondents reside in the Ashanti Region and the remaining (16.7%) reside in the other neighboring regions More than half 118 (52.68%) of the respondents had 1 to 5 members in their household and 6 (2.68%) have 11 to 15 members in their household. Majority of the respondents 168(75%) in the study admitted to not receiving any remittances as a result of having the disease.

Table 4.1.Socio-demographic characteristics of respondents

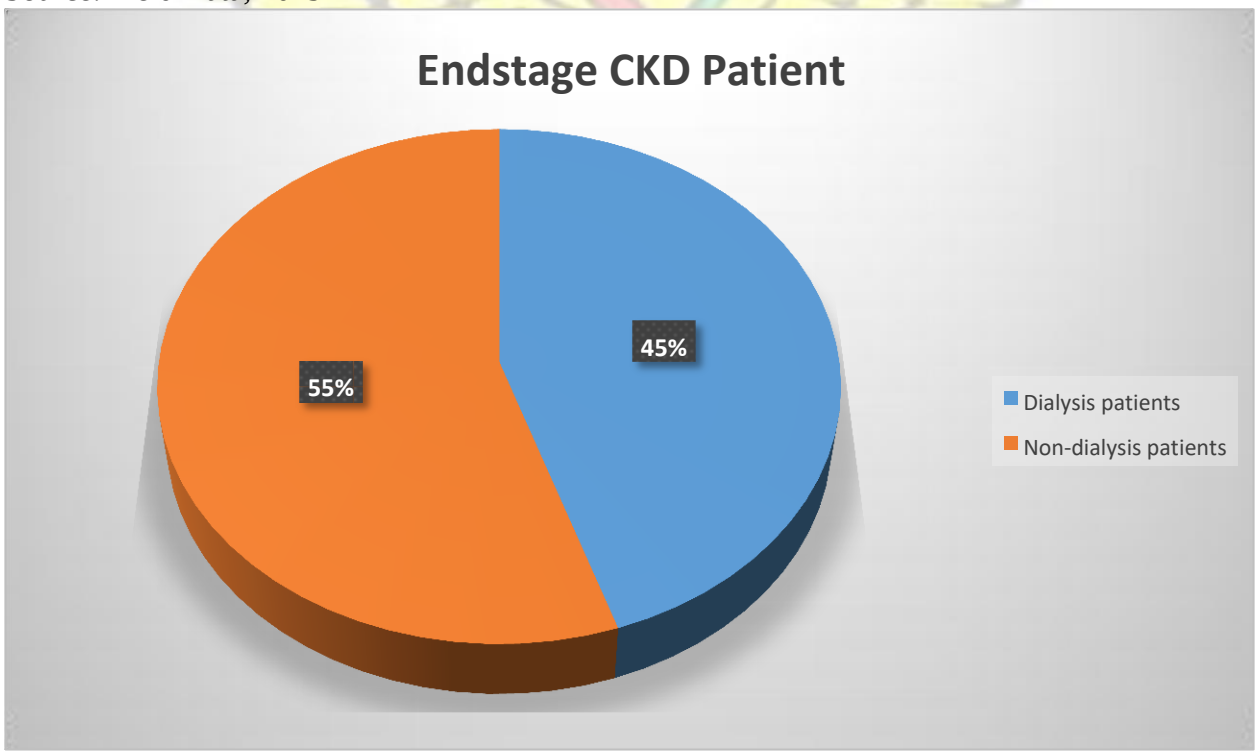
Variable	Frequency	Percentage
Age (n=224)		
❑ 14-24	11	4.91
❑ 25-34	25	11.61
❑ 35-44	50	22.32
❑ 45-54	52	23.21
❑ >54		38.39
Mean (SD)	***49.62 (15.37)***	
Gender (n=224)		
❑ Male	118	52.68
❑ Female	106	47.32
Marital status (n=224)		
❑ Single	39	17.41
❑ Married	131	58.48
❑ Separated	7	3.13
❑ Divorced	21	9.38
❑ Widowed	26	11.61

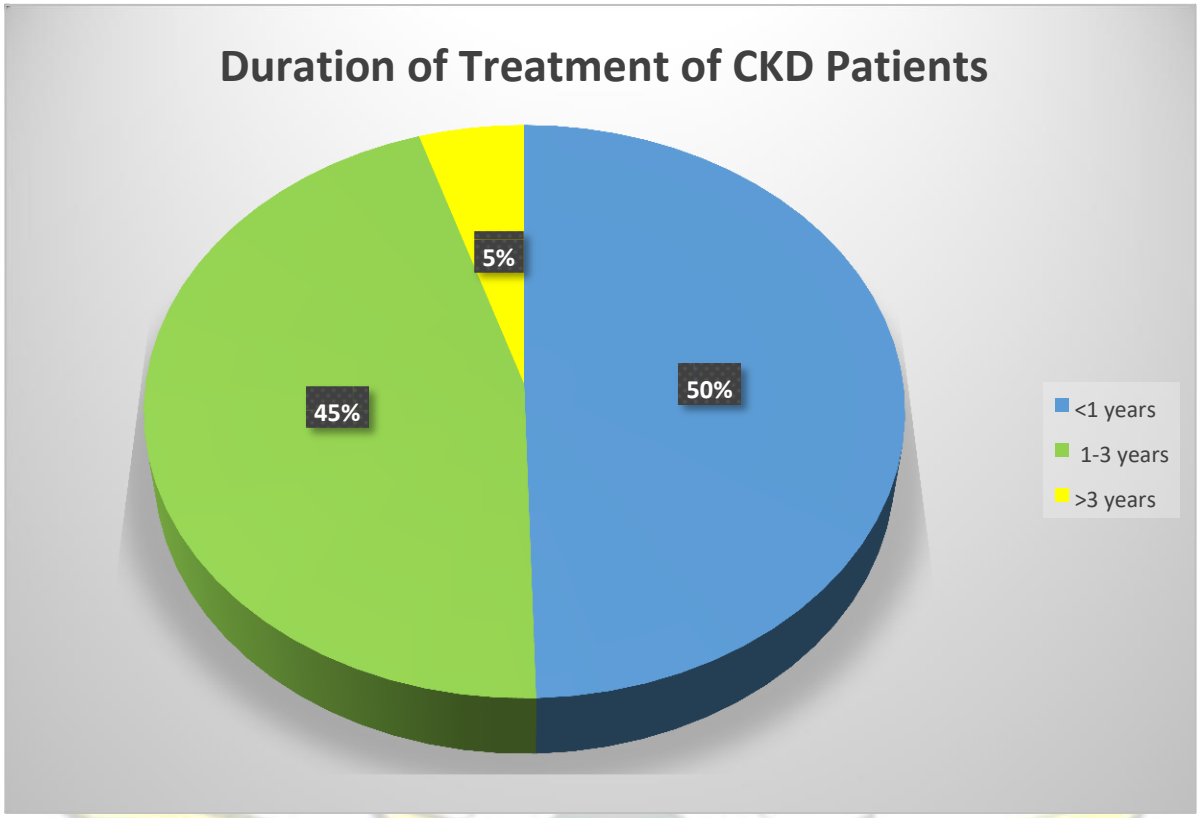
Region of residence(n=224)		
❑ Ahanti	188	83.93
❑ Ahafo	2	0.89
❑ Brong	17	7.59
❑ Central	2	0.89
❑ Eastern	3	1.34
❑ Greater Accra	2	0.89
❑ Upper East	1	0.45
❑ Western	9	4.02
Educational level (n=224)		
❑ No formal education	23	10.27
❑ Primary school level	21	9.38
❑ JHS level	48	21.43
❑ SHS level	79	35.27
❑ Tertiary level	53	23.66
Employment (n=224)		
❑ Unemployed	53	23.66
❑ Self employed	102	45.54
❑ Private	42	18.75
❑ Public	27	12.05
Number of people in household (n=224)		
❑ 1-5	118	52.68
❑ 6-11	100	44.64
❑ 11-15	6	2.68
Mean (SD)	**5.66(2.52)**	

Source: Field Data, 2019



Source: Field Data, 2019





Source: Field Data, 2019

4.2 Respondents Income and Spending

Tables 4.2 present respondents‘ income as well as health spending. As shown in Table 4.2, majority of the respondents (45.98%) earned less than GH¢ 500 (USD 95) monthly with only 22.32% earning more than GH¢ 1,000 (USD 190). The mean income was GH¢897.90 (USD 171.03); SD=835.32).

About 75% stated that they do not receive any form of remittances whilst 25% did. Majority of the respondents 127(56.70%) claimed that they were breadwinners in their families. Majority of the respondents 127(56.70%) also spent less than GHC 500 (USD 95) monthly on housekeeping

Table 4.2: Distribution of Respondents income and spending

Variable	Frequency	Percentage
Monthly income (n=224)		
<GH¢ 500	103	45.98
501-1000	71	31.70
>1000	50	22.32
Mean (SD) GH¢	***897.90 (835.32)***	
Mean USD	***171.03***	
Amount spent on housekeeping monthly (n=224)		
<GH¢ 500	127	56.70
GH¢ 501 -1000	80	35.71
>GH¢1000	17	7.59
Mean (SD) GH¢	***594.11(439.76)***	
Mean USD	***113.20***	
Cost of healthcare per month(n=224)		
<GH¢ 500	103	45.98
GH¢ 501 -1000	71	31.70
>GH¢1000	50	22.32
Mean (SD) GH¢	892.81(769.10)	
Mean USD	170.10	
All medications covered by NHIS(n=224)		
Yes	6	2.68
No	218	97.32
Amount spent on medications(n=218)		
_<GH¢ 100	19	8.72
GH¢ 101 -500	163	74.77
>500	36	16.51
Amount spent on diagnostics(n=224)		
_<GH¢ 100	96	42.86
GH¢ 101 -500	125	55.80
>500	3	1.34
Amount spent per session of dialysis(n=48)		
_<GH¢ 200	45	93.75
>GH C 200	3	6.25
Amount paid annually as NHIS levy(n=224)		
_<GH¢ 25	187	83.48
>GH C 25	37	16.52
Receive remittances (n=224)		
yes	56	25.00
no	168	75.00
Are you the bread winner? (n=224)		
Yes	127	56.70
No	97	43.30

How many household members support household financially? (n=224)		
❑ 1	4	1.79
❑ 2	19	8.48
❑ 3	19	8.48
❑ 4	28	12.50
❑>4	154	68.75
Mean(SD)	5.66(2.52)	

Source: Field Data,2019

Table 4.

3: Other Direct Non –Medical Cost parameters

Variable	Frequency	Percentage
Number of hospital visits per month (n=224)		
□ 1	130	58.04
□ 2	34	15.18
□ 3	7	3.13
□ >3	53	23.66
Amount spent on transportation to and from hospital (n=224)		
□ _< 50	195	87.05
□51-100	19	8.48
□>100	10	4.47
Mean (SD)		
Mean USD		
Amount spent on feeding (n=224)		
□ <50	221	98.66
□>50	3	1.34
Mean(SD)	10.21(27.53)	
Mean USD	1.94	

Source: Field Data, 2019

4.3 The Direct Cost of Seeking CKD Care

Table 4.3- 4.9 present results on the direct cost of seeking healthcare in the management of CKD among respondents for all stages of the disease as well as the overall direct cost for seeking CKD healthcare.

Table 4.4 Direct Treatment Cost for Stage I CKD

Direct Cost	Frequency (N)	Total Cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Medical Cost							
Cost of medication	9	2,020.00	224.44 (198.69)	150.00	100.00	730.00	49.34
Cost of diagnostics	9	1,532.00	170.22 (274.40)	84.00	50.00	900.00	37.42
Cost of dialysis	-	-	-	-	-	-	
Cost of NHIS Levy	9	144	16.00 (10.15)	20.00	5.00	27.00	2.78
Total medical cost	9	3696	410.67 (471.66)	255	175	1655	90.28
Non-medical cost							
Cost of transportation	9	297	33 (37.78)	20	5	120	7.25
Cost of feeding/diet	9	101	11.22 (15.82)	5	0	50	2.47
Total non-medical cost	9	398	44.22 (67.04)	20	10	170	9.72
Total Direct Cost for stage I CKD	**9**	**4094**	**454.89 (463.31)**	**315**	**192**	**1669**	**100**

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

Table 4.4 shows that, the mean monthly medical cost for Stage I CKD was (GHC 410.67, (USD 78.22); SD =471.66). Majority (49.34%) of the medical cost was cost patients had to incur for their medications. It is also shown in the table that, 90.28% of the

Table 4.

direct costs for Stage I CKD were medical costs whilst the remaining 9.72% were non –medical costs. The mean costs of patients transportation was GHC 33, USD (6.3); SD=37.78

5 Direct Treatment Cost for Stage II

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	12	2410	200.83 (151.74)	145	80	600	44.17
Cost of diagnostics	13	1724	132.62 (102.62)	84	34	400	31.60
Cost of dialysis	-	-	-	-	-	-	-
Cost of NHIS Levy	13	304	23.38 (7.39)	25	5	38	5.57
Total medical cost	**13**	**4438**	**341.38 (273.70)**	**277**	**139**	**1038**	**81.34**
Non-medical cost							
Cost of transportation	13	856	65.85 (66.26)	28	4	200	15.69
Cost of feeding/diet	13	162	12.46 (14.95)	10	3	60	2.97
Total non-medical cost	13	1018	78.31 (77.64)	34	9	260	18.66
Total Direct Cost for stage II		**5456**	**419.69 (267.26)**	**313**	**173**	**1158**	**100**

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

As shown in Table 4.5, the mean monthly medical cost for Stage II CKD was (GH C 341.38, (USD 65.02); SD =273.70). Medical cost formed 81.34% of the direct cost with about 44.17% of the medical cost being cost of medications. It is also shown in the table

Table 4.

that,18.66% accounted for non –medical costs with mean cost of transportation GHC 65.85, (USD 12.54); SD= 66.26 (15.69%) accounting for the major cost component.

6 Direct Treatment Cost for Stage III

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	46	9, 305	202.28 (94.93)	190.00	50.00	500.00	51.31
Cost of diagnostics	46	5, 747	124.93 (42.17)	117.50	80.00	250.00	31.69
Cost of dialysis	-	-	-	-	-	-	-
Cost of NHIS Levy	46	1, 026	22.30 (7.76)	25.00	5.00	39.00	6.66
Total medical cost	46	16, 078	349.52 (120.39)	335.00	155.00	708.00	88.66
Non-medical cost							
Cost of transportation	46	1,333	28.98 (27.54)	20.00	4.00	140.00	7.35
Cost of feeding/diet	46	362	7.87 (5.56)	6.00	1.00	30.00	2.00
Total non-medical cost	46	1, 695	36.84 (30.30)	27.50	9.00	150.00	9.35
Total Direct Cost for stage III	**46**	**18, 135**	**394.24 (125.45)**	**382.00**	**185.00**	**768.00**	**100**

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

Table 4.

Table 4.6 shows that, the mean monthly medical cost for Stage III CKD was (GHC 349.52, (USD 66.58); SD =120.39) whilst the mean monthly non-medical cost was GH 36.84, (USD 7.01); SD =30.30. More than half (51.31%) of the medical cost was cost patients had to incur for their medications whilst the least component of the medical cost was the cost of NHIS levy (6.6%). It is also shown in the table that, 2% of the direct costs were cost patients incurred in moving in and out of the hospital for treatment of CKD.

7: Direct Treatment Cost for Stage IV

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	47	1,4012	298.13 (179.29)	260	22	800	57.70
Cost of diagnostics	49	6,411	130.84 (82.40)	84	70	500	26.40
Cost of dialysis	-	-	-	-	-	-	-
Cost of NHIS Levy	49	892	18.20 (11.52)	25	0	50	3.67
Total medical cost	49	21,315	435 (224.63)	409	89	1110	87.77
Non-medical Cost							
Cost of transportation	49	2,036	41.55 (55.69)	25	4	300	8.38
Cost of feeding/diet	49	935	19.08 (56.90)	7	2	400	3.85
Total non-medical cost	49	2,971	60.63 (82.67)	32	8	426	12.23
Total Direct Cost for stage IV	**49**	**24286**	**495.63 (248.2)**	**439**	**129**	**1,300**	**100**

Source: Field Data, 2019

Table 4.

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)
As shown in Table 4.7, the mean monthly medical cost for Stage IV CKD was (GH C495.63, (USD 94.41); SD =248.20).Majority (GHC 435 USD 82.90 (87.77%); SD=224.63) of the Direct cost were Medical cost whilst the remaining (GHC 60.63 USD (11.55), 12.23%) were non-medical cost.

8: Direct Treatment Cost for End stage CKD Patient Non-dialysis

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	58	22,614	389.90 (237.67)	350	20	1000	56.78
Cost of diagnostics	59	10,435	176.86 (111.10)	150	54	500	26.20
Cost of dialysis	-	-	-	-	-	-	-
Cost of NHIS Levy	59	1,242 (8.79)	21.05	25	2	35	3.12
Total medical cost	**59**	**34,291**	**675.08**	**609**	**116**	**2,825**	**86.09**
Non-medical cost							
Cost of transportation	59	4,274	72.44 (164.75)	32	4	1,200	10.73
Cost of feeding/diet	59	1,265	21.44 (52.82)	10	1	400	3.18
Total non-medical cost	**59**	**5,539**	**93.88 (215.74)**	**49**	**7**	**1600**	**13.91**
Total Direct Cost for end stage	**59**	**39,830**	**675.08 (422.09)**	**609**	**116**	**2,825**	**100**

Source: Field Data, 2019
US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

Table 4.

Table 4.8 shows that, the mean monthly medical cost for Stage V (Nondialysis) CKD was (GHC 675.08, (USD 128.59); SD =422.09 whilst the mean monthly non-medical cost was (GHC 93.88, (USD 17.88); SD=215.74). Majority (56.78%) of the medical cost was cost patients had to incur for their medications. It is also shown in the table that, 86.06% of the direct costs for Stage V (Non-Dialysis) CKD were medical costs whilst the remaining 13.91% were non –medical costs.

9: Direct Treatment Cost for End stage CKD Patient on Dialysis

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	48	22,765	474.27 (227.75)	500	120	950	17.67
Cost of diagnostics	48	13,091	272.73 (419.32)	184	80	3,000	10.56
Cost of dialysis	48	79,440	1,655 (819.16)	1520	1,520	7,200	61.65
Cost of NHIS Levy	48	1,067	22.23 (6.69)	25	5	28	0.83
Total medical cost	**48**	**116,363**	**2424.23**	**640**	**84**	**3,800**	**90.31**
Non-medical cost							
Cost of transportation	48	9,352	194.83 (155.39)	128	64	800	7.26
Cost of feeding/diet	48	3,136	65.33 (69.42)	40	16	480	2.43
Total non-medical cost	48	12,488	260.17 (191.73)	80	196	960	9.69
Total Direct Cost for end stage	**48**	**128,851**	**2,684.40**	**2,435**	**1,785**	**8,209**	**100**

Table 4.

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

As shown in Table 4.9, the mean monthly medical cost for CKD Stage V(Dialysis patients) was (GH C 2424.23, (USD 461.75).Medical cost formed 90.31% of the direct cost with about 61.65% of the medical cost being cost of cost for dialysis only. It is also shown in the table that,9.63% accounted for non –medical costs with mean cost of transportation GHC 194.83,(USD 37.11);SD= 155.39 (7.26%) accounting for the major cost component.

10: Overall Direct Treatment Cost for CKD

Direct Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Medical Cost							
Cost of medication	218	73,126	335.44 (220.58)	255	20	1,000	33.20
Cost of diagnostics	224	38,940	173.84 (220.13)	130	34	3,000	17.66
Cost of dialysis	48	79,440	1,655 (819.16)	1,520	1520	7,200	36.06
Cost of NHIS Levy	224	4, 675	20.87 (8.98)	25	0	50	2.12
Total medical cost	224	196,181	875.81 (961.37)	463.50	89	8,009	89.06
Non-medical cost							
Cost of transportation	224	18,148	81.02 (130.66)	33.50	4	1,200	8.24
Cost of feeding/diet	224	5,961	26.61 (53.87)	10	0	480	2.71
Total non-medical cost	224	24,109	107.63 (169.48)	49	7	1,600	10.94
Total Direct Cost	224	220,290	983.44(534.50)	256.25	48	4804.50	100

Table 4.

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019)

Table 4.10 shows the summary of the direct costs for all the respondents. It is evident from the table above that, the mean overall monthly medical cost CKD treatment was (GHC 983.44, (USD 187.32); SD =534.50) and it accounted for 89.06% of the overall total direct cost, whilst the remaining 10.94% was for non-medical cost. Dialysis alone accounted for 36.60% of the overall direct cost; with patients incurring an average monthly cost of (GHC 1655, (USD 315.24); SD=819). Medications also accounted for 33.20% of the overall medical cost with patients spending averagely (GHC 335.44, (USD 63.89); SD= 220.58).NHIS levy formed the least component of the medical cost where patients spend averagely (GHC 20.87 (USD 4.00);SD=8.98) and it accounts for 2.12% of the total direct cost

It is also shown in the table that, the mean monthly cost of transportation for CKD was (GHC 81.02, (USD 15.43); SD=130.66) and it formed 8.24% of the overall direct cost. The mean monthly cost of feeding was (GHC 26.61(USD 5.10); SD=53.87) and it accounts for 2.71% of the overall direct cost.

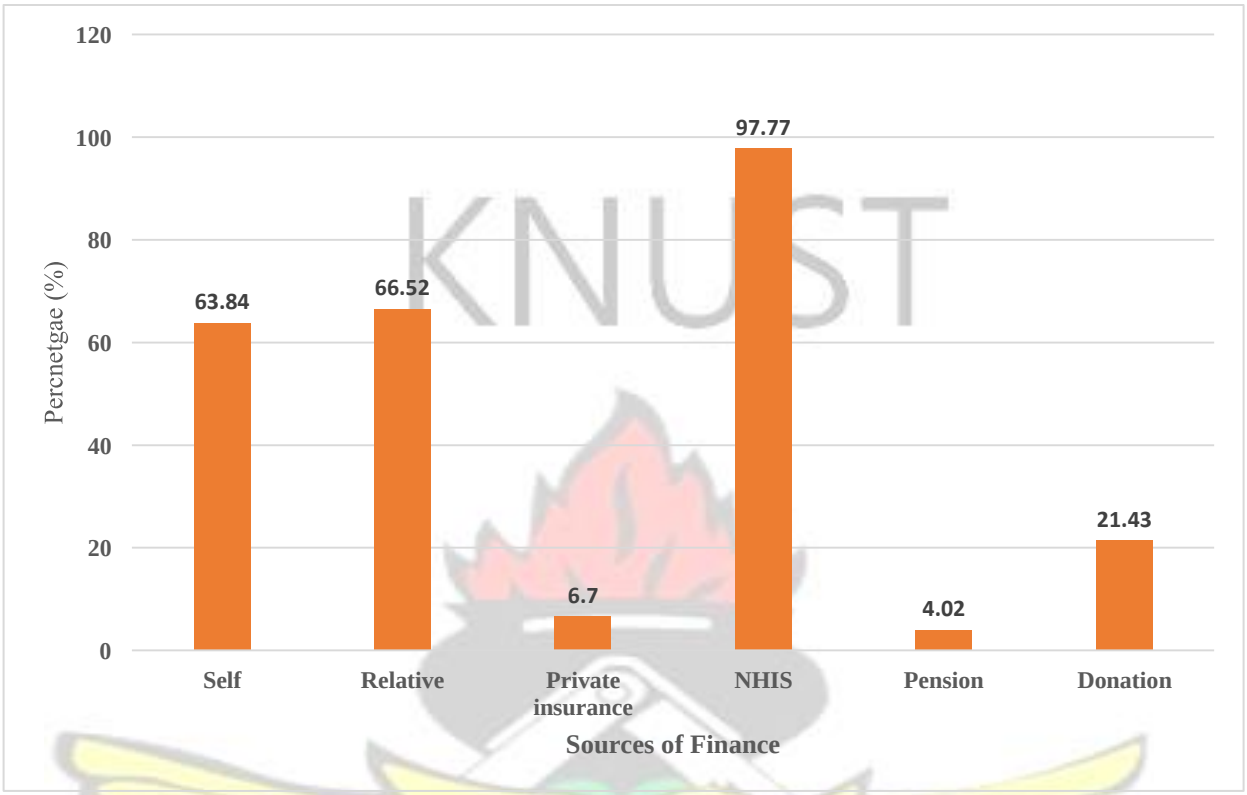


Figure 4.2: Sources of Finance for the Cost of Care

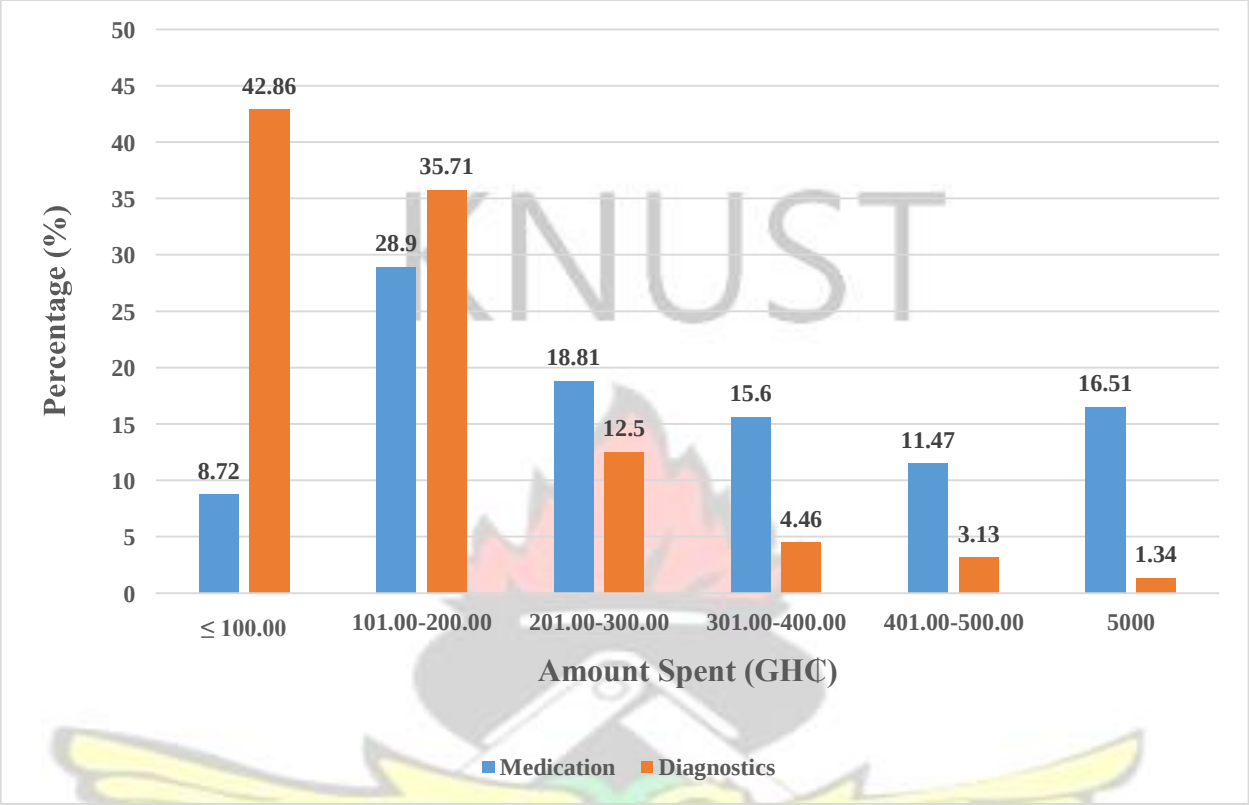


Figure 4.3: Amount CKD Patient Spend on Medication and Diagnostics/Laboratory

Majority of the direct cost of CKD was attributed to the medical cost for all the stages of the disease as seen from the table above. Majority of the respondents (91.28%) spent more than GHC 100(USD 19) per month on medications whilst 8.72% spent less than GHC 100 per month. With regards to diagnostic investigations, more than half of the respondents (57.14%) spent more than GHC 100(USD 19) per month whilst the remaining (42.86%) spent less than GHC 100.

4.4 Indirect Costs of Seeking Health Care in the Management of CKD

This section describes the indirect cost borne by clients on CKD treatment. Table 4.10-4.16 and Figure 4.4-4.6 presents results of indirect costs of seeking healthcare.

Variable	Frequency	Percentage
Absent from work		
□ Yes	149	87.13
□ No	22	12.87
		100.00
Income loss at work place(n=224)	4 2	
□ Yes	8135	76.70
□ No	3 41	23.30
	3	100.00
	6	
	1	
	4	
Reason for being unemployed(n=53)		
□ Retired	22	41.51
□ Student	12	22.64
□Laid off	11	20.75
□Choice	8	15.09
		100.00
Any accompanying relative/caregiver(n=224)		
□ Yes	173	77.23
□ No	51	22.77
		100.00
Is accompanying relative employed? (n=173)		
□ Yes	145	83.82
□ No	28	16.18
		100.00

Employment sector of accompanying relative/caregiver? (n=145) □ Public □ Private □Self employed	18 34 93	12.41 23.45 64.14 100.00

1: Indirect Treatment Cost for Stage I CKD

Indirect Cost	Frequency (N)	Total Cost (GH₵)*	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Cost of Productivity							
Loss of wages	5	223.65	44.73 (37.95)	31.95	10.65	85.2	54.83
Loss of working hours for patient	9	96.43	10.71 (5.48)	9.31	8.65	22.61	23.64
Loss of working hours for employed caregiver	4	87.78	14.63 (6.52)	8.65	6.65	22.61	21.52
Total Indirect Cost for Stage I CKD	**9**	**407.86**	**38.82 (51.94)**	**19.30**	**0**	**130.42**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank

Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregiver.

It is shown in Table 4.11 that, the mean indirect cost for patients with Stage I CKD was (GHC 38.82(USD 7.39); SD=51.94). Majority (54.83%) of the indirect cost was a result of wages that patients had lost as a result of not working for their employers to but rather using their productive time to seek for CKD care. Only Four (4) patients out of the nine (9) correspondents with Stage I CKD that had their relatives accompanied them to seek for CKD care and these relatives had an opportunity cost of (GHC 14.63(USD 2.80); SD=6.52) and this corresponds to 21.52% of the indirect cost for this Stage of the disease.

Table 4.1

Table 4.12: Indirect Treatment Cost for Stage II CKD

Indirect Cost	Frequency (N)	Total Cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Cost of Productivity							
Loss of wages	8	617.70	77.21 (22.59)	85.2	21.3	85.2	72.29
Loss of working hours for patient	13	157.61	12.12 (4.61)	10.64	6.65	21.28	18.45
Loss of working hours for employed caregiver	6	79.14	13.19 (4.26)	10.97	9.31	18.62	29.26
Total Indirect Cost for Stage II CKD	**13**	**854.44**	**65.73 (45.83)**	**93.18**	**6.65**	**122.44**	**100**

Source: Field Data, 2019

US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers.

Table 4.12 shows that, the mean monthly indirect cost for patients with Stage II CKD was (GHC 65.73, (USD 12.52); SD=45.83). Eight of the patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for 72.29% of the indirect cost with a mean of GH C77.21 (USD 14.71).Six(6) out of the thirteen(13) respondents with Stage II CKD had their caregivers accompanying them to seek treatment and these caregivers that were employed had a cost productivity of GH

C13.19(USD=2.51);SD=4.26) and this formed 29.26% of the indirect cost for this Stage of the disease **3: Indirect Treatment Cost for Stage III CKD**

Indirect Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Cost of Productivity							
Loss of wages	31	1,735.92	56.00 (35.21)	85.2	10.65	85.5	71.51
Loss of working hours	46	532.66	11.58 (5.41)	10.31	5.32	31.92	22.07
Loss of working hours for employed relative	14	158.94	11.35 (4.23)	10.64	5.99	21.28	6.55
Total Indirect Cost for Stage III CKD	**46**	**2,427.55**	**52.77 (40.84)**	**31.93**	**6.65**	**127.76**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers.

As shown in Table 4.13, the mean monthly indirect cost for patients with Stage III CKD was (GHC 52.77, (USD 10.10); SD=40.84). Thirty-one (31) of the patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for 71.51% of the indirect cost with a mean of GH C56 (USD 10.70). Fourteen (14) of the respondents with Stage III had relatives accompanying them and their mean cost of productivity was estimated to be GHC 11.35, (USD 2.16); SD=4.2)

Table 4.1

Table 4.1

4: Indirect Treatment Cost for Stage IV CKD

Indirect Cost	Frequency (N)	Total Cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Cost of Productivity							
Loss of wages	27	1469.70	54.43 (33.07)	85.20	10.65	85.20	57.75
Loss of working hours	49	655.69	43.38 (7.48)	10.64	4.66	43.89	25.63
Loss of working hours for employed relative	28	419.615	14.99 (8.62)	13.3	4.66	43.89	16.49
Total Indirect Cost for Stage IV CKD	**49**	**2,545.01**	**51.94**	**39.92**	**5.99**	**133.08**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank

Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers

Table 4.14 shows that, the mean monthly indirect cost for patients with Stage IV CKD was (GHC 51.94, (USD 9.90). Twenty seven(27) of the patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for more than half(57.75%) of the indirect cost with a mean of GH C54.43 (USD 10.40).Twenty eight (28) out of the forty nine(49) respondents with Stage IV CKD had their caregivers accompanying them to seek treatment and these caregivers that were employed had a mean cost productivity of GH C14.99(USD=2.90);SD=8.62) and this formed 16.49% of the indirect cost for this Stage of the disease

Table 4.1

5: Indirect Treatment Cost for End stage CKD Patients Non-dialysis

Indirect Cost	Frequency (N)	Total Cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Cost of Productivity							
Loss of wages	59	**2,950.05**	**70.24 (27.54)**	85.2	10.65	85.2	56.31
Loss of working hours for patient	59	1,282.12	21.73 (23.36)	11.97	5.32	138.32	24.47
Loss of working hours for employed caregivers	42	1,006.81	23.97 (25.58)	13.97	8.65	138.32	19.22
Total Indirect Cost for end stage	**59**	**5,238.98**	**88.80 (57.50)**	**95.84**	**6.65**	**361.84**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank

Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers

As shown in Table 4.15, the mean monthly indirect cost for patients with Stage V (ESRD Non-Dialysis) was (GHC88.80, (USD 16.91); SD=57.50). Fifty-nine (59) of the patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for more than half (56.31%) of the indirect cost with a mean of GH C70.24 (USD 13.40). Forty-two (42) of the respondents with Stage V (Non –dialysis) had relatives accompanying them and their mean cost of productivity was estimated to be GHC 23.97, (USD 4.60); SD=25.58)

Table 4.1

6: Indirect Treatment Cost for End stage CKD Patients on Dialysis

Indirect Cost	Frequency (N)	Total Cost (GH₵)	Mean (SD) (GH₵)	Median (GH₵)	Minimum (GH₵)	Maximum (GH₵)	Cost Profile (%)
Cost of Productivity							
Loss of wages	36	2,715.75	75.44 (22.25)	85.2	21.3	85.2	28.51
Loss of working hours for patient	48	3,814.44	79.47 (31.28)	74.48	42.56	244.72	40.05
Loss of working hours for employed caregiver	38	2,995.16	78.82 (33.00)	74.48	42.56	244.72	31.44
Total Indirect Cost for end stage	**48**	**9525.35**	**198.44 (75.82)**	**191.52**	**79.83**	**574.64**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers

Table 4.16 shows that, the mean monthly indirect cost per person for patients with Stage ESRD (Dialysis) was (GHC 198.44, (USD 37.80). Thirty-eight (36) of the patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for 28.51% of the indirect cost with a mean of GH C75.44 (USD 14.37). However, all the patients on dialysis had lost

Table 4.1

working hours since they had to be on dialysis during working hours and the estimated mean cost of productivity was GHC 79.47(USD 15.14); SD=31.28). This formed nearly half (40.05%) of the indirect cost for ESRD dialysis patients

Thirty-eight (38) out of the forty-eight (48) respondents with ESRD (Dialysis) had their caregivers or relatives accompanying them to seek treatment and these caregivers that were employed had a mean cost productivity of GH C78.82(USD=15.01); SD=33.00) and this formed 31.44% of the indirect cost for this Stage of the disease

7: Overall Indirect Treatment Cost for CKD

Indirect Cost	**Frequency (N)**	**Total Cost (GH₵)**	**Mean (SD) (GH₵)**	**Median (GH₵)**	**Minimum (GH₵)**	**Maximum (GH₵)**	**Cost Profile (%)**
Cost of Productivity							
Loss of wages	149	9,712.80	65.19 (30.45)	85.20	10.65	85.2	55.85
Loss of working hours for patient	149	4,548.60	30.53 (35.26)	13.3	5.32	244.72	26.15
Loss of working hours for employed caregiver	94	3,131.49	33.31 (37.79)	13.97	5.99	244.72	18.00
Total Indirect Cost	**224**	**17,392.89**	**137.98 (84.13)**	**63.87**	**0**	**574.64**	**100**

Source: Field Data, 2019 US$1.00 equivalent to GH₵5.25 (Bank of Ghana Average monthly Interbank

Exchange Rate, July 2019

Table 4.1

*The national minimum wage per day of GH₵10.65 as at January, 2019 was used to value productivity days and time lost to employed patients and employed caregivers

Table 4.17 shows the overall indirect cost for CKD (All stages inclusive). The mean monthly indirect cost per person for patients with CKD was (GHC 77.65, (USD 14.80); SD=84.13. Overall, 149 patients admitted to have lost wages at their workplace whilst seeking for CKD care and this accounted for 55.85% of the overall indirect cost with a mean of GH C65.19(USD 12.42).

Ninety four (94) out of the 224 respondents in the study population had their caregivers or relatives accompanying them to seek treatment and these caregivers that were employed had a mean cost productivity of GH C 33.31(USD=6.34);SD=37.79) and this formed 18.00% of the overall indirect cost for CKD.

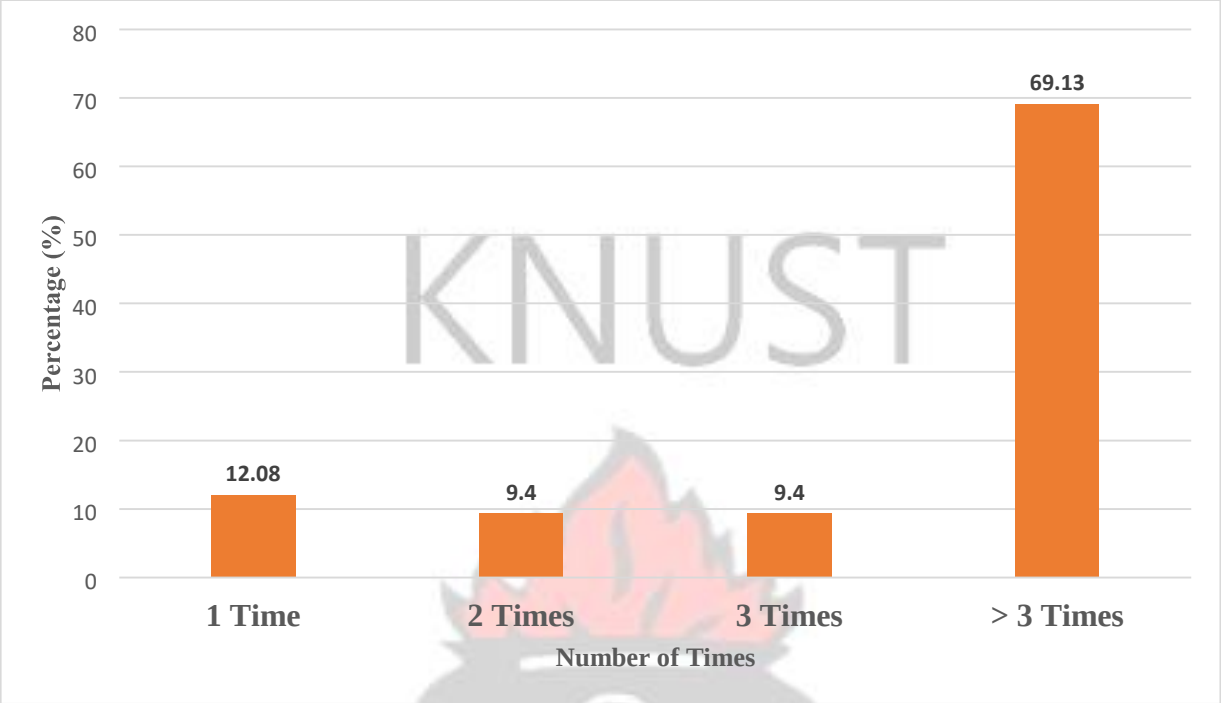


Figure 4.4 Number of Times CKD Patients Absented themselves from Work

Majority of the respondents (69.13%) had absented their selves from work over the past one month as result of suffering from CKD and this led to loss of productivity at work. Furthermore, 12.08% of the respondents had not been to work at least once within the past one month whilst 9.4% of the respondents had absented themselves for either two or three times at work.

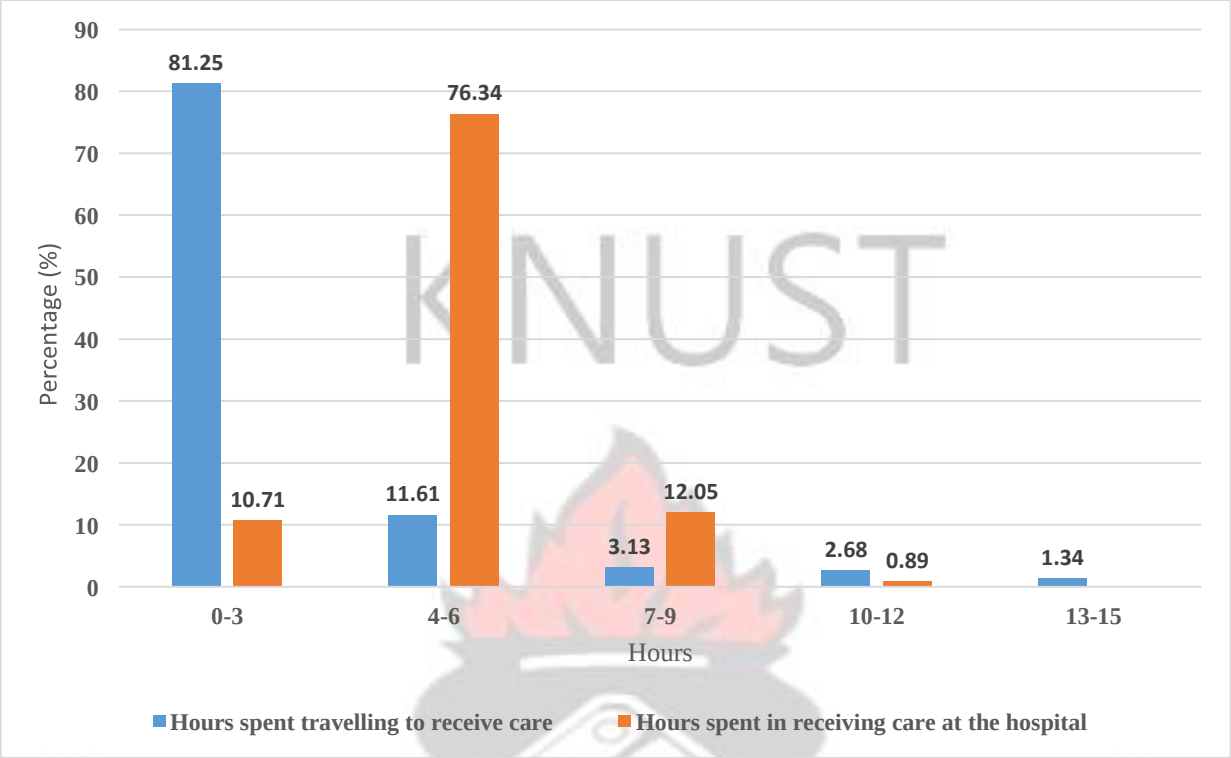


Figure 4.5: Hours Spent Traveling and Spent in Receiving Healthcare

Mean (SD) Hours spent travelling to receive care = 2.57 (2.48)

Mean (SD) Hours spent in receiving care the hospital = 5.20 (1.38)

It is evident from the figure above that, majority of the respondents (81.25%) spent not more than three hours in travelling from their residence to access CKD care at KATH whilst 11.6% of the respondents spent between 4 to 6 hours. A few of the respondents representing 3.13% and 2.68% spent between 7-9 and 10-12 hours respectively in moving to and from the hospital to have CKD healthcare. However, 1.34% of the respondents were found to have spent 13-15 hours on travelling in and out to seek for health care.

Furthermore, it is shown in the figure above that, majority of the patients (76.34%) spent between 4-6 hours in receiving health care at the hospital.12.05% of the respondents also spent between 7-9 hours in accessing CKD health care at the hospital whilst less than 1%

(0.89%) spent more than 9 hours in receiving health care at the facility.

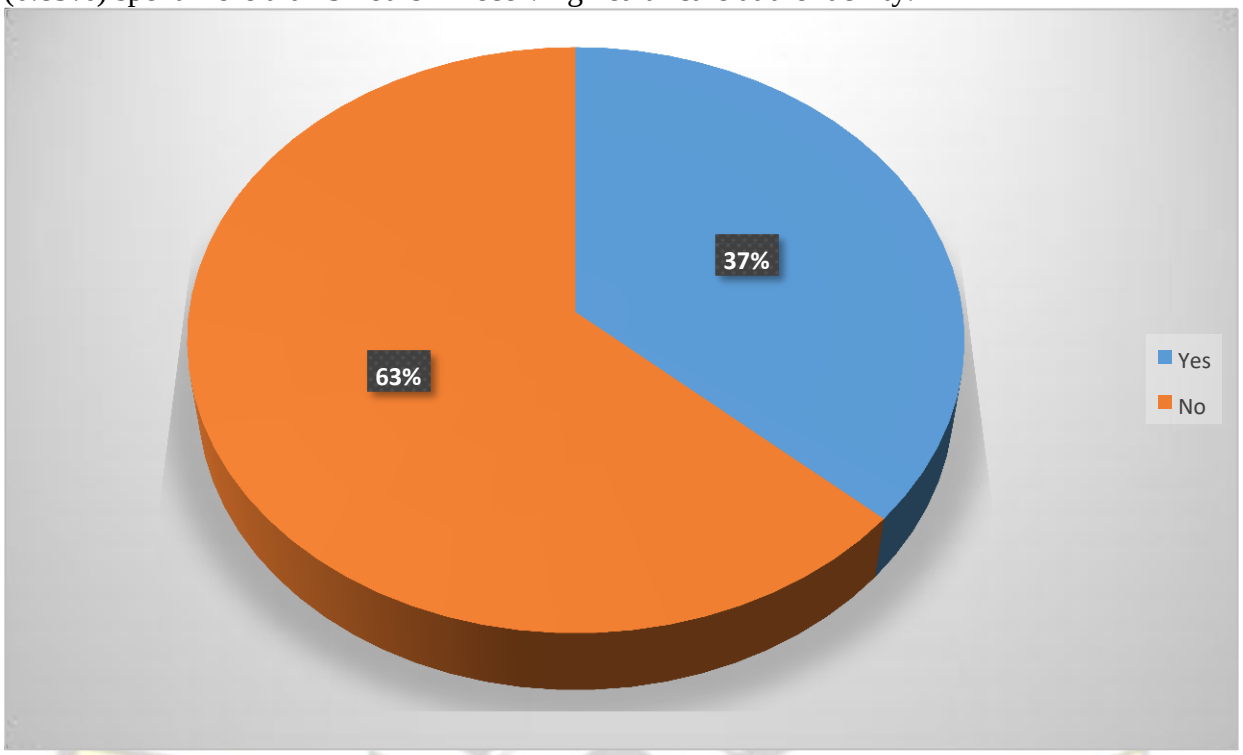


Figure 4.6 Suffered any Disability

The figure above shows that less than half of the respondents (37%) had developed disability as a result of suffering from CKD whilst the remaining 63% had not suffered from any disability as a result of CKD.

Table 4.18 Summary of monthly cost of all stages of CKD care

Stage of CKD		Average Cost per Month (GH₵ / US$*)	Percentage Cost (%)
Stage I	Direct	454.89 / 86.65*	92.14
	Indirect	38.82 / 7.39*	7.86
Stage II	Direct	419.69 / 79.94*	86.46
	Indirect	65.73 / 12.52*	13.54
Stage III	Direct	394.24 / 75.09*	88.19

	Indirect	**52.77 / 10.05***	**11.81**
Stage IV	**Direct**	**495.63 / 94.41***	**90.50**
	Indirect	**51.94 / 9.89***	**9.50**
Stage V (Non-dialysis)	**Direct**	**675.00 / 128.57***	**88.37**
	Indirect	**88.80 / 16.91***	**11.63**
Stage V (Dialysis)	**Direct**	**2,684.40 / 511.31***	**93.11**
	Indirect	**198.44 / 37.80***	**6.89**
Average monthly Household Cost	**Direct**	**983.44/187.32**	**87.70**
	Indirect	**137.98/26.28***	**12.30**
	Total	**1121.42/213.60***	**100.00**

US$1.00 equivalent GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019). ***US dollar equivalent**

Table 4.18 shows the summary of monthly cost of all the stages of CKD disease together with the average monthly household cost. The direct cost formed 87.70% of the house whilst the indirect cost formed 12.30%.

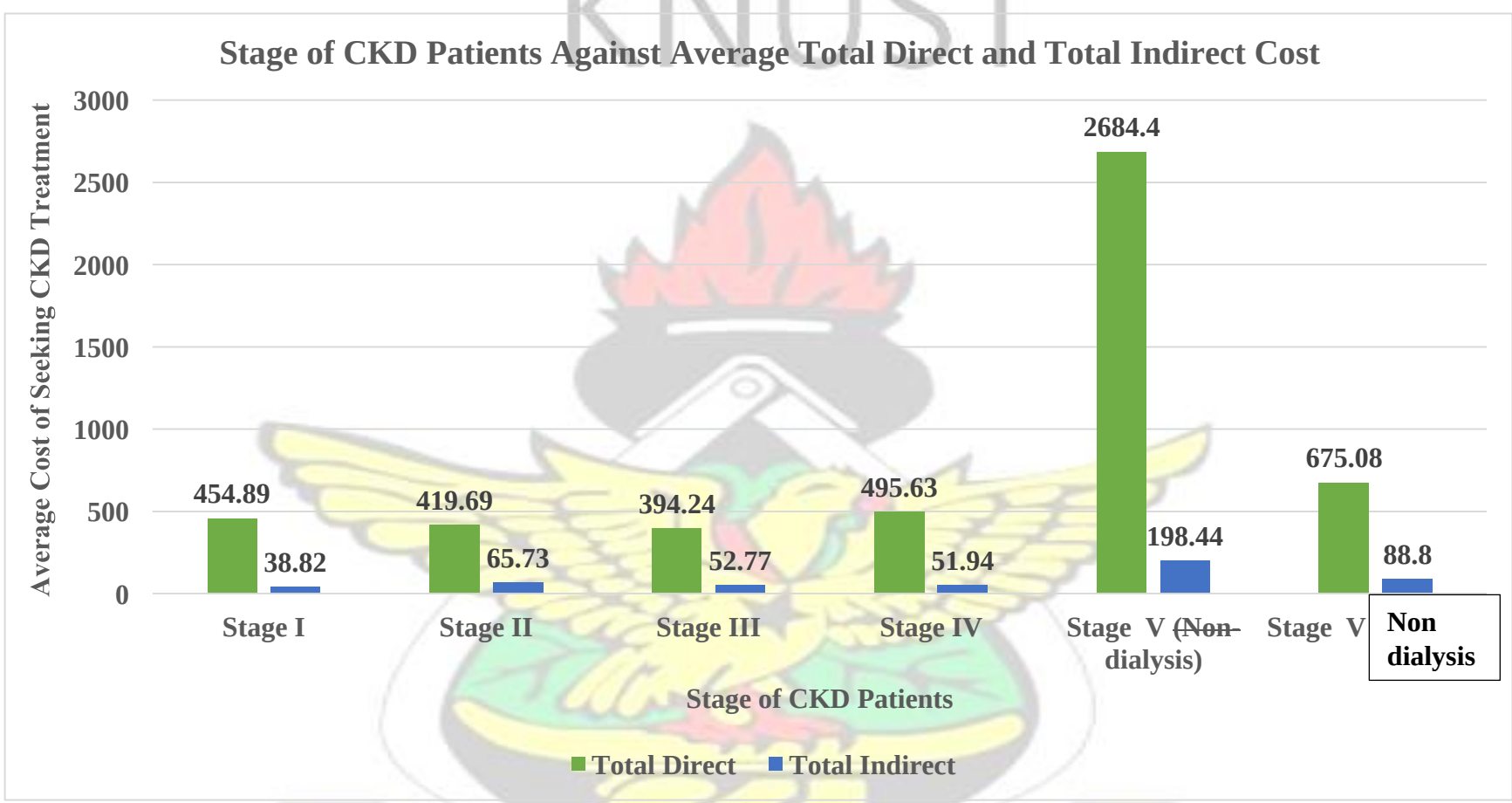

Stage of CKD Patients Against Average Total Direct and Total Indirect Cost
Average Cost of Seeking CKD Treatment
3000
2500
2000
1500
1000
500
0
454.89
38.82
419.69
65.73
394.24
52.77
495.63
51.94
2684.4
198.44
675.08
88.8
Stage I
Stage II
Stage III
Stage IV
Stage V (Non-dialysis)
Stage V
Non dialysis
Stage of CKD Patients
Total Direct
Total Indirect

Figure 4.7

The figure above shows a plot of the stages of CKD disease as against the direct and indirect cost for all stages of the disease. Patients with ESRD on dialysis incurred greater cost for the direct cost compared to all the other stages of the disease **Table 4.19**

Sensitivity Analysis of Mean Monthly Cost of CKD Patients

Cost of CKD		**Mean Cost of CKD**	**Discount Rate**		
			3% (GH₵/US$)	**5% (GH₵/US$)**	**7% (GH₵/US$)**
		Initial Amount (GH₵/US$*)			
Cost of Stage I CKD	Direct Cost	454.89 / 86.65*	480.36 / 91.50*	472.18 / 89.94*	463.68 / 88.32*
	Indirect Cost	38.82 / 7.39*	40.99 / 7.81*	40.30 / 7.68*	39.57 / 7.54*
Cost of Stage II CKD	Direct Cost	419.69 / 79.94*	443.19 / 84.42*	435.64 / 82.98*	427.75 / 81.48*
	Indirect Cost	65.73 / 12.52*	69.41 / 13.22*	68.23 / 13.00*	66.99 / 12.76*
Cost of Stage III CKD	Direct Cost	394.24 / 75.09*	416.32 / 79.30*	409.22 / 77.95*	401.81 / 76.54*
	Indirect Cost	52.77 / 10.05*	55.73 / 10.62*	55.73 / 10.62*	56.74 / 10.81*
Cost of Stage IV CKD	Direct Cost	495.63 / 94.41*	523.39 / 99.69*	514.46 / 98.00*	505.45 / 96.28*
	Indirect Cost	51.94 / 9.89*	54.85 / 10.45*	53.91 / 10.27*	52.94 / 10.08*
End stage CKD Patient (Dialysis)	Direct Cost	2,684.40 / 511.31*	2,834.73 / 539.95*	2,786.41 / 530.74*	2,735.94 / 521.13*
	Indirect Cost	198.44 / 37.80*	209.55 / 39.91*	205.98 / 39.23*	202.25 / 38.52*
End stage CKD Patient(Non-Dialysis)	Direct Cost	675.08 / 128.59*	694.88 / 132.36*	700.73 / 133.47*	688.04 / 131.06*
	Indirect Cost	88.80 / 16.91*	93.77 / 17.83*	92.17 / 17.56*	90.50 / 17.24*
Overall Cost of CKD	Direct Cost	983.44 / 187.32*	1,038.51 / 197.44*	1,020.81 / 194.44*	1,002.37 / 190.93*
	Indirect Cost	137.98 / 26.28*	145.71 / 27.70*	143.22 / 27.28*	140.63 / 26.79*
Total household cost of CKD		1121.42/213.60*	1184.22/225.14	1164.03/221.72	1143/217.72

Table 4.19 shows a one way sensitivity analysis of the mean monthly cost of CKD patients conducted at a discount rate of 3%,5% and 7% respectively and an inflation rate of 9.4%.

Table 4.20 Estimated Annual Household Cost of CKD Patient

Stage of CKD		Average Cost per Month (GH₵ / US$*)	Annually Estimated Average Cost (GH₵ / US$*)	Total Estimated Annual Cost (GH₵ / US$*)
Stage I	Direct	454.89 / 86.65*	5,458.68 / 1,039.75*	5,924.52 / 1,128.48*
	Indirect	38.82 / 7.39*	465.84 / 88.73*	
Stage II	Direct	419.69 / 79.94*	5,036.28 / 959.29*	5,825.04 / 1,109.53*
	Indirect	65.73 / 12.52*	788.76 / 150.24*	
Stage III	Direct	394.24 / 75.09*	4,730.88 / 901.12*	5,364.12 / 1,021.73*
	Indirect	52.77 / 10.05*	633.24 / 120.62*	
Stage IV	Direct	495.63 / 94.41*	5,947.56 / 1,132.87*	6,570.84 / 1,251.59*
	Indirect	51.94 / 9.89*	623.28 / 118.72*	
Stage V (Non-dialysis)	Direct	675.00 / 128.57*	8,100.00 / 1,542.86*	9,165.60 / 1,745.83*
	Indirect	88.80 / 16.91*	1,065.60 / 202.97*	
Stage V (Dialysis)	Direct	2,684.40 / 511.31*	32,212.80 / 6,135.77*	34,594.08 / 6,589.35*
	Indirect	198.44 / 37.80*	2,381.28 / 453.58*	

US$1.00 equivalent GH₵5.25 (Bank of Ghana Average monthly Interbank Exchange Rate, July 2019). ***US dollar equivalent**

Table 4.20 shows the estimated annual household cost of CKD Care from Stage I-V (Non –dialysis) were GH C 5925.52(USD 1128.48), GHC 5825.04(USD 1109.53), GHC 5364.12(1021.73), GH C 6570.84(USD 1251.60), GH C 9165.60(1745.82) respectively. The estimated annual household cost for ESRD on dialysis was GH C 34594.08(USD 6589.34)

4.5 Intangible Cost of Seeking Chronic Kidney Disease Healthcare

Table 4.21 presents the intangible cost of CKD care. Majority of the respondents (74.55%) confirmed to varying degrees of physical pain as a result of CKD whilst 25.45% had no physical pain.34.38% had moderate form of pain whilst 16.07% had experienced severe form of physical pain. Out of the 224 respondents in the study, 29.91% were either sad often or always as a result of having developed the disease. However, 21.43% never expressed the emotion of being sad despite battling with the disease.

Almost half of the respondents (47.32%) were unable to engage in any leisure activity with majority (68.87%) of them attributing their inability to feeling of exhaustion. However, 13.21% of them cited they had no desire to engage in any leisure activity.

For those respondents that were married, 80.80% revealed the disease had no effect on their marriage whilst 11.6% claimed that their sexual performances have been affected. Some (1.79%) had temporarily been separated from their spouses as a result of them travelling to seek for better income to be able to cater for them whilst 6.25% had their spouses divorcing them.

Patients with CKD enjoyed overwhelming support from their household as 91.07% of them had support from their household; 6.25% did not receive any household support whilst 2.68% had been abandoned.

Majority of the respondents(78.48%) felt their relation with the community members had not been affect by the disease as more than half of the respondents cited that their relation with their community members have been supportive;however,10.71% felt being abandoned by their community members as a result of the disease.

It is also shown from the table that, more than half of the respondents(59.82%) expressed concern of being uncomfortable in taking their medications with varying degrees being; seldom, often and always and at rates of 17.14%,26.79% and 15.63% respectively. Interestingly, only 3.13% of the respondents revealed their lives had been changed as they had now become Advocates for CKD to help reduce the disease burden.

Table 4.21 Intangible cost of CKD

Variable	Frequency	Percentage
Physical Pain rating (n =224)		
None	57	25.45
Mild	54	24.11
Moderate	77	34.38
Severe	36	16.07
Sadness as a result of having CKD (n=224)		
Never	48	21.43
Seldom	42	18.75
Often	67	29.91
Always	67	29.91
Engaged in leisure activity(n=224)		
Yes	118	52.68
No	106	47.32
Reason for not being engaged in leisure activity (n =106)		
No desire	14	13.21
Feel exhausted	73	68.87
Developed physical disability	19	17.92
Relationship with community (n=224)		
Abandoned	49	21.87
Supportive	175	78.48
How uncomfortable patients feel in taking medications daily		
Never	90	40.18
Seldom	39	17.41
Often	60	26.79
Always	35	15.63

Other ways CKD has affected patients' life		
No effect	15	6.70
Affected social life	144	64.30
Affected academic performance	10	4.46
Advocates of CKD	5	3.13
Health deterioration	50	22.32

Source: Field Data, 2019 CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter presents the discussions on the study that was conducted. It offers information on the results of this study in relation to the published literature on household costs for chronic kidney disease. It is described on the basis of the objectives of the research.

5.2 Background

Chronic kidney disease (CKD) is now recognized as a global public health priority (Lozano et.al 2013).Similarly, this stance is corroborated by Webster et.al (2017) where they opined that, CKD is a leading public health problem due to its rising prevalence, elevated mortality and high cost to health systems. CKD is a global health burden with enormous financial costs to health systems, people and families. In effect, CKD is a significant driver of healthrelated expenditures globally. The enfeebling nature of chronic kidney disease may affect the working ability of patients leading to absenteeism, loss of wages and working hours and in extreme situations ultimately leads to loss of employment. This places huge burden on the patients, their household, and their employers and in the larger setting, the economic burden of a country. In spite of all these consequent economic costs, there is little factual evidence on the

cost borne by CKD patients and their household in the management of the disease in most countries in the sub-Sahara region including Ghana. The purpose of this cross-sectional study was to determine the family household costs of patients diagnosed with chronic kidney disease (Stage I-V) being treated at the Komfo Anokye Teaching Hospital.

5.3 Direct Cost of seeking CKD care

The increasing incidence of CKD is associated with its attendant increase in the direct health care cost from the disease. There is a disastrous financial burden associated with kidney disease. High-income nations typically spend more than 2-3% of their annual healthcare budget on end-stage renal disease therapy, although those receiving such therapy account for less than 0.03% of the total population (Couser et.al, 2011) Direct cost of CKD has been measured by the cost of medications, diagnostics, consultations, dialysis, feeding, transportation and other out of pocket payments.

Results from this study revealed that the direct cost of seeking CKD care was the major component of the household cost. The overall direct cost formed 87.7% (GH C1,121.42, USD 213.60) of the household cost. This is relatively lower compared to the study by Halle et.al (2017) in Cameroun where direct cost accounted for 93.4% of the estimated total cost. The medical cost component of the direct cost formed the major cost component of the direct cost as well as that of the total costs for all the stages of the disease. The direct medical costs varied as high as 81.3% to 90.5% hence occupying a major proportion of the direct costs for all stages of the disease. This is in tune with research by Nguyen et.al, (2018) where they reported that the largest part of total expenses for CKD patients was direct medical cost.

Thai Quang Nguyen et.al (2018) in their study noted that, direct medical costs accounted for 57.0%,69.1% and 72.0% for CKD1-3,CKD 4-5 predialysis and hemodialysis groups

respectively. The higher direct medical costs for ESRD on dialysis is further corroborated by Halle et.al (2017)where they also reported that, direct medical costs accounts for 87.7% of the total costs for ESRD on maintenance dialysis. The evidently higher direct medical costs for Hemodialysis (HD) can be attributed to extra cost incurred by patients on dialysis such as expenses on, creation of fistulas for dialysis, erythropoietin, Kayexalate and other medications.

Additionally, this study revealed that, majority of out of pocket payments incurred from the direct cost were payments they made for their medications except for patients on HD. The average cost of medications per person per month was GH C 224.44;USD 198.69 (49.34%),GH C 200.83;USD 151.74(44.17%),GH C 202.28;USD 94.93(51.31%),GH C 298.13;USD 179.29(57.70%),GHC 389.90;USD 74.30(56.78%) of the direct cost for patients with stage I,II,III,IV and V(Nondialysis).However, for Stage V(dialysis patients),the major cost component of the direct cost was expenditure incurred from dialysis. It formed 61.65% of the direct cost compared to a relatively lower cost of medication component GH C 494.89; USD (17.67%).

An extrapolation of results from this study yielded an estimated annual cost per person for patients with CKD Stage I-V excluding ESRD on dialysis are GH C 5924.52(USD 1128.48), GH C 5825.04(USD 1106.28), GH C 5364.12(USD 1021.68), GH C 6570.84(USD 1251.60), GHC 9166.56(USD 1746) respectively. For patients on hemodialysis however, the estimated annual cost per person was GHC 34594.08(USD 6589.32).This also contrasts studies by Jommi et.al (2018) where they reported the mean annual cost per patients for

CKD Stage I-V excluding dialysis to be € 1169, € 1506, € 2122, € 4147, € 5453 respectively. This difference can also be due to the existence comorbities such as heart failure, hypertension, and diabetes among the patients with CKD.

The cost of a session of hemodialysis varies from one country to another. Studies from other countries such as Cameroun have reported the cost of a session of dialysis to be USD 8.5(Hall et.al.2017) whilst according Kaur et.al (2018), patients in India with ESRD on dialysis incur cost of INR 2838(USD 44).However, in contrast to this previous study, the results from this study revealed the average cost of a single session of dialysis was GH C190(USD 36.20).This significant difference in cost can be ascribed to the variations in features of these countries` health care scheme such public-private split in health care expenditure. Also, the funding and reimbursement framework for ESRD care suppliers and dialysis service may also contribute to the variations significantly.

This study also reveals that, all the respondents (100%) in the study were registered with the NHIA with about 97.77% admitting to the fact that the NHIS was a source of finance for their healthcare cost with majority of the respondents(83.48%) paying not more than GHC 25 annually as NHIS levy. However, the cost formed a very negligible aspect of the direct cost especially for patients with ESRD on dialysis where the cost profile of NHIS levy was 0.83%.Consequently patients have to do a lot of Out of pockets payments expenditure(OPPE) since their levies are not realistically adequate to cater for the catastrophic costs that they incur. This 100% health insurance coverage significantly varies from studies in Cameroun by Ngeugoue et.al (2019) where they reported only 1.4% of patients with CKD had 100% insurance coverage. This notwithstanding, patients with CKD at KATH do a lot of OPPEs.

This study further reveals that patients equally spend on non-medical cost such as feeding and transportation anytime they visit the hospital to access CKD care. Most patients (58.04%) diagnosed of CKD in this study visited the hospital at least once a month to seek healthcare. Patients on hemodialysis however, made an average monthly visits of eight times a month. Results from this study revealed that, direct non-medical costs formed 7.2%, 18.66%, 9.35%, 12.23%, 13.91% for stages I, II, III, IV and V(non-dialysis). For patients on HD, 9.69% formed direct non-medical costs. Majority of the non-medical cost was as a result of expenditure patients incurred in travelling in and out of the hospital for CKD care.

This is in contrast to the report by Nguyen et.al (2018) where direct non-medical costs for CKD reached its peak occupying 23.2% of the direct costs. This variance can be attributed to the geographical location of the CKD patients. Most of the patients (83.93%) in this study were within the Ashanti Region where the study site is located and might therefore spend less with regards to transportation despite the frequent visits to the hospital.

5.4 Indirect Cost of seeking CKD care

The burdensome nature of managing CKD is not only limited to the direct cost but extends to involve indirect costs as well. This is manifested as productivity loss as a result of absenteeism and patients inability to engage in other productive ventures Patients with chronic health situations, such as advanced CKD, face a number of physical, psychosocial and employer-based difficulties that may make staying in employment hard (Goldman 2017). It was evident from a study by Nguyen et.al (2018) that indirect costs formed 16.5%, 13.9% and 4.9% of the total costs for patients with CKD I-III, IV-V and V (HD patients) respectively. Similarly, a

recent study by Halle et.al.(2017) in Cameroun also reported that, indirect costs accounted for 6.6% of the total cost for patients on maintenance hemodialysis.

Results from this study also reveal that, indirect costs formed 7.86%, 13.54%, 11.81%, 9.50%, 11.63% and 6.89% respectively for CKD patients with Stage I, II, III, IV, V and V (HD patients). This can be ascribed to the reality that patients tend to spend much more on direct costs as the disease advances, hence the decrease in indirect costs as the disease worsens or progresses..

Furthermore, it is revealed in this study that, 53(23.66%) out of the total 224 respondents were unemployed. And for those that were unemployed,11(20.75%) of the unemployed population in this study was due to the fact that, they had been laid off from work as a result of their disease hence rendering them jobless although they were within the working class. This is in contrast with report by Amoako et.al (2014) where they reported in their study a high rate of unemployment among CKD patients.

Additionally, results from this study identifies that,37% of patients living with CKD had developed disability, However, this results contrasts earlier studies by Plantinga et al.(2011) where they concluded that, CKD is associated with higher prevalence of disability in the United States.

5.5 Intangible Cost

CKD does not only leave in its wake medical or economic problems, but also has its attendant social or societal issues that needs critical attention. Patients with CKD go through physical and psychological pain, stress and broken relationships which may adversely affect their quality of life. Patients with CKD may experience discrimination at the workplace, challenges

of remaining employed, more difficulty in finding a job and complications of the disease may lead to premature retirement from work. These challenges are even worse for ESRD on dialysis especially during dialysis sessions which may be invasive and exhaustive task, time-consuming. CKD is obviously noted to be associated with increased social and psychological problems. CKD patients are at elevated danger of depressive disorders owing to the significant psychological stress caused by the disease's physical and social modifications (Ahlawat, Tiwari & D'Cruz 2018).

Research in Africa including Ghana that seeks to evaluate the intangible cost of CKD has not been extensive. Results from this study identified that more than half of the patients with CKD felt sad because they had developed the diseases. From my study, 176(78.60%) expressed their concern of being saddened as a result of having CKD whilst 48(21.40%) were never sad. For those that were sad as a result of having the disease, 67(29.91%) expressed their emotions of always being sad as a result of the disease. This could be due to the fact that, patients with CKD have to be on life-long treatment, high cost of treatment, increasing number of comorbidities and limited ability to work hence affecting their daily lifestyle and the fear of death. This is consistent with results from Macaron et.al (2014) where over 50% of the patients were found to be depressed.

However, our findings is in contrast to findings from (Ahlawat, Tiwari & D`Cruz 2018), where they concluded that, close to half of CKD patients(44.1%) attending outpatient renal clinic in a public tertiary care public teaching hospital in India suffer from depression. The results of this study also contrasts results by Lee et.al (2013) where they also reported a prevalence of 47% among predialysis patients. The higher prevalence of depression in this study may be due to the tool used for the assessment of depression.

Physical pain is one of the common manifestation or complications CKD patients encounter. However, this cannot be quantified in monetary terms. According to Davison (2014), pain prevalence in patients with chronic kidney disease (CKD) has been reported to be in the range of 40–60% for patients receiving renal replacement therapy (RRT), 60–70% for preend-stage kidney disease (ESKD) and up to 100% for hospitalized CKD patients. According to Davison (2014), the prevalence of pain in patients with chronic kidney disease (CKD) was revealed to be in the range of 40–60% for patients receiving renal replacement therapy (RRT), 60–70% for pre-stage renal disease (ESKD) and up to 100% for hospitalized CKD

patients.

Similarly a recent study by Khaing et.al (2017) reported the prevalence of pain has been reported to be >60-70% among patients with advanced and ESRD. Findings from this study revealed that, patients had varying degrees of pain ranging from mild to moderate to severe. Fom this study,54(24.11%),77(34.38%),36(16.07%) had mild, moderate and severe pain respectively. However, the overall pain prevalence among the study population stood at 74.55% and this is congruent to the recent study by Khaing et.al (2017).

The intangible cost of CKD was further seen in problems with mobility as a result of disability, inability to engage in leisure activity, broken relationships with spouses, friends and family, non-adherence to medications as a result of feeling uncomfortable taking cocktail of drugs. Majority 118(52.68%) of the respondents in this study were able to engage in leisure activity despite the presence of the disease in their bodies. For those 116(47.32%) respondents that were not able to engage in any leisure activity, a greater chunk of them felt they were exhausted and hence unable to do any leisure activity.

5.6 Overall Household cost

Results from this study revealed that, that the mean cost per person per month for patients with CKD Stage I-V excluding ESRD on dialysis are GH C 493.71(USD 94.04), GHC 485.42(USD 92.19), GHC 447.01(USD 85.14), GHC 547.57(USD 104.30), and GH C 763.88 (USD 145.50) respectively. For patients with ESRD on dialysis however, the mean cost per person per month was very substantial with an estimated cost of GH C 2882.84(USD 549.11).This therefore emphasizes that, the household cost of seeking CKD care was highest in patients with ESRD on dialysis compared to ESRD without dialysis and in patients with Stage 1 to Stage 4.This is primarily because patients with ESRD on dialysis have to pay for each session of dialysis, required erythropoietin and any other additional medications that they may require. This finding is congruent with the study by Ngugen et.al, (2018) where they concluded that, patients on hemodialysis incurred highest costs, about three times compared to the other stages of CKD. The overall household cost among CKD patients seeking care at KATH was GH C1121.42 (USD 213.60) with GHC 983; USD 187.32(87.70%) being for direct cost whilst GHC 137.98; USD 26.28(12.3%) accounted for overall indirect cost. Majority of patients (74.56%) had monthly income of not more than GH C1, 000(USD 190.50) but relative to the overall household cost of GH C1121.42 (USD 213.60), it implies that most patients incurred a cost of more than 100%(101.12%) of their monthly income to be able to seek CKD care. This extra income may be due to monies receive from relatives and donations/gifts as well. This is similar to a report in India by Bassi et.al (2018) where 87.1% of patients in public hospitals were spending over 100% of their monthly income on dialysis compared to 78.9% of patients in private care. The overall household cost

of CKD patients is almost twice the mean income of patients with CKD seeking healthcare at KATH

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the major conclusions of the study and makes recommendations to improve on the existing current situation.

6.1 Conclusions

6.1.1 Background characteristics

The study concluded that the mean age of CKD patients that received health care at Komfo Anokye Teaching Hospital was 49.62(SD=15.37). Majority of the patients were males (52.68%) and only 23.66% had tertiary education. Almost half of the respondents (45.54%) were self-employed with 23.66% unemployed as a result of being student, retired or laid off because of having the disease. Majority of the respondents (83.93%) lived in the Ashanti region and the mean number of people in every household was 5.66. Half (50%) of the study population had been on treatment for less than a year. Almost half of the respondents (48%) had ESRD with less than half (45%) of this population being on dialysis.

6.1.2 Direct Cost of Seeking Chronic Kidney Disease Health Care

It can be concluded from the discussions that, the direct cost of seeking CKD care places significant financial burden on CKD patients that receive care at KATH. The overall mean monthly direct cost per patient was GH C 983.44(USD 187.32) (SD=534.50) and this formed 87.70% of the total household cost for CKD care at KATH. The medical cost component of the direct cost formed a major cost component of the direct cost and it formed 89.06% of the total direct cost. With the exception of ESRD patients on dialysis where dialysis was the major cost component of the direct cost, the OPPE on medication formed the greater cost component for all the other stages of the diseases. Comparatively, the direct cost incurred by ERSD patients on dialysis is significantly higher and almost four times higher than for patients with other stages of the disease including ESRD (Non-dialysis) patients. There is no important distinction in direct costs for stages I, II, II and IV. which are GHC 454.89(USD 86.65), GHC 419.69(USD 79.94), GH 394.24(USD 75.09) and GH 495.63(94.41) respectively as these patients have their mean monthly direct cost being less than GH 525(USD 100). However, for patients with ESRD whether on dialysis or not, the mean monthly direct cost per patient was above GH 525(USD 100); 675.00(USD 128.57) and GH 2684(511.31) respectively.

6.1.3 Indirect Cost of Seeking Chronic Kidney Disease Health Care

CKD and its attendant complications has significant impact on productivity and consequently leads to financial distress and economic losses. Indirect costs of CKD among patients receiving care at KATH manifested as loss of wages and productive working hours for both patients and their attendant employed caregivers. The overall mean total indirect cost was GH

137.98(USD 26.28) (SD=84.13) and it formed 12.30% of the mean monthly overall household cost. This was mainly due to patients loss wages as a result of patients absenting themselves from work and hence not working. The overall mean loss wage was GHC 65.19(USD 12.42) (SD=30.45) and it formed 55.85% of the total indirect cost. Caregivers that accompanied respondents and were gainfully employed lost GHC

33.31(USD 6.34) (SD=37.79) per month. Furthermore, it is evident from this study that, patients spent averagely not less than 5.20 hours anytime they visit the hospital to receive CKD care and this contributes to loss of productive working hours.

6.1.3 Intangible Cost of Seeking Chronic Kidney Disease Health Care

The intangible cost of CKD among patients receiving care at KATH included physical pain, sadness, stress involved in taking prescribed medications, broken relationship with household and community which ultimately affect the quality of life of the patient.74.55% of the respondents experienced varying degree of pain. For most of the respondents who were married, the disease had not had any toll effect on their marriage Respondents enjoyed overwhelming support from both family and community since they were mostly supportive of the respondents despite the presence of the disease. Most patients expressed some form of discomfort in taking their medications daily since they were mostly taking cocktail of drugs. Only 3.13% of the respondents had the disease impacting positively on their lives as they had become Advocates of CKD educating and creating awareness of the disease.

6.2 Recommendations

6.2.1 Ministry of Health/Government of Ghana/Other Stakeholders

i. This study implied that, the progression of the disease is associated with increasing health care cost especially for Stage V with or without Dialysis. Early detection and active treatment can efficiently decrease the incidence of ESRD and improve the health management capacities of such high-risk groups, potentially improving their resilience. Early detection and treatment are therefore crucial to preventing and delaying the development of the disease. Early detection and prevention programs should be aimed in particular at high-risk groups such as individuals with diabetes, high blood pressure or family history of kidney disease. The Government of Ghana should therefore introduce a number of preventive and patient education programs (including high-risk health management) to actively support the health of high-risk and kidney patients.

ii. Multidisciplinary care (MDC) programs may be used to decrease the cost and morbidity of chronic kidney disease (CKD). Multidisciplinary care could help improve the health of patients with chronic kidney disease in a cost-effective manner. Policymakers could consider implementing pilot multidisciplinary care programs to formally assess their efficacy and cost-effectiveness.

iii. The Government of Ghana should also consider giving Tax credits to companies that employs people with Chronic Kidney disease. This is to ensure people living with CKD are continually employed and not laid off at worker or discriminated against at their workplace.

iv. People with CKD particularly ESRD should be certified as being medically handicapped and should be paid monthly disability allowances to help meet the rising cost in CKD care.

v. It is evident from the study that most of the patients were diagnosed when they were at moderate to severe stage of the disease; Stage III, IV and V.It is therefore recommended that the Ministry of Health through its agencies such as Ghana Health Service, CHAG organizes Continuous professional development courses for primary health care physicians to help them ideally consult and /or refer patients with CKD early enough to the nephrologist.

6.2.2 Individual, Household and community level

i. The study showed that most patients are diagnosed at the late stage of the disease and therefore there should be vigorous campaign and health education at the community level to help encourage people to seek early detection and treatment of the disease to help slow down the progression of the disease, its complications and the huge financial costs that comes along with it.

ii. There should be the formation of Kidney Clubs with support of local hospitals within the communities. These clubs will provide support specifically for people with any stage of kidney disease. This will offer people with kidney disease and their families' opportunity to meet other people who have experience with kidney disease can learn from others how to cope with and manage their daily needs, how to provide appropriate and effective care, and how to more easily live with their current medical condition.

iii. The study showed that only a small portion of the study had become Advocates for CKD. It is therefore recommended that individuals who already have CKD provide. Peer support for recently diagnosed patients and this can also help patients with CKD make therapy decisions and reduce their concerns and fears about possible therapies.

6.2.3 Recommendations for further research

Further study could be undertaken to determine the socio-economic disposition of patients with chronic kidney disease. There is also the need to explore factors that affect the late presentation of patients to the renal unit leading them to incur higher cost at the late stage of the disease.

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APPENDICES APPENDIX I

CONSENT FORM

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE: _____ NAME: _____

Statement of person giving consent:

I have read the information on this study/research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction.

I understand that my participation is voluntary (not compulsory).

I know enough about the purpose, methods, risks and benefits of the research study to decide that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME:_____

DATE: _____ SIGNATURE/THUMB PRINT: _____

Statement of person witnessing consent (Process for Non-Literate Participants):

I _____ (Name of Witness) certify that information given to

_____ (Name of Participant), in the local language, is a true reflection of what l have read from the study Participant Information Leaflet, attached.

WITNESS‘ SIGNATURE (maintain if participant is non-literate): _____

MOTHER‘S SIGNATURE (maintain if participant is under 18 years): _____

MOTHER'S NAME: _____

FATHER'S SIGNATURE (maintain if participant is under 18 years): _____
FATHER'S NAME: _____

APPENDIX II

QUESTIONNAIRE KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY COLLEGE OF HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH

RESEARCH TITLE: HOUSEHOLD COST OF CHRONIC KIDNEY DISEASES CARE AMONG PATIENTS SEEKING HEALTH CARE AT KOMFO ANOKYE TEACHING HOSPITAL

QUESTIONNAIRE FOR ASSESSING HOUSEHOLD COST OF CHRONIC KIDNEY DISEASES CARE AMONG PATIENTS SEEKING HEALTH CARE AT KOMFO ANOKYE TEACHING HOSPITAL.

Introduction

Good morning/afternoon. My name is Michael Kofi Acheampong, a student at School of Public Health, KNUST. I am pursuing an MPH programme and I will be conducting several meetings with people like you at Komfo Anokye Teaching Hospital to find out your views and ideas about household cost of seeking chronic kidney disease healthcare.

Your opinions are highly essential at the same time vital as they will help us to improve the kind of service we provide. Whatever you say will be treated confidential, so feel at ease to express your candid opinion. Be assured that your responses will not in any way be linked to your identity. You are kindly requested to answer the questions below by indicating a tick or writing the appropriate answer when needed. THANK YOU.

Questionnaire number:

Date of Interview:

ID NO……

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Age in years ……

2. Gender [1] Male [2] Female

3. Marital Status

[1] Married [2] Single [3] Divorced [4] Widowed [5] Separated

4. Religion

[1] Christian [2] Muslim [3] Traditionalist [4] Other:

5. Educational status [1] No formal education [2] Primary [3] Secondary

[4] Tertiary [5] Others (specify)……

6. Employment Status

[1] Unemployed [2] Public sector employee [3] Private sector employee

[4] Self employed

7. If employed, are you still working in spite of your condition?

[1] Yes [2] No

8. Do you receive any remittance as a result of your disease?

[1] Yes [2] No

8. Place of residence……..

9. Number of people in the household……..

10. Are you a breadwinner of your household?

[1] Yes [2] No

11. Are you registered with NHIS?

[1]Yes [2] No

SECTION B: DIRECT COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE

12. When were you diagnosed of chronic kidney disease?.....years

13. At what stage were you diagnosed of chronic kidney disease?

[1] Stage I [2] Stage II [3] Stage III [4] Stage IV [5] End Stage

14. How long have you been on treatment for chronic kidney disease……....

15. How much do you and your caregiver spend on transportation when you visit the hospital as a result of having CKD?.....

16. How much do you and your caregiver spend on feeding when you visit the hospital as a result of having CKD?.....

17. What is the source of financing for the cost of care? (Tick as many)

[1] Self [2] Relatives [3] Private Insurance [4]NHIS [5] Pensions [6] Donations/Gift [7] Others

18. How often do you visit the hospital as result of chronic kidney disease within a month?

[1]Once [2] Twice [3] Thrice [4] more than three times

If you are an active subscriber of NHIS, answer question 19-22

19. How much do you pay annually as NHIS levy?.....
20. Are all your medications covered by NHIS?

[1]Yes [2] No

21. If no, how much do you spend monthly on your medications?.....

22. How much do you spend monthly on laboratory?..... If you are not an active subscriber of NHIS, answer question 23-25

23. How much do you spend monthly on consultation fees?.....

24. How much do you spend monthly on medications?.....

25. How much do you spend monthly on laboratory?.....

26. Are you on dialysis?

[1] Yes [2] No

If yes, answer question 27-28

27. How many sessions do you do in a month?

[1]One [2] Two [3] Three [4] More than three

28. How much does cost do you incur per session?.....

29. How many members of your household members support the household financially?

……

30. How much do you spend on healthcare every month?.....
31. How much do you spend on housekeeping every month?.....

32.How much is your monthly income?.....

SECTION C: INDIRECT COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE

If you‘re employed, answer 33-35

33. Have you absented yourself from work over the past one month because of suffering from chronic kidney disease?

[1]Yes [2] No

34. If yes, how many times have you absented yourself from work over the past one month? [1] Once [2] Twice [3] Thrice [4] More than three times

35. Have you lost income from your workplace over the past month as a result of seeking CKD care?

[1] Yes [2] No

36. If you‘re unemployed, what is the reason?

[1] On retirement [2] Student [3] Laid off due to CKD [4] By choice [5] Others (specify)…

37. How many hours did you spend travelling in and out in seeking chronic kidney disease care over the last month? …….

38. How many hours did you spend in receiving care at the hospital on your last visit?.....

39. Have you suffered any disability as a result of CKD?

[1] Yes [2] No

40. Do you have someone accompanying you when you attend the hospital to receive care?

[1]Yes [2] No

41. Is your accompanying relative employed?

[1] Yes [2] No

If yes, answer question 42-43

42. Which sector does he/she work with?

[1] Public Sector [2] Private Sector [3] Self employed

43. How many hours does your relative spend in a day taking care of you?.....

SECTION D: INTANGIBLE COST OF SEEKING CHRONIC KIDNEY DISEASE HEALTHCARE

44. How would you rate the physical pain have you suffered as a result of chronic kidney disease?

[1] None [2] Mild [3] Moderate [4] Severe

45. How frequently are you saddened by the fact that you have chronic kidney disease? [1] Never [2] Seldom [3] Often [4] Always

46. Are you able to engage in leisure activity since you were diagnosed of chronic kidney disease? [1]Yes [2] No

If no, answer question 47

47. Why are you not able to engage in leisure activity?.....

48. How has chronic kidney disease affected your marriage since you were diagnosed?.....

49. How does the rest of your household relate to you since you were diagnosed?

.....

50. How does your community members also relate to you since you had CKD?

.....

51. How uncomfortable do you feel on taking medications every day?

[1] Never [2] Seldom [3] Often [4] Always

52. In what other ways have CKD affected your life?.....

THANK YOU!!!