WILLINGNESS TO ACCEPT AND PAY FOR KIDNEY TRANSPLANT AMONG CHRONIC KIDNEY DISEASE PATIENTS ATTENDING KORLE-BU TEACHING HOSPITAL

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH (MPH) DEGREE
DECLARATION

I declare that except for references to other people’s works that have been duly acknowledged, this dissertation is the result of my own research and that this dissertation either in whole or part has not been presented for another degree elsewhere.

……………………………  ……………………………

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DEDICATION

This work is dedicated to my dear wife (Afi ofosu) and my lovely children (Fafa and Kekeli).
ACKNOWLEDGEMENT

I wish to express my gratitude to the almighty God for his guidance, grace and mercy throughout this programme, I am sincerely grateful to my academic supervisor Dr Justice Nonvignon who supervised and monitored every stage of this work. I also acknowledge the help of the Head of Department, Dr Patricia Akweongho, for her support and encouragement and all faculty members in Health Policy, Planning and Management Department.

This work was successful because of the tremendous support from my lovely wife, Afi Ofosu. I appreciate all the challenges she had to go through because of the busy nature of my course and work.
ABSTRACT

Background

The treatment of end stage renal disease is renal replacement therapy in the form of dialysis and kidney transplantation. The preferred treatment of choice is kidney transplantation which is absent in most African countries. Kidney transplantation is at its infancy in Ghana. This study seeks to determine how much patients are willing to pay for kidney transplant and whether this treatment is an acceptable option.

Aim

The aim of the study was to assess Chronic Kidney Disease (CKD) patients’ willingness to accept and pay for kidney transplantation as a treatment option for end stage renal disease in Ghana.

Methods

This cross-sectional study was conducted in Korle-Bu Teaching Hospital outpatient and dialysis units among CKD patients who are not on dialysis and those on dialysis. A consecutive sampling approach was used to recruit 342 consented patients. Structured questionnaire was used to obtain information on demographic, socio-economic, knowledge about transplant, perception of transplantation and contingency valuation (CV) method was used to assess willingness to pay for kidney transplantation. Standardized research instrument (INSPIRIT) was used to assess patients’ religiosity/spirituality. Willingness to pay and accept was reported in terms of proportions and logistic regression model was used to determine the significant predictors of willingness to pay.
Results

Nearly half of the participants (46.5%, 118/342) rated their knowledge level of kidney transplant below average and approximately 67% (230/342) of study participants were willing to accept a kidney transplantation. Overall, of every ten selected study participants, only about three (26.3%, 95%CI: 21.7 - 31.3%) of them were willing to pay for a kidney transplant at the current going price or more (≥ GHS 86,000). More than half (55.0%, 188/342) of the patients were willing to pay below GHS 20,000 to undertake a kidney transplant. One-fifth (21.3%, 73/342) of the patients were willing to pay the highest price quoted GHS106,000 to undergo the transplant. Among those who are willing to accept, (29.13%, 67) were willing to pay. From the logistic regression model, patients in higher wealth quintile and those not having health insurance were willing to pay for kidney transplant (aOR: 12.33, 95%CI: 2.32 - 65.51 vs aOR: 2.85, 95%CI: 1.09 - 7.45).

Conclusion

The overall willingness to pay for kidney transplant is low among chronic kidney disease patients attending Korle-Bu Teaching Hospital. The main predictors of willingness to pay were the wealth quintile and insurance status. In order to develop a sustainable kidney transplant programme, there should be alternative sources of funds including insurance remittances, government subsidies, support from individuals and non-governmental organizations.
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<tr>
<td>CKD</td>
<td>Chronic Kidney Disease</td>
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<tr>
<td>CV</td>
<td>Contingent Valuation</td>
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<tr>
<td>DALY</td>
<td>Disability Adjusted Life Year</td>
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<td>DM</td>
<td>Diabetes Mellitus</td>
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<tr>
<td>ENC</td>
<td>Early Nephrology Care</td>
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<tr>
<td>ESRD</td>
<td>End Stage Renal Disease</td>
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<tr>
<td>GBD</td>
<td>Global Burden of Disease</td>
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<tr>
<td>IRB</td>
<td>Institutional Review Board</td>
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<tr>
<td>KAP</td>
<td>Knowledge Attitude and Practice</td>
</tr>
<tr>
<td>KBTH</td>
<td>Korle-Bu Teaching Hospital</td>
</tr>
<tr>
<td>LKD</td>
<td>Living Kidney Donor</td>
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<tr>
<td>LMIC</td>
<td>Low to Middle Income Country</td>
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<td>NHIS</td>
<td>National Health Insurance Scheme</td>
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<td>QALY</td>
<td>Quality Adjusted Life Year</td>
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<tr>
<td>RRT</td>
<td>Renal Replacement Therapy</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub-Saharan Africa</td>
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<tr>
<td>SSNIT</td>
<td>Social Security and National Insurance Trust</td>
</tr>
<tr>
<td>STC</td>
<td>Scientific and Technical Committee</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
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CHAPTER ONE
INTRODUCTION

1.1 Background

Chronic Kidney Disease (CKD) is defined as kidney damage; either structural or functional abnormalities of the kidney lasting for 3 months or more with or without a decrease in glomerular filtration rate (GFR) with or without evidence of kidney damage. The evidence of kidney damage include presence of blood or protein in the urine (British Medical Journal & British Medical Journal, n.d. 2019).

Chronic kidney disease (CKD) is a major public health problem with worldwide prevalence between 11.7% to 15.1%(Hill et al., 2016) In 2015, the global burden of disease (GBD) study showed that, 1.2 million people died from kidney disease representing an increase of 32% since 2005. In 2010, 2.3 to 7.1 million people with end stage renal disease died without access to dialysis (Liyanage, Ninomiya, Jha, Neal, Patrice, Okpechi, 2015). Furthermore, an estimated 1.7 million people die from acute kidney injury (Mehta, Cerdá, Burdmann, Tonelli, García-García, Jha, 2015). As a result, the overall annual mortality due to kidney disease is approximately 5-10 million deaths.

In view of limited epidemiological data, lack of awareness and poor access to laboratory services, the true burden posed by kidney disease is likely underestimated in Africa. In addition, Disability Adjusted Life Years (DALYs) linked to kidney disease increased from 19 million in 1990 to 33 million in 2013 (Murray, Barber, Foreman, Abbasoglu Ozgoren, Abd-Allah, Abera, 2015).

It has been reported that 78% of the 500 million people afflicted globally by CKD reside in low- and middle-income countries with a prevalence of 14.3% in the general population and 36.1% in high-risk population (Ene-Iordache et al., 2016; Mills et al., 2015). The average prevalence in sub-Saharan Africa is 13.9% in sub-Saharan Africa with prevalence between 17% in Ghana and
30% in Zimbabwe (Stanifer et al., 2014). Chronic kidney disease is a progressive disease which eventually advances to End Stage Renal Disease (ESRD) (De Nicola & Zoccali, 2016).

Chronic kidney disease is ranked 19th as a cause of death worldwide and most of the mortality occur in LMICs. Currently, the annual rate of change in death is growing at a rate of more than 5% (GBD 2013 Mortality and Causes of Death Collaborators, 2015). In Ghana, 6 out every 100 deaths is due to kidney disease; mortality rate doubled between 2010 to 2013 (10.8%) (Adjei et al., 2019).

The economic burden associated with kidney disease is huge compared to other chronic diseases. Developed countries usually spend more than 2-3% of their annual income on treatment of end stage renal disease (Couser WG, Remuzzi G, Mendis S, 2011). In the United States, expenditures in 2011 on chronic and end stage renal disease were US$64 billion and US$34 billion, respectively (World Health Organization, 2011). The most functioning form of renal replacement therapy in Ghana currently is haemodialysis. Each dialysis treatment costs GHC 260 (US$49.7) per session, and a patient is required to have three treatment sessions per week (GHC 780 per week; US$149.1). This could be a huge financial burden on the patient and family. Although mortality is expected to reduce with dialysis treatment, without a kidney transplant, mortality is still high when compared with the general population as shown by the data obtained from the United States with 3- and 5-year survival rates of 57% and 42% respectively.

1.2 Problem statement

In Ghana the burden of kidney disease is unknown, however in one study in Ghana, 166 out of 3317 patients admitted to hospital had renal disease (5%) and of these 45 (27.1%) died mostly from renal failure (Plange-Rhule et al, 1999). Recent data from Korle-Bu Teaching Hospital in
Ghana, show that 15% of all medical admissions have kidney disease. In addition, 10% of all deaths on the medical ward are due to chronic kidney disease (unpublished).

The treatment modalities for ESRD are dialysis and kidney transplantation. Kidney transplant is the gold standard among these treatment options available to patients. It is the preferred option in low- and middle-income countries where cost of treatment is a major obstacle (Naicker, 2009). In developed countries the transplant rate is between 30-50 per million population (pmp) compared to LMICs where the transplant rate is between 0-10 pmp (Akoh, 2011). In Africa, the transplant rate averages between 4 pmp and 7.2 pmp (Naicker, 2009). As a result, this treatment option is unavailable in most African countries and only started recently in Ghana as a pilot project.

In Ghana where the burden of kidney disease is growing, the establishment of sustainable transplant programs could reduce the economic and other burden of CKD to households and society. Ghana as in many SSA countries, the kidney transplant will be more cost effective in the long-term compared to dialysis. However, the cost of transplant is above the reach of majority of these patients and this is a major barrier to kidney transplantation. In view of this most people in SSA who develop kidney disease may not be able to afford the cost of this treatment. In developed countries kidney transplantation is covered by insurance (Naicker, 2013), however in Ghana as in most SSA countries insurance does not cover renal replacement therapy (dialysis and kidney transplantation). As a result, patients must pay out of pocket for these health services (kidney transplant and dialysis).

The other potential barriers to kidney transplantation in Africa include; religious beliefs, cultural beliefs, socioeconomic status, sources of funds/family support, knowledge about kidney
transplantation (Dageforde, Box, Feurer, & Cavanaugh, 2015; Ghahramani, Wang, Sanati-Mehrizy, & Tandon, 2014; Pradel, Limcango, Mullins, & Bartlett, 2003).

Kidney transplantation is new in Ghana, hence this study sought to determine the willingness of CKD patients to pay for kidney transplantation, knowledge base of CKD patients concerning kidney transplantation, including willingness to donate and accept a kidney and identify other factors such as religious beliefs, demographic and socio-economic factors that influence their willingness and perception of kidney transplantation in Ghana.

1.3 Justification

Chronic Kidney Disease (CKD) is a major public health problem worldwide with three to four-fold burden in Africa and affects the young economically productive group (Day, 2015; Stanifer et al., 2014). When CKD is a progress to end stage renal disease (ESRD) the preferred treatment option is kidney transplantation because survival is predictable and better (Ilori et al., 2015). It also gives them a better quality of life and in the long-term, it is more cost-effective (Tan et al., 2017).

While kidney transplantation may be cost-effective, the quantum of money payed at once is still enormous and beyond the reach of most of these young citizens being afflicted by this disease. Thus, accessibility to this treatment may be hampered by their willingness pay and accept kidney transplant as a treatment choice. However, a few patients can pay for it and others travel abroad for kidney transplantation. Ascertaining modifiable factors that influence their willingness to accept and pay for kidney transplant, will help to educate patients and their family support base and improve on their chances of accepting a kidney for transplant. It will help with policy formulation and assist in establishing a sustainable transplant programme in Ghana.
1.4 Conceptual framework

Kidney transplant being the treatment of choice for end stage renal disease, however, patients’ willingness to pay and accept this treatment modality is influenced by multiple factors. This framework describes some of these factors peculiar to patients in Africa. The socioeconomic status of patients including, income, financial support from relatives, friends and workplaces may impact on their willingness to pay for transplant and decision-making regarding kidney transplantation. Patients’ knowledge of kidney transplantation, co-morbid conditions and health status are other factors which may affect their willingness to pay and decision regarding this treatment option. Additionally, demographic characteristics, religious status/spiritual status of the patients and social support from family members can influence their willingness to pay and accept a kidney transplant. In addition, their willingness to accept a kidney transplant can be hampered by their willingness to pay for it (Figure 1).
Figure 1: Conceptual framework

1.5 Research questions:

The study sought answers to the following research questions:

1. What is the level of knowledge of CKD patients concerning kidney transplantation in Ghana?
2. Will chronic kidney disease patients in Ghana be willing to accept a kidney for transplant?
3. How much will CKD patients in Ghana be willing to pay for kidney transplant?
4. What factors influence patients’ willingness to pay for kidney transplant in Ghana?
1.6 Study objectives

1.6.1 General objective

The general objective of this study was to assess CKD patients’ willingness to accept and pay for kidney transplantation as a treatment option for end stage renal disease in Ghana.

1.6.2 Specific objectives:

The specific objectives of this study were to:

1. Determine the level of knowledge of CKD patients on kidney transplant
2. Assess the willingness of CKD patients to accept kidney transplant
3. Determine the CKD patients’ willingness to pay for kidney transplant
4. Identify the factors associated with CKD patients’ willingness to pay for a kidney transplant
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This section discussed the burden of chronic kidney disease, treatment options for end stage renal disease including renal replacement therapy comprising dialysis (peritoneal and haemodialysis) and kidney transplantation. Further, the section discussed prevalence of renal replacement therapy and the cost implications of this treatment. In addition, it contains information on perception and acceptance of kidney transplant as a treatment option for end stage renal disease. Again, the section provides information on willingness to pay for chronic medical illness and methods for assessing willingness to pay for services.

2.2 Burden of Chronic Kidney Disease

The prevalence of chronic kidney disease in Sub-Saharan Africa has been estimated to be 13.9% (Stanifer et al., 2014); this is higher than the worldwide prevalence of 10%. Majority of patients with chronic kidney disease in Ghana are aged between 20 and 50 years, representing an economically productive and viable group (Matekole et al., 1993).

In 2015, the global burden of disease (GBD) study showed that, 1.2 million people died from kidney disease representing an increase of 32% since 2005. In 2010, 2.3 to 7.1 million people with end stage renal disease died without access to dialysis (Liyanage, Ninomiya, Jha, Neal, Patrice, Okpechi, 2015). Furthermore, an estimated 1.7 million people die from acute kidney injury (Mehta, Cerdá, Burdmann, Tonelli, García-García, Jha, 2015). As a result, the overall annual mortality due to kidney disease is approximately 5-10 million deaths per year. In view of limited epidemiological data, lack of awareness and poor access to laboratory services, the true burden posed by kidney disease is probably underestimated. In addition, DALYs linked to kidney disease
increased from 19 million in 1990 to 33 million in 2013 (Murray, Barber, Foreman, Abbasoglu Ozgoren, Abd-Allah, Abera, 2015).

The economic burden associated with kidney disease is huge. Developed countries usually spend more than 2-3% of their annual income on treatment of end stage renal disease (Couser WG, Remuzzi G, Mendis S, 2011). In the United States, expenditure on chronic and end stage renal disease were 64 billion and 34 billion united states dollars respectively (World Health Organization, 2011).

The treatment options for chronic kidney diseases include; haemodialysis, peritoneal dialysis and kidney transplantation. However, hemodialysis is the most common treatment in the sub-region (Ghahramani, Sanati-Mehrizy, & Wang, 2014). Unfortunately, treatment rates are low due to the high cost of treatment, lack of skilled personnel and limited resources (Ghahramani et al., 2014). Thus, majority of the patients cannot afford the full treatment and hence remain mostly symptomatic (Ilori et al., 2015).

The challenges faced by patients tend to influence their perceptions of the disease and the available treatment options. Observations at a large tertiary facility in Ghana revealed that patients diagnosed with chronic kidney disease and referred to the facility for specialist management often present very late. Further, they tend to seek alternative treatment including unorthodox methods before seeking expert medical treatment (Moritsugu, 2013).

Overall, patients and their caregivers hold varying views and perceptions about chronic kidney disease and its management. At the patient level are factors relating to cost, social, traditional and cultural beliefs (Matekole et al., 1993), and fear of side-effects from haemodialysis
Kidney transplantation is carried out in few African countries: South Africa, Nigeria, Mauritius and recently in Ghana (Naiker, 2010). Although, kidney transplant is the ultimate treatment of end stage renal disease, transplant rates are low in Africa (Naiker, 2010). Kidney transplantation is influenced by many factors, including financial constraints, religious beliefs, and lack of awareness of the need for this treatment amongst others.

It is not clear as to what factors influence Africans’ decisions about transplantation and donation; these may include, cultural factors, negative attitudes toward donation, lack of awareness of the need for transplantable organs in the African community, and mistrust of the health care system (Siminoff, Lawrence, 2003).

It is possible that in Africa where there are deep rooted customs and cultural beliefs and where traditional culture influences most of our thoughts and way of life, the prospects of future living and cadaveric kidney transplantation may be adversely affected. Although, the cost of kidney transplantation is beyond the reach of most Ghanaians afflicted by this disease, it is more cost effective compared to long-term dialysis.

2.3 Treatment of End Stage Renal Disease

The treatment of end stage renal disease is renal replacement therapy (RRT). It is a therapy that replaces the normal blood-filtering function of the diseased kidneys. The types of RRT include; dialysis and kidney transplantation. There two types of dialysis; peritoneal dialysis and haemodialysis.
2.3.1 Haemodialysis

In haemodialysis the blood is filtered with the aid of a machine. The patients’ blood flows through a tube into the dialysis machine and passes through filters before returning to the patient. In the process metabolic waste products and excess fluid are removed and acid-base disturbances are corrected. Haemodialysis is usually performed in the hospital (In-center haemodialysis), however it can also be performed at home (Home0haemodialysis). The In-center haemodialysis requires the patient to visit the hospital at least 2-3 times a week for treatment(Fleming, 2011).

The main indication for haemodialysis include; acute renal failure, chronic renal failure, electrolytes and acid-base disturbances, pulmonary oedema and uraemic complications (pericarditis and encephalopathy)(Fleming, 2011).

2.3.2 Peritoneal dialysis

In peritoneal dialysis the patients’ blood is filtered using osmotically active solution to draw fluid and metabolic wastes across the peritoneal membrane (semi-permeable membrane used as filter) into the peritoneum. The process involves filling the peritoneal cavity with the osmotically active solution and then draining the fluid out of the peritoneum after 4 hours (dwell time). This treatment option is user-friendly and convenient as it is mostly patient centered. The patient is trained on how to do this form of dialysis and allowed to do it independently at home. They are monitored both at home and reviewed regularly by the health care workers. The indication for peritoneal dialysis are the same as those for haemodialysis as enumerated above(Fleming, 2011).
2.3.3 Kidney transplantation

Kidney transplantation is a surgical procedure which involves giving the patient a new kidney. The kidney is usually from a blood group compatible donor. Nevertheless, with advancement in technology, non-compatible donor transplants can now be performed with comparable outcomes to the compatible donor transplant. The source of the kidney can either be a living person or a deceased person. In case of the living person first degree relatives are usually preferred donors, even though unrelated donor transplant can also be performed. The life span of the transplanted kidney depends on the source of the kidney. Kidney transplant has a favourable outcome with 1, 3, 5, 7, and 10-year survival rate of 99.1, 97.7, 94.3, 85.7, and 62.1% respectively (Shahbazi, Ranjbaran, Karami-Far, Soori, & Manesh, 2015).

2.3.4 Prevalence of renal replacement therapy

In Latin America and Europe, the overall prevalence of renal replacement therapy is 660 pmp and 782 pmp respectively. Globally dialysis rate is more more than 250 pmp (Naicker, 2009). Primary modality used worldwide is haemodialysis. Grassmann et al estimated that 77% of ESRD patients are on dialysis and 89% of this subset are on haemodialysis (Grassmann, Gioberge, Moeller, & Brown, 2005).

Even though the burden of CKD is said to be three to four times more frequent in Africa (Alebiosu, 2003), there is scarcity of treatment modalities. In-center haemodialysis is the most common treatment modality in most Sub-Sahara African (SSA) countries (Tan et al., 2017) and is currently the only form of treatment among adults in Ghana. Dialysis treatment rate is less than 20 pmp in SSA countries and it is absent in most of these countries (Alebiosu, Odusan, & Jaiyesimi, 2003). The haemodialysis rates in Africa include; 45 pmp in South Africa, 46 pmp in Sudan, 7.5 pmp for
Kenya, 421 pmp in Egypt and 650 pmp in Tunisia. Peritoneal dialysis rates in Africa include; 25 pmp in South Africa, 85 pmp in Sudan, 1.2 pmp in Kenya, and 0.3 pmp in Egypt (Naicker, 2009). In Ghana there are 22 haemodialysis centers out of which 5 are in public institutions and the rest are available in the private sector. There is currently no peritoneal dialysis services in Ghana.

The transplant rates are very low in Africa; averages 4 pmp and is 9.2 pmp in South Africa (Naicker, 2009). Kidney transplantation in Ghana is a budding therapeutic option for ESRD patients. The programme started in 2008 and halted in 2014 due to logistic problems. The problems have been resolved; thus, kidney transplant will recommence in October 2019.

2.4 Cost of treatment of Chronic Kidney Disease

Treatment of patient with chronic kidney disease poses a huge health care cost burden to society. This treatment consumes a large portion of the health care resources. Furthermore, cost for patients, family and the society at large are considerably high due to effect on quality of life, life expectancy and the nature of the renal replacement therapy treatment. Renal care has undergone economic assessment and the most quoted threshold for cost-effectiveness in healthcare is $50,000 per quality-adjusted life year (QALY) (Ubel, Hirth, Chernew, 2003). This implies that, $50,000 is considered a reasonable price for one additional healthy year. It appears the expenditure on renal care far exceeds this amount ($50,000).

The economic burden of CKD is substantial. According to the US Renal Data System, in 2013 among fee-for-service Medicare patients, total medical costs were $50.4 billion for CKD (excluding end-stage renal disease [ESRD]), and another $30.9 billion for the ESRD patient population (Saran, Li, Robinson, 2016). In multiple studies, costs for CKD patients were higher than for those without CKD, matched for age and comorbidity, with costs increasing by disease
stage and presence of comorbid diabetes mellitus (DM) (Khan, Kazmi, Abichandani, Tighiouart, Pereira, 2002).

Management of ESRD in LMICs is too expensive and the limited national budget cannot meet the cost of treatment. In Southeast Asia, the renal replacement therapy costs are more than ten times the annual per capita income. More so, health insurance coverage is low and almost non-existent. Furthermore, about 1.4 billion persons live on less than $2 (US$) per day in Southeast Asia (Agaba, Agaba, & Puepet, 2004). The limited availability of Renal Replacement Therapy (RRT) in Africa is due to high cost, lack of skilled personnel and limited resources. The average cost of haemodialysis in most SSA countries range from $100 to $160 (Alebiosu, Odusan, & Jaiyesimi, 2003) which is beyond the reach of most affected patients. As a result, even those on dialysis cannot afford to pay for the prescribed dialysis regimen, hence they receive treatment less frequently than expected. Therefore, many patients do not receive adequate dialysis. In a Nigerian study only 20% of patient could afford dialysis three times a week while majority (70%) could afford only once a week dialysis (Mbanya & Sobngwi, 2003)

Anecdotal evidence from Korle-Bu Teaching Hospital showed that kidney transplantation started as a pilot project in Ghana in 2008 and halted in 2014 because of logistic problems. The programme has served almost 20 patients and some surgeons have been trained and will be able to start a local transplant programme in future. In addition, some patients who can afford, travel abroad for kidney transplant and return home for follow-up. Information obtained from Korle-Bu teaching Hospital indicates that the cost of the transplant in Ghana was GHC 60,000 per head and in India, it ranges from $ 10,000 to $ 40,000 (GetWellGo website, 2019). A few patients went to the United States of America and payed between $ 150,000 to $ 200,000.00 (Costhelper health website, 2019). It is obvious from this point that, while majority may not be able to pay for this treatment, few patients
can afford or may receive support from donor agencies to pay for kidney transplantation. It is important therefore to assess the patient’s willingness to receive and pay for this treatment. This will help put in measures including policies that may make this treatment more affordable and available to these patients.

The most functioning form of renal replacement therapy in Ghana currently is haemodialysis. Each dialysis treatment costs GHC 260 per session, and a patient is required to have three treatment sessions per week (GHC 780 per week). This could incur a huge financial burden on the patient and his or her family. The most unfortunate tragedy is that although mortality will be reduced with dialysis treatment, without a kidney transplant, mortality is still increased when compared with the general population as shown by the data obtained in the United Kingdom with an 81% survival at 1 year (87% counted from day 90 of treatment) and 42% at 5 years (Shahbazi, Ranjbaran, Karami-Far, Soori, & Manesh, 2015).

2.5  Perception and willingness to accept kidney transplantation

Salter, et al. (2015) sought to find out the perceptions about haemodialysis and transplantation among African American adults with end stage renal disease (Salter et al., 2015). They identified that, the patient’s perceptions about how well their independence and daily activities were being maintained while undergoing dialysis influenced their attitude towards potentially pursuing kidney transplantation and their health (Salter et al., 2015). Furthermore, poor treatment from medical professionals and lack of knowledge about renal disease and treatment options including transplantation were noted as possible contributors to concerns raised by patients concerning kidney transplantation (Salter et al., 2015).
Ilori et al., (2015) conducted a study on the factors affecting willingness to accept a kidney transplant among minority patients at an urban safety-net hospital. They hypothesised that, factors such as physician discussion, knowledge and information about transplant, patient perception on kidney transplantation and views on kidney donation would affect willingness to undergo kidney transplantation in the future (Ilori et al., 2015). Findings from the study revealed that, key factors that influenced the patient’s willingness to receive a kidney transplant were the perception that the kidney transplantation will improve their quality of life, the willingness to attend class on kidney transplantation (to provide adequate facts about kidney transplantation), the perception on whether a living person can donate a kidney and the source of information (this was significant if patients receive information from multiple sources such as friends, family and social media) (Ilori et al., 2015).

Igbal et al., (2017) conducted a study on the knowledge, attitude and perception (KAP) about renal transplantation of CKD patients and their care givers (Igbal, 2017). They found out that the knowledge, attitude and perception towards renal transplantation was positively influenced by patient or care giver’s educational level and not their economic status (Igbal, 2017).

Morton et al., (2010) examined the views of patients and carers in treatment decision making for chronic kidney disease using a systemic review and thematic synthesis of qualitative studies (Morton, 2010). Findings from the study showed that the requirements of many patients and their carers were not being met. The experiences of other patients, problematic timing of information about treatment options and synchronous creation of vascular access and a preference to maintain the status quo were identified as factors influencing patient treatment decision making (Morton, 2010).
Gannon (2016) in a study titled kidney transplant candidate acceptance of live donor risks sought to identify the highest chances of ESRD kidney transplants candidates willing to accept for their potential living kidney donors (LKD) by using recent data and literature on risk education (Gannon, 2016).

Findings from the study showed that the availability of a potential LKD was strongly associated with the willingness to accept higher risk after controlling for dialysis status, race, age and religiosity (Gannon, 2016). Older patients were found to be risk averse; thus, they were not willing to accept higher risks for their LKD’s (Gannon, 2016). The study concluded that education about risks to LKDs using a multifaceted approach can help increase discussions about how to ask someone to consider donation and where to begin the search for a living donor (Gannon, 2016).

Kazley et al., (2014) conducted a study on health care provider perception of chronic kidney disease: knowledge and behaviour among African American patients (Kazley, 2014). The main aim of the study was to determine the knowledge and reactions of CKD patients regarding their disease, as perceived by nephrologists and clinic nurses (Kazley, 2014).

Findings from the study showed that majority of patients with CKD were in denial of their diagnosis and failed to agree to needed treatment options to help improve their conditions (Kazley, 2014). Further, patients were described to be somewhat knowledgeable about the types of treatment options available. They realised they needed to undergo changes in their lifestyle and they daily routine had to be altered but they still lacked pertinent knowledge and education of the importance of medical treatment and lifestyle changes. Most clinicians reported that patients failed to comply with recommended treatment due to lack of knowledge, feelings of denial, fear and frequent use of religiosity as a coping mechanism (Kazley, 2014).
Study findings revealed that pre-dialysis education and the perception that dialysis is a bridge to transplantation may increase a person’s willingness to get listed for transplant (Manton, 2013). On the other hand, fear of surgery, and fear of losing the transplant tend to decrease the chances of patients getting listed (Manton, 2013). Additionally, lack of education about transplant and interactions with peers who have had a failed transplant also acted as barriers to transplantation (Manton, 2013). It was noted that patients who received early nephrology care (ENC) were much more likely to be listed or in the process of being worked-up for transplantation (Manton, 2013). However, differences in socioeconomic status of patients influenced the ability of patients to receive ENC, thus, affecting their willingness to receive kidney transplantation (Manton, 2013).

2.6 Methods for assessing willingness to pay

Contingent valuation (CV) is a survey-centered method originally used for assessing monetary value of environmental goods and services not bought or sold in the marketplace. In theory it is a feasible method for using passive considerations in an economic analysis. What CV tries to study is first addressed from the perspective of the policymaker. This method is especially applied by companies or businesses when used for something intangible or something that has no market value. Intangibles including a view, or an experience can only be valued using contingent valuation method (Carson, 2000). In recent times this tool is being used in health to assess patient’s willingness to pay for health services as described below.

There are diverse methods of estimating willingness-to-Pay (WTP) for goods and services. One such method is the revealed preferences, which is done by observing persons' purchasing behavior at different amounts. The second way is based on specified and not revealed preferences to arrive at the WTP for goods and services that are frequently not hitherto marketed (López-Feldman, 2013; Nosratnejad, 2016).
The open-ended question approach involves asking participants a direct question such as “How much they will be willing to pay for a service”. This approach has been abandoned because difficulty getting responses from participants leading to missing data. Another method is the “iterative bidding approach” where an amount for a good or service is set low and increased until the participant declines to pay. This point is then used as the participant willingness to pay. This approach has also been abandoned because of starting point bias (Randall, 1974). The most documented method is contingent valuation (CV), which includes asking individuals “how much they are willing to pay for the provision of a given good or service”, given a full account of what is on offer. Contingent valuation has been authenticated as a means of obtaining consistent estimates for goods and services that have not yet been marketed (Hanemann 1991; Nosratnejad, 2016). This method has been enhanced by researchers in recent times with follow-up questions.

For instance, if a participant cannot pay GHC 100 for a particular service, the follow up question will be whether that person will pay GHC 50 for the same service. If the answer is yes, then that person’s willingness to pay will be between GHC 50 to GHC 100. However, if the answer is no then it is assumed the willingness to pay for that person is between GHC 0 and 50. Some studies used the open-ended question approach and the iterative bidding approach. In recent times most of the studies used the contingent valuation method (Brandt, Vásquez, & Hanemann, 2012; Klose, 1999; Sadri, MacKeigan, Leiter, & Einarson, 2005). Notwithstanding the shortfalls of the open-ended approach and the iterative bidding approach (Puteh, Ahmad, Aizuddin, Zainal, & Ismail, 2017; Ramsey, Sullivan, Psaty, & Patrick, 1997), the results obtained from these studies were comparable with studies recording low level of willingness to pay for services regarding chronic illness.
2.7 Willingness to pay for chronic illness

Health care cost in Ghana is largely borne by the individuals concerned and partly covered by national health insurance (NHIS). Treatment of end stage renal disease in Ghana is not covered by (NHIS) and patients have to pay for this treatment in the long-term. Although kidney transplantation is the ultimate treatment for CKD (Ilori et al., 2015), it was not available in Ghana until 2008 when the first transplant was performed. In view of the cost effectiveness of kidney transplant, it is the best suited for Africa and for that matter Ghana, where cost of health care is an issue. However, in a continent where daily expenditure is less than $2.5, willingness to pay for this treatment option will be hampered (Naicker, 2010).

Data on willingness to pay (WTP) for kidney transplantation is almost non-existent in Africa. Current data assessed the issue of payment for people who donate their kidneys to save lives (Herold, 2010). However, the issue of whether CKD patients are willing to pay for the transplant has not been assessed especially in Africa. Existing data compared cost effectiveness of kidney transplant and dialysis. In most of these research works, transplant was found to be more cost effective (Cathrine Elgaard Jensen & Karin Dam Petersen, 2014).

Willingness to pay for other services related to health have been assessed quite extensively, however there exist little or no information on willingness to pay for kidney transplantation as treatment option of end stage renal disease.

Puteh et al looked at patients’ willingness to pay for drugs for chronic and acute illness using a bidding technique of maximum amount patients were willing to pay and found that, 72.2% of them were not willing to pay for drug charges and WTP for drugs either for acute or chronic illness was low with a median of USD 3.8 per visit. In this study, a bivariate analysis showed that, low numbers
of dependent children (≤ 3), higher personal and household income were associated with willingness to pay (Puteh, Ahmad, Aizuddin, Zainal, & Ismail, 2017). Even though there were no missing data documented in this study, this method is prone to difficulty eliciting response from patients and thus leads to incomplete data.

Unutzer et al (2003), used open-ended question approach to measure willingness to pay for depression treatment in a primary care unit and found that, the mean amount patients were willing to pay was USD 270 per month. After six months their level of willingness to pay decreased along with the severity of their symptoms of depression. In this study willingness to pay was associated with household income and severity of depressive symptoms (Unützer et al., 2003). As indicated in the study by Puteh et al this method is associated with problems of eliciting response from participant and therefore prone to missing data.

In another study by Zhou et al, using open-ended question approach to assess willingness to pay for colo-rectal cancer screening, the level of willingness to pay was low. Majority of the participants in this study were willing to pay less than USD 300. Non-logistic regression showed that, male respondents, high educational status and those who accepted colorectal cancer screening were more willing to pay. Multiple logistic regression model in this study revealed that, respondents with higher annual household income per capita, those in government and private enterprises and have less family medical income were willing to pay (Zhou, Li, Liu, Liang, & Lin, 2018). This open-ended approach has the same limitations as the study by Puteh et al and Unutzer et al.

In a multi-country survey, Audureau et al used contingent valuation method to measure participants willingness to pay for chronic medical illness and showed that, generally patients’
level of willingness to pay was low. In this study they also demonstrated that, income predicted willingness to pay for conditions such as Chronic heart failure and Psoriasis. Further, purchase of branded treatment for chronic heart failure was predictive of willingness to pay. In addition, out-of-pocket treatment costs and educational level predicted willingness to pay for Psoriasis treatment (Audureau, Davis, Besson, Saba, & Ladner, 2019).

O’Brien et al in a study on willingness to pay for a hypothetical intervention that provides a 99% chance of healthy lung and 1% chance of death using a simple bidding game showed that, willingness to pay was significantly associated with household income. There was no association between the starting bid and mean willingness to pay when adjusted for health status and income. Since this method of measuring willingness to pay is associated with issues regarding starting-point bias, the authors tested for starting-point bias by assigning participants randomly to one of five starting bids (O’Brien & Viramontes, 1994).

Xuan et al (2018), used contingent valuation method to evaluate willingness to pay for different treatments and care services among patients with heart disease and found that, willingness to pay for hospital-based services were between USD 9.8 and USD 21.9 while that for home-based services were between USD 9.8 and USD 22. Urban-dwelling patients, employed patients, patients with higher level of education and those not covered by insurance were willing to pay more for services; preferably home-based services (Xuan Tran et al., 2018).

A study by Brandt et al (2012) used contingent valuation method to measure household willingness to pay for a hypothetical device that would reduce symptom-days through better management of asthma. In this study, the estimated mean score of willingness to pay for a 50% reduction in
symptom-days including associated decrease in psychosocial stress was $56.48 to $64.84 per month (Brandt, Vásquez, & Hanemann, 2012)

Another study used the CV method to assess willingness to pay for inhaled insulin by diabetic patients and found that their mean monthly pay for insulin was significantly more than the typical value per month for subcutaneous insulin (Sadri, MacKeigan, Leiter, & Einarson, 2005). In Sweden, WTP was used to assess the value of the treatment of hypertension. In this study, hypertensive patients were willing to pay between $ 107 and $ 120 for hypertensive therapy. They concluded that this finding was similar to a study from the United States of America, hence supports the use of WTP as a measure of willingness to pay for health services (Ramsey, Sullivan, Psaty & Patrick, 1997).

Contingent valuation method is currently used more often for assessing willingness to pay among patients with chronic medical illness, possibly because it is not associated with difficulty eliciting response from patients and also does not have starting-point bias. Contingent valuation method has been developed over the years and now has a dichotomous response approach with stated price options. This study will therefore employ contingent valuation method in assessing CKD patients’ willingness to pay for kidney transplant.

Although, willingness to pay has been studied quite extensively among other chronic illnesses, there is currently no study which looked at willingness to pay for kidney transplantation among CKD patients. Further, there is limited data on willingness to pay for chronic illness in Africa and there is currently no such studies in Ghana.
2.8 Conclusion

Kidney transplantation is the ultimate treatment for end stage renal disease. In addition, it is more cost-effective than long-term dialysis. Multiple factors influence patients’ decision concerning their decision to undergo kidney transplantation. Notable among these factors is their willingness to pay for kidney transplantation. Willingness to pay for other chronic illnesses and services such as paying for insurance premium has been assessed locally in Africa and globally. However, there is no data on assessment of willingness to pay for kidney transplantation in Africa where this treatment is not covered by insurance and where the price tag for the treatment is above the reach of most the patients. Assessing some of these modifiable factors including their willingness to pay for the service may help as first steps towards establishment of sustainable kidney transplant programme in Ghana. There are various methods for assessing willingness to pay including; the open-ended question approach, “iterative bidding approach and the dichotomous approach used in the contingent valuation method. The former methods have problems with eliciting response from participants and starting point bias respectively; thus, have been abandoned. The contingent valuation method is the most popular method used recently. However, the outcomes of these methods in assessing willingness to pay are comparable.
CHAPTER THREE
METHODS

3.1 Study design

This was a facility-based descriptive cross-sectional quantitative study that was conducted from April to May 2019, among chronic kidney disease patients in Korle-Bu Teaching Hospital.

3.2 Study setting

The study was conducted at the dialysis units and outpatient units of the department of medicine and therapeutics and the national cardiothoracic center in Korle-Bu Teaching Hospital.

Korle-Bu Teaching Hospital (KBTH) is currently the leading national referral centre in Ghana. It has 2,000 beds and 17 clinical and diagnostic Departments/Units. It has an average daily attendance of 1,500 patients and about 250 patient admissions. The clinical and diagnostic departments of the Hospital include Medicine, Child Health, Obstetrics and Gynaecology, Pathology, Laboratories, Radiology, Anaesthesia, Surgery, Polyclinic, Accident Centre and the Surgical/Medical Emergency as well as Pharmacy.

The Dialysis units are specialized sub-units in the Department of Medicine and Therapeutics and the national cardiothoracic center. The unit provides clinical services (both in and out-patient) services for patients with different stages of acute and chronic kidney disease as well putting ESRD patients on dialysis. The renal unit at the department of medicine has 18 machines that provide dialysis treatment for patients. The Unit currently provides dialysis services for a little over 260 ESRD patients. Patients come for dialysis treatment two to three times every week. Additionally, it provides kidney transplantation services, but does not provide peritoneal dialysis. The unit also provides outpatient services and attends to more than 90 outpatients weekly. KBTH also has the
National Cardiothoracic Center that offer cardiology and cardiothoracic surgery services for patients. In addition to these services, the center also provides haemodialysis services for ESRD patients. The Center has eight dialysis machines that provide hemodialysis services for 22 ESRD patients. Patients receive dialysis between 2-3 times per week.

3.3 Study population

The study population included adult ESRD patients receiving haemodialysis and non-dialysis CKD patients at Korle-Bu Teaching Hospital. Participants were recruited from the dialysis units of the Medical department and the National Cardiothoracic centre of the Korle-Bu Teaching Hospital and the central outpatient department.

3.4 Eligibility criteria

3.4.1 Inclusion criteria

1. Patients diagnosed with ESRD and were receiving haemodialysis
2. Patients diagnosed with CKD stage III-V
3. Patients who were 18 years and above

3.4.2 Exclusion criteria

1. Patients who received kidney transplant
2. Patients with other renal diseases such as acute kidney injury, nephrotic syndrome, renal cell carcinoma, metabolic renal diseases and tubular disorders
3. Vulnerable subjects such as pregnant women, children and institutionalized persons were excluded from the research
3.5 Sample size

Using the Cochran's (1977) formula, the minimum required sample size for this study was estimated as

\[
n = \frac{Z_{\alpha/2}^2 \times p \times (1-p)}{e^2}
\]

Where:

\( n \) = minimum required sample size

\( \alpha \) = Significance level = 5%

\( Z_{\alpha/2} \) = z-score at 95% confidence level of sided test = 1.96

\( p \) = Proportion of patients willing to accept kidney transplant was 66.7% (Takure et al., 2016)

\( q \) = Proportion of patients not willing to accept kidney transplant = 1 – 0.667 = 0.333

\( e \) = margin of error = 0.05

\[
n = \frac{1.96^2 \times 0.667 \times (1 - 0.667)}{0.05^2} = 341.3 \approx 341
\]

Hence 341 patients were sampled for the study as the required minimum sample size.

3.6 Sampling and study procedures

Patients were recruited from the outpatient clinic in department of medicine and dialysis units in the department and the cardiothoracic unit. Given that the population being studied is relatively small, participants were recruited consecutively in order of who came in first. The clinical files were arranged by the nurses and outpatient unit clerks in the order in which the presented. The
files were then used by the research assistants (RA) and the investigator for recruitment in the order in which they were arranged. In the situation where a patient refuses to consent to the study, the patient was skipped to the next patient until the sample size was attained. Dialysis patients were recruited during waiting hours just before their dialysis session started. Recruitment was done by research assistants who were trained by the principal investigator. The research assistants first identified clinical files of all patients and screened them for eligibility in a separate room at the clinic and dialysis units. Patients who met the eligibility criteria were approached for recruitment by the research assistant. Research recruited the patients in order starting from the first patient at the clinic for that day. The RAs did not have prior knowledge of the order in which the patients presented at the clinic.

3.7 Data collection tool

Interviewer-administered structured questionnaire comprising 50 items was administered to the research participants. The questionnaire was used to obtain basic demographic data (age, gender, educational status, marital status, ethnicity, religion, employment, income, wealth index and living status). Information on participant’s social support system (from family, friends) and their insurance status was also obtained. In addition, medical information (comorbidities, duration of dialysis therapy, frequency of dialysis) was collected. Further, information was obtained on the knowledge, attitude and perception of kidney transplantation. The questionnaire was adapted from a previous study and modified for the purpose of this study. Standardized instruments (INSPIRIT) was be used to obtain information on religiosity and spirituality. Contingency valuation was used to assess willingness to pay for kidney transplantation. Dialysis patients were recruited while they were waiting for their dialysis sessions and not during the dialysis treatment.
### 3.7.1 Study variables

#### Table 3.1: Definition of Variables and Their Scale of Measurement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Categories</th>
<th>Scale of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willingness to accept a kidney transplant</td>
<td>Would you undergo kidney transplant if you are given a chance when the time comes?” with possible responses of “Yes,” “No,” and “Not sure.”</td>
<td>Yes</td>
<td>Nominal</td>
</tr>
<tr>
<td>Willingness to pay</td>
<td>Assuming you were to pay an amount for a kidney transplant, will you be willing to pay? with possible responses of “Yes”, “No” and “Don’t know” Amounts will start from 106,000 Ghana cedis and reduce by 10,000 when question is repeated twice</td>
<td>Yes</td>
<td>ordinal</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Age as at last birthday of the respondents</td>
<td>none</td>
<td>Discrete</td>
</tr>
<tr>
<td>Religion</td>
<td>This is the respondent’s religion</td>
<td>Christian, Muslim, Non-denominational, Traditional, Other</td>
<td>Nominal</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>This is the respondents ethnic background</td>
<td>Ashanti/Fanti, Ewe, Ga-Adangbe, Dagbani, Hausa, Other</td>
<td>Nominal</td>
</tr>
<tr>
<td>Marital status</td>
<td>This describes the kind of relationship that exist between the respondent her sexual partner</td>
<td>Married, Single, Widowed, Divorced, Not married but living with a partner</td>
<td>Nominal</td>
</tr>
<tr>
<td>Educational status</td>
<td>This is the highest level of formal education reached by the respondent (whether completed it or not)</td>
<td>No formal education, Primary/JHS, Senior high, Sch/Vocational, Tertiary, Other</td>
<td>Ordinal</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Options</td>
<td>Scale Type</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Employment</td>
<td>The current employment status of the study respondent</td>
<td>Employed full time</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Employed part time</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unemployed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Retired</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Personal income; assessed using the “what is your monthly income from your regular work”</td>
<td>none</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Knowledge</td>
<td>This was assessed by asking the respondents to rate their level of knowledge on a 5-point scale (1—No knowledge, 2—Below average, 3—Average, 4—Above average, 5—Well informed)</td>
<td>No knowledge</td>
<td>Ordinal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Above average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Well informed</td>
<td></td>
</tr>
<tr>
<td>Prior knowledge</td>
<td>Patient’s prior knowledge of kidney transplant, thus, whether he/she has known of kidney transplant before</td>
<td>Yes</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Perception</td>
<td>Perceptions about kidney transplantation will be assessed using the question “Do you think a living person can donate a kidney to patients needing it?” (yes vs no).</td>
<td>Yes</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Physician discussion</td>
<td>Whether patient’s doctor had ever discussed kidney transplant as an alternative to dialysis with him/her</td>
<td>Yes</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>CKD stage</td>
<td>The stage of the chronic kidney disease based on laboratory results in clinical files</td>
<td>Stages 1, 2, 3, 4 and 5</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Social Support</td>
<td>Participants support system including friends, family and colleagues</td>
<td>None</td>
<td>Nominal</td>
</tr>
<tr>
<td>Friends</td>
<td>Number of friends the respondent get in touch with at least on monthly basis</td>
<td>None</td>
<td>Discrete</td>
</tr>
<tr>
<td>Supportive friends</td>
<td>Number of family/friends you talk to about personal issues any form of assistance or support given by a friend such as monetary, emotional, physical or spiritual support</td>
<td>None</td>
<td>Discrete</td>
</tr>
<tr>
<td>Health Insurance status</td>
<td>Whether the respondent has any form of valid health insurance or not.</td>
<td>Yes</td>
<td>Nominal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Religiosity and spirituality</td>
<td>Participants spiritual and religious beliefs and how it impacts on their willingness and perception to</td>
<td>It consists of 6 items and rated on a 5-point Likert scale with the least</td>
<td>Nominal</td>
</tr>
</tbody>
</table>
Wealth Index
This was a composite measure of a household’s cumulative living standard. The wealth index is calculated using easy-to-collect data on a household’s ownership of selected assets.

<table>
<thead>
<tr>
<th>Wealth Index</th>
<th>number indicating the lesser experience.</th>
</tr>
</thead>
<tbody>
<tr>
<td>接受肾移植评估</td>
<td></td>
</tr>
</tbody>
</table>

### 3.7.2 Contingent Valuation Method

This study adopted the “dichotomous choice format” of CV. A dichotomous payment method asks the participant if he would pay an amount X for a good or service. There are only two responses to this approach (Yes/No) (Hoehn, 1987) (Randall, A., 1974). In recent times, researchers added a follow-up question to the dichotomous approach in order improve on the precision of WTP estimates (Hanemann, W.M., 1991). For instance, if a respondent was not willing to pay 106,000 Ghana cedis for kidney transplantation, the follow-up question was whether he was willing to pay 96,000 Ghana cedis for the same service. If the answer is yes, then it assumed that his WTP is between 96,000 and 106,000 Ghana cedis. However, if he answers no, the next question was whether he will pay 86,000 Ghana cedis. If the patient answers no then he was asked to state how much he wants to pay for the service.

### 3.7.3 INSPIRIT

The INSPIRIT measures core spiritual experience, which involves an event producing a personal conviction of the existence of God (or some form of higher power as defined by the person) and a highly internalized relationship with God. It consists of 6 items and rated on a 5- point Likert scale with the least number indicating the lesser experience. Some items of the INSPIRIT include; I consider myself to be strongly religious or spiritually oriented; God dwells in me; I spend a reasonably amount of time in religious and spiritual practices. The response scale span from
strongly agree (5 point) to strongly disagree (1 point). It has been grounded in both theoretical and clinical research experience. It is parsimonious in nature. Administration of the INSPIRIT is easy and quick. The INSPIRIT has also demonstrated a significant empirical relationship between spiritual experience and both psychological and physical health in a number of studies. It is scored by summing up the items from the total score of INSPIRIT. It has a lower score of 1 and higher score of 30. In this study the scale had an internal consistency score of 0.87 measured using the Cronbach's alpha. 3.9 (Kass, Friedman, Leserman, Zuttermeister, & Benson, 1991).

3.8 Quality assurance

3.8.1 Pretest

The study questionnaire and research instruments were pretested at the cardiothoracic unit dialysis unit because it has similar characteristics and services like the KBTH and was representative of the study site. Issues identified during the pretest were poorly framed questions and inadequate information to assess socioeconomic status. The questions were reframed, and some were converted to open ended questions. In addition, the wealth quintile was introduced to assess socio-economic status before the actual study commenced.

3.8.2 Data handling

Information from the questionnaires was entered into SPSS version 22 as coded on the questionnaire. The entered data was double checked for wrong entries and corrected and exported into STATA version 15 for analysis. Consistency checks were run on certain variables using frequencies, cross tabulations and conditional tabulations. All data cleaning were done in STATA version 15.
3.9 Statistical analysis

Descriptive statistics on categorical variables were reported in the form of frequencies and percentages while that of the continuous variables were presented in terms of means and standard deviation or median with interquartile range depending on the distribution of the data. Chi-squared\Fishers’ exact test of independence was used to test for association between categorical independent variables and the outcome variable. Depending on the distribution of the continuous variables, Welch t-test\Wilcoxon rank-sum test was used to compare means\median of continuous variable across levels of the outcome variable. Proportion/percentages of respondents who answered “Yes” to any of the defined stated costs was reported as a measure of level of willingness to pay. Socio-economic status was assessed using the wealth quintile which was categorized into quintiles and percentage of participants per quintile (from 1 to 5) was determined. Test of normality of continuous variables was done using the skewness and kurtosis test. Logistic regression model was used to assess the effect of the various independent variables on the willingness to accept and pay for kidney transplantation. All statistical test was done at 5% significance level. The results obtained from the various analyses were presented in tables and charts.

3.10 Ethical consideration

3.10.1 Ethical approval

Ethical approval was obtained from Korle-Bu Teaching Hospital-Scientific and Technical Committee/Institutional Review Board (STC/IRB).

3.10.2 Recruitment and sampling procedure

Participants were fully informed of the nature of the study. They were made aware that participation in this study was voluntary and that they were at liberty to withdraw from the study
at any time with no consequence. Anonymity was ensured using codes and access to data was restricted to the researcher and interviewers only. Subjects who agree to take part in the study signed an informed consent after due explanation. Invasive investigations were not performed, and no laboratory procedure was carried out.

3.11 Limitations

This survey was conducted in only one center, even though a large referral center, it may not represent a nationwide view on this subject hence there is a need for nationwide multi-center survey to capture the views of majority of the Ghanaian populace on this issue. In view of the consecutive sampling method adopted for this research, the sample cannot be representative of the entire population.
CHAPTER FOUR
RESULTS

4.1 Introduction

This section discussed results obtained at the end of the study. It contains background characteristics of the study population (table 1), a chi-square test showing association between background characteristics and willingness to pay (table 2) and logistic regression model showing the predictors of willingness to pay for kidney transplant. The section also contains results on patients’ level of willingness to pay (figure 2) and distribution of insurance by the wealth quintile (figure 3).

4.2 Background characteristics of study participants

The total number of patients recruited for the study were 342 and the average age was 50.2 ± 17.1 years with minimum and maximum age of 18 and 85 years respectively. The proportion of males was 56.7% (194/342). More than half (56.73%, 194/342) of the patients were currently married while 6.7% (23/342) were divorced. Akans were the predominant ethnic group (56.7%, 194/342) with Dagbanis (3.51%, 12/342) being the least tribe. Christianity was the predominant religious affiliation (Table 1). Majority (40.4%, 138/342) of study participants had education up to the tertiary level. Only 5.6% (19/342) of the participants did not have any formal education. Regarding employment status of the study participants, 43.0% (147/342) were employed with 33.6% (115/342) unemployed.

For CKD staging of the study participants, majority (62.8%, 215/342) had end stage renal disease and were on haemodialysis. Less than a tenth of study participants had stage 3 CKD (Table 1).
Nearly half of the participants (46.5%, 118/342) rated their knowledge level of kidney transplantation below average whilst approximately 10% rated their knowledge level above average (Table 1). Almost 88% of study participants had valid NHIS. Approximately 67% (230/342) of study participants were willing to accept a kidney if needed. Less than five percent (4.4%, 15/342) of the patients had other sources of income (SSNIT – 6, apartment rentals – 1, Trading/Working/skill – 8).
### Table 1: Background characteristics of study participants at a renal clinic at the Korle-Bu Teaching hospital, Accra, Ghana. 2019

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
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<tr>
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<td>43.27</td>
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<td>33.63</td>
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<tr>
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<td>327</td>
<td>95.61</td>
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</table>
4.3 Willingness to pay for kidney transplant

Overall, of every ten selected study participants, about three (26.3%, 95% CI: 21.7 - 31.3%) of them were willing to pay for a kidney transplant at the current going price or more (≥ GHS 86,000), with about 55% (188/342) willing to pay below GHS20,000 to undertake a kidney transplant. Furthermore, about one-fifth (21.3%, 73/342) of the patients were willing to pay the highest price quoted GHS106,000 to undergo the transplant. Three patients asserted they do not want any transplant even when it is being done for free (Figure 1). Among those willing to accept, (67, 29.13%) were willing to pay. Interestingly out of those not willing to accept (23, 20.54%) could pay for the service.

![Figure 2: Patients’ willingness to pay for kidney transplant.](image-url)
4.4 Association between background characteristics and willingness to pay for kidney transplant

Table 2 presents the test of association between background characteristics and willingness to pay. From the tests, sex of participants, educational level, wealth quintile, level of social support, knowledge level, and health insurance status were significantly associated with participants’ willingness to pay for kidney transplant. Regarding sex of participants, the proportion of males who were willing to pay for the transplant was significantly more than that of females (31.4% vs 19.6%, p=0.014). Willingness of study participants to pay for transplant was observed directly related to participants level of education. Thus, increase in educational level was associated with higher proportion of participants who were willing to pay for transplant (chi=33.32, p<0.001). Participants willingness to pay increased significantly with higher wealth quintile (chi=69.09, p<0.001). Regarding participants knowledge level on kidney transplant, participants whose knowledge level was above average were comparatively more willing to pay for a transplant than those with average and below average knowledge level (52.0% vs 29.7% vs 22.0%, p=0.010). There was no enough statistical evidence to show that the age, marital status, ethnicity, religion, employment status, level of religiosity, and participants willingness to accept transplant was significantly associated with willingness to pay for kidney transplant at the going price (p>0.05).
Table 2: Chi-square test showing association between background characteristics and willingness to pay for kidney transplant

<table>
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<th>Willingness to pay</th>
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<th>Yes, n (%)</th>
<th>p-value</th>
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<td>51.7 ± 17.95</td>
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<tr>
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<tr>
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<td>20(25)</td>
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<td>52(82.54)</td>
<td>11(17.46)</td>
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<td>stage 5</td>
<td>24(72.73)</td>
<td>9(27.27)</td>
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<td>End stage on dialysis</td>
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</tbody>
</table>

N = frequency; % represent column percentages; p-values obtained from chi-square test of association.
4.4 Logistic regression model showing association between background characteristics and willingness to pay for kidney transplant

After adjusting for all other confounding factors in the multiple logistic regression model, wealth quintile and insurance status of the participants were the only factors that were identified to be significantly predictive of willingness to pay (p-value < 0.05). From the model, it is shown that higher wealth quintile is associated with higher odds of being willing to pay for kidney transplant. Thus, the odds of being willing to pay for kidney transplant among participants in the fifth quintile was about 12.3 times that of those in the first quintile (aOR: 12.33, 95%CI: 2.32 - 65.51). The odds of willingness to pay for kidney transplant among participants in fourth, third, and second quintiles were 3.32, 3.0, and 1.04 times the odds of those in the first quintile.

Regarding the insurance status of the participants, patients with no insurance had about 2.9 times higher odds of being willing to pay for a kidney transplant compared to those with health insurance (aOR: 2.85, 95%CI: 1.09 - 7.45).

The unadjusted logistic regression model showed that, the odds of paying for a transplant was 47% less in among females compared to males (uOR: 0.53, 95% CI: 0.32 - 0.88). However, this effect was not significant after adjusting for the covariates (p>0.05). Similarly, education level was significantly predictive of willingness to pay for transplant (p<0.001). That is, participants with primary, secondary and tertiary level of education had about more than three times higher odds of being willing to pay for a transplant compared to those with no formal education. Nonetheless, this effect became insignificant after controlling for other covariates (p>0.05). Participants’ level of social support and knowledge on kidney transplant had significant relationship with willingness to pay for transplant (p<0.05) in the unadjusted regression model but seizes to be significant after controlling for other covariates.
Table 3: Logistic regression model showing association between background characteristics and willingness to pay for kidney transplant

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<td>P-value</td>
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<td>P-value</td>
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<td>&lt; 0.001</td>
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<td>ref</td>
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</tr>
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<td>1.04</td>
<td>0.16 - 6.77</td>
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<td>2.32 - 65.51</td>
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<tr>
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<td>0.82 - 2.72</td>
<td>1.20</td>
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<td>1.56 - 9.4</td>
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</table>

Ref: Reference category, CI: Confidence interval, UOR: Unadjusted odds ratio, AOR: Adjusted odds ratio
4.5 Health insurance status by wealth index

Figure 3 shows the distribution of patients’ insurance status across their wealth index. From the graph, the proportion patients with insurance (NHIS) turn to decrease with higher wealth index.

![Figure 3: Distribution of health insurance status by wealth index](image)

4.6 Conclusion

Majority of CKD patients were willing to pay below the price earmarked for kidney transplantation. The main predictors of kidney transplantation were higher wealth quintile and not having insurance.
CHAPTER FIVE
DISCUSSION

5.1 Introduction

This study sought to determine patients’ willingness to pay (WTP) for kidney transplant and factors that predict their level of willingness to pay for kidney transplant. The results show that nearly a third of participants were willing to pay for kidney transplant at the current price of at least GHC 86,000 while two out of every ten participants were willing to pay more than the GHC 86,000 quoted for kidney transplant service. Majority of participants were willing to pay less than GHC 20,000 for this service. Further, less than ten percent of the respondents, either prefer free transplant service or will rather not undergo kidney transplant. Higher wealth quintile and not having national health insurance were significantly predictive of willingness to pay for kidney transplant. Knowledge of kidney transplant, employment status, level of education, social support and sex did not predict willingness to pay for this health service.

The study also demonstrated that more than two-thirds of the participants were willing to accept kidney transplantation as a treatment option for end stage renal disease. Willingness to accept kidney transplant had no significant association with willingness to pay for this service.

More than half of the study participants rated their level of knowledge on kidney transplantation below average.

5.2 Knowledge on kidney transplantation

This study found that, more than half of participants rated their level of knowledge on kidney transplantation below average which is comparable to findings in a study by Igbal et al among chronic kidney disease patients in Nigeria (Igbal, Hossain, Faroque, Iqbal, Selim, Bhuiyan, &
Chowdhury, 2017). In another study by Ilori et al among African Americans with chronic kidney disease (Ilori et al., 2015), majority (79.8%) rated their knowledge on kidney transplantation as below average which agrees with findings from our present study. This is in consonance with another study in the United States of America (Keddis, Finnie, & Kim, 2019). Takano et al conducted a study across racial groups in USA among CKD patients and found that African Americans have lower level of knowledge compared to the Caucasians and Asians (Finkelstein et al., 2008). In contrast an Indian study revealed moderately adequate knowledge of kidney transplantation among chronic kidney disease patients (BM, 2018).

5.3 Willingness to accept kidney transplantation

The present study revealed that more than two-thirds (67.3%) of the participants were willing to accept kidney as a treatment option for end stage renal disease. A cross sectional survey in West China among patients with end stage renal disease showed that nearly half (46.4%) of respondents were willing to accept a kidney for transplant (Tan et al., 2017). Ilori et al conducted a cross sectional survey among predominantly minority population with CKD in the United States of America (USA) and found that more than half (53.7%) were willing to accept a kidney for transplantation (Ilori et al., 2015). A Nigerian study assessing knowledge, awareness, and acceptability of renal transplantation among patients with end-stage renal disease demonstrated that more than two-thirds (66.7%) were willing to accept kidney transplant (Takure, Jinadu, Adebayo, Shittu, Salako, 2016). This finding corroborates the result of the present study. The Nigerian study and the present study demonstrated that the percentage of CKD patients in developing countries willing to accept a kidney transplant was more than those in developed countries like USA and China. The disparity observed may be due to differences in population of patients studied, setting of the study and tools or questionnaires used in assessing willingness to
accept a kidney for transplant. Future research should therefore consider multi-center and cross-
national studies that can address some of these differences among countries and settings which
have a significant bearing on the outcome of the studies.

5.4 Willingness to pay for kidney transplantation

In this study, majority of participants’ willingness to pay for kidney transplant was below the
expected price for the transplant service. However, a few can pay for this service at the current
going price or more.

A study by Puteh et.al. in 2017 looked at patients’ willingness to pay for drugs and found that
72.2% of them were not willing to pay for drug charges and WTP for drugs either for acute or
chronic illness were low with a median of USD 3.8 per visit (Puteh, Ahmad, Aizuddin, Zainal, &
Ismail, 2017). This is similar to findings from our study where the willingness to pay for kidney
transplant service was low for majority of the patients. Another study by Xuan et al in 2018, which
had similar findings to those from our study, explored the preferences and willingness to pay for
home-based and hospital-based service among heart disease patients showed that their level of
willingness to pay was below the expected price of the services (Xuan Tran et al., 2018). A
Taiwanese study among lung cancer patients further showed a low level of willingness to pay for
cancer treatments which further supports our study findings (Lang, 2010). A similar outcome was
observed in another study by Zhou et al where patients’ willingness to pay for Colo-rectal cancer
was below the expected provider price for the service (Zhou et al., 2018). In contrast, a study on
willingness to pay for depression treatment in primary care centers revealed that the amount
patients were willing to pay for treatment of depression was comparable to the cost of other chronic
illness and higher than the actual cost of depression treatment (Unützer et al., 2003). In general, it
appears from the above findings that patients are willing to pay charges which are below the expected cost of the services they receive from health service providers.

### 5.5 Factors associated with willingness to pay for kidney transplantation

The study revealed that higher wealth quintile (5th quintile) was associated with higher odds of willingness to pay for kidney transplant. Those in the upper quintile of wealth status were more willing to pay compared to those in the lower quintile. In view of this, the high cost of the transplant service and patients’ inability to pay are likely reasons why they may be unwilling to pay for this service. Further, insurance status was predictive of willingness to pay for kidney transplantation. Patients with no insurance were more willing to pay compared to those with insurance. Furthermore, comparing health insurance status across the wealth index, showed that those in the upper quintile were less likely to have health insurance. This demonstrates that those without insurance (NHIS) had the means to pay for this service. It is likely that majority of these patients belong to the category of those who cannot pay and therefore corroborating the previous discussion that cost of service and wealth status are likely reasons for low level of willingness to pay for this health service. Furthermore, more than forty percent of our patients were unemployed, and more than ninety percent do not have any other regular source of income hence could not readily commit themselves to a paying for a service they may not be able to mobilize funds to support. This is supported by many studies which demonstrated that ability to pay was one of the significant influencing factors for willingness to pay coupled with place of residence (rural vs urban)(Noor Aizuddin, Sulong, & Aljunid, 2012; Puteh, Ahmad, Aizuddin, Zaina, & Ismail, 2017). Xuan et al, further corroborated this assertion in their study which showed higher willingness to pay among relatively wealthy urban residents compared to rural folks (Xuan Tran et al., 2018). This may be because they have superior financial strength and awareness about the benefits of the service. This
assertion is also supported by a study by Kleinman et al which showed that patients were willing to pay more per month for medication that provide complete and faster relief from symptoms of gastro-esophageal reflux disease (Kleinman et al., 2002). More so, a multi-center study involving developing countries, showed a strong correlation between patients financial ability to pay for therapy and their willingness to pay (Audureau et al., 2019).

A study by Puteh et al showed after a bivariate analysis showed that higher personal and household income were associated with willingness to pay for drugs (Puteh, Ahmad, Aizuddin, Zainal, & Ismail, 2017). A cross sectional study by Pinto et al looking at the relationship between patient characteristics and patient satisfaction variables with willingness to pay for inhaled insulin demonstrated that, household income and patient satisfaction predicted willingness to pay (Pinto, Holiday-Goodman, Black, & Lesch, 2009). Another study demonstrated similar findings where household income predicted patients’ willingness to pay for health care programs (O’Brien & Viramontes, 1994). The association between income and willingness to pay is supported by other studies (Unützer et al., 2003; Zhou et al., 2018). Augustin et al conducted a cross sectional study in Germany to assess willingness to pay for cure of low-risk melanoma patients and found that household income, age, employment status, subjective health status and anxiety were predictive of willingness to pay (Augustin et al., 2018). In contrast, age and employment status were not predictors of willingness to pay in this present study. However, in line with the findings of this study, Zhou et al showed in their study that gender and employment status did not predict willingness to pay (Zhou et al., 2018). While gender was shown to be a predictor of willingness to pay in other studies (Kao et al., 2009; Kasparian, McLoone, & Butow, 2009), sex had no influence on willingness to pay in the present study.
CHAPTER SIX

6.1 Conclusion

The overall willingness to pay for kidney transplantation is low among chronic kidney disease patients in Korle-Bu Teaching Hospital. The wealth index and not having insurance were predictors of willingness to pay. Overall, more than two-thirds of patients were willing to accept kidney transplant, however there was no significant association between willingness to pay and willingness to accept kidney transplantation. Knowledge of kidney transplantation, employment status, level of education, social support and sex did not predict willingness to pay for this health service. There is therefore a need for policy makers to put in measures that will make kidney transplantation a more affordable and an attractive option compared to long-term haemodialysis, since it more cost effective and gives a better outcome.

6.2 Recommendations

Based on the findings of this study, the following recommendations are made in order to set up a sustainable kidney transplant programme in Korle-Bu Teaching Hospital:

1. The low level of willingness to pay among these cohort of patients is an indication that, they may require support as follows;

   ✓ The Government should subsidize the cost of kidney transplantation to reduce the cost burden on the patient in order to make it a more attractive option as it is more cost effective in the long-term compared to chronic haemodialysis

   ✓ The National Health Insurance Scheme (NHIS) should partially support this treatment or where possible provide full support for selected motivated patients especially for the young ones who form the workforce of society.
2. The low level of patients’ knowledge implies that; patients, relatives, various groups (e.g. churches, societal groups etc) should be well educated to understand the benefits of kidney transplant. Understanding the benefits and cost-effectiveness of kidney transplantation may help make decisions that will make it possible for patients to access kidney transplants that benefit the patients in the long-term.

3. Since most people cannot afford the actual cost of kidney transplant, will be prudent to institute preventive measures including education by hospital facilities on the need to steps to prevent kidney disease. In addition, policies should be put in place and implemented regarding screening to facilitate early detection of kidney disease for treatment. Screening will help to identify at-risk patients who need treatment and control of their risk factors to prevent development of the disease.

4. Due to diversity of culture in our country which influences our understanding and perception of life, future studies should factor in the culture of the people to throw more light on their perception concerning kidney transplantation which may impact on their willingness to pay for transplant.
REFERENCES


GetWellGo. Best Hospitals For Kidney Transplant In India [Internet]. [cited 2019 Oct 13]. Available from: https://getwellgo.com/go/best-hospitals-for-kidney-transplant-in-india/?gclid=EAAlIQobChMlm0GWKjqZ5QIVB87tCh0eWwihEAAAYASAAEgJocfD_BwE


https://doi.org/10.1176/ps.54.3.340


APPENDICES

Appendix A: consent form

KORLE-BU TEACHING HOSPITAL

TELEPHONE: 666987

INFORMED CONSENT FORM

Participant ID Number:
Participant’s initials:
Date:
Title: Willingness to accept and pay for kidney transplantation as treatment choice for end stage renal disease in Ghana

You are being asked to take part in a research study looking at your willingness to receive and pay for kidney transplantation. Please read this form carefully and ask any questions you may have before agreeing to take part in the study. We will offer explanations or interpretation for those who cannot read.

**What the study is about:** The purpose of this study is to learn about whether patients are willing to accept kidney transplant as one of the treatment options for kidney disease in Ghana. In addition, it also seeks to estimate the patients’ level of willingness to pay for this treatment. This study will also look at the modifiable factors associated with patients’ willingness to pay.

**What we will ask you to do:** If you agree to be in this study, we will conduct an interview with you. The interview will include questions about your health and demographic information. We will also obtain some information such as your medical diagnosis, and medication from your clinical file. The interview will take about 30 minutes to complete.

**Risks and benefits:**
There is the risk that you may find some of the questions about your conditions to be sensitive. There are no benefits to you and you will not bear any cost associated with the study. **Korle-Bu Teaching is the major referral centre for most medical conditions in Ghana and we hope to learn about this common problem and provide information for policy makers to make this treatment affordable.**

**Compensation:** There will be no compensation

**Your answers will be confidential.** The records of this study will be kept private. In any sort of report we make public we will not include any information that will make it possible to identify you. Research records will be kept in a locked file; only the researchers will have access to the records.

**Taking part is voluntary:** Taking part in this study is completely voluntary. You may skip any questions that you do not want to answer. If you decide not to take part or to skip some of the questions, it will not affect your current or future relationship with Korle-Bu Teaching Hospital/School of Medicine and Dentistry, University of Ghana. If you decide to take part, you will be asked to sign a consent form.
If you have questions: The researcher conducting this study is Vincent Boima, please ask any questions you have now. If you have questions later, you may contact the above researchers via the contact below;
Dr Vincent Boima – 0244528210
If you want to speak with someone not directly involved in this research study, please contact the Research Ethics Committee Administrator at Korle Bu Teaching Hospital
Korlebu Teaching Hospital IRB contact: 0302666766

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, or the research has been fully explained to me and I have received answers to any questions I asked. I consent to take part in the study.

Your Signature _______________________ Date ______________________

Your Name ______________________________________

OR

Thumb Print………………………… Date ……………………………
Appendix B: Questionnaire
Willingness to Accept and Pay for Kidney Transplantation as Treatment Choice for End Stage Renal Disease in Ghana

ID
Enter questionnaire ID

Date of Survey
Please be sure the date and time are correct before proceeding.

yyyy-mm-dd     hh:mm

Name of Interviewer

DEMOGRAPHICS

1. What is your age?

2. What is your gender?
   - Male
   - Female

3. What is the highest level of education you have received?
   - No formal education
   - Primary/JHHS
   - Senior high School/Vocational
   - Tertiary education
   - Other

   Please Specify

6/3/2019

Willingness to Accept and Pay for Kidney Transplantation-Revised Version

4. What is your employment status?

☐ Employed full time
☐ Employed part time
☐ Unemployed
☐ Retired
5. Who earns income to support you? 

6. How many hours each week do(es) the above person(s) work? 

7. What best corresponds to the above person(s) current work situation
   - Working full time
   - Working part time
   - Not working and not looking for work
   - Unemployed and looking for work
   - Disabled or retired and not looking for work
   - Currently in school

8. Do you have other regular source of income?
   - Yes
   - No

9. Since you answered "Yes" to the above question; what resources do you use? 

10. Since your answer is yes to question 8 specify and estimated amount earned from other sources 

11. What is your monthly income from your regular work (in Ghana cedis)? 

12. How many people are supported by this income including you? 

   - 
   - 
   - 
   - 

0/3/2019

Willingness to Accept and Pay for Kidney Transplantation-Revised Version

13. What is your ethnicity?
   ○ Ashanti/Fant
   ○ Ewe
   ○ Ga-Adangbe
   ○ Dagbanli
   ○ Hausa
   ○ Other
Please Specify

14. What is your current marital status?
   ○ Married
   ○ Single
   ○ Widowed
   ○ Divorced
   ○ Not married but living with a partner

15. What is your religion?
   ○ Christian
   ○ Muslim
   ○ Non-denominational
   ○ Traditionalist
   ○ Other
   Please Specify

Does your household have?

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</tr>
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</tr>
<tr>
<td>Video deck/CD/DVDplayer</td>
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<tr>
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<tr>
<td>Freezer</td>
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<td></td>
</tr>
<tr>
<td>Mobile Telephone</td>
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<td></td>
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<tr>
<td>Non-mobile Telephone</td>
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<td></td>
</tr>
<tr>
<td>Desktop Computer</td>
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</table>
6/3/2019

Willingness to Accept and Pay for Kidney Transplantation-Revised Version

Fan

Bicycle

Motorbike
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<tr>
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<td>□</td>
</tr>
<tr>
<td><strong>Tractor</strong></td>
<td>□</td>
</tr>
</tbody>
</table>

**Main material of the floor**
- Earth/sand/mud
- Wood/Palm/Bamboo
- Cement floor
- Terrazzo
- Ceramic tiles

**Main source of drinking water for household members**
- River/stream/spring/pond/lake
- Water from open well
- Water from covered well/borehole
- Piped water
- Bottled/sachet water

**Main method for sewage disposal**
- Dumped around house
- Refuse dump
- Burned
- Collection

**Main toilet facility for household members**
- No facility/bush
- Pitlatrine with slab
- Ventilated improved Pit
- Latrine Flush Toilet

**What type of fuel does your household normally use for cooking?**
- Firewood
- Saw Dust
- Charcoal
- Kerosene
- LP Gas
- Electricity
- Other

Please Specify

The following questions concern your spiritual or religious beliefs and experience:

15a. How strongly religious (or spiritually-oriented) do you consider yourself to be?
   - Not at all
   - Not very strong
   - Somewhat strong
   - Strong

15b. About how often do you spend time on religious or spiritual practices?
   - Once per year or less
   - Once per month to several times per year
   - Once per week to several times per month
   - Several times per day to several times per week

15c. How often have you felt as though you were very close to a powerful spiritual force?
   - Never
   - Once or twice
   - Several times
   - Often

People have many different images and definitions of the higher power that we often call God. Use your image and your definition of God. When answering the following questions:

15d. How close do you feel to God?
   - I don't believe in God
   - Not very close
   - Somewhat close
   - Extremely close

15e. Have you ever had an experience that has convinced you that God exists?
   - No
   - I don't know
   - May be
   - Yes
15f. Indicate whether you agree or disagree with the statement "God dwells within you"
   ○ Definitely Disagree
   ○ Tend to disagree
   ○ Tend to agree
   ○ Definitely agree

The next series of questions will focus on questions about your level of social support.

16. How many friends do you see or hear from at least once a month?

________________________

17. How many friends could you call on for help? (by help we mean any form of assistance or support given by a friend such as monetary, emotional, physical or spiritual support)

________________________

18. How many family friends could you talk to about personal issues? By personal issues we mean any vital or unsettled problem that affects you. This may be related to finance, health, family, work or any aspect of personal life.

________________________

19. How many family members can you call on for help?

________________________

20. Do you have medical insurance? (NHIS/private medical insurance).
   ○ Yes
   ○ No

21. If Yes, what type?
   ○ NHIS
   ○ Private Insurance
   ○ Both
   ○ Other

The next series of questions will focus on knowledge and attitudes towards kidney disease and transplantation.

22. How long have you had kidney disease?

________________________
23. Do you know what percentage of kidney function you have?
   ○ >60%
   ○ 30-60%
   ○ 15-30%
   ○ <15%
   ○ I don't know

24. Have you heard about kidney transplant before?
   ○ Yes
   ○ No
   ○ Don't Know/Not sure

25. If yes, from who?
   ○ My doctor
   ○ Friend
   ○ Relative
   ○ Social media, literature, news
   ○ Other
   Please Specify

26. Has your doctor ever discussed kidney transplant as an alternative to dialysis with you?
   ○ Yes
   ○ No
   ○ Don't Know/Not sure

27. How long did your doctor talk to you about transplant?
   ○ Didn't talk about transplant.
   ○ <15 minutes
   ○ 15-30 minutes
   ○ Over 30 minutes.
   ○ I don't think the time has come yet.

28. Have you ever been referred for transplant evaluation?
   ○ Yes
   ○ No
29. How would you rate your knowledge about kidney transplant?
   - Haveno knowledge of it
   - Little
   - Average
   - Above average
   - Well informed

30. Are you aware of any transplant centers in centers in Ghana?
   - Yes
   - No
   - Don't Know/Not sure

31. Do you feel that you need to know more about kidney transplant?
   - Yes
   - No
   - Don't Know/Not sure

32. If there is a class about kidney transplant, would you attend?
   - Yes
   - No
   - Don't Know/Not sure

33. Do you know the level of kidney function when a transplant can be done?
   - When the kidney function is less than 20ml/min
   - Only after a patient has started dialysis.
   - I don't know

34. Would you undergo kidney transplant if you are given a chance when the time comes?
   - Yes
   - No
   - Don't Know/Not sure
35. If you answered "No" to question 34 above, please rank how important these factors are in your decision not to undergo a kidney transplant.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Not important</th>
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<th>Important</th>
<th>Very important</th>
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</tr>
</thead>
<tbody>
<tr>
<td>a. I don’t trust the doctors</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>b. I need more time to think and learn about it</td>
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<td>c. Religious concerns</td>
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<td>d. Complications from transplant</td>
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<td>e. Surgical concerns-pain, fear SUGR</td>
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<td>f. CONCERNS</td>
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<td>g. I don’t want somebody else’s organ in my body</td>
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<td>h. I don’t think I’ll ever need it. I feel healthy</td>
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<tr>
<td>i. Financial concerns- not sure how the cost of transplant and medicines will be covered</td>
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</table>

Other Factors?
- Yes
- No

If yes, Please Specify
36. Do you think a living person can donate a kidney to patients needing it?
   ○ Yes
   ○ No
   ○ Don't Know/Not sure

37. Would you prefer a living kidney from a living person or a deceased (a person who has previously died) kidney?
   ○ Deceased Kidney
   ○ Living Kidney
   ○ N/A - I don't want a kidney transplant.
   ○ No preference

38. If you need a kidney transplant, do you think you would be able to ask someone to donate a kidney to you?
   ○ Yes
   ○ No

39. If yes, who would you ask?
   ○ Close Family (spouse, children, parents, siblings)
   ○ Relatives
   ○ Friends
   ○ All of them: Friends or family
   ○ Other
   ○ Please Specify

________________________________________________________________________
40. If no, why is that?
   ○ I am worried of the effects of losing one kidney in them
   ○ I don't want my relatives to know that I have kidney disease
   ○ I don't have anybody to ask
   ○ I feel uncomfortable asking something for myself
   ○ I am not sure how the cost of transplant would be covered
   ○ More than or equal of any two above responses
   ○ Other

Please Specify

____________________________________________________________________________________

41. If you had the opportunity, would you have donated your kidneys?
   ○ Yes
   ○ No
   ○ I am not sure

42. If no, why?
   ○ Fear of surgery
   ○ What if my single kidney fail in future
   ○ I am not healthy overall
   ○ My family won't let me
   ○ Other

Please Specify

____________________________________________________________________________________

43. Do you think that a person's race can affect their chances of getting a kidney transplant?
   ○ Yes
   ○ No
   ○ Don't Know/Not sure

44. If you answered yes to question 43 above, what role do you think race plays in getting a kidney transplant?
   ○ No role
   ○ I think it will help getting a transplant
45. Quality of life refers to how the individual’s wellbeing may be impacted over time by a disease, a disability, or a disorder. How do you think getting a kidney transplant will affect your Quality of life compared with dialysis?

- Will not affect the quality of life
- Improve the quality of life
- Decrease the quality of life
- I don’t know

Next set of questions assesses your willingness to pay for kidney transplantation

46. Assuming you were to pay 106,000 Ghana cedis per head for a kidney transplant, will you be willing to pay?

- Yes
- No
- Don’t Know/Not sure

47. If the premium is set at 96,000 Ghana cedis per head for a kidney transplant, would you be willing to pay?

- Yes
- No
- Don’t Know/Not sure

48. If the premium is set at 86,000 Ghana cedis per head for a kidney transplant, would you be willing to pay?

- Yes
- No
- Don’t Know/Not sure
49. If no to questions 46, 47 and 48, then how much are you willing to pay for this treatment?

50. CKD stage
   - stage 3
   - stage 4
   - stage 5
   - End stage on dialysis

INTERVIEWER’S REMARKS

THANK THE RESPONDENT FOR COMPLETING
Appendix C: Ethical Approval