

**SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA**

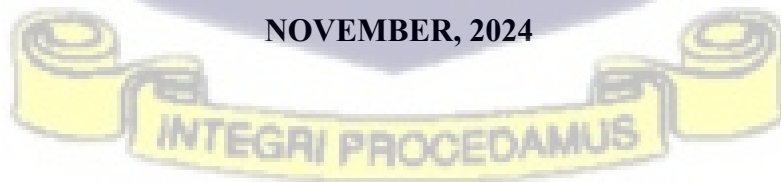


**PREVALENCE AND FACTORS ASSOCIATED WITH HERBAL MEDICINE USE  
AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE AT KORLE-BU  
TEACHING HOSPITAL, GHANA**

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HEALTH DEGREE**

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## DECLARATION

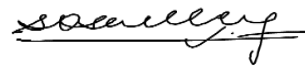
I, Daniel Abugbila, the author of this dissertation, do hereby declare that with the exception of references to the literature and works of other researchers which have been duly cited the work in this dissertation is the result of my original work.

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.....

DATE: 16/10/2025

DATE:16/10/25



## DEDICATION

To God Almighty and my lovely family, your undying love and never-ending support have been my cornerstone and strength. I dedicate this proposal to each of you for your trust and faith in me, encouraging me and always been there for me. Your existence is a blessing to me and I am forever grateful and indebted to you. This dissertation is a testament of the love and bond we share.



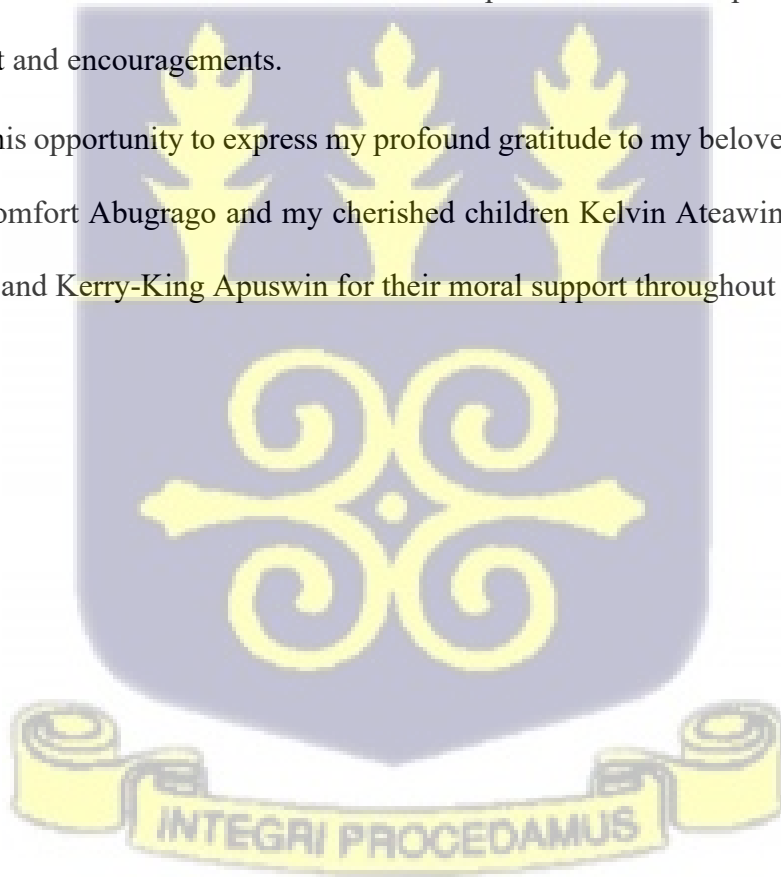
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## ABSTRACT

**Background:** Chronic Kidney Disease (CKD) is a global public health challenge with significant prevalence in Ghana. Despite the increasing reliance on herbal medicine for managing chronic conditions, there is limited research on its use among CKD patients. This study investigates the prevalence, types, factors, and risks associated with herbal medicine use among CKD patients at Korle Bu Teaching Hospital, Ghana.

**Methods:** A cross-sectional study was conducted using records of 245 CKD patients from the Renal Unit of Korle Bu Teaching Hospital. Data on demographics, disease history, and herbal medicine use were extracted through structured data sheets. Descriptive statistics and logistic regression analyses were employed to determine the prevalence and factors associated with herbal medicine use. Ethical approval was obtained, and data confidentiality was ensured.

**Results:** The mean age of participants was  $48.30 \pm 14.61$  years, with a slight female majority (51.4%). Approximately 73.1% (95% CI: 67.0 – 78.5) of CKD patients reported using herbal medicine, with 32.4% being chronic users. Herbal medicines were primarily consumed in leaf form (72.6%), and the main reason for usage was health enhancement (61.2%). Key sources of information included relatives (49%) and media platforms (22.8%). Significant associations were observed between herbal medicine use and factors such as educational level ( $p=0.016$ ), family history ( $p=0.001$ ), friends' usage ( $p<0.001$ ), and awareness of side effects ( $p<0.001$ ). Patients with comorbidities were 1.99 times more likely to use herbal medicine (cOR=1.99, 95% CI: 0.97 – 4.11,  $p=0.006$ ).

**Conclusion:** Herbal medicine use is prevalent among CKD patients in Ghana, driven by socio-demographic and cultural factors. The study highlights the need for healthcare providers to integrate patient education on the potential risks and benefits of herbal medicine into CKD management to ensure patient safety and improve care outcomes.

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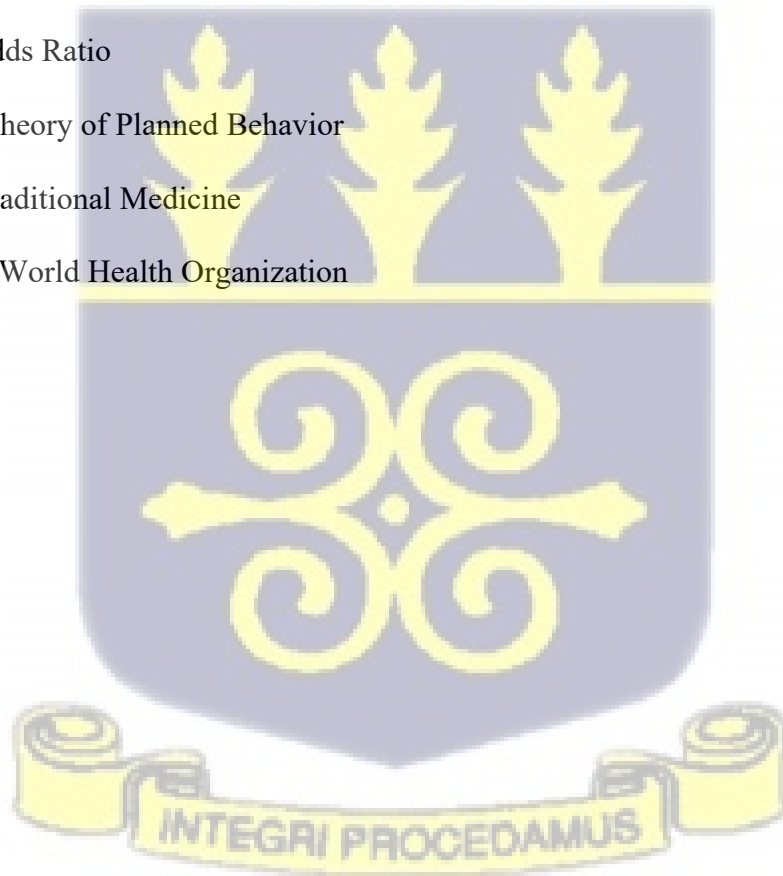
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## LIST OF ABBREVIATIONS

1. Adj OR - Adjusted Odds Ratio
2. AOR - Adjusted Odds Ratio
3. BP – Blood Pressure
4. CKD - chronic kidney disease
5. HIV - Human Immunodeficiency Virus
6. HD – Hemodialysis
7. HTN - Hypertension
8. KBTH - Korle Bu Teaching Hospital
9. KD - Kidney Disease
10. OR - Odds Ratio
11. TPB - Theory of Planned Behavior
12. TM - Traditional Medicine
13. WHO - World Health Organization



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Chronic Kidney Disease (CKD) is a worldwide medical issue, with its prevalence rising in both developed and developing countries. In Ghana, the burden of CKD is exacerbated by the widespread use of herbal remedies deeply rooted in the culture. Herbal medicine is seen as a traditional and easily accessible form of healthcare. However, concerns have been raised about the potential adverse effects of certain herbal preparations on kidney health, necessitating focused investigation (Trivedi & Kumar, 2023). The utilization of traditional medicine in Ghana is influenced by sociocultural preferences and the high cost of modern healthcare, leading individuals to seek more affordable options (Klinghardt, 2023). It is recommended to grant legal recognition and co-recognition to traditional medicine in Ghana, and develop comprehensive training programs (Reid, 2023). Ghana, located on the west coast of Africa, confronts a growing public health challenge with the rising incidence of chronic diseases, including CKD (Adu et al., 2017). While herbal remedies are often perceived as natural and safe, their impact on kidney health has not been comprehensively studied, particularly in the context of the Greater Accra Region.

CKD is generally characterized by a prolonged decline in glomerular filtration rate, persisting over months or years. Globally, an estimated 697.5 million individuals are affected by CKD, with a prevalence rate of 9.1%. Between 1990 and 2017, the overall global prevalence of CKD across all age groups increased by 29.3%, although the age-standardized prevalence remained relatively unchanged during the same period.

In 2017, CKD was responsible for 1.2 million deaths. It remained the biggest cause of death globally (Chen, Knicely & Grams 2019) and CKD consequences, such as anemia, are

connected with an increased risk of death (Fishbane & Spinowitz 2018). The WHO defines traditional medicine as "health practices, approaches, knowledge, and beliefs that incorporate plant, animal, and mineral-based medicines, spiritual therapies, and manual techniques, applied either singly or in combination, to treat, diagnose, and prevent illnesses and maintain well-being." Herbal medicine stands out as the most popular of these techniques, both among the general public and those suffering from chronic illnesses such as CKD (Tassew et al. 2024). The concurrent use of medicinal plants alongside prescribed medications is increasingly prevalent among individuals managing kidney diseases (Jha, 2010; Touiti et al., 2020; Chen, Tsim & Zhao, 2021; Borkar et al., 2022; Khan et al., 2022).

Alternative and indigenous medical systems continue to gain popularity among developing countries. Their usage has also been on the rise in recent times. The occurrence of chronic kidney disease (CKD) in Africa is 15.8%, while in sub-Saharan Africa, it is 13.9% (Kaze et al. 2018). In Ghana, kidney disease (KD) poses a significant public health challenge, with a prevalence rate of 13.3%. Chronic glomerulonephritis, diabetes mellitus, and hypertension are identified as the primary causes (Adje et al., 2018; Tannor et al., 2019). Kidney failure is prevalent, and hemodialysis (HD) remains the most common treatment for survival. Despite hemodialysis being available in Ghana for over 50 years, many individuals with renal failure lack access to this treatment (Tannor et al., 2019). Furthermore, even among those with access to HD, the use of herbal medicine remains common (Adje et al., 2018). In Ghana, individuals utilize a wide range of resources to address their healthcare needs, with approximately 60%-70% depending on traditional medicine, particularly herbal remedies, for primary care (Asase, 2023). However, in comparable sub-Saharan African contexts, the use of herbal medicine has been associated with both acute and chronic kidney injuries, potentially influencing the effectiveness of interventions targeting CKD, either positively or negatively (Stanifer et al., 2014). Gaining insight into the use and practices surrounding Traditional Medicine (TM) is

crucial for crafting effective disease management strategies and implementing targeted public health measures to address the significant regional burden of CKD. Despite its importance, the prevalence and patterns of herbal medicine use among CKD patients in Ghana remain largely understudied. The prevalence and patterns of herbal medicine use among CKD patients in Ghana remain largely unexplored. Existing research has predominantly centered on herbal medicine use among individuals with other chronic conditions, including hypertension, diabetes, and HIV (Laar et al., 2017; James et al., 2018; Shiferaw et al., 2020; Chetty, Govender & Reddy, 2022; Lassale et al., 2022; Asafo-Agyei et al., 2023).

While studies on CKD prevalence exist in Ghana, there is a notable research gap concerning the specific contribution of herbal remedies to kidney diseases. This study aims to bridge this gap by investigating the prevalence of herbal-related CKD in the Greater Accra Region, focusing on the patient population at the Korle Bu Teaching Hospital with CKD (Plange-Rhule et al., 2019). The findings are expected to enhance academic insights into the issue while informing the design of targeted public health interventions to address the specific challenges associated with herbal medicine practices.

## **1.2 Problem statement**

Globally, around 80% of the population depends on herbal medicines as a primary healthcare resource (WHO, 2021). At the same time, chronic kidney disease (CKD) affects an estimated 11–15% of the global population, posing a growing public health concern, particularly in high-income countries (Hoste et al., 2018; Lv & Zhang, 2019). CKD is characterized by gradual loss of kidney function, leading to complications such as hypertension, anemia, cardiovascular disease, and kidney failure. China has made significant progress in researching and applying herbal medicines for CKD management (Lv & Zhang, 2019). In sub-Saharan Africa, the use of traditional medicine among adults with CKD is widespread reported at 70.3% in Tanzania

(Stanifer et al., 2015) and 21.7% in Ethiopia (Animaw et al., 2021). In Ghana, herbal medicine remains a central component of healthcare, with approximately 60–70% of the population relying on it for disease prevention and management, including chronic conditions (Alex et al., 2023). This reliance is largely influenced by perceptions of effectiveness, cultural familiarity, affordability, and accessibility compared to conventional healthcare (Afriyie & Kumi-Kyereme, 2023; Ampomah et al., 2023; Peprah et al., 2019). However, despite the popularity of these traditional remedies, their safety and pharmacological effects on individuals with CKD remain uncertain. Many herbal preparations are either unregulated or poorly standardized, and some contain nephrotoxic compounds that can worsen kidney damage or interfere with prescribed medications (Jha, 2010; Salah et al., 2023).

The continuous use of untested herbal formulations among CKD patients poses a significant threat to treatment outcomes. Herbal remedies may cause nephrotoxicity, electrolyte imbalances, or drug-nutrient interactions, particularly when combined with immunosuppressants or antihypertensive drugs. Inadequate regulation and lack of pharmacovigilance make it difficult to monitor adverse effects. Yet, despite these risks, little is known about the prevalence, patterns, or determinants of herbal medicine use among CKD patients in Ghana. This knowledge gap persists even as the prevalence of CKD continues to rise in the country (Tannor et al., 2023). Existing literature has shown considerable herbal medicine use among other chronic disease groups, such as 18.9% in diabetic patients, 19.5% in hypertensive patients, and 53.2% among people living with HIV (Botchway et al., 2022; Mohammed et al., 2013). These figures point to a widespread dependence on traditional remedies for chronic health conditions, suggesting that CKD patients may exhibit similar or even higher usage patterns. However, the extent and determinants of such use among CKD patients remain largely undocumented in the Ghanaian context. Furthermore, disclosure of herbal medicine use to healthcare providers is often limited. Research indicates that only about

31.8% of patients discuss their herbal medicine use with their physicians (Gracida-Osorno et al., 2023). This lack of communication can lead to clinical complications, including harmful drug-herb interactions, reduced therapeutic efficacy, and difficulties in managing CKD progression. Complementary and alternative medicine (CAM) use is also common among dialysis and transplant patients, reported at 57% and 49%, respectively (Gracida-Osorno et al., 2023). These patterns highlight a pressing need for patient-centered research that considers cultural beliefs, access to care, and communication barriers within the healthcare system.

The central problem, therefore, is the widespread but poorly understood use of herbal medicines among CKD patients in Ghana, despite their potential to exacerbate kidney damage and compromise treatment. The causes include limited access to renal care, high cost of conventional treatment, strong cultural and religious beliefs in herbal efficacy, and inadequate patient education. The consequences include delayed medical intervention, worsening renal function, and increased morbidity and mortality. Understanding these factors is essential to inform safe treatment strategies and improve CKD management outcomes.

By determining the prevalence of herbal medicine use and identifying the sociodemographic, clinical, and psychosocial factors that influence its utilization among CKD patients, this study will contribute to the evidence base for policy and clinical decision-making. The findings will help health professionals develop targeted educational interventions, strengthen patient-provider communication, and guide the integration of safe herbal practices into chronic disease care in Ghana.

### **1.3 Justification**

The aim of this study was to assess the prevalence of herbal product use among patients with kidney diseases. This study seeks to determine the extent of herbal product use among individuals suffering from kidney conditions for various reasons. Patient safety depends on being able to recognize any interactions between herbal products and conventional therapies,

which can be identified with the help of patients' dependence on herbal remedies. In order to provide comprehensive care that incorporates patients' preferences and behaviors, it is imperative to assess the frequency of herbal medicine use given its popularity in many cultures and reported benefits. Documenting the use of herbal products can also help medical professionals provide patients with well-informed guidance and assistance, resulting in comprehensive and successful treatment plans. Recognizing these trends might help inform public health initiatives by emphasizing areas in which herbal product safety and possible dangers education is lacking. In the end, having this knowledge can improve kidney disease management overall and result in improved healthcare results.



#### 1.4 Conceptual framework

The study will utilize the Theory of Planned Behavior (TPB) model, which offers a structured framework for analyzing the factors influencing behavioral intentions, particularly the intention to use herbal medicine. Additionally, numerous studies conducted under diverse spatial and temporal conditions have validated the TPB's strong theoretical foundation, reliability, and validity. According to the TPB, intention is the key determinant in deciding whether or not to engage in a specific behavior. The utilization of herbal medicine by patients with CKD is influenced by a complex interplay of factors. Demographic variables such as age, gender, marital status, religion, and income level significantly shape the likelihood of herbal medicine use. This relationship has been well-documented in various studies, particularly in the African context. A systematic review of herbal medicine across the region identified key demographic characteristics, including female gender, rural residence, longer duration of the disease along with the occurrence of complications, has been identified as significant predictors for the use of herbal medicine (Tassew et al., 2024).

These demographic factors not only influence the probability of using herbal medicine but also influence patients' knowledge and perceptions about these remedies. For instance, research has shown that women tend to possess more knowledge about herbal medicine compared to men, which subsequently impacts their health-seeking behaviors (Zaidi et al., 2022). Knowledge about herbal medicine plays a critical role in shaping how patients with CKD approach their treatment options, guiding decisions that could have profound implications for their health outcomes. Moreover, individuals with a greater understanding of herbal medicine are more likely to use it. This intention is influenced by three primary factors: attitude, subjective norms (such as the availability of alternative healthcare services), and perceived behavioral control (related to health-seeking behavior). Attitude refers to how positively or negatively a person

perceives a specific behavior. Demographic factors, such as age and gender, significantly influence both the knowledge of and the use of herbal medicine.

Understanding these factors that drive herbal medicine use among CKD patients is essential for developing targeted interventions. By recognizing the demographic and knowledge-based determinants of herbal medicine use, healthcare providers can better tailor their educational efforts and support systems to ensure that patients make informed decisions about their treatment options. This, in turn, could lead to improved management of CKD, reducing the risk of complications associated with inappropriate or uninformed use of herbal medicine.

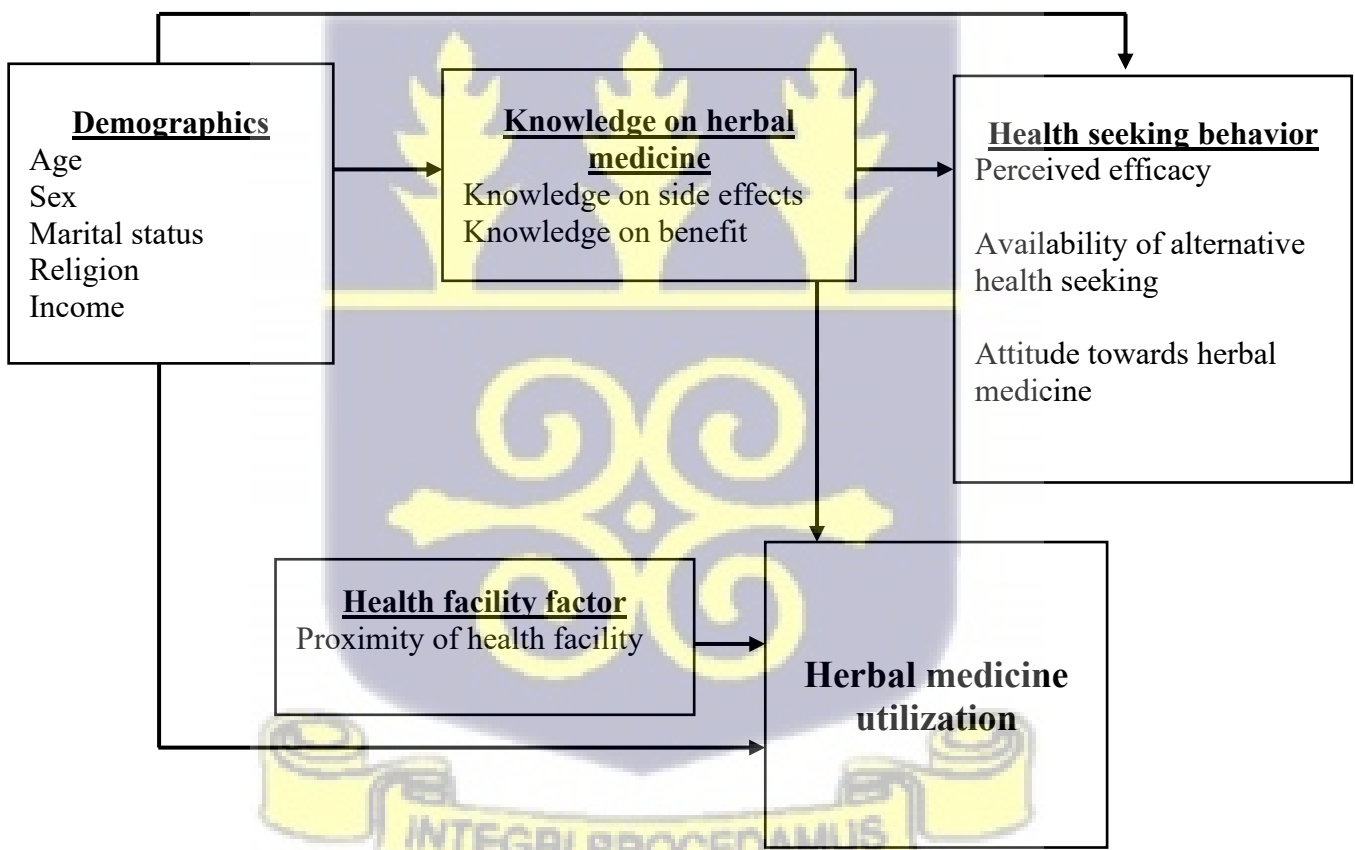


Figure 1: Conceptual Framework for Assessing Herbal Medicine Use and Its Association with Chronic Kidney Disease at Korle-Bu Teaching Hospital

## **1.5 Objectives**

### **1.5.1 General objectives**

To determine prevalence of herbal medicine use and associated risk factors among patients with CKD in Korle-Bu Teaching Hospital.

### **1.5.2 Specific objectives**

1. To determine prevalence of herbal medicine, use among patients with CKD.
2. To identify type of herbal medicines commonly used by CKD patients.
3. To establish factors associated with the use of herbal medicine among CKD patients.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Overview of herbal medicine use in Ghana

For their primary healthcare requirements, between 60% and 70% of Ghanaians turn to traditional medicine, primarily herbal medicine, to manage both communicable and noncommunicable diseases (Mintah et al. 2022). Ghana's population is divided at 1:1200 between traditional healers and doctors, compared to 1:20,000 for medical professionals (Busia, 2007). In 2020, the doctor-to-population ratio in Ghana was 1:6,355, which falls short of the World Health Organization's (WHO) standard of 1:1,320 and the Commonwealth's norm of 1:5,000, despite significant progress over the years (NDPC, 2021). Accessibility, affordability, and trust are some of the reasons why Ghanaians rely so heavily on herbal medication (Asase 2023). Where traditional medicine has not yet been able to effectively treat conditions like diabetes and cancer, herbal medicine shows great promise for managing and curing these illnesses (Cetto 2015). Herbal remedies served as a vital source of hope for many individuals in Ghana and around the world, including China, during the recent COVID-19 pandemic (Ministry of Science and Technology, 2002). Traditional medicine is recognized as a valuable complement to Ghana's healthcare system in the Medium-Term National Development Policy Framework (2022–2025) (NDPC, 2021).

#### 2.2 Prevalence of herbal medicine use among patients with CKD

Rather than evidence-based medications or professional suggestions, religious, cultural, and social considerations have a greater influence on the acceptance of traditional treatments (Alrowais & Alyousefi, 2017). In Morocco, the prevalence of herbal medicine use among CKD patients was reported to be 50.7%. In contrast, a much lower prevalence was found in Saudi Arabia (Ben Salah et al., 2023). A similar study found that 52% of CKD patients used herbal medicine, with 64% of pre-dialysis patients, 33% of dialysis patients, and 40.5% of transplant

recipients reporting its use (Osman et al., 2015). In Palestine, the usage rate was even higher, at 64.4%, with 172 out of 267 patients interviewed having used at least one form of complementary and alternative medicine in the month prior to the interview (Zyoud et al., 2016). A study on complementary and alternative medicine among patients with End-Stage Renal Disease revealed that 36% of participants had used herbal medicine within the month prior to the survey (Birdee et al., 2013). Additionally, another study reported that 128 patients (46.5%) used herbal medicine overall, although no significant differences were observed between CAM users and non-users across different stages of CKD ( $p = 0.156$ ) (Tsai et al., 2024).

Interestingly, the use of herbal medicine in South India was reported to be 66.6% (Castelino et al., 2019). The variations in these findings may be due to differences in study samples, geographic location, or patients' reluctance to disclose their use of herbal medicine to healthcare professionals. Previous studies have indicated that individuals with higher levels of wealth and education are more likely to use herbal medicine. In Tanzania, the prevalence of herbal medicine use among CKD patients was notably high, with one study reporting that 70.3% of adults with CKD used traditional medicine (Stanifer et al., 2015). In another study, half of the patients reported using medicinal plants, with approximately one-third using them specifically for chronic kidney disease. Around two-thirds of these patients believed that medicinal plants were not harmful, while nearly one in every four patients had discontinued allopathic treatment in favor of using only medicinal plants (Herrera-Añazco et al., 2019). However, the Tanzanian study did not specify the types of traditional medicine used. In England, where the social and cultural context differs significantly, 80% of individuals use medicinal plants, although only 51% believe they are completely safe. Nevertheless, 55% consider their harmful effects to be less significant than those of allopathic medicine (Zahn et al., 2019). The use of medicinal plants is also common among high-risk groups, such as

pregnant women. For example, in Mexico, up to 30% of women consume medicinal plants during the first trimester of pregnancy (Stanifer et al., 2017).

### 2.3 Type of herbal medicines commonly used by CKD patients

The most commonly used herbal medicine was Acacia gum, with 81.6% (49) of participants using it, followed by spiritual therapies, which were used by 56.6% (34) of participants (Ben Salah et al., 2023). In another study conducted it was reported that, thymus vulgaris-based anticough and mucolytic products were the most often used formed herbal products, with *Thymus amoenum* (*Echium amoenum*) being the most often used unformulated herb (15.27%). A total of eighteen patients (4.5%) reported using a herbal mix with unknown ingredients (Mohammadi et al., 2020). In another study, herbal and natural products were the most commonly used form of herbal medicine, accounting for 78%, followed by mind and body therapies, which made up 21.6% (Osman et al., 2015).

In another study, it was found that 15.4% of patients (41 individuals) used a single type of herbal medicine, 18.7% used two different types, and 30.3% used more than two types, based on their health status. The most common form of herbal therapy among the patients was herbal remedies (43.5%), followed by diet (22.8%), honey (35.6%), and Islamic exorcism (16.9%) (Zyoud et al., 2016). Similarly, another study highlighted the use of plant-based products for treating kidney disease, including five traditional plant-based medicines: *Aloe vera*, *Commifora africana*, *Cymbopogon citrullus*, *Persea americana*, and *Zanthoxylum chalybeum* (Stanifer et al., 2015).

### 2.4 Factors associated with the use of herbal medicine among CKD patients

The use of herbal medicine among patients with chronic kidney disease (CKD) is shaped by sociodemographic, economic, psychosocial, cultural, and health-system factors. The strength and direction of these factors vary across populations and settings. Several studies have linked herbal medicine use to age, sex, education, and socioeconomic status. Male patients, those who

are unemployed, and individuals whose CKD etiology is unknown are more likely to use herbal medicines (Touiti et al., 2020). Cost reduction (48%), easy access (70%), and perceived efficacy (74%) were the most common reasons reported for herbal use (Touiti et al., 2020). Similarly, 18.6% of CKD patients in another study reported using herbal supplements, with education level showing a significant association (Shamsuddin et al., 2019). This suggests that limited educational attainment may influence perceptions about disease management and treatment options. In contrast, a study conducted in Egypt found that herbal medicine use was higher among men, employed individuals, urban residents, and those with higher income and education levels (Osman et al., 2015). Comparable results were observed in South India, where herbal medicine use was significantly associated with occupational status ( $p = .035$ ) and income ( $p = .006$ ) (Castelino et al., 2019). Furthermore, patients in the early stages of CKD were more likely to use herbal remedies than those with advanced disease (Castelino et al., 2019). These contrasting findings suggest that the predictors of herbal medicine use differ across contexts while in some regions, low income and low education drive use, in others, herbal products are common among urban and higher-income groups. The literature therefore reveals both consistencies and inconsistencies. Some studies associate herbal medicine use with lower socioeconomic status, limited education, and unemployment (Touiti et al., 2020; Shamsuddin et al., 2019), whereas others link it to higher income, education, and urban residence (Osman et al., 2015; Castelino et al., 2019). These differences may be explained by cultural norms, varying health-system access, and the purpose of herbal use whether as an alternative or complementary therapy. Psychosocial and health-system factors also play an important role. Patients often turn to herbal medicine because of dissatisfaction with modern healthcare, perceived ineffectiveness of prescribed drugs, and a preference for “natural” treatments (Al-Faris et al., 2008). Long appointment intervals extended waiting times, and communication barriers with clinicians further contribute to herbal use (Gad et al., 2013). In

some cases, the high cost of conventional medicines and distance to healthcare facilities encourage patients to choose herbal options (Gad et al., 2013). Specific disease symptoms and treatment experiences also influence behavior. For instance, patients with acute skin diseases were significantly more likely to use herbal medicine (AlGhamdi et al., 2015). Although similar evidence among CKD patients is limited, this finding suggests that the type or visibility of symptoms can motivate the use of traditional remedies. In summary, herbal medicine use among CKD patients is a multifactorial phenomenon influenced by demographic, cultural, and systemic factors. While affordability, accessibility, and cultural beliefs consistently predict use, the role of income, education, and occupation differs across studies. These variations highlight the importance of context-specific strategies to promote the safe, informed use of herbal medicines among individuals with CKD.



## CHAPTER THREE

### METHODS

#### 3.1 Introduction

The methodical process for ascertaining the prevalence of herbal related chronic kidney diseases in Ghana is presented in this chapter. It offers a thorough explanation of study design, study site, the study population, inclusion and exclusion criteria, the sampling process, data processing, and ethical considerations.

#### 3.2 Study design

The study employed a cross-sectional survey design, utilizing a records review approach. The minimum cycle for a patient attending the renal clinic is once every three months. A computer-generated random sequence of unique code numbers was created from the sampling frame in the LHIMS (list of patients scheduled for each clinic day). These unique codes were then traced to the corresponding patient folders. Demographic information was collected from the patients' folders or through a questionnaire and recorded in a structured data collection sheet. Data on herbal medicine use, types of herbal medicine consumed, and provisional diagnoses were also reviewed.

#### 3.3 Study site

The Korle-Bu Teaching Hospital (KBTH) was founded in 1923 by Governor Gordon Guggisberg as a colonial hospital for the Gold Coast. Situated in Korle-Gonno, a suburb of Accra in the Ablekuma South constituency, it is Ghana's premier national referral hospital, with a bed capacity of 2,000 and a staff of over 7,000. KBTH serves as a referral center not only for facilities within Ghana but also for neighboring countries in the West African region. The Renal Unit, part of the medical department, operates its clinic on Wednesdays, seeing approximately 20 new patients and an average of 80 patients each clinic day.

### 3.4 Study population

This study included CKD patients seeking health services at the Korle Bu Teaching Hospital.

### 3.5 Inclusion and exclusion criteria

#### 3.5.1 Inclusion criteria

Electronic medical records of all patients who were diagnosed with CKD and are managed at the Korle Bu Teaching Hospital were included in the study

#### 3.5.2 Exclusion criteria

Patients with incomplete medical records were excluded. Incomplete records were defined as those missing key information such as identifying details, diagnosis, or documentation on herbal medicine use. Records without any entry on herbal medicine use were excluded because the variable represented the study's primary outcome.

### 3.6 Sample size determination

The sample size was determined using Cochran's formula for a single population proportion at a 95% confidence level:

$$n = (Z^2 \times p \times (1 - p)) / d^2$$

Where:

$Z = 1.96$  (standard normal deviate corresponding to a 95% confidence level)

$p$  = estimated proportion of herbal medicine use among CKD patients (18.6%)

$d$  = margin of error (0.10)

Substituting the values into the formula gives:

$$\begin{aligned} n &= (1.96^2 \times 0.186 \times (1 - 0.186)) / (0.10^2) \\ &= 232.65 = 233 \end{aligned}$$

Nonresponse rate of 5% (0.05) gives:  $0.05 \times 233 = 11.65 = 12$

Adding 12 to the sample size ( $n$ ) of 233 gives, (*i.e.*  $12 + 233 = 245$ ) Hence, the sample size desired for the study was 245.

### 3.7 Sampling

A simple random sampling method was applied to ensure that each eligible CKD patient record had an equal chance of being selected. The sampling frame comprised all electronic medical records of CKD patients in the Renal Unit database of Korle-Bu Teaching Hospital during the study period (January 2018–December 2023).

The researcher obtained the complete list of patient identification numbers from the hospital's LHIMS database. These IDs were transferred into Microsoft Excel and assigned serial numbers. The *RAND()* function in Excel was used to generate random numbers for each record. The dataset was then sorted based on these random numbers in ascending order, and the first 245 records corresponding to the calculated sample size were selected. The selected folders were then traced manually in the renal records unit, screened for completeness, and extracted using the approved data extraction tool.

### 3.8 Data collection instruments

A standardized data collection sheet was created, organized into three main sections. The first section captured the patients' demographic information, including age, sex, marital status, religion, and other relevant details. The second section focused on disease-related information, such as the cause of renal failure, family history of renal failure, other comorbidities, and drug history from the past two months. The third section addressed the patients' use of herbal and supplemental treatments, including the route of administration and sources of information on herbal medicine.

### 3.9 Data collection

Data was collected and extracted by two trained research assistants from Korle-Bu Teaching Hospital. A Microsoft Excel worksheet was used to manually record key data elements extracted from the register. Following data collection, the data from both research assistants was combined and organized into logical sections, including demographics, medical history,

laboratory investigations, client outcomes, and/or services offered. The data extraction process was completed within one month.

### 3.10 Quality control

To ensure data quality and reliability, the data collection template was pretested. Two research assistants were trained one week before the actual data collection. The data extraction tool was pretested at the Renal Unit of the Greater Accra Regional Hospital, a secondary-level facility in Accra that manages CKD cases similar to those at Korle-Bu Teaching Hospital. The pretest involved 10 patient records and was used to evaluate the clarity, consistency, and completeness of the tool. Feedback from this exercise informed modifications to the data collection format before implementation at Korle-Bu Teaching Hospital.

During data collection, a standardized process was adopted to minimize potential bias. Both research assistants followed a step-by-step procedure under the supervision of the principal investigator and a clinical officer. The steps included:

1. **Retrieval of records:** The assistants obtained the randomly selected patient folders or electronic files from the Renal Unit records office using the generated study codes.
2. **Verification of eligibility:** Each folder was reviewed to ensure it met the inclusion criteria and contained complete information, especially regarding herbal medicine use.
3. **Data extraction:** Relevant variables were carefully transcribed into the standardized data-extraction form.
4. **Cross-checking for accuracy:** At the end of each data collection session, both assistants compared their entries for consistency. Any discrepancies identified were jointly reviewed and resolved.
5. **Daily review and validation:** The completed forms were reviewed daily by the principal investigator and a clinical officer, who corrected any detected errors or inconsistencies.

6. **Data entry and backup:** Verified data were entered into Microsoft Excel and stored in a password-protected folder. A secondary backup copy was maintained on an encrypted external drive to prevent data loss.

### 3.11 Study variables

| Core indicators              | Definition                                                                                 | Scale of measurement     |
|------------------------------|--------------------------------------------------------------------------------------------|--------------------------|
| <b>Dependent variable</b>    |                                                                                            |                          |
| <b>Herbal medicine use</b>   | The use of medications naturally made from plants with little or without industrial effect | <b>Categorical</b>       |
| <b>Independent variables</b> |                                                                                            |                          |
| <b>Sex</b>                   | Defined as male and female                                                                 | <b>Nominal</b>           |
| <b>Age</b>                   | Age at last birth day                                                                      | <b>Numeric/Continues</b> |
| <b>Level of education</b>    | Define as no education, primary, secondary and tertiary                                    | <b>Categorical</b>       |
| <b>Marital status</b>        | This is defined as single, married, divorced/separated and widowed                         | <b>Categorical</b>       |
| <b>Religion</b>              | Define as Christianity, Islamic and traditionalist                                         | <b>Nominal</b>           |
| <b>Clinical variables</b>    |                                                                                            |                          |
| <b>Comorbidities</b>         | Other medical diagnosis alongside CKD                                                      | <b>Categorical</b>       |

### 3.12 Data Management and Data Analysis

#### 3.12.1 Data Processing and Management

Data extracted from medical records were double-entered into Microsoft Excel 2019 and cross-verified for accuracy. The final dataset was exported to Stata version 16/SE for cleaning and analysis. Data cleaning involved identifying and correcting duplicate entries, standardizing variable formats, and checking for inconsistencies between demographic and clinical fields. Missing data were treated using listwise deletion for non-critical variables and cross-validation with corresponding hospital records where possible.

Continuous variables such as age were assessed for normality and transformed where necessary. Derived variables were created for categorical analyses, including binary variables (e.g., herbal medicine use: Yes/No; comorbidity: Yes/No) and grouped variables (e.g., education level, income category). Data from multiple extraction sheets were merged using a unique patient identifier. No imputation was performed for the primary outcome variable. All datasets were stored in password-protected folders accessible only to the investigator and supervisor

### **3.12.2 Data Analysis**

Data was entered into Kobo-Collect and exported to Stata 16/SE for analysis. Means and standard deviations were used to summarize continuous variables. Frequencies and proportions were used to summarize and describe categorical variables. Relationship between herbal medicine consumption among patients and socio-demographic characteristics were analysed using Chi-Square test. Logistic regression models were used to assess factors associated with herbal medicine use among CKD patient.

### **3.13 Ethical consideration**

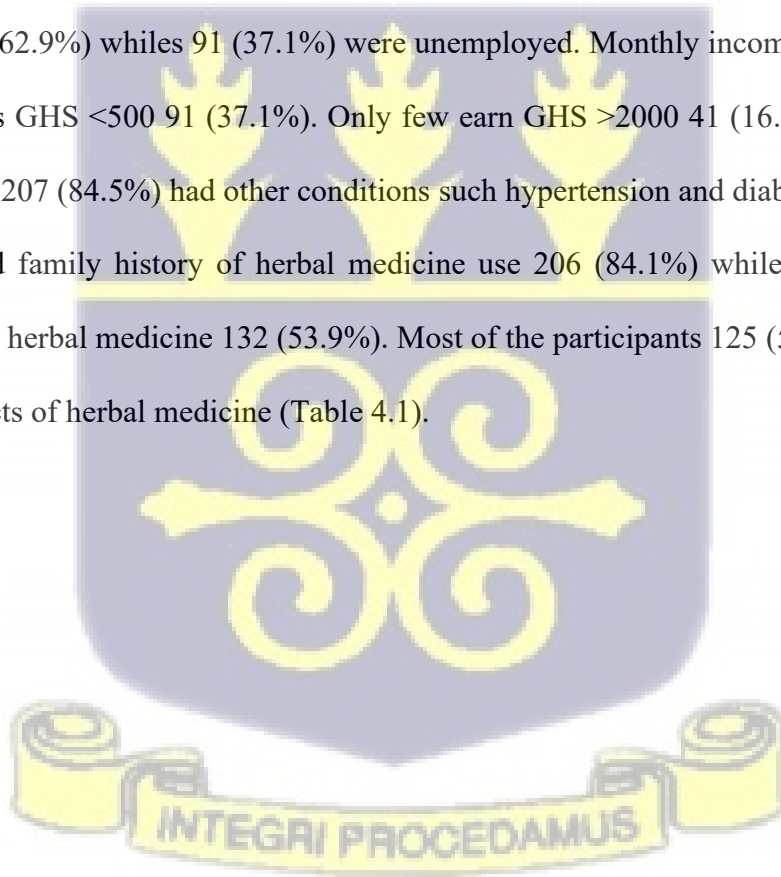
Ethical approval for the study was obtained from KBTH. Written informed consent was sought from all eligible participants after explaining the study's aims, objectives, benefits, risks, and procedures involved. Participants were informed that their involvement was entirely voluntary, and they could withdraw at any time. The collected data was securely stored, with access limited to the principal investigator and supervisor. To ensure anonymity, participants were identified only by codes and numbers, rather than their names, during and after the data collection process.

## CHAPTER FOUR

### RESULTS

#### 4.1 Background characteristics

The mean age of participants was  $48.30 \pm 14.61$  years. Of the 245 participants, most 96 (39.2%) were aged 30 – 49 years and few were aged 15 – 29 years 31 (12.6%). There were more females 126 (51.4%) than males 119 (48.6%). Most of the participants were married 128 (52.2%) at the time of the survey. Only few were single 70 (28.6%), divorced 23 (9.3%) or widowed 24 (9.8%). At the time of the survey, most of the participants attained senior high level of education 76 (31%). About 30 (12.2%) not educated. Further, most of the participants were employed 154 (62.9%) whiles 91 (37.1%) were unemployed. Monthly income for most of the participants was GHS <500 91 (37.1%). Only few earn GHS >2000 41 (16.7%). Majority of the participants 207 (84.5%) had other conditions such hypertension and diabetes. Most of the participants had family history of herbal medicine use 206 (84.1%) whiles about half had friends who use herbal medicine 132 (53.9%). Most of the participants 125 (51%) were aware of the side effects of herbal medicine (Table 4.1).



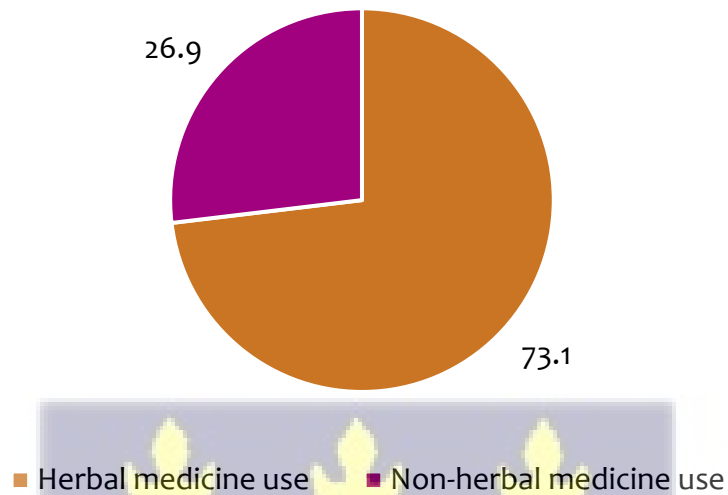
**Table 4.1 Background characteristics**

| Characteristics                                  | Frequency          | Percentage |
|--------------------------------------------------|--------------------|------------|
|                                                  | N = 245            | %          |
| <b>Age group (In years)</b>                      |                    |            |
| 15 – 29                                          | 31                 | 12.6       |
| 30 – 49                                          | 96                 | 39.2       |
| 50 – 69                                          | 96                 | 29.2       |
| 70 – 89                                          | 22                 | 9.0        |
| <b>Mean (±SD)</b>                                | <b>48.30±14.61</b> |            |
| <b>Sex</b>                                       |                    |            |
| Female                                           | 126                | 51.4       |
| Male                                             | 119                | 48.6       |
| <b>Marital status</b>                            |                    |            |
| Single                                           | 70                 | 28.6       |
| Married                                          | 128                | 52.2       |
| Divorced                                         | 23                 | 9.3        |
| Widowed                                          | 24                 | 9.8        |
| <b>Educational level</b>                         |                    |            |
| No formal education                              | 30                 | 12.2       |
| Primary                                          | 22                 | 8.9        |
| JHS                                              | 37                 | 15.1       |
| SHS                                              | 76                 | 31.0       |
| Tertiary                                         | 30                 | 12.2       |
| <b>Employment status</b>                         |                    |            |
| Unemployed                                       | 154                | 62.9       |
| Employed                                         | 91                 | 37.1       |
| <b>Monthly Income (GHS)</b>                      |                    |            |
| <500                                             | 91                 | 37.1       |
| 500 – 1000                                       | 48                 | 19.6       |
| 1000 – 1500                                      | 34                 | 13.9       |
| 1500 – 2000                                      | 31                 | 12.7       |
| >2000                                            | 41                 | 16.7       |
| <b>Commodity (Hypertension, diabetes, etc.)</b>  |                    |            |
| No                                               | 38                 | 15.5       |
| Yes                                              | 207                | 84.5       |
| <b>Family history of herbal medicine use</b>     |                    |            |
| No                                               | 39                 | 15.9       |
| Yes                                              | 206                | 84.1       |
| <b>Have friends who use herbal medicine</b>      |                    |            |
| No                                               | 113                | 46.1       |
| Yes                                              | 132                | 53.9       |
| <b>Awareness of herbal medicine side effects</b> |                    |            |
| Yes                                              | 125                | 51.0       |
| No                                               | 78                 | 31.8       |
| Don't know                                       | 42                 | 17.2       |

*Table 1: Background characteristics*

#### 4.2 Prevalence of herbal medicine use

Of the 200 participants, 73.1% (95% CI: 67.0 – 78.5) consumes herbal medicine while 26.9% (95% CI: 21.4 – 32.9) did not use herbal medicine.

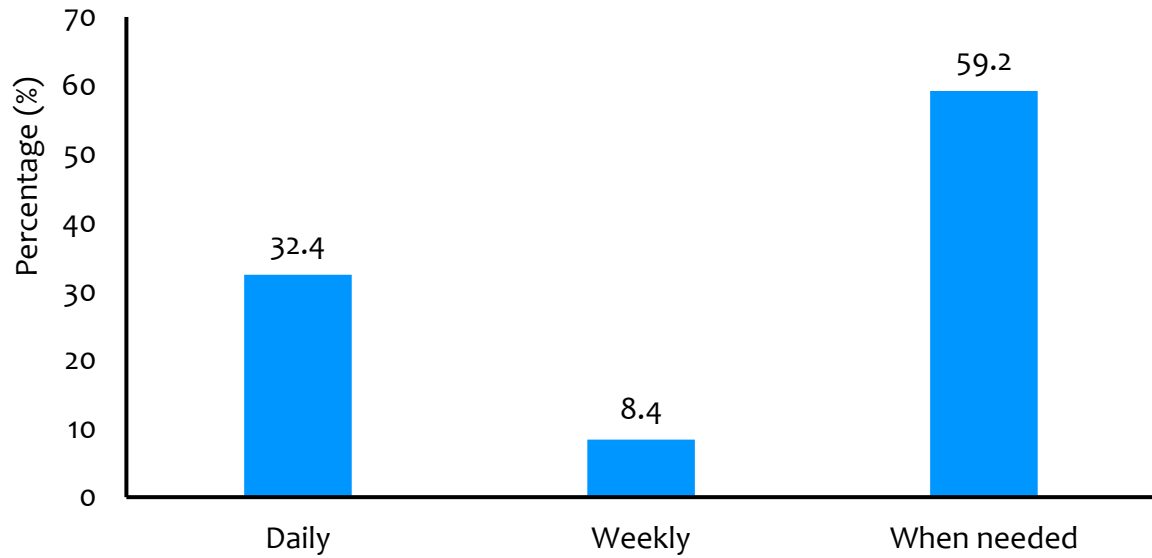


**Figure 4.1 Prevalence of herbal medicine use**

*Figure 2: Prevalence of herbal medicine use*

Of the 179 participants who consumed herbal medicine, 32.4% (95% CI: 25.6 – 39.8) were chronic users, thus consumes herbal medicine daily while 8.4% (95% CI: 4.7 – 13.4) consume weekly. However, about 59.2% (95% CI: 51.6 – 66.4) consume herbal medicine when needed



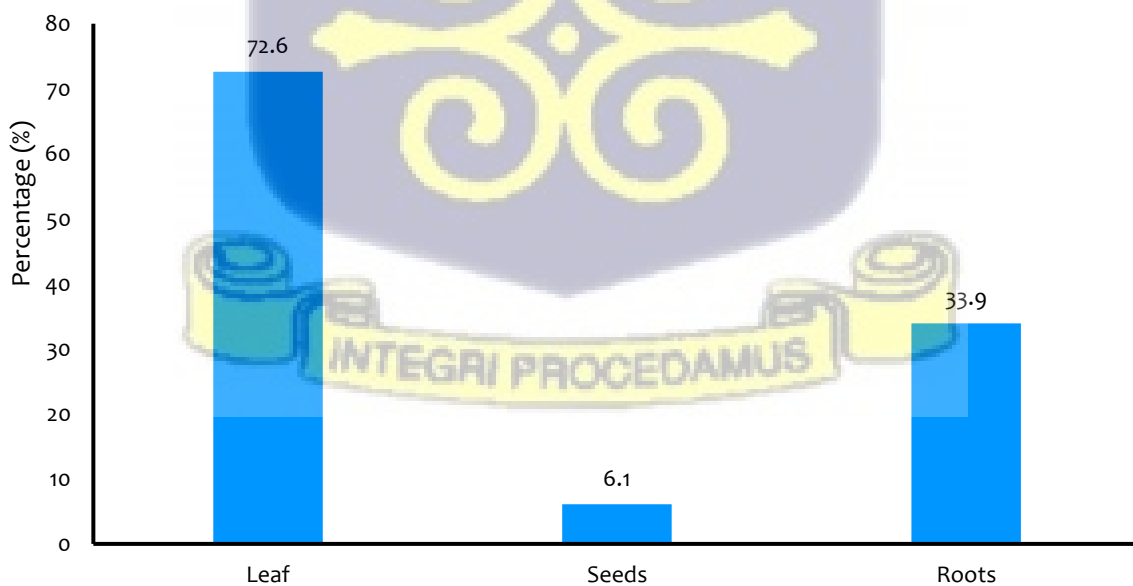


**Figure 4.2 Frequency of herbal medicine use**

*Figure 3: Frequency of herbal medicine use*

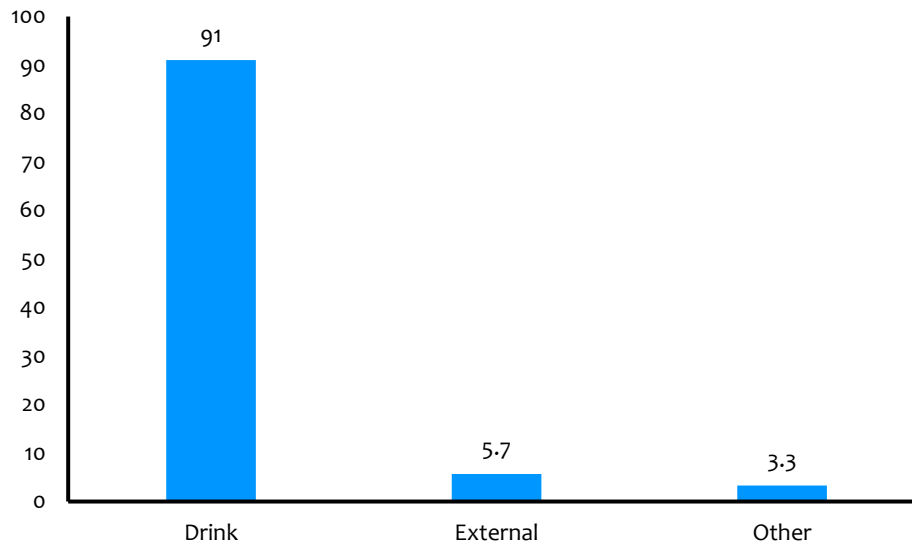
#### 4.3 Types of herbal medicine consumed

Of the 179 patients who consume herbal medicine, majority take herbal medicine in a leaf form (72.6%: 95% CI 66.6 – 78.1) whiles 6.1% (95% CI: 3.5 – 9.8) and 33.9% (95% CI: 27.9 – 40.2) consume herbal medicine in seeds and root forms respectively.



**Figure 4.3 Forms of herbal medicine consumption**

Figure 4: *Forms of herbal medicine consumption*



#### 4.4 Reason for herbal medicine consumption

Of the 179 patients who consume herbal medicine, 61.2% (95% CI: 54.8 – 67.4) consume to enhance health whiles 27.8% (95% CI: 22.2 – 33.8) consume to treatment of the disease. Others consume herbal medicine to enhance physical functions and cosmetic purposes (2.4%: 95% CI: 0.5 – 12.8).

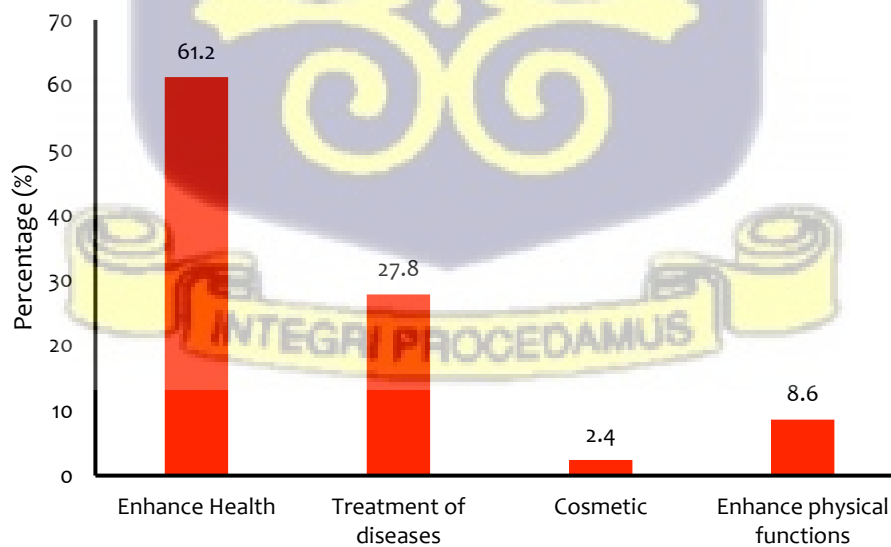


Figure 4.4 Reasons for herbal medicine use

Figure 5: Reasons for herbal medicine use

#### 4.5 Sources of information on herbal medicine

Most of the participants obtain information on herbal medicine from parents and relatives (49%; 95% CI: 42.5 – 55.4). Others obtain from friends and colleagues (15.1%; 95% CI: 10.8 – 20.2), TV and scientific programs (22.8%; 95% CI: 17.7 – 28.6), doctors and herbalists (5.7%; 95% CI: 3.2 – 9.4), internet and social media (13.5%; 95% CI: 9.5 – 18.4) and from studying learning (9.8%; 95% CI: 6.4 – 14.2).

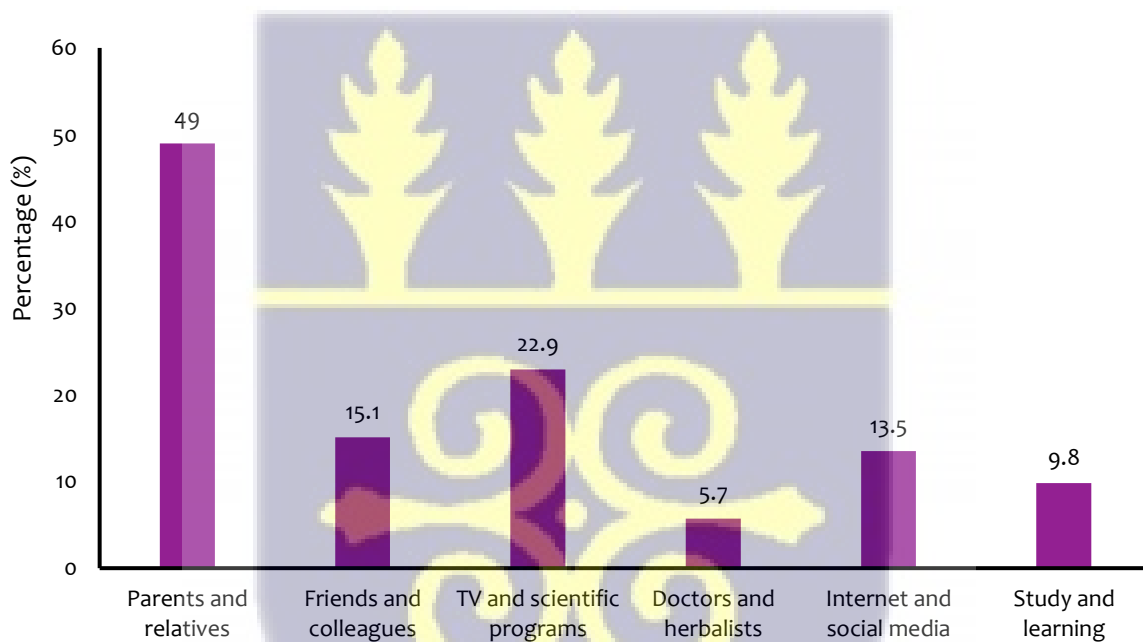


Figure 4.6 Sources of information on herbal medicine

Figure 6: Sources of information on herbal medicine

#### 4.6 Association between herbal medicine use and background characteristics

Chi-square and Fisher's exact tests were performed to examine the relationship between herbal medicine use and various background characteristics. The results showed a significant association between education level and the use of herbal medicine ( $p=0.016$ ). Additionally,

significant associations were found between herbal medicine use and having a family history of herbal medicine use ( $p=0.001$ ), having friends who use herbal medicine ( $p<0.001$ ), and awareness of the side effects of herbal medicine ( $p<0.001$ ).

**Table 4.2 Association between herbal medicine use and background characteristics**

| Characteristics                                  | No        | Yes        | p-value |
|--------------------------------------------------|-----------|------------|---------|
|                                                  | [n=66]    | [n=179]    |         |
| <b>Age group</b>                                 |           |            |         |
| 15 – 29                                          | 11 (16.7) | 20 (11.2)  | 0.335   |
| 30 – 49                                          | 21 (31.8) | 75 (41.9)  |         |
| 50 – 69                                          | 26 (39.4) | 70 (39.1)  |         |
| 70 – 89                                          | 8 (12.1)  | 14 (7.8)   |         |
| <b>Sex</b>                                       |           |            |         |
| Female                                           | 28 (42.4) | 98 (54.8)  | 0.087   |
| Male                                             | 28 (57.6) | 81 (45.2)  |         |
| <b>Marital status</b>                            |           |            |         |
| Single                                           | 20 (30.3) | 50 (27.9)  | 0.338   |
| Married                                          | 29 (43.9) | 99 (55.3)  |         |
| Divorced                                         | 8 (12.1)  | 15 (8.4)   |         |
| Widowed                                          | 9 (13.6)  | 15 (8.4)   |         |
| <b>Educational level</b>                         |           |            |         |
| No formal education                              | 7 (10.6)  | 23 (12.8)  | 0.016   |
| Primary                                          | 3 (4.6)   | 19 (10.6)  |         |
| JHS                                              | 12 (18.2) | 25 (14.0)  |         |
| SHS                                              | 13 (19.7) | 63 (35.2)  |         |
| Tertiary                                         | 31 (19.7) | 63 (35.2)  |         |
| <b>Employment status</b>                         |           |            |         |
| Unemployed                                       | 29 (43.9) | 62 (34.6)  | 0.181   |
| Employed                                         | 37 (56.1) | 117 (65.4) |         |
| <b>Income</b>                                    |           |            |         |
| <500                                             | 29 (43.9) | 62 (34.6)  | 0.331   |
| 500 – 1000                                       | 11 (16.7) | 37 (20.7)  |         |
| 1000 – 1500                                      | 5 (7.6)   | 29 (16.2)  |         |
| 1500 – 2000                                      | 8 (12.1)  | 23 (12.8)  |         |
| <2000                                            | 13 (19.7) | 28 (15.6)  |         |
| <b>Commodity (Hypertension, diabetes etc)</b>    |           |            |         |
| No                                               | 15 (22.7) | 23 (12.9)  | 0.058   |
| Yes                                              | 51 (77.3) | 156 (87.2) |         |
| <b>Family history of herbal medicine use</b>     |           |            |         |
| No                                               | 2 (3.0)   | 37 (20.7)  | 0.001   |
| Yes                                              | 64 (97.0) | 142 (79.3) |         |
| <b>Have friends who use herbal medicine</b>      |           |            |         |
| No                                               | 3 (4.5)   | 110 (61.5) | <0.001  |
| Yes                                              | 63 (95.5) | 69 (38.5)  |         |
| <b>Awareness of herbal medicine side effects</b> |           |            |         |
| Yes                                              | 63 (95.5) | 62 (34.6)  | <0.001  |
| No                                               | 0 (0)     | 78 (43.6)  |         |
| Don't know                                       | 3 (4.6)   | 39 (21.8)  |         |

Table 2: Association between herbal medicine use and background characteristics

#### 4.7 Factors associated with herbal medicine

##### 4.7.1 Binary logistic regression

In the univariate logistic regression, patients with comorbidities were 1.99 times more likely to use herbal medicine compared to those without any other conditions [cOR=1.99; 95% CI: 0.97 – 4.11,  $p=0.006$ ]. Additionally, patients with a family history of herbal medicine consumption were 1.12 times more likely to use herbal medicine [cOR=1.12; 95% CI: 1.02 – 3.51,  $p=0.004$ ]. Patients with friends who consumed herbal medicine were 1.03 times more likely to use herbal medicine [cOR=1.03; 95% CI: 1.01 – 6.10,  $p<0.001$ ]. Finally, patients who were unaware of the side effects of herbal medicine were 13.1 times more likely to use herbal medicine [cOR=13.12; 95% CI: 11.23 – 15.10,  $p<0.001$ ].



**Table 4.3 Factors associated with herbal medicine use**

| <b>Characteristics</b>                           | <b>cOR</b> | <b>95% CI</b>   | <b>p-value</b> |
|--------------------------------------------------|------------|-----------------|----------------|
| <b>Age group</b>                                 |            |                 |                |
| 15 – 29                                          |            |                 |                |
| 30 – 49                                          | 1.96       | [0.81 – 4.73]   | 0.133          |
| 50 – 69                                          | 1.48       | [0.62 – 3.51]   | 0.372          |
| 70 – 89                                          | 0.96       | [0.31 – 3.00]   | 0.948          |
| <b>Sex</b>                                       |            |                 |                |
| Female                                           |            |                 |                |
| Male                                             | 0.61       | [0.34 – 1.07]   | 0.088          |
| <b>Marital status</b>                            |            |                 |                |
| Single                                           |            |                 |                |
| Married                                          | 1.36       | [0.70 – 2.65]   | 0.357          |
| Divorced                                         | 0.75       | [0.27 – 2.04]   | 0.574          |
| Widowed                                          | 0.67       | [0.25 – 1.76]   | 0.415          |
| <b>Educational level</b>                         |            |                 |                |
| No formal education                              |            |                 |                |
| Primary                                          | 1.93       | [0.43 – 8.49]   | 0.386          |
| JHS                                              | 0.63       | [0.21 – 1.88]   | 0.413          |
| SHS                                              | 1.47       | [0.52 – 4.15]   | 0.462          |
| Tertiary                                         | 0.48       | [0.18 – 1.25]   | 0.134          |
| <b>Employment status</b>                         |            |                 |                |
| Unemployed                                       |            |                 |                |
| Employed                                         | 1.47       | [0.83 – 2.69]   | 0.182          |
| <b>Income</b>                                    |            |                 |                |
| <500                                             |            |                 |                |
| 500 – 1000                                       | 1.57       | [0.70 – 3.51]   | 0.270          |
| 1000 – 1500                                      | 2.71       | [0.95 – 7.72]   | 0.062          |
| 1500 – 2000                                      | 1.34       | [0.53 – 3.36]   | 0.527          |
| <2000                                            | 1.07       | [0.45 – 2.22]   | 0.985          |
| <b>Commodity (Hypertension, diabetes etc)</b>    |            |                 |                |
| No                                               |            |                 |                |
| Yes                                              | 1.99       | [0.97 – 4.11]   | 0.006          |
| <b>Family history of herbal medicine use</b>     |            |                 |                |
| No                                               |            |                 |                |
| Yes                                              | 1.12       | [1.02 – 3.51]   | 0.004          |
| <b>Have friends who use herbal medicine</b>      |            |                 |                |
| No                                               |            |                 |                |
| Yes                                              | 1.03       | [1.01 – 6.10]   | <0.001         |
| <b>Awareness of herbal medicine side effects</b> |            |                 |                |
| No                                               |            |                 |                |
| Yes                                              | 0.51       | [0.90 – 12.45]  | 0.004          |
| Don't know                                       | 13.12      | [11.23 – 15.10] | <0.001         |

*Table 3: Factors associated with herbal medicine use*

#### 4.7.2 Multivariate logistic regression

In the multivariate logistic regression, patients with comorbidities were 2.34 times more likely to use herbal medicine compared to those without any other conditions [aOR=2.34; 95% CI: 0.45 – 12.12, p=0.010]. Additionally, patients with friends who consumed herbal medicine were 1.06 times more likely to use herbal medicine [aOR=1.06; 95% CI: 1.08 – 1.56, p<0.001].

Table 4: Factors associated with herbal medicine use

**Table 4.4 Factors associated with herbal medicine use**

| Characteristics                               | aOR   | 95% CI         | p-value |
|-----------------------------------------------|-------|----------------|---------|
| <b>Age group</b>                              |       |                |         |
| 15 – 29                                       |       |                |         |
| 30 – 49                                       | 0.24  | [0.03 – 1.82]  | 0.168   |
| 50 – 69                                       | 0.09  | [0.01 – 0.92]  | 0.142   |
| 70 – 89                                       | 0.04  | [0.05 – 0.22]  | 0.106   |
| <b>Sex</b>                                    |       |                |         |
| Female                                        |       |                |         |
| Male                                          | 2.22  | [0.66 – 7.45]  | 0.196   |
| <b>Marital status</b>                         |       |                |         |
| Single                                        |       |                |         |
| Married                                       | 8.27  | [1.57 – 43.51] | 0.113   |
| Divorced                                      | 8.37  | [0.79 – 88.45] | 0.077   |
| Widowed                                       | 1.29  | [0.12 – 13.05] | 0.825   |
| <b>Educational level</b>                      |       |                |         |
| No formal education                           |       |                |         |
| Primary                                       | 10.56 | [0.68 – 16.32] | 0.091   |
| JHS                                           | 4.58  | [0.38 – 54.49] | 0.228   |
| SHS                                           | 2.40  | [0.22 – 26.13] | 0.472   |
| Tertiary                                      | 0.62  | [0.05 – 7.54]  | 0.706   |
| <b>Employment status</b>                      |       |                |         |
| Unemployed                                    |       |                |         |
| Employed                                      | 9.06  | [0.43 – 19.29] | 0.157   |
| <b>Income</b>                                 |       |                |         |
| <500                                          |       |                |         |
| 500 – 1000                                    | 0.46  | [0.02 – 12.22] | 0.646   |
| 1000 – 1500                                   | 3.25  | [0.15 – 66.47] | 0.444   |
| 1500 – 2000                                   | 0.05  | [0.01 – 2.09]  | 0.117   |
| >2000                                         | 0.33  | [0.02 – 8.86]  | 0.515   |
| <b>Commodity (Hypertension, diabetes etc)</b> |       |                |         |
| No                                            |       |                |         |
| Yes                                           | 2.34  | [0.45 – 12.12] | 0.010   |
| <b>Family history of herbal medicine use</b>  |       |                |         |

|                                             |      |                |        |
|---------------------------------------------|------|----------------|--------|
| No                                          |      |                |        |
| Yes                                         | 1.37 | [0.04 – 4.91]  | 0.457  |
| <b>Have friends who use herbal medicine</b> |      |                |        |
| No                                          |      |                |        |
| Yes                                         | 1.06 | [1.081 – 1.56] | <0.001 |

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## CHAPTER FIVE

### DISCUSSION

#### 5.1 Prevalence of herbal medicine use among patients with CKD

Herbal supplements are typically not recommended for individuals with renal conditions. However, recent studies have highlighted the potential preventive role of herbal therapy in chronic kidney disease (CKD), whether used as a single herb or in a formulated mixture. The objective of this study is to assess the prevalence of herbal medicine use and identify the related risk factors among CKD patients at KBTH. The findings indicate that 7 out of 10 patients seeking healthcare at the hospital use herbal medicine, with approximately 60% consuming it to improve their health. Consumption of herbal medicine in this study was however higher than what was reported in Morocco (50.7%) (Touiti et al., 2020a), Palestine (64.4%) (Zyoud et al., 2016), India (66.6%) (Castelino et al., 2019). Also, in Iran, 63% of haemodialysis patients reported using herbal medicines (Roozbeh et al., 2013). When taken as a whole, these results made it abundantly evident that people with renal illness frequently use herbal medicines. The variations in findings across different studies on herbal medicine use can be attributed to factors such as differences in study populations, geographic locations, or patients' hesitance to report their use of herbal remedies to healthcare professionals. Despite these differences, similar trends have been observed in other regions. For instance, in Tanzania, a study found that 70.3% of adults with CKD used traditional medicine (Stanifer et al., 2015a). The high prevalence of herbal medicine use in this study may be partly due to around half of the participants being unaware of the potential side effects associated with these remedies.

Similarly, having close friends and relatives who consume herbal medicine could also be a factor as this study found about 80% of relatives and friends being major consumers of herbal medicine. Another study highlighted that limited awareness of the disease among individuals

with CKD may play a role in the widespread use of herbal medicine within this group. This could be indicative of their overall poorer health or their belief that their health condition is more severe (Stanifer et al., 2015).

Again, having other conditions could also increase the use of herbal medicine since over 80% of the patients had comorbid conditions. This has been reported in other study where comorbidity is associated with an increased prevalence of concomitant herbal medicine use (Mbali et al., 2021).

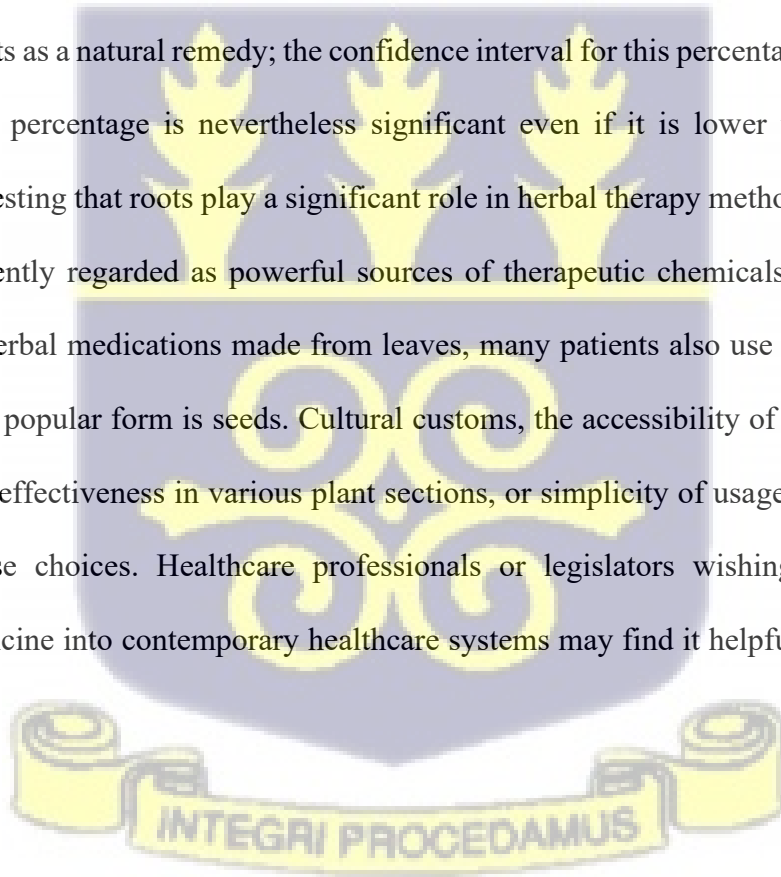
## **5.2 Factors associated with the use of herbal medicine among CKD patients**

Other findings from this study indicated that herbal medicine use among CKD patients was associated with medical conditions and having friends who also use herbal medicine. Patients with other medical conditions, such as hypertension and diabetes, were more likely to use herbal medicine than those without additional health issues. This observation is consistent with earlier studies, which indicated that individuals with hypertension frequently use herbal remedies to address a range of health concerns. Common reasons for using herbal medicine in these studies included regulating blood pressure, managing hypertension-related comorbidities, and reducing side effects from prescribed medications, such as frequent urination, headaches, and fatigue (Joshi & Dahake, 2010). This is consistent with the current study, where about 27% of patients reported using herbal medicine to treat diseases. Additionally, individuals with comorbid conditions may use herbal medicine for various reasons, including cultural or traditional beliefs, the perception that herbal remedies are safer and more natural than pharmaceuticals, and the affordability and accessibility of treatments for multiple conditions. Further, in this study, patients with friends who consume herbal medicine were also more likely to consume herbal medicine. This could be that, patients with friends who consume herbal medicine are more likely to use it themselves, likely due to social influence and shared beliefs. Also, peer recommendations, positive experiences, and trust in the advice of friends can

encourage patients to try herbal remedies, especially if they perceive them as effective or more natural. This social dynamic can play a significant role in shaping healthcare decisions, particularly in communities where traditional or herbal medicine is commonly accepted.

### **5.3 Type of herbal medicines commonly used by CKD patients**

In this study, herbal medicine in a leaf, seeds and roots forms were commonly consumed by patients with CKD. The use of herbal medicine in a leaf form was consumed by 7 in 10 patients. However, with a confidence interval of 3.5% to 9.8%, only 6.1% of patients take herbal medicine in seed form. This implies that the use of seeds as an herbal remedy is comparatively uncommon among these patients, which may be explained by unfamiliarity, processing challenges, or the belief that seeds are less potent than other forms. Remarkably, 33.9% of patients use roots as a natural remedy; the confidence interval for this percentage is from 27.9% to 40.2%. This percentage is nevertheless significant even if it is lower than that of leaf ingestion, suggesting that roots play a significant role in herbal therapy methods as well. Since roots are frequently regarded as powerful sources of therapeutic chemicals. Although most people prefer herbal medications made from leaves, many patients also use cures made from roots. The least popular form is seeds. Cultural customs, the accessibility of particular plants, their perceived effectiveness in various plant sections, or simplicity of usage may all have an impact on these choices. Healthcare professionals or legislators wishing to incorporate traditional medicine into contemporary healthcare systems may find it helpful to comprehend these factors.



## CHAPTER SIX

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusion

In this study 7 in 10 CKD patients use herbal medicine, with the primary reasons being to enhance health and to treat disease. The multivariate logistic regression analysis indicated that patients with comorbid conditions were more likely to use herbal medicine than those without such conditions. Furthermore, individuals whose friends used herbal medicine were 1.06 times more likely to use it themselves. These results emphasize the impact of both health status and social influences on herbal medicine consumption.

#### 6.2 Recommendations

Healthcare providers should incorporate discussions about herbal medicine into patient consultations, especially for those with comorbidities. This approach will help ensure the safe use of herbal remedies and prevent potential interactions with prescribed medications. Providers should educate patients with evidence-based information on both the benefits and risks associated with herbal treatments, empowering them to make informed choices regarding their health.

Hospital administrators also have a role in raising awareness about the safe use of herbal medicine. Implementing social campaigns can encourage patients to disclose their herbal consumption to healthcare providers, which will promote better patient care. Additionally, efforts should be made towards regulating and standardizing herbal products to ensure their safety, quality, and efficacy.

## REFERENCES

- Aboyade, O.M., Beauclair, R., Mbamalu, O.N., Puoane, T.R. & Hughes, G.D., 2016, 'Health-seeking behaviours of older black women living with non-communicable diseases in an urban township in South Africa', *BMC Complementary and Alternative Medicine*, 16(1).
- Adjei, D.N., Stronks, K., Adu, D., Beune, E., Meeks, K., Smeeth, L., Addo, J., Owuso-Dabo, E., Klipstein-Grobusch, K., Mockenhaupt, F.P., Schulze, M.B., Danquah, I., Spranger, J., Bahendeka, S., De-Graft Aikins, A. & Agyemang, C., 2018, 'Chronic kidney disease burden among African migrants in three European countries and in urban and rural Ghana: The RODAM cross-sectional study', *Nephrology Dialysis Transplantation*, 33(10), 1812–1822.
- Ampomah, I.G., Malau-Aduli, B.S., Seidu, A.A., Malau-Aduli, A.E.O. & Emeto, T.I., 2023, 'Integrating traditional medicine into the Ghanaian health system: perceptions and experiences of traditional medicine practitioners in the Ashanti region', *International Health*, 15(4), 414–427.
- Asafo-Agyei, T., Appau, Y., Barimah, K.B. & Asase, A., 2023, 'Medicinal plants used for management of diabetes and hypertension in Ghana', *Heliyon*, 9(12).
- Asase, A., 2023, 'Ghana's herbal medicine industry: prospects, challenges and ways forward from a developing country perspective', *Frontiers in Pharmacology*, 14.
- Borkar, P., Yadav, V., Tiwari, R.R. & Samarth, R.M., 2022, *A systematic review of potential candidates of herbal medicine in treatment of chronic kidney disease*, *Phytomedicine Plus*, 2(4).

Botchway, M., Davis, R.E., Appiah, L.T., Moore, S. & Merchant, A.T., 2022, 'The Influence of Religious Participation and Use of Traditional Medicine on Type 2 Diabetes Control in Urban Ghana', *Journal of Religion and Health*, 61(3), 1966–1979.

Chen, J., Tsim, K.W.K. & Zhao, Y.Y., 2021, *Editorial: Applications of Herbal Medicine to Control Chronic Kidney Disease*, *Frontiers in Pharmacology*, 12.

Chen, T.K., Knicely, D.H. & Grams, M.E., 2019, *Chronic Kidney Disease Diagnosis and Management: A Review*, *JAMA - Journal of the American Medical Association*, 322(13), 1294–1304.

Chetty, L., Govender, N. & Reddy, P., 2022, 'Traditional Medicine Use among Type 2 Diabetes Patients in KZN', *Advances in Public Health*, 2022.

Fishbane, S. & Spinowitz, B., 2018, 'Update on Anemia in ESRD and Earlier Stages of CKD: Core Curriculum 2018', *American Journal of Kidney Diseases*, 71(3), 423–435.

James, P.B., Kamara, H., Bah, A.J., Steel, A. & Wardle, J., 2018, 'Herbal medicine use among hypertensive patients attending public and private health facilities in Freetown Sierra Leone', *Complementary Therapies in Clinical Practice*, 31, 7–15.

Jha, V., 2010, *Herbal medicines and chronic kidney disease*, *Nephrology*, vol. 15, 10–17.

Kankeu, H.T., Saksena, P., Xu, K. & Evans, D.B., 2013, *The financial burden from non-communicable diseases in low- and middle-income countries: A literature review*, *Health Research Policy and Systems*, 11(1).

Kaze, A.D., Ilori, T., Jaar, B.G. & Echouffo-Tcheugui, J.B., 2018, *Burden of chronic kidney disease on the African continent: A systematic review and meta-analysis*, *BMC Nephrology*, 19(1).

Khan, M.A., Kassianos, A.J., Hoy, W.E., Alam, A.K., Healy, H.G. & Gobe, G.C., 2022, *Promoting Plant-Based Therapies for Chronic Kidney Disease*, *Journal of Evidence-Based Integrative Medicine*, 27.

Laar, A.K., Kwara, A., Nortey, P.A., Ankomah, A.K., Okyerefo, M.P.K. & Lartey, M.Y., 2017, 'Use of Non-Prescription Remedies by Ghanaian Human Immunodeficiency Virus-Positive Persons on Antiretroviral Therapy', *Frontiers in Public Health*, 5.

Lassale, C., Gaye, B., Diop, I.B., Mipinda, J.B., Kramoh, K.E., Kouam Kouam, C., Ikama, M.S., Takombe, J.L., Damorou, J.M., Toure, I.A., Balde, D.M., Dzudie, A., Houenassi, M., Kane, A., Kimbally-Kaki, S.G., Kingue, S., Limbole, E., Mfeukeu Kuate, L., Ferreira, B., Nhavoto, C., Sidy Ali, A., Azizi, M., N'Guetta, R., Antignac, M. & Jouven, X., 2022, 'Use of traditional medicine and control of hypertension in 12 African countries', *BMJ Global Health*, 7(6).

Liwa, A.C., Smart, L.R., Frumkin, A., Epstein, H.A.B., Fitzgerald, D.W. & Peck, R.N., 2014, *Traditional herbal medicine use among hypertensive patients in sub-Saharan Africa: A systematic review*, *Current Hypertension Reports*, 16(6).

- Mohammadi, S., Asghari, G., Emami-Naini, A., Mansourian, M. & Badri, S., 2020, 'Herbal supplement use and herb–drug interactions among patients with kidney disease', *Journal of Research in Pharmacy Practice*, 9(2), 61.
- Mohammed, R., Candidate, G.M., Tagoe-Darko, E. & Mensah, C.M., 2013, *Use of Traditional Medicine by HIV/AIDS Patients in Kumasi Metropolis, Ghana: A Cross-sectional Survey*, vol. 3.
- Peprah, P., Agyemang-Duah, W., Arthur-Holmes, F., Budu, H.I., Abalo, E.M., Okwei, R. & Nyonyo, J., 2019, “‘We are nothing without herbs’”: A story of herbal remedies use during pregnancy in rural Ghana', *BMC Complementary and Alternative Medicine*, 19(1).
- Shiferaw, A., Baye, A.M., Amogne, W. & Feyissa, M., 2020, 'Herbal medicine use and determinant factors among hiv/aids patients on antiretroviral therapy in tikur anbessa specialized hospital, addis ababa, ethiopia', *HIV/AIDS - Research and Palliative Care*, 12, 941–949.
- Stanifer, J.W., Jing, B., Tolan, S., Helmke, N., Mukerjee, R., Naicker, S. & Patel, U., 2014, 'The epidemiology of chronic kidney disease in sub-Saharan Africa: A systematic review and meta-analysis', *The Lancet Global Health*, 2(3), e174–e181.
- Tannor, E.K., Sarfo, F.S., Mobula, L.M., Sarfo-Kantanka, O., Adu-Gyamfi, R. & Plange-Rhule, J., 2019, 'Prevalence and predictors of chronic kidney disease among Ghanaian patients with hypertension and diabetes mellitus: A multicenter cross-sectional study', *Journal of Clinical Hypertension*, 21(10), 1542–1550.

- Tassew, W.C., Assefa, G.W., Zeleke, A.M. & Ferede, Y.A., 2024, 'Prevalence and associated factors of herbal medicine use among patients living with chronic disease in Ethiopia: A systematic review and meta-analysis', *Metabolism Open*, 21, 100280.
- Touiti, N., Houssaini, T.S., Iken, I., Benslimane, A. & Achour, S., 2020, 'Prevalence of herbal medicine use among patients with kidney disease: A cross-sectional study from Morocco', *Nephrologie et Therapeutique*, 16(1), 43–49.
- Al-Faris, E. A., Al-Rowais, N., Mohamed, A. G., Al-Rukban, M. O., Al, A., Al-Noor, M. A. B., Al-Harby, S., & Sheikh, A. (2008). Prevalence and pattern of alternative medicine use: The results of a household survey. *Ann Saudi Med*.
- Alrowais, N. A., & Alyousefi, N. A. (2017). The prevalence extent of Complementary and Alternative Medicine (CAM) use among Saudis. *Saudi Pharmaceutical Journal*, 25(3), 306–318. <https://doi.org/10.1016/j.jsps.2016.09.009>
- Ben Salah, G., Farooqui, M., Salem Alshammari, M., Elghazali, A., Kassem, L., Ibrahim, N., Ben Abdelmalek, I., & Rasheed, M. K. (2023). Prevalence, types and disclosure of complementary and alternative medicine (CAM) use among chronic kidney disease (CKD) patients in Saudi Arabia. *Journal of Pharmaceutical Policy and Practice*, 16(1), 89. <https://doi.org/10.1186/s40545-023-00589-2>
- Birdee, G. S., Phillips, R. S., & Brown, R. S. (2013). Use of Complementary and Alternative Medicine among Patients with End-Stage Renal Disease. *Evidence-Based Complementary and Alternative Medicine*, 2013, 1–6. <https://doi.org/10.1155/2013/654109>
- Castelino, L., Nayak-Rao, S., & Shenoy, Mp. (2019). Prevalence of use of complementary and alternative medicine in chronic kidney disease: A cross-sectional single-center study from South India. *Saudi Journal of Kidney Diseases and Transplantation*, 30(1), 185. <https://doi.org/10.4103/1319-2442.252909>

- Gad, A., Al-Faris, E., Al-Rowais, N., & Al-Rukban, M. (2013). Use of complementary and alternative medicine for children: A parents' perspective. *Complementary Therapies in Medicine*, 21(5), 496–500. <https://doi.org/10.1016/j.ctim.2013.06.007>
- Herrera-Añazco, P., Taype-Rondan, A., Ortiz, P. J., Málaga, G., Del Carpio-Toia, A. M., Alvarez-Valdivia, M. G., Juárez- Huanca, C., Ciudad- Fernandez, L., Bruner- Meléndez, R., Samaniego- Mojica, W., & Perez- Rafael, E. (2019). Use of medicinal plants in patients with chronic kidney disease from Peru. *Complementary Therapies in Medicine*, 47, 102215. <https://doi.org/10.1016/j.ctim.2019.102215>
- Mohammadi, S., Asghari, G., Emami-Naini, A., Mansourian, M., & Badri, S. (2020). Herbal supplement use and herb–drug interactions among patients with kidney disease. *Journal of Research in Pharmacy Practice*, 9(2), 61. [https://doi.org/10.4103/jrpp.JRPP\\_20\\_30](https://doi.org/10.4103/jrpp.JRPP_20_30)
- Obirikorang, Y., Obirikorang, C., Acheampong, E., Odame Anto, E., Gyamfi, D., Philip Segbefia, S., Opoku Boateng, M., Pascal Dapilla, D., Brenya, P. K., Amankwaa, B., Adu, E. A., Nsenbah Batu, E., Gyimah Akwasi, A., & Amoah, B. (2018). Predictors of Noncompliance to Antihypertensive Therapy among Hypertensive Patients Ghana: Application of Health Belief Model. *International Journal of Hypertension*, 2018, 1–9. <https://doi.org/10.1155/2018/4701097>
- Osman, N. A., Hassanein, S. M., Leil, M. M., & NasrAllah, M. M. (2015). Complementary and Alternative Medicine Use Among Patients With Chronic Kidney Disease and Kidney Transplant Recipients. *Journal of Renal Nutrition*, 25(6), 466–471. <https://doi.org/10.1053/j.jrn.2015.04.009>
- Shamsuddin, N., Karuppannan, M., Hafiz Wan Md Adnan, W. A., Farooqui, M., & Gnanasan, S. (2019). Pattern of complementary and alternative medicine (CAM) use among patients with chronic kidney disease. *Complementary Therapies in Clinical Practice*, 37, 86–92. <https://doi.org/10.1016/j.ctcp.2019.09.003>

- Stanifer, J. W., Kilonzo, K., Wang, D., Su, G., Mao, W., Zhang, L., Zhang, L., Nayak-Rao, S., & Miranda, J. J. (2017). Traditional Medicines and Kidney Disease in Low- and Middle-Income Countries: Opportunities and Challenges. *Seminars in Nephrology*, 37(3), 245–259. <https://doi.org/10.1016/j.semnephrol.2017.02.005>
- Stanifer, J. W., Lunyera, J., Boyd, D., Karia, F., Maro, V., Omolo, J., & Patel, U. D. (2015). Traditional medicine practices among community members with chronic kidney disease in northern Tanzania: An ethnomedical survey. *BMC Nephrology*, 16(1), 170. <https://doi.org/10.1186/s12882-015-0161-y>
- Touiti, N., Houssaini, T. S., Iken, I., Benslimane, A., & Achour, S. (2020). Prevalence of herbal medicine use among patients with kidney disease: A cross-sectional study from Morocco. *Néphrologie & Thérapeutique*, 16(1), 43–49. <https://doi.org/10.1016/j.nephro.2019.01.007>
- Tsai, M.-Y., Huang, Y.-C., Cheng, B.-C., Chin, C.-Y., Hsu, Y.-T., & Lee, W.-C. (2024). Prevalence and varieties of complementary and alternative medicine usage among individuals with pre-dialysis chronic kidney disease in Taiwan: An investigative cross-sectional analysis. *BMC Complementary Medicine and Therapies*, 24(1), 11. <https://doi.org/10.1186/s12906-023-04311-2>
- Zahn, R., Perry, N., Perry, E., & Mukaetova-Ladinska, E. B. (2019). Use of herbal medicines: Pilot survey of UK users' views. *Complementary Therapies in Medicine*, 44, 83–90. <https://doi.org/10.1016/j.ctim.2019.02.007>
- Zyoud, S. H., Al-Jabi, S. W., Sweileh, W. M., Tabeeb, G. H., Ayaseh, N. A., Sawafta, M. N., Khdeir, R. L., Mezyed, D. O., Daraghmeh, D. N., & Awang, R. (2016). Use of complementary and alternative medicines in haemodialysis patients: A cross-sectional study from Palestine. *BMC Complementary and Alternative Medicine*, 16(1), 204. <https://doi.org/10.1186/s12906-016-1196-8>

- Castelino, L., Nayak-Rao, S., & Shenoy, Mp. (2019). Prevalence of use of complementary and alternative medicine in chronic kidney disease: A cross-sectional single-center study from South India. *Saudi Journal of Kidney Diseases and Transplantation*, 30(1), 185. <https://doi.org/10.4103/1319-2442.252909>
- Herrera-Añazco, P., Taype-Rondan, A., Ortiz, P. J., Málaga, G., Del Carpio-Toia, A. M., Alvarez-Valdivia, M. G., Juárez- Huanca, C., Ciudad- Fernandez, L., Bruner- Meléndez, R., Samaniego- Mojica, W., & Perez- Rafael, E. (2019). Use of medicinal plants in patients with chronic kidney disease from Peru. *Complementary Therapies in Medicine*, 47, 102215. <https://doi.org/10.1016/j.ctim.2019.102215>
- Joshi, V. D., & Dahake, A. P. (n.d.). *Adverse Effects Associated with the Use of Antihypertensive Drugs: An Overview*. Mbali, H., Khaki Sithole, J. J., & Nyondo-Mipando, A. L. (2021). Prevalence and correlates of herbal medicine use among Anti-Retroviral Therapy (ART) clients at Queen Elizabeth Central Hospital (QECH), Blantyre Malawi: A cross-sectional study. *Malawi Medical Journal*, 33(3), 153–158. <https://doi.org/10.4314/mmj.v33i3.2>
- Osman, N. A., Hassanein, S. M., Leil, M. M., & NasrAllah, M. M. (2015). Complementary and Alternative Medicine Use Among Patients With Chronic Kidney Disease and Kidney Transplant Recipients. *Journal of Renal Nutrition*, 25(6), 466–471. <https://doi.org/10.1053/j.jrn.2015.04.009>
- Roosbeh, J., Hashempur, M. H., & Heydari, M. (2013). *Use of Herbal Remedies Among Patients Undergoing Hemodialysis*. 7(6).
- Shamsuddin, N., Karuppannan, M., Hafiz Wan Md Adnan, W. A., Farooqui, M., & Gnanasan, S. (2019). Pattern of complementary and alternative medicine (CAM) use among patients with chronic kidney disease. *Complementary Therapies in Clinical Practice*, 37, 86–92. <https://doi.org/10.1016/j.ctcp.2019.09.003>

- Stanifer, J. W., Kilonzo, K., Wang, D., Su, G., Mao, W., Zhang, L., Zhang, L., Nayak-Rao, S., & Miranda, J. J. (2017). Traditional Medicines and Kidney Disease in Low- and Middle-Income Countries: Opportunities and Challenges. *Seminars in Nephrology*, 37(3), 245–259. <https://doi.org/10.1016/j.semnephrol.2017.02.005>
- Stanifer, J. W., Lunyera, J., Boyd, D., Karia, F., Maro, V., Omolo, J., & Patel, U. D. (2015a). Traditional medicine practices among community members with chronic kidney disease in northern Tanzania: An ethnomedical survey. *BMC Nephrology*, 16(1), 170. <https://doi.org/10.1186/s12882-015-0161-y>
- Stanifer, J. W., Lunyera, J., Boyd, D., Karia, F., Maro, V., Omolo, J., & Patel, U. D. (2015b). Traditional medicine practices among community members with chronic kidney disease in northern Tanzania: An ethnomedical survey. *BMC Nephrology*, 16(1), 170. <https://doi.org/10.1186/s12882-015-0161-y>
- Touiti, N., Houssaini, T. S., Iken, I., Benslimane, A., & Achour, S. (2020a). Prevalence of herbal medicine use among patients with kidney disease: A cross-sectional study from Morocco. *Néphrologie & Thérapeutique*, 16(1), 43–49. <https://doi.org/10.1016/j.nephro.2019.01.007>
- Touiti, N., Houssaini, T. S., Iken, I., Benslimane, A., & Achour, S. (2020b). Prevalence of herbal medicine use among patients with kidney disease: A cross-sectional study from Morocco. *Néphrologie & Thérapeutique*, 16(1), 43–49. <https://doi.org/10.1016/j.nephro.2019.01.007>
- Zahn, R., Perry, N., Perry, E., & Mukaetova-Ladinska, E. B. (2019). Use of herbal medicines: Pilot survey of UK users' views. *Complementary Therapies in Medicine*, 44, 83–90. <https://doi.org/10.1016/j.ctim.2019.02.007>
- Zyoud, S. H., Al-Jabi, S. W., Sweileh, W. M., Tabeeb, G. H., Ayaseh, N. A., Sawafta, M. N., Khdeir, R. L., Mezyed, D. O., Daraghme, D. N., & Awang, R. (2016). Use of

complementary and alternative medicines in haemodialysis patients: A cross-sectional study from Palestine. *BMC Complementary and Alternative Medicine*, 16(1), 204.  
<https://doi.org/10.1186/s12906-016-1196-8>



## APPENDICES

### Appendix I: Participant Information Sheet

**Title of study:** Prevalence of Herbal Related Chronic Kidney Diseases in Ghana, the Case of the Korle-Bu Teaching Hospital.

**Introduction:** I am Daniel Abugbila, a master's student of the University of Ghana.

**Purpose of Research:** The purpose of this research is to determine the prevalence and associated factors of herbal medicine use among Chronic Kidney Disease patients at Korle-Bu Teaching Hospital, Ghana, and to assess its impact on disease progression and management.

**Nature of Research:** The research aims to provide insight into the patterns of herbal medicine use among CKD patients in Ghana, particularly at Korle-Bu Teaching Hospital. By analyzing patient records, the study seeks to identify the prevalence of herbal medicine use, its associated risks, and its potential impact on the management of CKD in the Ghanaian context.

**Participants involvement:** Participants would be required to answer certain questions. Please do well to answer sincerely and to the best of your knowledge. There are minimal risks associated with the study as some of the questions may make you a bit uncomfortable.

**Benefits:** This project will provide valuable data to enhance the understanding of herbal medicine use among CKD patients in Ghana, informing healthcare policies and patient management strategies. The findings will contribute to improving patient safety and guiding the integration of traditional and modern medical practices in CKD treatment.

**Costs:** There will be cost involved in partaking in the study

**Compensation:** There will be no material compensation for the participants but their willingness to partake will be appreciated.

**Confidentiality:** The information collected on you will be kept confidential. All data will be securely kept by the principal investigator and no one will have access to them. Participant's name will also not be required.

**Voluntary Participation/ Withdrawal:** Your participation in this study is fully voluntary. You may withdraw from the study at any time.

**Outcome and Feedback:** The data will be analyzed as required by the study. No direct feedback would be given to participants but the information obtained from this study would raise awareness about the clinical significance of herbal medicine use among CKD patients in Ghana.

**Appropriate Alternative procedures and treatment:** None

**Feedback to participants:** There will be no direct feedback to participants

**Declaration of conflict of interest:** There is no conflict of interest

**Data storage and duration, data ownership:** Data obtained from the study will be in the custody of the PI. Data would be appropriately stored on a password protected Personal Computer of the PI. Data would be kept for the period of the study.

**Funding information:** All funds would be provided by the Principal Investigator

**Sharing Participants Information or Data:** The data that would be obtained is solely for the Principal Investigator.

**Storage of samples:** N/A

**Provision of Information and consent for participants:** A copy of the Information sheet and

Consent form will be given to you after it has been signed or thumb-printed to keep.

For further clarification, you may contact:

Mr. Daniel Abugbila

+233242573342

## Appendix II: Consent Form

STUDY TITLE: Prevalence of Herbal Related Chronic Kidney Diseases in Ghana, the Case of the Korle-Bu Teaching Hospital.

### PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (.....*name of language*). I fully understand the contents and any potential implications as well as my right to change my mind (i.e., withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant.....

Participants' Signature .....OR Thumb Print.....

Date.....

### INTERPRETERS' STATEMENT

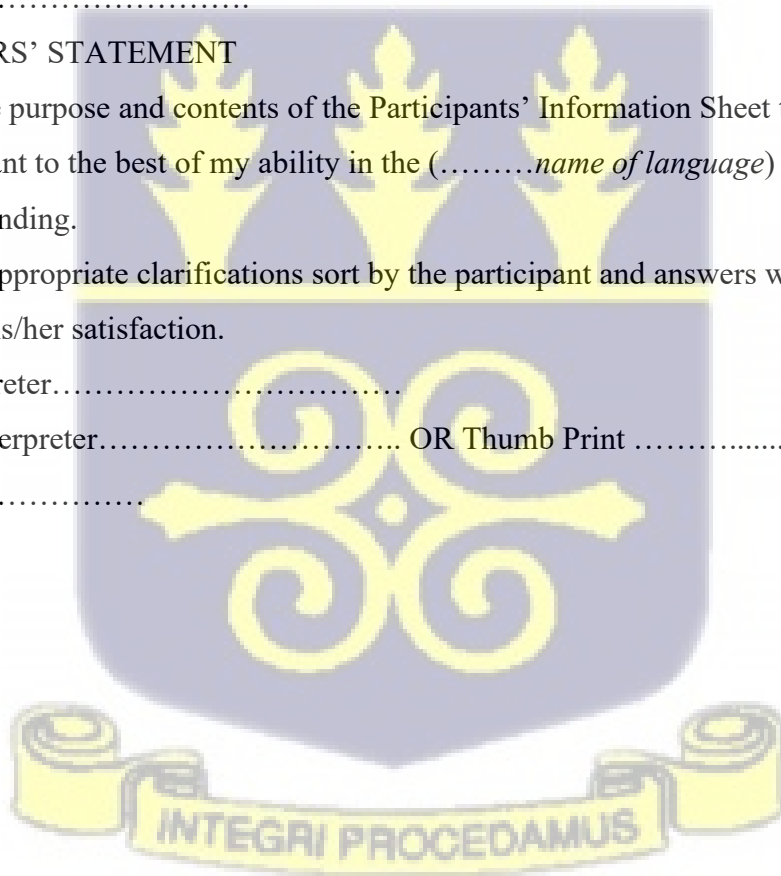
I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (.....*name of language*) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter.....

Signature of Interpreter..... OR Thumb Print .....

Date.....



STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language, he/she understood (*....name of language*)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name.....

Signature..... OR Thumb Print .....

Date.....

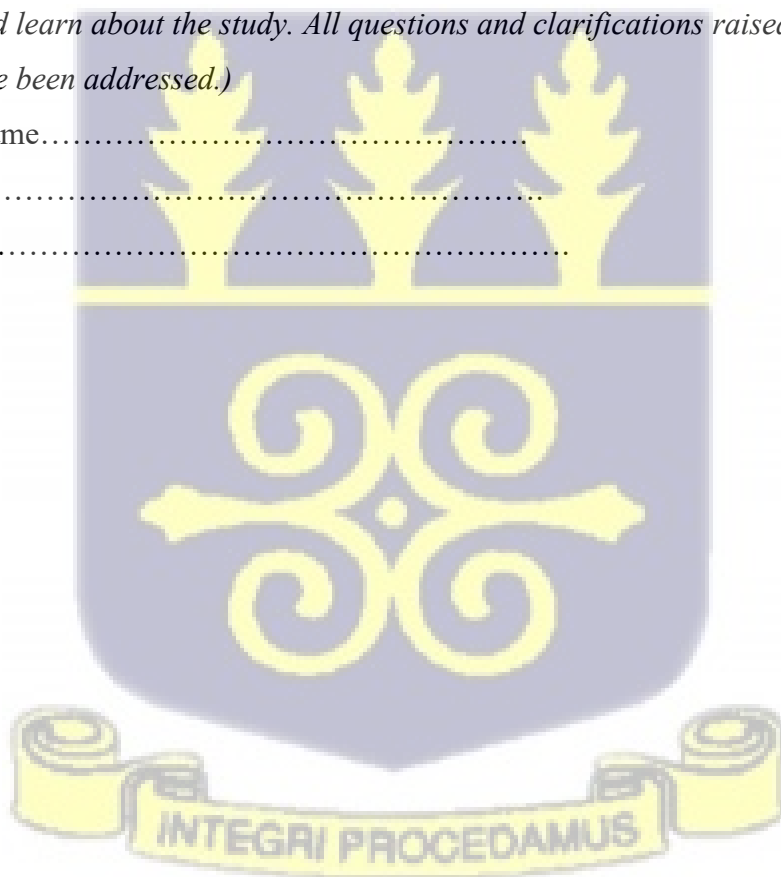
INVESTIGATOR STATEMENT AND SIGNATURE

*Brief statement or declaration that investigator has given enough information to participants to make informed decisions. (Example: I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.)*

Researcher's name.....

Signature .....

Date.....



**Appendix III: Questionnaire**

| <b>Demographic</b>                                 |                        |
|----------------------------------------------------|------------------------|
| Age (In years)                                     |                        |
| Gender                                             | Male                   |
|                                                    | female                 |
| Marital status                                     | Married                |
|                                                    | Single                 |
|                                                    | Divorced               |
|                                                    | Widowed                |
| Educational level                                  | Uneducated             |
|                                                    | Primary                |
|                                                    | Intermediate           |
|                                                    | Secondary              |
|                                                    | Tertiary               |
| Employment status                                  | Unemployed             |
|                                                    | Employee               |
| Income                                             | 500                    |
|                                                    | 500 - 1000             |
|                                                    | 1000 - 1500            |
|                                                    | 1500 - 2000            |
|                                                    | 2000+                  |
| Chronic diseases                                   | None                   |
|                                                    | Diabetes               |
|                                                    | Hypertension           |
|                                                    | Obesity                |
|                                                    | Anemia                 |
|                                                    | Other                  |
| <b>UTILIZATION</b>                                 |                        |
| Have you ever (even once in your life) used herbs? | Yes                    |
|                                                    | No                     |
| When was the last time you used herbs?             | Every day              |
|                                                    | Two days ago, or less  |
|                                                    | A week or less ago     |
|                                                    | A month or less ago    |
|                                                    | Six weeks ago, or less |
| What is the frequency of your use of herbs?        | Daily                  |
|                                                    | Weekly                 |
|                                                    | Only when needed       |
|                                                    | No answer              |
| Does your use of herbs have specific doses?        | Yes                    |

|                                                                                                                  |                                 |
|------------------------------------------------------------------------------------------------------------------|---------------------------------|
|                                                                                                                  | No                              |
|                                                                                                                  | Sometimes                       |
|                                                                                                                  | No answer                       |
| What kind of herbs do you use? (Give names and example for each)                                                 | Leaves                          |
|                                                                                                                  | Seeds                           |
|                                                                                                                  | Roots                           |
|                                                                                                                  | Other                           |
| How do you use herbs?                                                                                            | In the form of a drink or eat   |
|                                                                                                                  | External use                    |
|                                                                                                                  | Other                           |
| What is the reason for your use of herbs?                                                                        | Enhance Health                  |
|                                                                                                                  | Treatment of diseases           |
|                                                                                                                  | Cosmetic                        |
|                                                                                                                  | Enhance physical functions      |
|                                                                                                                  | Other                           |
| What do you feel after using herbs?                                                                              | Better                          |
|                                                                                                                  | Worse                           |
|                                                                                                                  | No change                       |
|                                                                                                                  | Other                           |
| Where do you take the herbs you use most often?                                                                  | Parents and relatives           |
|                                                                                                                  | Friends and colleagues          |
|                                                                                                                  | Herbs shops                     |
|                                                                                                                  | Websites                        |
|                                                                                                                  | Herbalists                      |
| What will you do if you have a side effect because of your use of a large dose of herbs during treatment or use? | Other places                    |
|                                                                                                                  | Treated with another herb       |
|                                                                                                                  | Go to the doctor                |
| What are the most common cases where herbs are used?                                                             | Other                           |
|                                                                                                                  | Fractures                       |
|                                                                                                                  | Diabetes                        |
|                                                                                                                  | Hypertension                    |
|                                                                                                                  | High temperature                |
|                                                                                                                  | Malaria and infectious diseases |
|                                                                                                                  | Headaches                       |
|                                                                                                                  | Constipation                    |
|                                                                                                                  | Other                           |
| When herbs are often used by a person?                                                                           | before a health exposure        |
|                                                                                                                  | During a health exposure        |
|                                                                                                                  | After a health exposure         |
| Do you go to the doctor once you have the disease or depend on the herbs first?                                  | Go to the doctor                |
|                                                                                                                  | Use herbs                       |
|                                                                                                                  | Other                           |

|                                                                                               |                                     |
|-----------------------------------------------------------------------------------------------|-------------------------------------|
| Is there anyone who uses herbs for the purpose of medication in your family?                  | Yes                                 |
|                                                                                               | No                                  |
| Is there anyone who uses herbs for the purpose of medication from your friends or colleagues? | Yes                                 |
|                                                                                               | No                                  |
|                                                                                               | I don't know                        |
| Do you use herbal medicine for your children?                                                 | I do not have a child               |
|                                                                                               | I have children and I do not use it |
|                                                                                               | I used it once                      |
| Do you advise others to use herbs?                                                            | Yes                                 |
|                                                                                               | No                                  |
| What is the purpose of using herbal medicine?                                                 | Immunotherapy                       |
|                                                                                               | Therapeutic                         |
|                                                                                               | Cosmetic                            |
|                                                                                               | Other                               |
| Is mixing herbs together leads to a more effective result?                                    | Yes                                 |
|                                                                                               | No                                  |
|                                                                                               | I don't know                        |
| Are there any instructions and restrictions to be taken into consideration when using herbs?  | Yes                                 |
|                                                                                               | No                                  |
|                                                                                               | I don't know                        |
| Are there any side effects to using herbal medicine?                                          | Yes                                 |
|                                                                                               | No                                  |
|                                                                                               | I don't know                        |
| What is the source of information you have about herbs?                                       | Parents and relatives               |
|                                                                                               | Friends and colleagues              |
|                                                                                               | TV and scientific programs          |
|                                                                                               | Doctors and herbalists              |
|                                                                                               | Internet and social media           |
|                                                                                               | Study and learning                  |



## Appendix IV: Workplan and Budget

### Workplan

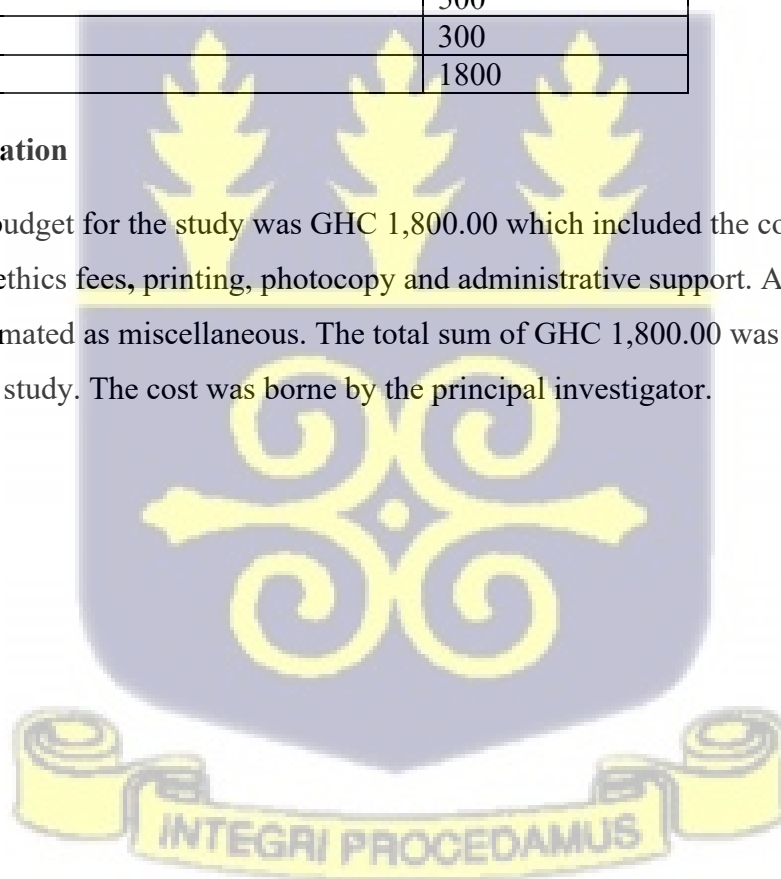
| ACTIVITY                      | DURATION                                                                     |
|-------------------------------|------------------------------------------------------------------------------|
| Proposal writing              | 1 <sup>st</sup> week of January,2024 – 4 <sup>th</sup> week of February,2024 |
| Submission of Ethical Review  | 12 <sup>th</sup> April, 2024                                                 |
| Data Collection               | 1 <sup>st</sup> week of June – 3 <sup>rd</sup> week of August,2024           |
| Data analysis and manuscripts | 4 <sup>th</sup> week of September – 2 <sup>nd</sup> week of November,2024    |

### Budget

| Item                   | Amount (GHC) |
|------------------------|--------------|
| Printing and photocopy | 400          |
| Transportation         | 300          |
| Administrative support | 500          |
| Ethics Fee             | 500          |
| Miscellaneous          | 300          |
| Total                  | 1800         |

### Budget justification

The estimated budget for the study was GHC 1,800.00 which included the cost of transportation, ethics fees, printing, photocopy and administrative support. A sum of GHC 100.00 was estimated as miscellaneous. The total sum of GHC 1,800.00 was used for conducting this study. The cost was borne by the principal investigator.



**Appendix V: Ethical Clearance**

**MEDICAL DIRECTORATE  
KORLE BU TEACHING HOSPITAL**

25<sup>TH</sup> APRIL, 2024

ABUGBILA DANIEL  
UNIVERSITY OF GHANA  
ACCRA, GHANA.

**ADMINISTRATIVE APPROVAL**

**KBTH-ADM/00093/2024**

The Korle Bu Teaching Hospital Research Office reviewed and granted an administrative approval to conduct a study in the Hospital titled: **"Assessing the Prevalence of Herbal Related Chronic Kidney Diseases in Ghana, the Case of the Korle Bu Teaching Hospital."**

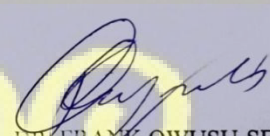
Kindly, note that, any modification/amendment to the approval study protocol without approval renders this certificate invalid.

The approval is valid till **31<sup>ST</sup>OCTOBER, 2024**. You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

You are to contact the **Head of Medical Department** to make arrangement to begin your study

Sincere regards.

  
MR. EUGENE BUDU  
AG. HEAD OF RESEARCH

  
DR. FRANK OWUSU-SEKYERE  
DIRECTOR OF MEDICAL AFFAIRS

**Distribution:**

1. The Head, Department of Medicine, Korle Bu

