USE OF HERBAL REMEDIES AND PERCEPTION OF THE HEALTH RISKS AMONG RENAL PATIENTS RECEIVING TREATMENT IN THE UNIVERSITYCOLLEGEHOSPITAL, IBADAN

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DEDICATION

I dedicate this work to the Almighty God, my provider, and to as many as the information therein would be of benefit to, one way or another.

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ABSTRACT

Renal disease is a prevalent health problem worldwide, with a higher incidence in developing countries. In Nigeria, about 85% of people are known to use herbal remedies and consult traditional medicine practitioners for their healthcare, as well as for social and psychological benefits. The pharmacological activity, chemical components and microbial contents of herbs, and their ability to interfere with the efficacy of orthodox medicines, make herbal remedies potentially dangerous for renal patients. There is limited information on the prevalence of the use of herbal remedies among renal patients. The aim of this study was to assess the use of herbal remedies among renal patients and their perception of the health risks involved.

The study was a cross-sectional design involving sixty four (64) available and consenting renal patients receiving treatment in the University College Hospital (UCH), Ibadan. Having obtained ethical approval from the UI/UCH Ethics Research Committee, purposive sampling was used in recruiting the respondents. They were interviewed using semi-structured, pre-tested, interviewer-administered questionnaires. Data were collected on respondents' socio-demographic information, perception on the associated health risks, prevalence, and factors associated with the use of herbal remedies. Perception was assessed on a 13-point scale and scores ≥7 were regarded as good, while scores ≤6 were regarded as poor. Data were analyzed using descriptive statistics and Chi-square test at p=0.05.

The mean ages of the respondents were 51.9±16.9 years, and 50.0% were males. Majority (84.4%) was married, 59.4% were Christians and 96.9% were Yoruba. 37.5% had secondary education. Most (95.3%) had no family history of kidney problems, but 53.1% had history of dialysis. Majority (81.3%) had good perception on the health risks associated with the use of herbal remedies. Majority (84.4%) also perceived that the use of herbs, especially in the wrong dosage could be harmful to the body, and 73.4% stated that the combination of herbal remedies with orthodox medicines can lead to complications, especially in patients with renal problems. Most (81.3%) stated that herbalremedies could be contaminated where they were planted and during preparation and this could cause adverse reactions.Prevalence of the use of herbal remedies was 56.3%. 75% used herbs for malaria, while 30.2% used herbs from pear tree leaves for the relief of kidney symptoms. Most of them (73.7%) did not

inform their doctor that they used herbal remedies because, according to them, there was no reason for them to tell their doctor. Family members and friends (52.8%) are a major influencing factor in patient's decision-making with regard to the use of herbal remedies.There is a significant association between the level of education (secondary education 37.5%, tertiary education 34.4%) and the frequency of use of herbal remedies.

Most renal patients make use of herbal remedies despite receiving allopathic medicines which might compromise effective outcome of orthodox treatment. Health education and counseling should be conducted for renal patients on the adverse effects of combining traditional and conventional therapies.

Keywords: Renal disease, herbal remedies, complementary and alternative medicines, traditional medicines.

Word count: 484

CERTIFICATION

I hereby certify that this study was carried out by TAKURE Susan Adenike in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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GLOSSARY OF ABBREVIATIONS

AD: Anno Domini (a Latin phrase for "in the year of our Lord", i.e. the year of Christ's birth)

AKI: Acute Kidney Injury

BC: Before Christ (used when describing events that occurred before Christ's advent)

CAM: Complementary and Alternative Medicine

CMAC: Chairman, Advisory Committee

CKD: Chronic Kidney Disease

DM: Diabetes Mellitus

eGFR: Estimated Glomerular Filtration Rate

ESRD: End-Stage Renal Disease

HDS: Herbal Dietary Supplements

HRs: Herbal remedies

LUTH: LagosUniversity Teaching hospital

NAFDAC: National Agency for Food and Drug Administration and Control

NAN: National Association of Nephrology

NCCAM: United StatesNational Centre for Complementary and Alternative Medicine

NFK: National Kidney Foundation

NGOs: Non-Governmental Organization

NOA: National Orientation Agency

TCM: Traditional Chinese Medicine

TM: Traditional Medicine

UCH: University College Hospital

UNTH: University of Nigeria Teaching Hospital

WHO: World Health Organization

OPERATIONAL DEFINITION OF TERMS

Allopathic medicine: System of medical practice which treats disease by use of remedies which produce effects different from those produced by the disease under treatment.

Ayurveda: Concept about health and disease that promotes the use of herbal compounds, special diets, and other unique health practices, which originated in India.

Chronic kidney disease (CKD): A condition in which the kidneys no longer function as they should due to a decrease in renal mass, development of glomerular hypertension and intra-tubular proteinuria.

Complementary and alternative medicine (CAM): A category of medicines that includes a variety of treatment approaches that fall outside the realm of conventional medicine.

Herbal remedies: Herbal remedies include herbs, herbal materials, herbal preparations, and finished products that contain parts of plants or other plant materials as active ingredients (Mahomoodally, 2013).

Perception: The way in which something is regarded, understood or interpreted.

Renal: A term used to define any condition that has to do with the kidneys, such as renal failure, renal cancer, etc.

Renal patient: Any person that has been diagnosed as having a kidney problem.

Traditional medicine: Traditional medicine is the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether or not explicable, used in the maintenance of health, as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness (WHO, 2000).

Unani medicine: a traditional system of healing and health maintenance observed in South Asia.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Renal disease, also known as kidney disease, is a condition in which the kidney fails to adequately filtre wastes from the blood. The two main forms are acute kidney injury (AKI), which is usually reversible with adequate treatment, and chronic kidney disease (CKD), which is often irreversible. In both cases, there is usually an underlying cause. Kidney failure is usually determined by a decrease in the glomerular filtration rate which is the rate at which blood is filtred from the glomerular of the kidney. Renal disease is a prevalent health problem worldwide. In a global overview, about 1 783 000 people underwent treatment for end-stage renal disease (ESRD) at the end of 2005 (Grassmann, Gioberge, Moeller and Brown, 2005). National Association of Nephrology (NAN) in Nigeria reported that about 36.8 million Nigerians have CKD, (NAN, 2013). It has been reported that the incidence of kidney disease is higher in developing countries than in the industrialized countries (Bamigboye, 2003). The incidence of CKD in Nigeria has been shown to range between 1.6 and 12.4% (Odubanjo, Olusola and Kadiri, 2011). In a study by Ulasi and Ijoma (2010), highlighting the enormity of CKD in Nigeria with the situation in a teaching hospital in the southeast of Nigeria as a reference, ESRD cases accounted for 8% of all medical admissions and 42% of renal admissions. Age, hypertension, obesity, a history of diabetes mellitus (DM), use of herbal remedies (HRs) and prolonged use of non-steroidal anti-inflammatory analgesics have been identified as risk factors for CKD in Nigeria (Akinsola, Odesanmi and Ogunniyi, 2009).

Traditional medical practice still thrives in Africa and other developing countries where the practitioners are highly patronized (Klauss and Adal, 2004; Courtright and Lewellan, 2004; Courtright and Chirambo, 2007). The reason for the dependence on traditional medications in Africa is not far-fetched. Factors such as proximity and easy accessibility of the traditional practitioners to the community, cost, availability of the medicines and traditional beliefs have been implicated as some of the reasons for the patronage of these services (Klauss and Adal, 2007; Nwosu, 2002; Courtright, 2005). In addition, there is an increasing interest in the use of HRs due to the

everyday consumer's preference of products of natural origin resulting in a growing number of national traditional medicine research institutes in developing countries such as Nigeria, China, Ghana, India, Madagascar and Vietnam (WHO, 2000). Also, modern hospitals are often located far away in the cities and their processes are considered time consuming and more expensive, which discourage patients from utilizing them. However, the inappropriate use of traditional medicines can result in hazardous effects. In Nigeria, about 85% of people are known to use HRs and consult traditional medicine practitioners for their healthcare, as well as social, and psychological benefits because of poverty and dissatisfaction with conventional medical care (Oshikoya, Senbanjo, Njokanma, and Soipe, 2008). Some patients with kidney disease initially use HRs for treatment and seek help from spiritual houses, only to eventually resort to hospitals and specialists at a stage when the ailment is advanced (Bamgboye, 2003). The use of HRs, although a popular branch of alternative medicines, may be inappropriate for renal patients. The pharmacological activity, chemical components and microbial contents of herbs as well as their ability to interfere with the effectiveness of orthodox medications, make HRs potentially dangerous for renal patients (Forte and Cohen, 2008). Most herbal products have no clear statement of content or medically related information on the package labels, and have not been validated or certified by any recognized body. Not all documented useful plants are harmless. Some of these HRs have been implicated in the etiology of acute renal failure, interstitial nephritis, uroepithelial malignancies and progressive CKD (Jha, 2010). Although there is emerging evidence in the literatures that some may be reno-protective, many nephrologists are reluctant to consider them in research trials for fear of adverse effects, including nephrotoxicity, or deleterious interaction with co-prescribed, conventional medicines (Burrowes and Houten, 2006). More important is the fact that most of our populace is ignorant of the contents of these herbal concoctions. Hence there is need to restrict their use.

1.2 Statement of problem

CKD is a worldwide health problem leading to a decreased quality of life and increased mortality, and is a condition in which the kidneys no longer function as they should due to a decrease in renal mass, development of glomerular hypertension and

intra-tubular proteinuria. It is classified on a scale of one to five stages based on a level of glomerular filtration rate, with five being the lowest level of function. There is a high prevalence of stage five CKD in the Nigeria population (1.6% -12.4%), compared to the median worldwide prevalence of CKD (Odubanjo, Olusola and Kadiri, 2011). Stages three to five CKD, with an estimated glomerular filtration rate (eGFR) of less than 60 ml/min, is associated with a high number of complications so these patients may be more vulnerable to the adverse effects of any herbs and supplements (NKF, 2002). The use of traditional medicines for healthcare is prevalent in Nigeria, and this constitutes a major challenge to human health and resources.

Additionally, it has been documented in many recent studies that several HRs induce adverse renal effects ranging from worsening kidney function to actual renal failure. These include aristolochic acid, and L-glutamine (Guh, Chen and Chuang, 2007; Debelle, Vanherweghem, and Nortier, 2008; Mu Tong and Fangchi, 2010). Some examples include *Ginkgo biloba* known as "*Obi gbogbo nse*" in Yoruba, which is known to induce hemorrhagic complications, glycyrrhizic acid found in plants induce hypertension and hypokalemia, alfalfa or noni juice (*Morinda citrifolia*) induce hyperkalemia, star fruit (*Averrhoa carambola*) induce encephalopathy, and cranberry juice induce nephrolithiasis. The precise mechanism of injury is not known in most cases. This has led to concerns about detrimental effects of herbal use in patients with chronic kidney problems. The use of herbal HRs in patients that undergo hemodialysis seems to have more risk susceptibility in comparison with that in the general population. Volume overload and hyperkalemia are the other important considerations of HRs in these patients. Also, it was assessed that about 35% of AKI cases are caused by HRs in the developing countries of the world (Jamshid, Mohammad and Mojtaba, 2013).

To further compound the problems, there is inadequate information on the beneficial and detrimental effects of HRs since safety has not been established through extensive research. Unlike orthodox medicines, HRs do not go through the same scrutiny and evaluation process by NAFDAC. A good number of CAM users take it concurrently with conventional (orthodox) medicines (Barnes, Powell-Griner, McFann and Nahin, 2002; Chen, 2005). However, some patients who use herbal products are reluctant to disclose use of CAM to their doctors either due to fear of physician's criticism or

because the physician failed to ask (Ezeome and Anarado, 2007; Chang, Wallis and Tiralongo, 2007). In addition, most users of CAM practice self-medication without guide or supervision from licensed or certified herbal medicine practitioners (Ezeome and Anarado, 2007).

In Nigeria, studies carried out on prevalence of CAM use were among cancer patients and a prevalence rate of 65.0% was recorded at the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria, and 31.1% among children with chronic health conditions in Lagos University Teaching hospital (LUTH), (Ezeome and Anarado, 2007; Oshikoya et al., 2008). The study on the use of CAM by cancer patients at the UNTH showed that only 21.2% of the patients studied reported unwanted side effects from complementary and alternative treatment. The side effects included full thickness chemical burns following application of herbal products on the skin, loss of weight, anorexia, nausea and vomiting, general malaise, and diarrhea. Many studies have reported potential benefits from the use of CAM among which were relief of pain, feeling healthy/good, reduction of edema (accumulation of fluid in the interstitial spaces), relief of constipation, and wound healing (Oke and Bamdele, 2004; Ezeome and Anarado, 2007; Ghazeeri, Awwad, Alameddine and Naja, 2012).

Although herbs and alternative medicines have long been in use, there is little evidence regarding their safety and efficacy (Onyiapat, Okoronkwo and Ogbonnaya, 2011; Chang, Wallis and Tiralongo, 2007). Majority of those who use CAM and HRs perceive them to be natural and safe, but are unaware of their composition and potential harmful effects. Poor quality control of these herbs and the co-administration of herbs and conventional treatment may result in adverse reactions (Ghazeeri, Awwad, Alameddine and Naja, 2012; Davis, Oh, Butow, Mullan, Clarke, 2012). This poses a threat to the life of the individual in particular, and the public in general.

1.3 Justification

Few surveys in western countries have investigated the use of herbal dietary supplements (HDS) by patients with CKD. Grabe and Garrison (2004) in the US found 29% of patients with CKD used herbal dietary supplements, while Spanner and Duncan (2005) in Canada reported 45% used HDS. However, these studies had small populations and did not investigate patient's adherence to conventional medication.

Given the concerns about the effect of HDS on renal function and the higher prevalence of the use of HDS in African countries, it is important to establish the extent of use amongst CKD patients in African countries so health care providers can be better informed, and advise their patients accordingly.

Hejaili, Ghamdi, Flaiw, Al-Juhani, Taher and Al-Khader (2007) stated that patients on renal replacement therapy need to be aware of factors that can affect their health and wellbeing. These include compliance with treatment, knowledge of diet to avoid, amount and type of fluids to take or to avoid, and awareness of possible complications that can accompany the condition. This is also important in Nigeria where there seems to be a dearth of information on the prevalence of the use of HRs among renal patients.

This study therefore examines the use of herbal remedies by renal patients and their perception of the health implications, with a view to shedding more light on their personal health care, perception and practices, as most problems confronting the primary healthcare providers are due to lack of knowledge and sensitivity to good health practices by the locals, and due to the economic and cultural factors associated with these practices.

The outcome of the study will help initiate specific directed efforts towards reducing these risk factors, thereby halting or reducing the progress of renal disease through relevant health promotion and education strategies, such as public enlightenment, training and advocacy.

1.4 Research questions

1. What is the perception of renal patients receiving treatment in the University College Hospital, Ibadan on the health risks associated with the use of herbal remedies?
2. What is the prevalence of the use of herbal remedies among renal patients receiving treatment in the University College Hospital, Ibadan?
3. What are the factors associated with the use of herbal remedies among renal patients receiving treatment in the University College Hospital?

1.5 Objectives of the study

Broad objective

The broad objective of this study was to assess the use of herbal remedies and perception of the health risks among renal patients receiving the treatment in the University College Hospital, Ibadan, Oyo state, Nigeria.

Specific objectives

The specific objectives of this study were:

1. To assess the perception of renal patients receiving treatment in the University College Hospital, Ibadan on the health risks associated with the use of herbal remedies.
2. To determine the prevalence of the use of herbal remedies among renal patients receiving treatment in the University College Hospital, Ibadan.
3. To determine the factors associated with the use of herbal remedies among renal patients receiving treatment in the University College Hospital, Ibadan.

1.6 Research hypotheses

The following hypotheses were tested by the study:

H_o1: There is no association between respondents' perception of the health risks and the use of herbal remedies.

H_o2: There is no association between respondents' level of education and the use of herbal remedies.

Ho3: There is no association between respondents' level of education and frequency of the use of herbal remedies.

Ho4: There is no association between respondents' gender and the use of herbal remedies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Herbal Remedies

Herbal remedies (HRs) include herbs, herbal materials, herbal preparations, and finished products that contain parts of plants or other plant materials as active ingredients (Mahomoodally, 2013). An herb can be any form of a plant or plant product, including leaves, stems, flowers, roots, and seeds. HRs can be purchased in bulk in the crude form or as refined pharmaceutical dosage forms such as capsules, tablets, concentrated extracts, teas, tinctures and decoctions (Fakeye, Adisa and Musa, 2009). These plants can also be sold raw or as extracts, where the plant is macerated with water, alcohol, or other solvents to extract some of the chemicals. The resulting products contain dozens of chemicals, including fatty acids, sterols, alkaloids, flavonoids, glycosides, saponins, etc (Bent, 2008). A single plant may, for example, contain bitter substances that stimulate digestion, anti-inflammatory compounds that reduce swellings and pain, phenolic compounds that can act as antioxidants and veno-tonics, antibacterial and antifungal tannins that act as natural antibiotics, diuretic substances that enhance the elimination of waste products, and toxins and alkaloids that enhance mood and give a sense of well-being (Gurib-Fakim, 2006).

2.2 History of herbal remedies (World, Africa, and Nigeria)

The use of traditional medicine is as old as the origin of man itself. Several diverse lines of evidence indicate that medicinal plants represent the oldest and most widespread form of medication (Halberstein, 2005). In 2600-3000 B.C., as recorded in the pharmacopoeia of the Emperor, Shen Nung of China saw the use of HRs in the Chaulmoogra oil from species of *Hydnocarpus Gaertn* for the treatment of leprosy. Also used for the treatment of different ailments, some of which are still in use include: *Cedrus species* (Cedar), *Cupressus sempervirens* (Cypress), *Glycyrrhiza glabra* (Licorice), and *Commiphora species* (Myrrh), (Gurib-Fakim, 2006). Similarly, in 1500 B.C., the seeds of the opium poppy (*Papaver somniferum L.)* and castor oil seed, *(Ricinus communis L.)* were excavated from some ancient Egyptian tombs; they may have been used for medicinal purposes. Hippocrates, (460 B.C.), was the first Greek to regard medicine as a science; he

is now referred to as the father of medicine. His *Materia medica* consisted essentially of herbal recipes and he was able to describe and compile some 400 simple remedies. Some of the medicinal plants he described include: opium, mint, sage, rosemary and verbena. Theophrastus of Athens, (370 B.C.), produced some manuscripts including the famous *Historia plantarium* which became a reference botanical text book during and after his lifetime.

The first Medical School in Alexandria, Africa was built by Ptolemy in 332 B.C. According to history, the Medical School was eventually destroyed by some Christian fanatics in A.D. 391. In A.D. 60, the great work of Dioscorides-*De Materia Medica* was regarded as the standard reference work in Europe during the medieval period because it contained 24 detailed books on over 600 medicinal plants, (Halberstein, 2005). Also in A.D.131, in the middle ages, Galen, a most distinguished physician of antiquity after Hippocrates treated diseases essentially with the use of herbs. His associates also employed herbs and minerals for the treatment of sick people. Following those developments, additional discoveries of useful medicinal plants resulted from experimentations in several early historic cultures 1000 to 2000 years ago in China, India, and Tibet. The herbal specialist was recognized as a powerful and influential professional in these societies, (Jingfeng and Yan, 2003; Halberstein, 2005). About 1000 years ago, healers in the Aztec and Maya Indian cultures of Mexico and Central America were experimenting with natural curing substances. The ancient Aztec healers exploited at least 132 medicinal herbs for the treatment of specific ailments ranging from pimples and nosebleeds to gout and epilepsy. Respiratory and gastrointestinal infections were addressed with remedies produced from a combination of different herbal products, and some of the preparations were known to prevent certain diseases, (Evans, 2004). Another major advancement was achieved in the 18th century with the revolutionary taxonomic work of Swedish naturalist, Carolus Linnaeus, whose classifications of thousands of botanical species provided the foundation for the standardized documentation of the relationships and evolutionary histories of medicinal plants. His classic *Systema Naturae*, (1735), established the framework for modern biological taxonomy, and his famous works *Genera Botanica* and *Critica Botanica*,(1737), and *Philosophica Botanica*,(1751), deal

with the subject of the precise identification of plants and their characteristics, including catalogues with Latin terminology of all species known at that time. In Species *Plantarum*, (1757), Linnaeus recorded descriptions of over 5900 plant species. These landmark publications are still being consulted by botanists, herbalists, horticulturalists, and taxonomists, (Halberstein, 2005).

2.3 Traditional Medicine, and Complementary and Alternative Medicine

The World Health Organization (WHO) defines traditional medicine (TM) as including diverse health practices, approaches, knowledge and beliefs incorporating plant, animal, and/or mineral-based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness, (WHO, 2002). TM is a comprehensive term used to refer both to systems such as traditional Chinese medicine, Indian ayurveda or Arabic unani medicine, and to various forms of indigenous medicines.

In countries where the dominant health care system is based on allopathic medicine, or where TM has not been incorporated into the national health care system, TM is often termed "complementary", "alternative" or "non-conventional" medicine, (WHO, 2002a).

Herbal remedies are an integral part of complementary medicines, National Centre for Complementary and Alternative Medicines (NCCAM, 2013). They include herbs, herbal materials, herbal preparations and finished herbal products that contain, as active ingredients, parts of plants, or other plant materials, or combinations thereof. TM is, however, used when referring to Africa, Latin America, South-East Asia, and/or the Western Pacific, whereas CAM is used when referring to Europe and/or North America, and Australia. When referring in a general sense to all of these regions, the comprehensive Traditional Medicine/Complementary and Alternative Medicine (TM/CAM) is used.

TM is widely used, and is of rapidly growing health system and economic importance. In Africa up to 80% of the population uses TM to help meet their health care needs. In Asia and Latin America, several populations continue to use TM as a result of historical circumstances and cultural beliefs. In China, TM accounts for around 40% of all health

care delivery. Meanwhile, in many developed countries, CAM is becoming more and more popular. The percentage of the population which has used CAM, at least once, is 48% in Australia, 70% in Canada, 42% in USA, 38% in Belgium and 75% in France, (WHO, 2002a). In many parts of the world, expenditure on TM/CAM is not only significant, but growing rapidly. In Malaysia, an estimated US $500 million is spent annually on this type of health care, compared to about US$ 300 million on allopathic medicine. In the USA, in 1997 out-of-pocket CAM expenditure was estimated at US$ 2700 million. In Australia, Canada and the United Kingdom, annual CAM expenditure is estimated at US$ 80 million, US$ 2400 million and US$ 2300 million, respectively (WHO, 2002a).

2.4 Traditional Systems of Medicine

The United States National Centre for Complementary and Alternative Medicine (NCCAM) defines CAM as a 'group of diverse medical and healthcare systems, practices and products that are not presently considered to be a part of conventional medicine', (NCCAM, 2014). The exact definition of what constitutes CAM is, however, culturally dependent. In India for example, Ayurveda is practiced on a nationwide scale and is commonly regarded as orthodox medicine, (Isnard, Deray, Baumelou, Le Quintrec, Vanherweghem, 2004). In China, traditional Chinese medicines such as herbal remedies, acupuncture, acupressure, qi gond and t'ai chi chu'an are widely practiced alongside modern western medicine, (Isnard, Deray, Baumelou, Le Quintrec, Vanherweghem 2004). In Nigeria, the practice of using HRs and nutritional supplements is common, while water therapy and spiritual practices are rare (Okwuonu, Ezeani, Olokor and Aniede, 2014). Below are different arrays of traditional medicinal systems across the world.

2.4.1 Asian Medicinal System

The most established herbal therapeutic systems are Ayurveda, Unani and Siddha of Indian origin, WU-Hsing in China and Kampo of Japan. Traditional Chinese Medicine (TCM) has formed a unique system of diagnosing and curing illness. The TCM approach is fundamentally different from that of western medicine. In TCM, the understanding of the human body is based on the holistic understanding of the universe as described in

Daoism, and the treatment of illness is based primarily on the diagnosis and differentiation of syndromes. The TCM approach treats organs as the core of the human body. Most of the HRs are mixtures of plants, sometimes also containing animal parts and minerals. The basis of preparation is synergistic or additive therapeutic value of the preparation. Under ideal conditions, care is taken by traditionally trained practitioners to identify the ingredients carefully, to harvest the plants at very specific times to ensure appropriate levels of bioactivity, to prepare the remedies under strict rules and to prescribe them to achieve an appropriate clinical response. In spite of the fact that parameters of use may be known to the practitioner, including side effects that can be expected, packaging inserts accompanying commercial products do not often cite these; neither do they always accurately represent the contents.

Also, there is a general acceptance in Asian countries, particularly India, for patients to seek concurrent treatment through more than one Indian Medicinal System as well as allopathy, or, in Chinese herbalism, to fraudulently incorporate pharmaceuticals in some remedies. This only compounds issue related to recognizing the source of potential side effects, and it is uncommon for them to be reported at all. Moreover, without enforceable regulatory systems to govern the activities of practitioners and formulators, unexpected adverse reactions are always likely. In this respect, formulations may be inappropriately made, prescribed, or taken, (Elvin-Lewis, 2001; Ahmad *et al.*, 2006).

2.4.2 European Herbalism

European TM has its roots mostly in ancient Mediterranean civilizations and in plants from abroad. In the middle ages, the color or shape of a plant denoted a cosmic clue to its medical usefulness, and hence the Doctrine of Signatures was a criterion by which many plants were selected, e.g. heart-shaped leaf as a heart remedy, yellow plant parts for treating hepatitis, etc. By the nineteenth century, some of the medicinal plants had become part of the pharmacopoeias of allopathy, naturopathy, and homeopathy. Usually when compounds are isolated and sometimes synthesized their pharmaceutical uses are more carefully regulated, (De Smet, 1997; Elvin-Lewis, 2001).

2.4.3 Neo-Western Herbalism

In its totality, European TM has matured along with American herbal remedy into Neo-Western herbalism. In this system, single plant preparations that have been either selected from formulations found in ancient pharmacopeias or derived from medicinal plants valued in other countries, including those of indigenous origin, are sold alone or as mixtures in an assortment of combinations. For example, one of the most popular plants in use in Europe today is *Echinacea* with its origins in North American (Midwestern) indigenous medicine. Also, novel formulations can be devised without ethno medical data to support their merit, or represent a mixture of plants known to a variety of medicinal systems, (Soller, 2000; Elvin-Lewis, 2001).

2.4.4 African Traditional Medicine

African traditional medicine is the oldest and perhaps the most diverse of all medicinal systems. Africa is considered to be the cradle of mankind with a rich biological and cultural diversity-marked regional difference in healing practices. Unfortunately, the systems of medicines are poorly recorded and remain so till date. Yet, the documentation of medicinal uses of African plants is becoming increasingly urgent because of the rapid loss of the natural habitats of some of these plants due to anthropogenic activities. The African continent is reported to have one of the highest rates of deforestation in the world. The paradox is that it is also a continent with a high rate of endemism, with the Republic of Madagascar topping the list at 82%, (Gurib-Fakim, 2006). African traditional medicine in its varied forms is holistic, involving both the body and the mind. The healer typically diagnoses and treats the psychological basis of an illness before prescribing medicines to treat the symptoms, (Gurib-Fakim, 2006). In sub-Saharan Africa, the ratio of traditional healers to the population is 1/500, while that for medical doctors to the population is 1/40 000, (Abdool-Karim, Zqubu-Page and Arends, 1994).

In some African countries, up to 70% of the general population receives treatment from traditional healer. Across the Southern African Development Community, there exists an extensive network of traditional health providers that has an important role in health-care delivery, particularly in rural areas where western medical care is limited. Traditional

healers occupy a central place in the primary health care of these communities. They serve not only as practitioners but also as educators, counsellors, support workers, custodians of indigenous knowledge, and teachers of traditional culture and spirituality, (Puckree, Mkhize, Mgobhozi and Lin, 2002; Zachariah,Nkoma and Harries, 2002). Famous African medicinal plants include *Acacia senegal* (Gum Arabic), *Agathosma betulina* (Buchu), *Aloe ferox* (Cape Aloes), *Aloe vera* (North African Origin), *Artemisia afra* (African wormwood), *Aspalanthus linearis* (Rooibos tea), *Boswellia sacra* (Frankincense), *Catha edulis* (Khat), *Commiphora myrrha* (Myrrh), *Harpagophytum procumbens* (Devil's Claw), *Hibiscus sabdariffa* (Hibiscus Roselle), *Hypoxis hemerocallidea* (African potato), *Prunus africana* (African Cherry), and *Catharanthus roseus* (Rose Periwinkle), (Gurib-Fakim, 2006).

2.4.5 Herbal remedies in Nigeria

Herbal remedy has developed the world over, in response to the health needs of the people and it involves the development of various traditional systems of using locally available resources for the alleviation of their health crisis. It is a readily available, inexpensive method of therapy (Ogbuehi and Ebong, 2015).

Nigerians have a deep belief and reliance on the services of the traditional practitioners for their health care needs. An estimated 75% of the population still prefers to solve their health problems by consulting the traditional healers (Adesina, 2008). General use of HRs amongst Nigerians is also well documented. According to Ezeome and Anarado (2007), the use of herbs and other forms of CAM was common among cancer patients in Nigeria. Other studies have revealed its use in children (Oshikoya and Senbanjo, 2008), hypertensive patients (Nwako and Fakeye, 2010), pregnant women (Fakeye, Adisa and Musa, 2009), as well as medical in-patients (Fakeye, Tijani, and Adebisi, 2007) and out-patients (Yusuf and Tayo, 2011). TM practitioners acquire herbal knowledge either through inheritance or apprenticeship as a call by one or the other. In the past, many of them practiced the art as a hobby or as a form of community service with little or no financial rewards thus making the practice "pure and efficacious". Trado-medical knowledge system is well structured and organized and has survived through generations to maintain harmony between body, mind and soul within its socio-cultural and religious

contexts (Adefolaju, 2011). The various ethnic groups in Nigeria have different traditional health care practitioners apart from their western health care counterparts. The Yoruba call them 'Babalawo'; the Igbo call them 'Dibia', while the Hausa refer to them as 'Boka'. However, different experts have emerged within their ranks including herbalists, bone-setters, psychiatrics, and traditional birth-attendants, among several others. They usually rely on vegetables, mineral substances, animal parts and certain other methods such as prayers, divinations and incantations (Owumi and Jerome, 2008). TM has impacted significantly on the lives of the people especially in the rural areas where access to orthodox medicare is minimal. Apart from the lack of access, the prohibitive cost of western medications makes TM more attractive to users.

Traditional medical practice, in spite of its popularity, has been challenged on many grounds (Adefolaju, 2011). One of such is that its popularity is based on the anecdotal experiences of patients. Osborne (2007) notes that the practitioners inflate the claims attached to advertisement and its products as well as not having scientific data about its effectiveness, thus making it difficult to ascertain legitimate and effective therapy and therapist. Some of the other arguments against traditional medicine include:

• That traditional medical practitioners lack the skills required for correct diagnosis of serious disorders,

• That they are always unwilling to accept the limitations of their knowledge, skills and medicines particularly in complicated organic disorders,

• That traditional medicine lacks standard dosage and has not been subjected to scientific verifications,

• That even though the educated are convinced that the healers have supernatural knowledge, and that this knowledge is medically useful, they have found them to be unscrupulous and dubious, and

• That the healers lack the equipment required to conduct physical examination (Adefolaju, 2011).

In a similar vein, a former Director-General of the National Agency for Food and Drug Administration and Control (NAFDAC) expressed the challenges being faced in regulating traditional medicines (The Nation documentation, inadequate coordination of

the practitioners' activities, poor communication between the practitioners and their patients, secrecy of actual contents and, or difficulty in determining actual ingredients). Furthermore, most of the claims of the traditional practitioners are said to be unsubstantiated and their post market monitoring has been difficult. Patients are also said to have reported adverse reactions. Akinleye (2008) corroborated this when he identifies some of the drawbacks of TM as incorrect diagnosis, imprecise dosage, low hygiene standards, the secrecy of some healing methods and the absence of written records about the patients.

TM practice in Nigeria, however, faces greater challenges in the hands of government officials who look at it with disdain and disrespect. This is a carry-over from the colonialists who "needed" to uproot this traditional medical practice for their own medical system to thrive and therefore portrayed the former as nothing more than witchcraft and fetish. Their successor, the Nigerian elite, despite the cultural background, was not better, as the western propaganda had been infused to smear the historical and the indigenous health care system. This is manifested in the Nigeria government's reluctance to accord TM its primate position in the healthcare delivery system. As a matter of fact, TM is practiced in Nigeria today without enabling national legislation that will regulate its practice as obtained in many parts of the world (WHO 2011).

2.5 Common herbs and their uses in Nigeria

Plants are a great source of medicine useful in the treatment of various diseases (Bako, John, Bala and Bakfur, 2005). Humans learnt to exploit plants for medicine almost as early as they cultivated them for food (Muhammad and Amusa, 2005). Traditional medicines have not only played a vital role in providing healing but have also contributed to the discovery of most pharmaceutically active substances in plants (Pearce and Puroshothaman, 2002), which have been used in the commercial production of drugs. Many nations are now integrating traditional medicine into their primary healthcare systems. Twenty five percent of global prescription drugs are directly derived from plants (Isichei, 2005). Archaeological evidence shows that even pre-historic man used plant to heal. In Nigeria, various plants are used for the management of diseases and these vary from one locality to another (Aiyeloja and Bello, 2006; Odugbemi, Akinsulire, Aibinu and

Fagbeku, 2007; Olorunniyi and Morenikeji, 2013). Four of these herbs and their healing properties are shown in Table 2.1.

Table 2.1: Four commonly used herbs in Nigeria and their uses

SN	Species Name	Local names	Common names	Parts used	Medicinal use(s)
1	*Persea Americana*	Igba/apoka, ube-beke	Avocado (alligator) pear	Leaves	Relief of kidney symptoms by cleansing the kidneys of impurities and toxins. Also useful for pain relief in toothaches, headaches lower back pains and menstrual cramps.
2	*Acacia sieberiana*	Siyi, Sie, Farakaya	Acacia	Bark, stem, twigs, roots, leaves, latex	Kidney disease and other body ailments, such as cancer and fever
3	*Adansonia digitata*	Ose, Igi ose, Kukaa, kulambali	Baobab	Leaves, fruit pulp	Kidney disease and other body ailments, such as malaria, asthma , diarrhea
4	*Aerva lanata*	Ewe owo, aja, efunile, alhaji, furfurata, fatumi	Bhadram Cherula	Whole plant	Kidney disease and other body ailments such as ulcers, constipation and sore throat

Source: Kutama et al, 2015

2.6 Perceived efficacy of herbal remedies

The efficacy of a medicine is based on its ability to improve health and wellbeing. Thus, according to Twumasi, 2005, the functional scope of each medical system is greatly determined by its ability to get positive outcomes in specific cases of illness (Bright, 2013). Although herbs are often perceived as "natural" and therefore safe, many different side effects have been reported owing to active ingredients, contaminants, or interactions with drugs (Bent, 2008). Although many studies identified the increasing prevalence of the use of herbal remedies throughout the world, only a few reported on how patients perceived the efficacy of this healthcare modality in specific diseases (Clement, Morton-Gitten, Basdeo, Blades, Francis, Gomes, Janjua and Singh, 2007). According to Clement et al,2007, the major factor contributing to the increasing popularity of herbs in developed countries and their sustained use in developing countries is the perception that HRs are efficacious, and in some cases, more so than allopathic medicines. This favorable level of perceived efficacy support their continued use, and in a significant number of patients, concomitant use with orthodox or allopathic medicines. In a study of how users of primary health care in Trinidad perceived HRs, Clement et al. 2007 discovered that 86.6% believed that HRs were equally or more efficacious than orthodox medicines for specific ailments and diseases, though in a study conducted among academic doctors in Nigeria, about half (47.5%) of the doctors think the use of CAM is unsafe. About 84.6%, 86.4%, and 64.3% of doctors think CAM use can cause adverse reactions/side effects, drug interactions, and noncompliance, respectively (Jimoh, 2014).

According to Mensah, 2008), and Twumasi 2005, the potency and effectiveness of TM have been proven through research. Herbal therapies have shown remarkable success in healing acute as well as chronic diseases (Shaikh and Hatcher, 2005). Buor, 1993, for instance discovered that there is a kind of psychological security in the medical approaches of the traditional medicine man which is able to relieve a patient of strong psychic pressure. HRs provide more effective treatments for certain health problems such as boils, tuberculosis, stroke, arthritis, epilepsy, asthma, infertility, hernia, hypertension, diabetes, malaria, depression, mental illness and disease prevention as well as for the ageing population, where modern medicine has either failed to produce equally good

results, or has simply ignored the need for systematic attention and research (Darko, 2009; Twumasi, 2005a; Yeboah, 2000; Davies, 1994; Buor, 1993). Also, in cases of sexually transmitted diseases, typhoid fever, yellow fever, menstrual and fertility problems, HRs are considered more effective (Shaikh and Hatcher, 2005). Herbal remedies have also shown a wide range of efficacy in the treatment of various diseases such as breast, cervical and prostate cancers, skin infections, jaundice, scabies, eczema, typhoid, erectile dysfunctions, snakebite, gastric ulcer, cardiovascular disorders and managing HIV/AIDS (Verma and Singh, 2008; Okigbo and Mmeka, 2006; WHO, 2003b).

Significantly, it is evident that some herbal medicines have been recognized internationally for the treatment of certain diseases (International Union of Pure and Applied Chemistry (IUPAC), 2008, Okigbo and Mmeka, 2006, Calixto, 2000). Herbs remain the foundation for a large amount of commercial medications used today for the treatment of heart disease, blood pressure regulation, pain remedies, asthma and other health problems (IUPAC, 2008, Okigbo and Mmeka, 2006, Calixto, 2000). For instance, Artemisinin, which is extracted from the Chinese herbal wormwood plant "Artemisia annua", is the basis of more effective anti-malarial drugs the world has ever known (WHO, 2008; Okigbo and Mmeka, 2006). Western researchers learned of the plant for the first time in the 1980s, but it had been used in China for almost 2000 years to treat malaria. However, due to scepticism surrounding the drug, it was only until 2004 that WHO approved of it for use internationally, International Union of Pure and Applied Chemistry (IUPAC, 2008, Okigbo and Mmeka, 2006). Artemisinin is also effective in combating other diseases and has demonstrated significant potential for the treatment of cancer and schistosomiasis (Baidoo, 2009; IUPAC, 2008).

Moreover, the Neem tree (*azadirachta indica*) "Dogoyaro", which is also common in Nigeria, is effective in the treatment of several diseases (Okoli, Aigbe, Ohaju-Obodo, and Mensah, 2007). The bark of the Neem tree is perceived to be effective in the treatment of malaria (Davies, 1994; Brown, 1992). In addition to this, Davies (1994), accounts that East Indians use it to make a strong soap that cures skin diseases. Africans also chew it to

clean their teeth and it works as well as brushing with toothpaste, and supposed to be healthier for the gums. More so, the plant Curcuma Longa is perceived to be effective in the treatment of scabies, itches, boils, abscesses, eczema and eye diseases (Okigbo and Mmeka, 2006; Davies, 1994).

Furthermore, a growing body of research has demonstrated that the commonly used herbs and spices such as garlic (Allium sativum), black cumin, cloves, cinnamon, thyme (Thymus vulgaris), bay leaves, mustard, and rosemary, possess antimicrobial properties that, in some cases, can be used therapeutically. Others such as saffron, turmeric, tea and flaxseed provide significant protection against cancer (Lucas, 2010). For example, thyme and garlic contain certain antibiotic substances that prevent bacteria growth in the mucus, and are of great benefit for the respiratory system, and helps reduce cholesterol levels and high blood pressure (Okigbo and Mmeka, 2006; Calixto, 2000; Pamplona-Roger, 1999). Herbal plants like Black cohosh (Cimicifuga racemosa), Dong quai (Angelica sinensis) and chaste tree berry (Agnus castus) have been reported to be specifically useful for premenstrual syndrome (Okigbo and Mmeka, 2006). HRs are good dietary supplements, which are nutritive and replenish the body. For example, sunflower seed (Helianthus annuus) and moringa provide vitamin B6 (Pyridoxine), (Okigbo and Mmeka, 2006). Several well-known orthodox medicines like morphine, taxol, colchicine, digoxin, artesunate, guanidine, ephedrine, reserpine, vincristine, atropine, and codein could trace their sources to herbs (IUPAC, 2008).

The world health organization (WHO) noted that inappropriate use of traditional medicines or practices can have negative or dangerous effects, and advised that further researches are needed to ascertain the efficacy and safety of several medicinal plants and practices used in traditional medicine system(WHO, 2000).

2.7 Prevalence of the use of herbal remedies

In many parts of the world, there is a rich tradition in the use of herbal remedies for the treatment of many diseases (Adibe, 2009). In developed countries such as the United States, herbal products have seen an increasing level of use, and it is now used by approximately 20% of the population (Bent, 2008). Seventy (70%) percent of the population in Canada and over 50% of people living in Europe and North America have used CAMs (Achigbu and Achigbu, 2014). In these countries, the drive for the use of HRs may stem from the notion that as plants, herbs are natural; hence, they are safer than orthodox medicines (Ameade, Amalba, Helegbe and Mohammed, 2015).

In developing countries, a resurgence of interest in HRs has resulted from the preference for products of natural origin by many consumers (Adibe, 2009). According to WHO (2002), up to 80% of persons living in Africa use TMs, especially HRs, for their primary healthcare. This high dependence on HRs by the people in developing countries may be due to difficulty in the accessibility, affordability, availability and acceptability of orthodox health facilities.

In Nigeria, the use of HRs is a practice that is common to both the poor illiterates and the rich and highly educated. This is because HRs are easily accessible, affordable and readily available (Adibe, 2009).

The use of HRs plays a significant role in the management of both minor and major illnesses (Barnes, et al, 2013). According to WHO, HRs are the first line of treatment for 60% of children with high fever due to malaria in Nigeria, Ghana, Mali and Zambia (WHO, 2013). The increasing use of CAM gobally, with a high prevalence in both children and adults with chronic illnesses, has been widely reported(Oshikoya, Senbanjo, Njokanma, and Soipe, 2008). The vast majority of HRs are used prior to, or in the absence of conventional medical services (Suswardany, Sibbritt, Supardi, Chang, and Adams, 2015), and sometimes combined with the conventional (orthodox) medicine.

With this high level ofuse of HRs in both developed and developing countries, the reports of patients combining orthodox medicines with herbal products without their doctors'

knowledge being on the ascendency is not surprising. (Molassiotis, Fernadez-Ortega, Pud, et al, 2005).

2.8 Sources of herbs

In certain countries, such as Taiwan and Nigeria, herbs can be obtained from temples, night markets, street vendors, herbal stores, neighborhoods, or relatives, and from traditional medicine practitioners. Ordinary people recommend the medicines to others without safety considerations. The general public and many practitioners also believe that the herbs are non-toxic (Bandaranayake, 2006). Access to health services in low- to middle-income countries is often limited, especially in rural and remote regions. Traditional medicines and traditional healers, those health care practices, treatments and providers that are indigenous to the culture, and which are historically and predominantly operated outside the state-funded healthcare system, as well as beyond the practices and curriculum of the dominant medical profession, are an important, popular component of health seeking and treatment for many people in low- to middle-income countries in Africa, as elsewhere (WHO, 2013). Traditional medicines and traditional healers are often utilized and patronized, respectively, by the general population on a regular basis for health maintenance, (Supardi, 2011), and/or for the cure of both chronic and acute diseases,(Ogbuehi and Ebong, 2015).

Indeed, there is scientific evidence supporting the use of some HRs. It is estimated that 25% of modern medicines are made from plants first used traditionally (WHO, 2002). However, the inappropriate use of TMs can result in hazardous effects, which is why the WHO advised that researches be carried out to ascertain the safety and efficacy of these products before making them available to consumers. The WHO by its comprehensive traditional medicine strategy in 2002 is helping nations develop policies for the evaluation and regulation of TMs and increasing its availability and affordability,(Achigbu and Achigbu, 2014).

2.9 Factors related to the use of herbal remedies among patients generally

There are several reasons for the use of herbals, and these vary from country to country (Shaikh and Hatcher, 2005). The most common reasons for the continued patronage of HRs are that, it is more accessible, more affordable, culturally acceptable, and above all, effective Bright, 2013.

Availability and physical accessibility: In developing countries, broad use of herbal remedies is often attributed to its availability and physical accessibility (WHO, 2002a). HRs are readily accessible and available to many people, especially in the rural areas (Baidoo, 2009; Darko, 2009 and Twumasi, 2005a). Thus, Buor (1993) argues that TM is more easily accessible to the rural populace, who constitute a greater proportion of the total population of the country, especially in the northern regions of Ghana where modern medical facilities are barely adequate. In Ghana, for instance, the ratio of herbal practitioners to the population is1:400. This contrasts starkly with the availability of allopathic practitioners, for which the ratio is1:12,000 (Darko, 2009; WHO 2013). Moreover, the distribution of allopathic practitioners may be uneven, with most of them being found in the cities or other urban areas thus making it difficult for rural populations to access (WHO, 2002a). Often, modern healthcare facilities are inadequate in the rural areas and sometimes even non-existent. As a result, drug peddlers, and particularly herbal practitioners, become the first point of contact for the majority of the rural population (Baidoo, 2009; Darko, 2009).

Affordability: Another important reason for the increasing patronage of herbal remedies is its relative affordability. In some communities it is the only available healthcare delivery system that is affordable to the poor (Yaw, Dennis, George, and Henry, 2014; Darko, 2009; Twumasi, 2005a). This is because, compared to the modern healthcare, HRs are less expensive, and herbal practitioners are more willing to accept delayed payment, payment in kind such as fowls, goats, palm oil, salt, or palm wine, or in some, cases, patients can negotiate the amount (Yaw, 2014; Darko, 2009; Okigbo and Mmeka, 2006). The National Health Insurance scheme does limit coverage to only patients with acute kidney injury. In a study in Ghana, assessing Clinical and demographic

characteristics of chronic kidney disease patients in a tertiary facility, only 4.3% of patients with stage 5 CKD were able to initiate haemodialysis (HD) (Yaw et al., 2014). The average number of sessions before stoppage (on account of cost) was 12.4 (range 6-18). In Ibadan, Nigeria, 70% of patients were not able to afford more than three sessions of maintenance haemodialysis (Ayo, 2001). Therefore, to achieve "health for all" there is the need to integrate it into the modern health care system.

Cultural Acceptability: Significantly, the utilisation of HRs is often due to its cultural acceptability, especially in the rural areas of developing countries (Darko, 2009; Obomsawin, 2007; WHO 2002a). Herbal practitioners know the socio-cultural background of the people they are dealing with and offer a satisfied and culturally meaningful interpretation of illness (Darko, 2009; Twumasi, 2005a). Davies, 1994, comments that herbal practitioners are part of the medical culture of the society and as socially sanctioned authorities of health care, they are less likely to overlook important cultural beliefs and practices, and can give culturally relevant and effective advice needed by their clients to understand and follow both traditionally and non-traditionally prescribed treatments. Twumasi, 2005a, states that traditional practitioners speak to their patients or their relatives in a language that they could easily understand and follow, hence the high patronage. This supports the work of Buor, 1993 who asserts that the rural and illiterate community has such confidence in the work of traditional healers that their activities tend to have psychosomatic effect on them. Thus, according to Fakeye et al., 2009, it is not unusual for patients to use HRs first, only to fall back on orthodox medicines when all other measures have failed. Van der Geest 1997 also argues that the cultural affinity between traditional healers and their patients support the increasing patronage of such medicines. According to him, the fact that traditional healers and their patients share ideas about the origin, meaning and preferable treatment of illness enhances the efficacy of treatment.

2.10 Health risks associated with the use of herbs

Traditional health services do not have the answers to all of the health problems (Yaboah, 2000). While many herbs may be considered safe, some have hazardous side effects (IUPAC, 2008), which include acute kidney injury, tubular function defects,

dyselectrolytaemias, systemic hypertension, chronic kidney disease (CKD), renal papillary necrosis, urolithiasis and urothelial cancer (Olarewaju, Chijioke and Adewale, 2014). Herbs believed to have an effect on blood clotting abilities (for example, ginkgo biloba and ginseng) may cause serious side effects for patients with certain blood-related conditions such as hemophilia (Lucas, 2010).

Herbal remedies may interact with prescription medications, over-the-counter drugs, vitamins and minerals. For example, the herbal medicine, ginkgo biloba, taken with ibuprofen may lead to spontaneous and/or excessive bleeding. High doses of garlic may also enhance the adverse effects of anticoagulant and anti-platelet drugs, including aspirin, clopidogrel (Plavix), enoxaparin (Lovenox), and others (IUPAC, 2008). A study on the use of CAM by cancer patients at the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria (Ezeoma and Anarado, 2007), showed that only 21.2% of the patients studied reported unwanted side effects from CAM treatment. The side effects included full thickness chemical burns following application of herbal product on the skin, slimming down, anorexia, nausea and vomiting, general malaise, and diarrhea.

In Nigeria, formal medicinal plants are subjected to the national regulatory framework for food and drug administration and control (NAFDAC). A study in Nigeria has also shown that a lot of herbal formulations have been documented as being efficacious for specific conditions out of which only about twenty are circulating as herbal medicinal products, and have undergone full registration status at NAFDAC, which is the institution mandated by the government to undertake research and development of plant medicines, assess and approve the efficacy and long term safety, and clinical monitoring of herbal medicinal products in Nigeria (Ijoma, Ulasi and Kalu, 2014; Adegboyega and Oluwalana, 2011).

Adulteration, inappropriate formulation, or lack of understanding of plant and drug interactions have led to adverse reactions that are sometimes life threatening or lethal (Lucas, 2010; Ahmad, Farrukh, Amed and Owais, 2006; Elvin-Lewis, 2001). For instance, in 1996 more than 50 people in Belgium suffered kidney failure after taking

herbal preparation which contained Aristolochia fangchi (a toxic plant), instead of Stephania tetrandra or Magnolia Sofficinalis (WHO, 2003).

2.11 Drug and herb interaction

There are many reported cases of drug and herbal interactions. Many people, especially those living with HIV/AIDS, use both HRs and prescribed drugs. A number of clinically significant interactions between prescribed medicines and HRs have been identified. When these medications are used together, they can interact in the body, causing changes in the way the herb and/or the drug work. Such changes are called herb-drug interactions. Concurrent uses of herbal (or homeopathic) remedies alongside prescribed or over-the-counter (OTC) medications are frequent, and may mimic, magnify, or oppose the effect of the drug. Herb-drug interactions are not chemical interactions between a drug and an herbal component to produce something toxic. Instead, the interactions generally cause either an increase or decrease in the amount of drug in the bloodstream. As with conventional medicines, HRs interact with drugs in two general ways: pharmacokinetically and pharmacodynamically. Pharmacokinetic interactions result in alterations in the absorption, distribution, metabolism, or elimination of the drug or natural medicine. These interactions affect drug action by quantitative alterations, either increasing or decreasing the amount of drug available to have an effect. Pharmacodynamic interactions cause alterations in the way a drug or natural medicine affects a tissue or organ system. These actions affect drug action in a qualitative way, either through enhancing or antagonizing effects (Ahmad, Farrukh, Amed and Owais, 2006).

Herbal remedies can act through a variety of mechanisms to alter the pharmacokinetic profile of concomitantly administered drugs (Fugh-Berman, 2000). St John‘s wort, for example, induces the cytochrome P450 iso-enzyme CYP 3A4 and intestinal P-glycoproteins, accelerating the metabolic degradation of many drugs including cyclosphorin, anti-retroviral agents, digoxin, and warfarin (Moore, Goodwin, Jones, Wisely, Serabjit-Singh,Wilson, Colins and Kliewer, 2000). These effects may potentiate or antagonize drug absorption or metabolism, the patient‘s metabolism, or cause

unwanted side reactions such as hypersensitivity (Cupp, 1999; Blumenthal, 2000). HRs may interact with prescription medications, OTC drugs, vitamins and minerals. For example, the herbal remedy, ginkgo biloba, taken with ibuprofen may lead to spontaneous and, or excessive bleeding. High doses of garlic may also enhance the adverse effects of anticoagulant and anti-platelet drugs, including aspirin, clopidogrel (Plavix), enoxaparin (Lovenox), and others (IUPAC, 2008).

Care should be taken to understand the effects of foods on HRs during anticoagulant therapy in the treatment of diabetes, depression, pain, asthma, heart conditions, or blood pressure disorders, and during slimming (Elvin-Lewis, 2001). For example, the high content of vitamin K in a variety of green vegetables, particularly broccoli and other brassicaceae, can, in large amounts, be antagonist to the effects of anti-coagulant therapy (D'Arcy, 1993; Elvin-Lewis, 2001). In addition, grapefruit juice, can lead to the elevation of serum concentrations of a variety of medications like cyclosporine, some 1,4-dihydropyridine calcium antagonists, and some 3-hydroxy-3-methyglutaryl coenzyme A reductase inhibitors (Kane and Lipsky, 2000).The scientific data about the interactions of various HRs with a drug and its pharmacokinetics and bio-availability should be evaluated to assess the potential toxicity as well as the pharmacological basis of efficacy (Soller, 2000).

2.12 Herbs standardization and regulation

Generally, all medicines, whether they are synthetic or of plant origin, should fulfill the basic requirements of being safe and effective (EMEA, 2005; WHO, 2002). The term "herbal drugs" denotes plants or plant parts that have been converted into phyto-pharmaceuticals by means of simple processes involving harvesting, drying, and storage (EMEA, 1998). Hence they are capable of variation. This variability is also caused by differences in growth, geographical location, and time of harvesting.

Standardization of HRs is the process of prescribing a set of standards or inherent characteristics, constant parameters, definitive qualitative and quantitative values that carry an assurance of quality, efficacy, safety and reproducibility. It is the process of developing and agreeing upon technical standards. Specific standards are worked out by

experimentation and observations, which would lead to the process of prescribing a set of characteristics exhibited by the particular herbal remedy. Hence standardization is a tool in the quality control process (Folashade, Omoregie and Ochogu, 2012).

The variability in the content and concentration of constituents of plant material, together with the range of extraction techniques and processing steps used by different manufacturers results in marked variability in content and quality of commercially available herbal products (Schulz, 2000). The use of chromatographic techniques and marker compounds to standardize herbal preparations promotes batch-to-batch consistency but does not ensure consistent pharmacological activity or stability. Consistency in composition and biological activity are prerequisites for the safe and effective use of therapeutic agents. But standardization of correct dosage forms is not always easy, especially in poly-herbal preparations or single plants that are not cultivated under controlled condition. And there is no guarantee that a product contains the amount of the compound stated on the label (Goldman, 2001; Ahmad, Farrukh, Amed and Owais 2006).

Also there is need for countries in this continent to develop and adopt national Pharmacopoeia such as Nigeria Pharmacopoeia. This will provide a platform for regulation and standardization of herbal remedies. The NAFDAC, in the last 6 years has achieved success in the regulation of HRs. In Nigeria for instance, NAFDAC has used its authority to ward off the media on advertisement of unregulated herbal products (Falodun, 2010).

2.13 Use of herbal remedies on chronic kidney disease (CKD)

Not all documented useful plants are harmless. Some of these HRs have been implicated in the etiology of acute renal failure, interstitial nephritis, uro-epithelial malignancies and progressive CKD (Okwuonu, Ezeani, Olokor and Aiede, 2014). Renal involvement associated with the use of traditional medicinal products can take several forms (Isnard, Deray, Baumelou, Le Quintec and Vanherweghem, 2004), including acute kidney injury (AKI), tubular function defects, dyselectrolytaemias, systemic hypertension, chronic kidney disease (CKD), renal papillary necrosis, urolithiasis and urothelial cancer. Patients

with pre-existing CKD can develop complications from the HRs used; examples of such remedies are *Ginkgo biloba*-induced hemorrhagic complications, glycyrrhizin acid-induced hypertension and hypokalemia, alfalfa or noni juice (*Morinda citrifolia*)-induced hyperkalemia, star fruit (*Averrhoa carambola*)-induced encephalopathy and cranberry juice-induced nephrolithiasis. Causality infection is suspected on the basis of a temporal association between the intake of an agent and the injury. Majority of cases are largely preventable and potentially reversible if recognized early and promptly treated.

AKI from herbal nephrotoxins is very common in the tropics of Africa and Asian (Olanrewaju, Chijioke Ameh and Adewale, 2014). Nephrotoxic herbal remedy was the commonest cause of acute tubular necrosis with prevalence of 37.5% reported by Kadiri, Ogunlesi and Osinfade (1992) in the southwestern part of Nigeria. Few years after this report, the same author also documented fifty-three (53) cases of (AKI) to traditional herbal preparations. A recent case reported by (Olanrewaju, Chijioke, Ameh and Adewale, 2014) documented an AKI from herbal vaginal remedy in north central part of Nigeria.

In South Africa, Goldman, 2001, had equally reported ninety-one (91) cases of AKI from herbal and patent remedies over a four-year period. Seedat and Nathoo, 1993, also in South Africa, found infections and herbal toxins as the most common causes of AKI in his series. He observed that the most common nephrotoxin was a traditional herbal remedy called *Callilepsis laureola*, a tuberous plant that causes hepatic (liver) and renal (kidney) injury. In the Asian population, herbal remedy-induced AKI has been reported particularly in association with Chinese herbs. This Chinese herbal preparation contains complex mixture of herbs which may be combined with animal materials and has been implicated in different types of acute renal disorders. The exact mechanism of kidney injury by herbal nephrotoxins is unknown but may involve toxic and, or hypoxic-ischemic insults through damage to the mitochondrial oxidative phosphorylation processes. The kidney is vulnerable to toxin-induced injury by virtue of its being highly vascularised, possessing a large endothelial surface, its high metabolic activities and ability to filter and concentrate blood-borne

nephrotoxins. Various renal syndromes have been reported after the use of HRs, including acute tubular necrosis, acute interstitial nephritis, Fanconi's syndrome, hypokalemia or hyperkalemia, hypertension, papillary necrosis, chronic interstitial nephritis, nephrolithiasis, urinary retention and cancer of the urinary tract (Isnard, Deray, Baumelou, Le Quintec and Vanherweghem, 2004).

AKI due to nephroroxins generally carries a poor prognosis with mortality rates between 24% and 75%. However, mortality depends on associated co-morbidities such as liver disease or sepsis. Luyckx and Naicker (2008) reported that 26.9% of the patients recovered within 3 days with intravenous fluid alone, and additional 26.9% who had acute tubular necrosis also tend to recover over time. Dialysis tends to improve the outcomes of the patients in the series from Nigeria and Kenya. The absence of co-morbid factors is probably the reason for the favourable outcome in the patients. Renal replacement therapy, either in form of intermittent haemodialysis or continuous renal replacement therapy is capital intensive, and majority of the patients cannot afford the procedure due to their poor socio-economic status (Olanrewaju, Chijioke, Ameh and Adewale, 2014).

In conclusion, there is wide spread use of HRs among renal patients, which calls for surveillance and institution of preventive measures for acute and chronic kidney disease. The use of HRs and socio-cultural practices that predispose to health hazards should be discouraged. The government should intensify efforts in the regulation and standardization of production and marketing of herbal products through a policy on quality control standards.

2.14 Conceptual Frame Work

The precede framework principles were applied to this study.

2.14.1 The Precede Framework

This outlines and describes the antecedent factors that influence behaviours. These factors are: Predisposing factors, Enabling factors and Reinforcing factors.

Predisposing factors: These are the antecedents to behaviour that provide rationale for the behaviour. They are knowledge, values, beliefs, attitudes, perceptions, norms, and behavioural intensions. Most adults do not have enough knowledge about the relevance of regular monitoring of the blood pressure. Predisposing factors have the potential to influence the decisions people take about their health and their given health behaviour. They do this by either encouraging the behaviour or by inhibiting the behaviour from occurring.

Enabling factors: These factors are also antecedents to behaviour because they also influence the realization of motives, aspirations and decisions. These include skills, everyday routines, personal resources, community resources, such as availability of health resources, accessibility of health resources, and ability to source for these resources, government policies and access to health related skills.

Reinforcing Factors: These comprise of the feedback or influence of significant others or people that influence the continuance or discontinuance of a particular behaviour. Examples of these factors include pressure from peers, siblings, co-workers, policy makers, patients, peer groups and other social support group. They are also factors subsequent to behaviour that provide perpetual rewards or incentives for the behaviour and contribute to its persistence or discontinuance.

THE PRECEDE FRAMEWORK

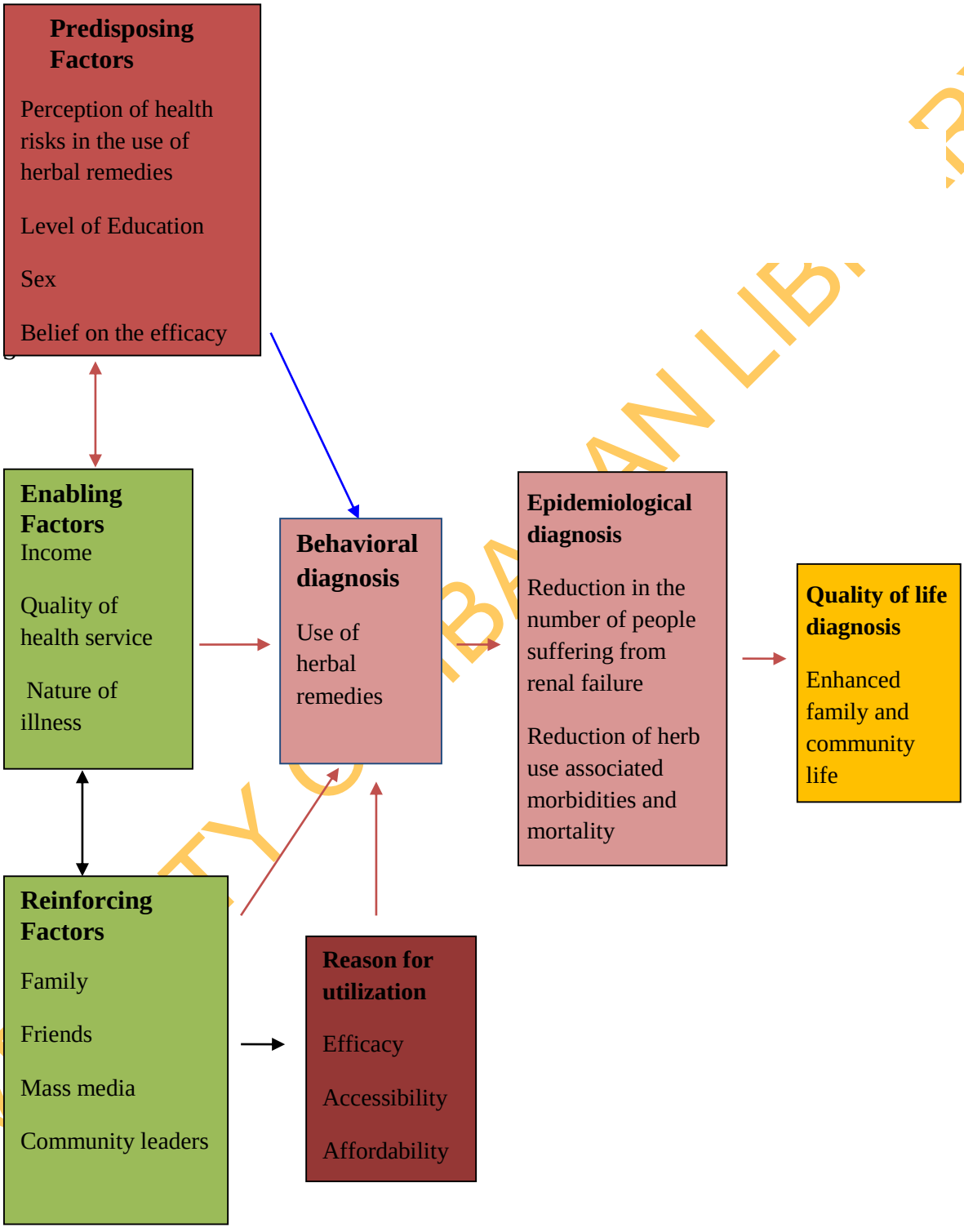

Figure 2.1: Application of the Precede Model on the use of herbal remedies

CHAPTER THREE

METHODOLOGY

3.1 Study Design

The study was a descriptive cross-sectional design. It is limited in scope to the assessment of the use of herbal remedies and perception of the health risks among renal patients receiving treatment in the University College Hospital, Ibadan.

3.2 Description of Study Site

The study was carried out in the University College Hospital (UCH), Ibadan, Oyo state. Ibadan is located in the southwestern part of Nigeria. It is the largest city in West Africa and the capital of Oyo State. Ibadan was formally called Igbori-Ipara, that is, the forest of Ipara. This is because the forest acted as the boundary between towns where the Ijebus, Egbas and the Oyos occupied. As more and more people settled and live there, the name was changed to Ibadan.

Ibadan occupies a large area of 3123.30km^2, 15% of which falls within the urban sector. The remaining 85% cover the rural setting. 11 local government areas were created in Ibadan in August 1991 by the then Military Head of State, Major General Ibrahim Gbadamosi Babangida (Rtd) during the nationwide local government reforms. Out of the 11 Local Government Areas, 5 are urban while the remaining 6 are rural based. The urban local government areas are Ibadan North, Ibadan Northwest, Ibadan Northeast, Ibadan Southwest and Ibadan Southeast, while the rural local government areas are Akinyele, Lagelu, Egbeda, Onaara, Oluyole and Iddo.

The University College Hospital is a federal government owned tertiary health institution established in 1952. Located in the municipality of Ibadan, Oyo state, it is one of the biggest hospitals in Nigeria. It is attached to the University of Ibadan, both of which function symbiotically in the areas of health manpower training, research and clinical services.

The renal clinic is one of several other clinics in the medical department. It is run every Tuesday from 12 noon, and an average of twenty eight (28) patients (both old and new cases) is seen each clinic day.

3.3 Study Population

The study population consisted of available and consenting renal patients receiving treatment in the University College Hospital, Ibadan, during the period of data collection.

3.4 Inclusion criteria

- Diagnosed renal patients receiving treatment in the University College Hospital Ibadan, Oyo state, were included in this study.

3.5 Exclusion criteria

- The study excluded other patients without renal problems in the University College Hospital, Ibadan, Oyo state.

Variables

- Dependent variables: knowledge of CKD, perception of susceptibility to CKD
- Independent variables (socio-demographic characteristics): sex, age, level of education, religion

3.6 Sample Size Determination

The estimated national prevalence of kidney failure in Nigeria is 12.4%, (Odubanjo, Olushola and Kadiri 2011). Based on this, a sample size (n) of 178 was initially determined using the Leslie Kish sample size formula as follows:

$$n = \frac{Z^2pq}{d^2}$$

Where: n = minimum sample size required

Z = confidence limit of survey at 95% (1.96)

p = Prevalence of hypertension in Nigeria (12.4%) = 0.124

q = 1-p

d = absolute deviation from true value (degree of accuracy) = 5%

$$n = \frac{1.96^2 \times 0.12 \times 0.88}{0.05^2}$$

$$= 162.2$$

To compensate for non-response, 10% attrition rate was added to the minimum sample size

10% of 162 = 16

162 + 16 = 178.

However, the turnout of renal patients for treatment in the University College Hospital, Ibadan, was very low during the period of the study. Thus, a total of sixty four (64) available and consenting patients participated in the study.

3.7 Sampling Technique

Purposive sampling was adopted for this study. The study involved the purposive selection of 64renal patients receiving treatment in the University College Hospital, Ibadan, that were available during the period of the study, and who consented to take part in the study.

3.8 Instrument for Data Collection

Semi-structured, interviewer-administered questionnaires were designed from information gathered through the review of literatures. The questionnaire was divided into four major sections as follows:

Section A: This elicited information about the respondents' socio-demographic and medical history.

Section B: Perception of renal patients on the health risks associated with the use of herbal remedies.

Section C: Prevalence of the use of herbal remedies among renal patients.

Section D: Factors associated with the use of herbal remedies among renal patients.

3.9 Validity of the instrument

The instrument was validated by first having somebody who understood the topic, read through it and check for common errors. Afterwards, two research assistants were recruited and trained, with emphasis on strict adherence to ethical issues in the course of data collection. A pre-test was carried out among renal patients that were receiving treatment in the Federal Medical Centre, Abeokuta, Ogun state, to test the validity of the instrument. Having done this, the instrument was reviewed and necessary adjustments made on it. The researcher supervised and monitored the data collection process.

3.10 Reliability

A measure is said to have a high reliability if it produces consistent results under consistent conditions. In order to determine the reliability of the questionnaire, a pre-test was conducted on a sample size of twenty two (22) renal patients in the Federal Medical Centre, Abeokuta, Ogun state, a tertiary health facility. Copies of the pretested questionnaires were cleaned, coded and entered into the computer. Facilitated by the use of SPSS, the reliability of the questionnaire was determined using Cronbach's Alpha model technique of SPSS (Version 20). The reliability coefficient obtained was 0.964 implying that the instrument was reliable. Necessary adjustments (which included deletion of irrelevant questions and re-arrangement of the questions) were made on the instrument before it was finally used.

3.11 Data Collection Process

Data was collected by the researcher and two research assistants using forty-three (43)-item questionnaires. The research assistants were trained a day before the day of data collection on data collection procedure. The training was facilitated by the investigator who focused on what the study aimed to assess and the specific objectives of the research. Research assistants were also trained about ethical issues that must be considered and observed during the course of data collection. Training methods adopted were role plays, lectures and discussions. Demonstration and return demonstration was

also done with focus on interviewing skills. Support and assistance was requested from the medical staff, who prepared the minds of the patients for the study.

Data collection started after the researcher had done the following;

1. The researcher made a formal application for data collection to the office of the Chairman, Medical Advisory Committee (CMAC), University College Hospital (UCH), Ibadan.

2. Met with the matrons and the nurses in charge of the renal clinic and the wards in which renal patients were admitted. Through this meeting, the study was introduced and permission to interview consenting respondents was obtained.

3. Established rapport with the prospective respondents during which the nature, purpose and objectives of the study were explained.

Subsequently, data were collected over a period of fifteen (15) days, including weekends, between the 6th and 20th of October 2015. Collection took place on clinic days between 12 noon and 4:00pm, as well as on the wards. After each interview session was completed, the instrument was checked for completeness and it was cleaned to ensure quality data.

3.12 Data Management and Analysis

Prior to data entry, a 13-point perception scale was developed. Scores ≥7 were regarded as good perception while scores ≤6 represented poor perception. Other specific questions were developed and organised into sections where socio-demographic details, medical history, prevalence of the use of herbal remedies and factors associated with the use of herbal remedies were all measured.

The questionnaires were sorted and serially numbered 01 to 64 for easy recall. Answers were carefully checked to ensure correctness of response. A good coding guide was developed and used to facilitate coding of the collected data. Data entry, cleaning and analysis was done using SPSS Version 20.0. Analysis was done using descriptive statistics, percentages and proportion, while inferential statistics was done using Chi-

square to analyse categorical variables. The level of significance was set at $p<0.05$. The results were presented sequentially in tables and this could be found in chapter 4.

3.13 Ethical Considerations

The researcher ensured compliance with the principles of research ethics by first obtaining ethical approval from the UI/UCH Ethical Committee. Also, the researcher ensured that participation of respondents was voluntary, based on attestation to the informed consent made available. Freedom to withdraw from the study at any stage was allowed. The research was relatively risk-free. No invasive procedure or interventional activity was involved. Only the respondents' time for participation was required. To ensure anonymity and confidentiality of research participants, names and information that could reveal the identity of research participants were all removed from the research instruments, and the questionnaires were serially numbered. The data that was collected from this study were analysed and kept in a password-protected computer to ensure confidentiality of the research participants' information. Information sharing was only among the research team members.

CHAPTER FOUR

RESULTS

4.1 Demographic characteristics and medical history of the study participants

The socio-demographic characteristics of respondents are shown in Table 4.1. The mean age of the participants was 51.9 ± 16.9 years (range was 14-84 years). Less than a third (32.7%) were aged between 52 and 67 years, while 31.3% were in the age bracket of 36 and 51years, followed by 17.2% that were more than 68 years. Half of the respondents (50.0%) were males. Majority of them (84.4%), were married, and 67.2% were in a monogamous family setting. More than half of the respondents (59.4%) were Christians. Nearly all (96.9%) of the respondents were Yoruba. Slightly over one third of the respondents (37.5%) had secondary education, while 34.4% had tertiary education. 34.4% were engaged in businesses and trading, while about a quarter (23.4%) were civil servants.

Table 4.1b shows the estimated monthly income and possession of health insurance among the respondents. More than a third (34.4%) earned an estimated monthly income in the range of twenty and fifty thousand naira (#20,000 - #50,000) naira, while less than half (26.6%) earned below twenty thousand naira (#20000).

A large majority (92.2%) of the respondents had no medical insurance cover. Among the few (7.8%) with medical insurance, the only medical insurance type used was the National Health Insurance Scheme (NHIS).

Table 4.1c shows a part of the medical history of the respondents. More than half (59.4%), of the respondents had their kidney disease diagnosed at, or less than two years ago. More than half of the respondents (53.1%) had history of dialysis, out of which 15 (44.1%) of them already had five (5) and below sessions of hemodialysis, and 35.3% had done hemodialysis between 6 to 10 times. The mean frequency of hemodialysis sessions had by the respondents was 6.47±3.4. Close to a sixth of the respondents had been followed up in the UCH renal clinic for not more than 24 months (2 years). The mean

number of follow-up at the UCH renal clinic was 36.5±48.4 months. Most (95.3%) of the respondents have no family history of kidney problems.

Respondents' complaints before going to the clinic were as displayed in Table 4.1d. Multiple options were allowed, and 57.8% of the respondents had a complaint of leg swelling, malaise (53.1%), facial swelling (46.9%), vomiting (35.9%), nausea (31.3%), reduced urinary output (26.6%) and high blood pressure (4.7%).

Table 4.1e shows the primary risk factors of renal disease stated by the respondents. More than half (56.3%) of the respondents related the cause of their renal disease to hypertension. Respondents who associated their present renal condition with diabetes mellitus were 31.3%. Some (17.5%) associated their present renal condition with diabetes and hypertension, while 7.8% related their condition to inflammation and infection of the kidney.

Table 4.1: Socio-demographic characteristics of respondents (N=64)

Variables	Frequency (N)	Percentage (%)
Age (years)		
<20	3	4.7
20-35	9	14.1
36-51	20	31.3
52-67	21	32.7
≥68	11	17.2
Sex		
Male	32	50.0
Female	32	50.0
Marital Status		
Single	6	9.4
Married	54	84.4
Separated	1	1.6
Widow/Widower	3	4.7
Family Type		
Monogamous	43	67.2
Polygamous	15	23.4
Not Applicable	6	9.4
Religion		
Christianity	38	59.4
Islam	26	40.6
Ethnic background		
Igbo	2	3.1
Yoruba	62	96.9
Educational Status		
No formal education	3	4.7
Primary school	8	12.5
Secondary education	24	37.5
College/tertiary education	22	34.4
Post university education	7	10.9
Occupation		
Civil servants	15	23.4
Driving	2	3.1
Artisan	3	4.7
Business/Trading	22	34.4
Retiree	14	21.9
Clergy	3	4.7
Student	5	7.8

Table 4.1b: Monthly income and possession of medical insurance cover by the respondents (N=64)

Variables	Frequency (N)	Percentage (%)
Monthly Income		
Less than 20000	17	26.6
20,000-50,000	22	34.4
60000-100000	6	9.4
More than 100,000	8	12.5
Above 200000	4	6.3
Don't wish to divulge	4	6.3
I can't estimate	3	4.7
Possession of medical insurance cover		
Yes	5*	7.8
No	59	92.2

***The five respondents that had medical insurance were covered by NHIS

Table 4.1c: Medical history of respondents (N=64)

Variables	Frequency (N)	Percentage (%)
Duration of kidney disease diagnosis (years)		
0-2 years	38	59.4
More than 2 years to 4 years	6	9.4
More than 4 years to 6 years	9	14.1
More than 6 years to 8 years	6	9.4
More than 8 years	5	7.8
History of dialysis		
Yes	34	53.1
No	30	46.9
No of sessions of hemodialysis (N=34)		
≤5	15	44.1
6-10	12	35.3
>10	7	20.6
Duration of follow-up in the UCH renal clinic (years)		
≤2	38	59.4
3-4	8	12.5
5-9	13	20.3
≥10	5	7.8
Family History of Kidney problems		
Yes	3	4.7
No	61	95.3

Table 4.1d: Medical History: Respondents' complaint before going to the hospital (N=64*)

Complaints	Frequency (N)	Percentage (%)
Leg swelling	37	57.8
Malaise	34	53.1
Facial swelling	30	46.9
Facial swelling and leg swelling	27	42.2
No complaint specific to kidney problems	24	37.5
Vomiting	23	35.9
Nausea	20	31.3
Diabetes mellitus	20	31.3
Reduced urinary output	17	26.6
Nausea, vomiting and malaise	7	10.9
High blood pressure	3	4.7
Leg swelling, malaise and others	3	4.7
Blood in urine	2	3.1
Abdominal pain	2	3.1
Facial swelling, leg swelling, malaise and others	2	3.1
Hesitancy	1	1.6
Protein in urine	1	1.6

***multiple response**

Table 4.1e: Medical history: The primary risk factors of renal disease among the study respondents (N=64*)

Respondents' risk factors for renal disease	Frequency (N)	Percentage (%)
Hypertension	36	56.3
Diabetes Mellitus	20	26.7
Diabetes Mellitus and Hypertension	11	31.3
Inflammation and infection of the kidney	5	7.8
HIV/AIDS	2	3.1
Obstructive uropathy (obstruction of the urinary system)	1	1.6

***multiple response**

4.2 Perception of respondents on the health risks associated with the use of herbal remedies

Table 4.2 shows the frequency distribution of respondents' perception on the health risks associated with the use of herbal remedies. Majority of the respondents (81.2%) have good perception, while 18.8% have poor perception.

Table4.2b shows that majority of the respondents (76.6%) perceived that some herbs could be harmful especially to renal patients. Almost all (84.4%) of the respondents also perceived that the use of herbs, especially in the wrong dosage, could be harmful to the body. Most of the respondents (90.6%) reported that it is better for renal patients to use orthodox medicines rather than herbal remedies, while majority (73.4%) perceived that combination of herbal remedies with orthodox medicines can lead to complications especially in patients with renal problems. Some (62.5%) of the respondents stated that the use of herbal remedies with orthodox medicines can interfere with the effectiveness of the latter. Few (15.6%) of the respondents, however, perceived herbal remedies to be safer than orthodox medications.

Some (64.1%) of the respondents perceived that herbs have negative side effects, and when used by patients with renal problems could worsen their condition. Most of them (81.3%) stated that herbal remedies could be contaminated during preparation and this could cause adverse reactions in the body. Majority (71.9%) of the respondents also perceived that some herbs could have been contaminated by heavy metals and other contaminants where they were planted.

Most (64.1%) of the respondents agreed that metabolism of herbs, especially in renal patients can exert more pressure on the kidney and further damages the kidney. About three-quarter, (75.0%) agreed that most herbs are taken in wrong dosage. Seventeen(26.6%) respondents perceived that only herbal remedies not registered by NAFDAC could be harmful for use by humans. Majority (68.8%) of them perceived that most herbal products have not been scientifically tested on human beings before they are sold and used and could, therefore, be harmful to people using them . Only very few (15.6%) of the respondents agreed that western doctors will allow the use of herbal remedies.

Table 4.2: Level of perception among respondents (N=64)

Level of Perception	Frequency (N)	Percentage (%)
Good	52	81.2
Poor	12	18.8

Table 4.2b: Perception of respondents on the health risk associated with the use of herbal remedies (N = 64)

Perceptions	Agree N (%)	Disagree N (%)	Undecided N (%)
Some herbs could be harmful especially to renal patients	49 (76.6)	2 (3.1)	13 (20.3)
Use of herbs especially in the wrong dosage could be harmful to the body	54 (84.4)	1 (1.6)	9 (14.1)
It is better for renal patients to use orthodox medicine rather than herbal medicine	58 (90.6)	3 (4.7)	3 (4.7)
Herbal remedies are safer than orthodox medicine	10 (15.6)	43 (67.2)	11 (17.2)
Use of herbal remedies with orthodox medicine can interfere with the effectiveness of the latter	40 (62.5)	10 (15.6)	14 (21.9)
Combination of herbal remedies with orthodox medicine can lead to complications especially in patients with renal problems	47 (73.4)	2 (3.1)	15 (23.4)
Herbs have negative side effects and when used by patients with renal problems could worsen their condition	41 (64.1)	2 (3.1)	21 (32.8)
Herbal remedies could be contaminated during preparation and this could cause adverse reactions in the body	52 (81.3)	3 (4.7)	9 (14.1)
Some herbs could have been contaminated by heavy metals and other contaminants where they were planted	46 (71.9)	1 (1.6)	17 (26.6)
Metabolism of herbs especially in renal patients can exert more pressure on the kidney thus, damaging them further	41 (64.1)	1 (1.6)	22 (34.4)
Most herbs are taken in wrong dosage	48 (75.0)	1 (1.6)	15 (23.4)
Western-trained doctors allow the use of herbal remedies	10(15.6)	28 (43.8)	26 (40.6)
Only herbal remedies not registered by NAFDAC could be harmful for use by humans	17 (26.6)	18 (28.1)	29 (45.3)
Most herbal products have not been scientifically tested in human beings before they were sold and used, and can therefore cause harm to people using them	44 (68.8)	1 (1.6)	19 (29.7)

4.3 Prevalence of the use of herbal remedies among renal patients

Table 4.3 shows the frequency distribution on the prevalence of the use of herbal remedies among respondents. Out of the 64 respondents, the prevalence of the use of herbal remedies was 56.3%. Among the respondents that used herbal remedies, 61.1% had been using it for between 1 to 10 years, while 19.4% have been using it for between 11 to 20 years. On the types of herbal remedies used, 50.9 stated that they had used ant-malaria herbal remedies, while 30.2% reported that they had used pear tree leaves for relief of kidney symptoms. Majority (69.4) reported that they used herbal remedies occasionally, while few (13.9) stated that they used herbal remedies daily.

Only very few of the respondents (13.9%) have had to abandon orthodox medications for herbal remedies, out of which 60% gave their reasons for abandoning the orthodox to be that they rarely use them. Some of them (20%) said they had to abandon it because orthodox medications affected their health negatively and that they were not effective.

Doctor's awareness about use of herbal remedies is presented in table 4.3b. More than half of the respondents that used herbal remedies (52.8%) did not inform their doctor that they used herbal remedies. They had different reasons for not informing their doctors. Some (73.7%) said that there was no reason for them to tell the doctor, 10.5% said because the doctor never asked, and 5.3% said because their doctor would never approve, even if the remedy was effective.

Table 4.3: Prevalence of the use of herbal remedies among respondents

Variables	Frequency (N)	Percentage (%)
Used herbal remedies in the last six month (N=64)		
Yes	36	56.3
No	28	43.8
Duration of use (years) (N=36)		
Between 1 to 10 years	22	61.1
Between 11 to 20 years	7	19.4
Between 20 - 30years	3	8.3
Between 30 to 40 years	4	11.1
Typologies of herbal remedies used (N=36)		
Anti-malaria herbs	27	75.0
Pear tree leaves	16	44.4
Anti-hypertensive herbs	2	5.6
Anti-cholesterol	8	22.2
Frequency of use (N=36)		
Daily	5	13.9
Weekly	1	2.8
Occasionally	25	69.4
Only once	5	13.9
Ever abandoned orthodox medicine for herbal remedies (N=36)		
Yes	5	13.9
No	31	86.1
Reasons for abandoning orthodox medications (N=5)		
I hardly use orthodox drugs	3	60.0
It affects my health negatively	1	20.0
Because it wasn't really effective	1	20.0

Table 4.3b: Doctor's awareness about use of herbal remedies and reasons for not telling the doctor

Variables	Frequency (N)	Percentage (%)
Doctor's awareness about respondents' use of herbal remedies(N=36)		
Yes	10	27.8
No	19	52.8
No response	7	19.4
Reasons for not telling the doctor (N=19)		
I didn't know I had to	1	5.3
There was no reason for me to tell him	14	73.7
I couldn't bring myself to tell my doctor	1	5.3
Because my doctor would never approve, even if the herbal remedy was effective	1	5.3
Because the doctor did not ask	2	10.5

4.4 Factors associated with the use of herbal remedies among respondents

Factors associated with the use of herbal remedies among respondents are shown in table 4.4. A little above half of the respondents (52.8%) stated that they their families and friends recommended them, while (38.9%) of the respondents said because they wanted to try anything that could help. Other reasons given by the respondents for using herbal remedies included the fact that they were safer and cheap (30.6%).

Table 4.4b shows sources of information on herbal remedies. Sources of information reported by the respondents were family members (61.1%), friends (50.0%) and health personnel (30.6%).

Method of acquiring herbal remedies is presented in Table 4.4c. Half (50.0) of the respondents reported that they acquired herbal remedies from the market, 22.2% obtained them personally from the bush, while 19.4% obtained them from friends.

As shown in Table4.4d, most of the respondents (63.9%) that use herbal remedies reported to have benefited from the use of herbal remedies, of which some (34.8%) said it relieved them of fever, 30.4% said that it relieved them of abdominal pains, while 21.7% said it relieved them of facial and leg swellings.

Experience of side effects from the use of herbal remedies is presented in table 4.4e.Very few (16.7%) of the respondents that used herbal remedies admitted to have had problems after taking them, of which half of them (50%) vomited, while 33.3% of them had diarrhoea. All of them said they stopped using the herbal remedies when they had such problems. Almost all the respondents (95.3%) said they would not recommend the use of herbal remedies for someone with kidney disease.

Table 4.4: Factors associated with the use of herbal remedies among respondents (N = 64)

Variables	Frequency (N)	Percentage (%)
Reasons for using herbal remedies		
My family members and friends recommended them	19	52.8
Just trying everything that could help	14	38.9
They are safer and cheaper than orthodox medicines	11	30.6
Orthodox medicines are not effective enough	12	33.3
It was a routine family medication for managing minor ailments	3	8.3

***multiple response**

Table 4.4b: Sources of information on herbal remedies (N = 36)*

Variable	Frequency (N)	Percentage (%)
Sources of information on herbal remedies		
Family members	22	61.1
Friends	18	50.0
Health personnel	11	30.6
Drug vendors	2	5.6
Media	2	5.6
Other patients	2	5.6
Complementary alternative medical practitioners (CAM)	1	2.8

***multiple response**

Table 4.4c: Method of acquiring herbal remedies (N = 36)

Variable	Frequency (N)	Percentage (%)
Methods through which herbal remedies were acquired		
Purchased in the market	18	50.0
Obtained from the field	8	22.2
Friends	7	19.4
Relations	6	16.7
Complementary and alternative medicine practitioners	2	5.6

***multiple response**

Table 4.4d: Benefits of herbal remedies among respondents who had used herbal remedies

Variables	Frequency (N)	Percentage (%)
Any benefits from the use of herbal remedies(N=36)		
Yes	23	63.9
No	7	19.4
Unsure	6	16.7
Benefits (N=23)*		
Relief from fever	8	34.8
Relief from abdominal pains	7	30.4
Relief from facial and leg swelling	5	21.7
It was very effective	5	21.7
It is cheaper	4	17.4
Control of high blood pressure	2	8.7

***multiple response**

Table 4.4e: Experience of side effects from the use of herbal remedies

Variables	Frequency (N)	Percentage (%)
Ever had any problem after taking herbal remedies (N=36)		
Yes	6	16.7
No	30	83.3
Problems experienced with use (N=6)		
Vomiting	3	50.0
Diarrhea	2	33.3
Skin rashes	1	16.7
Stopped using them when you had such problems (N=6)		
Yes	6	100.0
Recommend the use of herbal remedies for someone with kidney disease (N=64)		
Yes	3	4.7
No	61	95.3

Test of hypotheses

Hypothesis 1

The null hypothesis states that there is no association between the respondents' perception of the health risks associated with the use of herbal remedies and the actual use of herbal remedies. Perception was categorized into good and bad perceptions, while use of herbal remedies was categorized into those that were using and those that were not using. Chi-square was used to test for the association and the result is presented in Table 4.5 below.

Table 4.5: Association between respondents' perception of the health risks associated with the use of herbal remedies and the actual use of herbal remedies

Variables	Poor Perception (N)	Good Perception (N)	X^2	df	p-value
Use of herbal remedies					
Yes	6	30	0.234	1	0.628
No	6	22			

P-value is 0.628 and is greater than 0.05. Therefore there is no significant association between the respondents' perception of the health risks associated with the use of herbal remedies and the actual use of herbal remedies. Hence, we fail to reject the null hypothesis.

Hypothesis 2

The null hypothesis states that there is no association between the level of education of the respondents and the use of herbal remedies. Use of herbal remedies was categorized into 'yes and no', while level of education was categorized into 'never went to school, primary level, secondary level, and tertiary level'. Chi-square was used to test for the association and the result is presented in Table 4.6 below.

Table 4.6: Association between respondents' level of education and use of herbal remedies

Variables	Used herbal remedies (N)	Didn't use herbal remedies (N)	X^2	df	p-value
Level of Education					
Never went to school	1	2	1.854	4	0.763
Primary level	6	2			
Secondary level	13	11			
Tertiary level	12	10			
Post university education	4	3			

P-value is 0.763 and is greater than 0.05. Therefore there is no significant association between the respondents' level of education and use of herbal remedies. Hence, we fail toreject the null hypothesis.

Hypothesis 3

The null hypothesis states that there is no association between the level of education of the respondents and the frequency of use of herbal remedies. Frequency of use of herbal remedies was categorized into 'daily, weekly, occasionally and only once', while level of education was categorized into 'never went to school, primary level, secondary level, and tertiary level'. Chi-square was used to test for the association and the result is presented in Table 4.7 below.

Table 4.7: Association between respondents' frequency of use of herbal remedies and level of education

Variable	**Frequency of use of herbal remedies**				**X^2**	**Df**	**P-value**
	Daily	**Weekly**	**Occasionally**	**Only once**			
Level of education							
No education	0	0	1	0	25.440	12	0.013
Primary education	0	0	2	4			
Secondary education	0	1	12	0			
tertiary education	4	0	7	1			
Post University education	1	0	3	0			

P-value is 0.013 and is less than 0.05. Therefore there is a significant association between level of education and frequency of use of herbal remedies. Hence we reject the null hypothesis.

Hypothesis 4

The null hypothesis states that there is no association between the respondents' gender and the use of herbal remedies. Gender was categorized 'male and female', while use of herbal remedies was categorized into 'those that were using them and those that were not using herbal remedies'. Chi-square was used to test for the association and the result is presented in Table 4.8 below.

Table 4.8: Association between respondents' gender and use of herbal remedies

Variables	Male (N)	Female (N)	X^2	df	p-value
Use of herbal remedies					
Yes	19	17	0.254	1	0.614
No	13	15			

P-value is 0.614 and is greater than 0.05. Therefore there is no significant association between the respondents' gender and the use of herbal remedies. Hence, we fail to reject the null hypothesis.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

This cross-sectional descriptive study was conducted to understand theuse of herbal remedies and perception of the health risks among renal patients receiving treatment in the University College Hospital, Ibadan. This chapter focuses on the findings of the study. It is organized into the following sub-sections: Socio-demographic characteristics(including the medical history) of the respondents, perception of the health risks associated with the use of herbal remedies, prevalence of the use of herbal remedies among renal patients and factors associated with the use of herbal remedies. Other sub-sections are the implication of the findings for health promotion and education, and social policy, conclusion and recommendation.

5.1 Socio-demographic characteristics of the respondents

The mean age of the participants was 51.9 ± 16.9 years (range was 14-84 years). The majority of them were aged between 36 and 51 years, followed by the age bracket of 52 to 67years. This is similar to what was reported by (Achigbu and Achigbu, 2014). This corroborates the claim that the prevalence of kidney diseases rises dramatically with age (Sambasivarao, 2013). According to him the high prevalence in the elderly reflects the presence of a variety of different risk factors such as diabetes and hypertension, and age-associated decline in kidney functions in older individuals. Half of the respondents were males which may be an indication that gender is not a predisposing factor to renal diseases. Majority of them were married and in a monogamous family setting which is supported by the fact that more than half of the respondents were Christians. Christianity in Nigeria is known to promote monogamous marriage although that is not to say that some Christians do not have more than one wife. As expected, nearly all the respondents were Yoruba. This was due to the fact that the sample site was located in Ibadan, a major city in the south-west. A little more than one third of the respondents had secondary education, while almost equal proportion had tertiary education. Majority of the respondents were engaged in businesses, with a little more than a third earning an estimated monthly income in the range of #20,000 - #50,000. This may be due to the fact

that most of them are old and sick, so they may be depending on the stipend they get from their children. Sadly, almost all the respondents had no medical insurance cover partly because people have not yet fully embraced the idea of medical health hinsurance. Although among the very few with medical insurance, the only insurance they had was the National Health Insurance Scheme (NHIS).

5.2 Medical history of study respondents

More than half of the respondents had their kidney disease diagnosed at or less than two years ago. More than half of the respondents had history of dialysis. Hemodialysis is a procedure that cleans and filters the blood (NDIC,1994). It rids the body of harmful wastes and extra salt and fluids. It also controls blood pressure and helps the body keep the proper balance of chemicals such as potassium, sodium, and chloride. A little below half already had above five (5) sessions of hemodialysis. Close to a sixth of the respondents had been followed up in the UCH renal clinic for not more than 24 months (2 years). Almost all the respondents had no family history of kidney problems. This may be an indication that kidney/renal problems are not genetically inherited. Although some risk factors of kidney disease like hypertension and diabetes are genetically transferable, this does not necessarily mean that it will lead to kidney problem.

Sometimes kidney diseases do not cause any symptoms until the late stages, a situation which was observed in this study, as more than one-third of the respondents stated that they did not experience any symptom related to kidney problem before the diagnosis. Although, some people experienced fatigue, loss of appetite, leg cramps, caused by waste products that build up in the blood. Other symptoms that may show when kidney starts malfunctioning are generalized body itching, sleep disturbance, restlessness, weak bones, joint problems, depression, pain, burning during, or eased by urination, blood in urine, difficulty with urinating (straining), diminished flow of urine, erratic flow, hesitating during urination (‘start-stop’), dripping (drops/trickles) of urine after urinating, significant changes in urine color for no known reason (pale to clear urine or orange to dark brown urine and sediments in the urine). More than half of the respondents had a complaint of leg swelling, and malaise, while some complained of facial swelling, nausea

and vomiting, and reduced urinary output. Few of the respondents however complained of high blood pressure, abdominal pain, protein in urine and blood in urine.

High blood pressure is a leading cause of CKD (American Kidney Fund, 2009). Over time, high blood pressure can damage blood vessels throughout the body which can reduce blood supply to vital organs like the kidneys. As a result, the kidneys may stop removing wastes and extra fluid from the blood. The extra fluid in the blood vessels may build up and further raise the blood pressure. In this study, the primary risk factor for renal disease stated by the most of the respondents was hypertension, although some mentioned diabetes mellitus.

5.3 Perception on the health risks associated with the use of herbal remedies

Majority of the respondents had a good perception on the health risks associated with the use of herbal remedies. Many herbal remedies have not been put to clinical trial to see how effective they are, and determine the correct dosage. This may account for their harmful effects, even if they seem effective, as some of these herbal remedies are not even approved by any regulating body. It is good to see that majority of the respondents perceived that some herbs could be harmful, especially to renal patients because renal patients are especially at risk as their kidneys are already not fully functional, and taking such herbs can exert more pressure on the kidneys which may further damage them. This finding is consistent with the finding of (Molassiotis, 2005).

The difference between a drug and poison is in the dosage. This is the major reason why many of the herbal remedies cannot be trusted because the correct dosage has not been scientifically determined. Most of the manufactures do not even write or educate the users on the dosage. This results in many of them just using and abusing the herbal remedies. In this study, almost all the respondents perceived that the use of herbs, especially in the wrong dosage could be harmful to the body and that it is better for renal patients to use orthodox medicines rather than herbal remedies. This shows that they prefer the use of orthodox medications to herbal remedies. This may be because they have been enlightened and advised by their doctors not to use herbal remedies. Most of

the respondents also perceived that combing herbal remedies with orthodox medicines could lead to complications especially in patients with renal problems, as many of them believed that it could interfere with the effectiveness of the orthodox medicines. However few of the respondents still perceived herbal remedies to be safer than orthodox medications. This agrees with (Fasoto, 2007) where a significant number of herb users perceived that these therapies had greater efficacy and safety than conventional allopathic medicines .

Safety of herbal remedies has been erroneously attributed to their natural sources (Oreagba, Oshikoya, & Amachree, 2011). This misconception was one of the reasons for using herbal remedies in Nigeria and other developing and developed countries. The fact that herbs are of natural origin does not automatically guaranty their safety as several cases have been reported of the preparation of herbal remedies or products being adulterated, or contaminated with heavy metals and microorganisms (Nnorom *et al.*, 2006). The potential toxicity of herbal remedies or products resulting from unhygienic preparations, as well as lack of safety warnings on their labels, is becoming a concern regarding their use. In this study most of the respondents recognized that herbal remedies could be contaminated during preparation which could cause adverse reactions in the body. Most of the respondents also perceived that some herbs could have been contaminated by heavy metals and other contaminants where they were planted. Most of the respondents agreed that metabolism of herbs, especially in renal patients, can exert more pressure on the kidneys and further damage them, although some of them perceived that only herbal remedies not registered by NAFDAC could be harmful for use. The study showed that there is no significant association between respondents' perception of health risks associated with the use of herbal remedies and their actual use of these remedies. This means that their perception does not determine their behavior with regards to the use or non-use of herbs. There may, however, be other influencing factors that may determine whether or not they will use them.

5.4 Prevalence of the use of herbal remedies among renal patients

The use of herbal remedies has risen worldwide. In this study, more than half of the respondents had used herbal remedies which was close to what was reported by (Oreagba, Oshikoya, and Amachree, 2011) in a study carried out in Lagos, south-western Nigeria. Among the respondents that used herbal remedies, more than half (61.1%) had been using it for between 1 to 10 years. Of the respondents who had used herbal remedies, more than half of them said they used them occasionally, although a significant few of them took them daily.

The most used herbal remedies among respondents that used herbal remedies were the herbs for malaria, with three quarter of the respondents having used them. This may be because malaria is still a major problem in developing countries in Sub-Saharan Africa, Nigeria inclusive. Herbal remedies for malaria are hawked from time to time, and are very easy to get. Although some of these herbal remedies for malaria are claimed to be effective to the extent that the World Health Organisation (WHO) recognized the central position traditional medicine plays, especially in the areas of prevention and management of diseases such as malaria (Adefolaju, 2011). The findings of this study are consistent with many studies carried out by Achigbu and Achigbu(2014). In another study carried out by Oreagba et al.(2011) and Ameade, Amalba, Helegbe, and Mohammed(2015), malaria was the commonest indication for the use of herbal remedies.

Most of the respondents that used herbal remedies did not inform their doctors that they used herbal remedies. Most of them had the impression that medical doctors will never approve of their use of herbal remedies especially with orthodox medications. This may be an indication of a poor doctor-patient relationship because a patient that fully trusts his/her doctor will seek the doctor's go-ahead before they use any herbal remedy. Some of the reasons given by most of them for not telling their doctors were that they did not see any reason for them to tell the doctor, while few of them said because their doctors never asked. Only very few of the respondents have had to abandon orthodox medications for herbal remedies, out of which about 60% said it was because they don't

like them, while some said they had to abandon it because orthodox medications affected their health negatively and that they were not effective.

5.5 Factors associated with the use of herbal remedies

Some of the respondents stated that they resorted to the use of herbal remedies because their families and friends recommended them. This shows the significant influencing role of families and friends play in the lives of patients. Family members and friends are an influencing factor in patient's decision-making regarding the use of herbal remedies. This could be a result of the closely knit family culture in the south-western region of Nigeria. The influence of relatives, friends and neighbours on health-care-seeking preferences for herbal remedies has been reported globally in both adults and children (Oreagba, Oshikoya and Amachree, 2011). These findings are supported by a large number of other surveys in patients with chronic illnesses, including kidney diseases (Tangkiatkumjai, Boardman, Praditpornsilpa, and Walker, 2014). Other reasons given by the respondents for using herbal remedies included the fact that they are cheap, and the desire to try everything that could help, while some said they resorted to the use of herbal remedies because of the ineffectiveness of the orthodox medicines, although some said it was because the herbal remedies could cure kidney diseases. Sources of information on herbal remedies included family members (61.1%), friends (50.0%), health personnel (30.6%), drug vendors (5.6%) and other patients (5.6%). Half of the respondents that used herbal remedies, however, got them from the market, while some (22.2%), obtained them from the bush by themselves. Few of the respondents got them from friends and relations.

An expectation or perception of gaining benefit from using herbal remedies was the most important factor influencing use of herbal remedies. Most of the respondents that used herbal remedies reported to have benefited from using them, of which some (34.8%), said it relieved their fever, 30.4% said it relieved them of abdominal pain, 21.7% said it was very effective, while 17.4% said it was cheaper than orthodox medicines. Since many of the respondents combined herbal remedies with orthodox medications, the benefits from this combination could not be fully attributed to the herbal remedies. However very few of the respondents that used herbal remedies admitted to have had problems after taking

them, of which half of them vomited, while some of them said they had diarrhoea. This may be a side effect of the herbal remedies used. It may also be as a result of using overdose of these remedies. Almost all the respondents said they will not recommend the use of herbal remedies for someone with kidney disease. Most of them said they will not recommend them because they are not medical doctors.

5.6 Implication for health promotion and education

The findings of this study have provided important information on the use of herbal remedies (HRs) among renal patients. The findings highlighted the above average prevalent use of HRs and a major lack of awareness among respondents' doctors on their use of herbal remedies. These are gaps that could be addressed with relevant health promotion and education strategies. The strategies considered were public enlightenment, training and advocacy.

Public enlightenment

The use of herbal remedies which was common among the respondents could cause more harm than good in that the production and sale of herbal remedies is not well regulated in Nigeria. Apart from this, the dangers associated with the combination of HRs and contemporary medicines could be dangerous to health. To this end, there is need for public enlightenment by relevant authorities such as NAFDAC and NDLEA to help guard against the unfavourable use of herbal remedies. This could be done in partnership with NGOs and relevant civil societies, as well as use of behavioural change communication materials such as posters, flyers, health talk programmes on radio and television, and internet postings. The massages will be tailored towards the appropriate use of herbal remedies, the need to purchase them in the right place, and possible side effects. This will go a long way in helping renal patients make informed decisions.

Training

On a typical clinic day, available renal patients could be trained on how to personally prepare some local herbs, such as morringa, under hygienic conditions, and to use them in safe measures, with emphasis on informing the doctor of all remedies they are using to help facilitate treatment. Training could be done through methods such as health talk and lecture. The process could be guided through a training curriculum. Health personnel who are vast in health promotion and education could handle this and stress the need for appropriate use of HRs. The salient reasons why patients should disclose their use of HRs to the doctor will also be emphasized. It is an opportunity for governmental and non–governmental bodies to develop training programmes targeted at fostering and improving doctor-patient relationship. The use of materials such as charts and flyers will help reinforce the messages during the talk. Questions and answers could be useful in evaluating the objectives that was used to facilitate the training program. Regular training (health talks and lectures in this case) will be helpful in guiding patients on what to do as regards use of HRs and disclosure of the use of such to their physicians.

Advocacy

A health promotion strategy in the form of advocacy can also be used. This will help influence the creation of health-centered policies to guide against the misuse of herbal remedies. It could also help in enforcing the current laws through relevant bodies such as NAFDAC and NDLEA. To do this, representatives of the patients and also NGOs will identify the appropriate stakeholders in the health sector. This could be the minister for health, the director for health, commissioner for health, lawmakers, etc. A visit could be made to these people, and the need for regulation of HRs outlined to them. Furthermore, other advocacy methods such as the use of the media and lobbying could also be employed to put pressure on the people concerned. The proposed policy could target those producing HRs, to ensure that the quality of their products are good enough, vendors, to ensure that they sell the right thing and that things are done ethically, and complementary and alternative medical practitioners, to ensure that they operate within ethical standards.

5.7 Conclusion

This study has demonstrated that majority of the renal patients studied were between the ages of 14-84 years. More than half of the respondents had their kidney disease diagnosed at, or less than two years ago and almost all the respondents have no family history of kidney problems.

Majority of the respondents had a good perception of the health risks associated with the use of herbal remedies, with majority perceiving that some herbs could be harmful especially to renal patients. Most of the respondents also perceived that combining herbal remedies with orthodox medicines could lead to complications especially in patients with renal problems. Many of them believed that it could interfere with the effectiveness of the orthodox medicines.

Despite the good perception, more than half of the respondents had used, and were still using herbal remedies. The most used herbal remedies among respondents were herbs for malaria, which showed that malaria is still a major problem in Nigeria. Most of the respondents that used herbal remedies did not inform their doctors that they used them, because they had the impression that their physicians will never approve of it, especially when combined with orthodox medications.

This study also highlighted the significant influencing role of family members and friends. Family members and friends are an influencing factor in patient's decision-making regarding the use of herbal remedies. Some of the respondents stated that they resorted to the use of herbal remedies because their families and friends recommended them. Sources of information on herbal remedies included family members, friends, health personnel and drug vendors.

5.8 Recommendations

Based on the findings from this study, the following recommendations were made:

1. Advertisement of herbal remedies should be regulated by relevant governmental agencies such as the National Orientation Agency (NOA), and other relevant governmental bodies. This will go a long way in controlling the incessant and inappropriate use of HRs among the populace and especially, among renal patients.

2. Considering the fact that respondents still use herbal remedies after receiving treatment in orthodox health facilities, it is necessary to evaluate the safety, efficacy and quality of these products through quality control bodies, such as NAFDAC. This may be a useful means of minimizing the potential adverse effects, since herbal remedies cannot be completely eradicated from our society.

3. Family members and friends were a major influencing factor in patients' decision to use herbal remedies. Healthcare providers and policy makers should acknowledge this influence and provide high quality information about the beneficial and detrimental effects of herbal remedies on the health of renal patients, especially on the potential dangers associated with combining herbal remedies with contemporary medicines due to their interactions.

4. Many patients use herbal remedies because they feel that they are cheaper than orthodox medicines. To this end, orthodox health facilities should be made easily accessible to patients by making the cost of treatment affordable. Obsolete equipment in government health facilities should also be replaced with updated ones for effective healthcare delivery

5. Finally, appropriate legislation and regulation of herbal remedies is also necessary. While many countries have developed their own regulation and legislation, Nigeria has not effectively developed and enforced her own regulation and legislation. Since it would appear that herbal remedies is here to stay, the medical community and Ministry of Health need to consider broader policies, common laws and a rationalisation of the available legislation.

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APPENDIX 1

QUESTIONNAIRE

USE OF HERBAL REMEDIES AND PERCEPTION OF THE HEALTH RISKS AMONG RENAL PATIENTS RECEIVING TREATMENT IN THEUNIVERSITY COLLEGE HOSPITAL, IBADAN.

S/N_____

Dear Sir/ma

Introduction:

I am a student in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. I am carrying out a study on the **Use of Herbal Remedies and Perception of the Health Risks among Renal Patients Receiving Treatment in the University College Hospital, Ibadan.** The study is being conducted as part of a Masters in Public Health dissertation and it is strictly for academic purpose. Participation is voluntary and will not take much of your time. Your identity, responses and opinions will not be shared with anyone. All information will be kept confidential and no name is required in filling the questionnaire. You are requested to please give honest answers to the questions as much as possible because your responses and those of others will be used to make appropriate recommendations for the improvement of the programme.

Thanks for your anticipated cooperation.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Age of respondent as at last birthday (In years)_____
2. Sex of respondents 1. Male [ ] 2. Female [ ]
3. Marital status: 1. Single [ ] 2. Married [ ] 3. Separated [ ] 4. Divorced [ ] 5. Widow/widower [ ]
4. Type of family 1. Monogamous [ ] 2. Polygamous [ ]
5. Religion: 1. Christianity [ ] 2. Islam [ ] 3. Traditional [ ] 4. Others (specify) _____
6. Ethnicity: 1. Igbo [ ] 2. Yoruba [ ] 3. Hausa [ ] 4. Others (please specify)_____
7. Educational Qualification:

   1. No Education [ ]

   2. Primary School Leaving Certificate [ ]

3. Secondary Education [ ]

4. College/tertiary Education [ ]

6. Post University Education [ ]

7. Others (specify) _____

8. Occupation: 1. Civil servant [ ] 2.Farming [ ] 3. Driver [ ]
4. Artisan [ ] 5. Business/Trading [ ] 6. Retiree [ ] 7. Clergy [ ]
8. Student [ ]

9. Estimated monthly income: 1. Less than #20,000 [ ] 2. Between #20,000 & #50,000 [ ] 3. Between #50,000 & #100,000 [ ]
4. Between #100,000 & #200,000 [ ]
5. Above #200,000 6. Don't wish to divulge [ ] 7. I can't estimate [ ]

10. Do you have medical insurance cover? 1. Yes [ ] 2. No [ ]

10b.If yes specify..... 1. NHIS [ ] 2. Private Health Insurance [ ]
4. Others (Please specify)…….. [ ]

Medical History

11. How long have you had kidney disease? ..... months.
12. What were your complaints before going to the clinic for diagnosis? (***You may tick more than one option***)

SN	***Complaints***	***Please tick as appropriate***
I	No complaints specific to kidney problems (went for a different reason and the kidney problem was diagnosed)	
Ii	Reduced urinary output	
Iii	Blood in urine	
Iv	Hesitancy (difficulty in starting the flow of urine when one desires to urinate)	
V	Nausea	
Vi	Vomiting	
Vii	Facial swelling	
Viii	Leg swelling	
Ix	Malaise (tiredness)	
X	Others (specify)…….	

13. What was/were the primary cause(s) or risk factor(s) for your renal disease? (***You may tick more than one option)***1. Diabetes Mellitus [ ] 2. Hypertension [ ] 3. HIV/AIDS [ ] 4. Glomerulonephritis (non-infectious kidney disease) [ ] 5. Obstructive uropathy [ ] (obstruction in the urinary system) [ ] 6. Polycystic kidney disease (massive kidney enlargement with the formation of several fluid sacs) [ ] 7. Pregnancy [ ] 8. Inflammation and infection of the kidneys [ ] 9. I don't know [ ]

14. Any history of dialysis? 1. Yes [ ] 2. No [ ]

14b. If yes, duration of hemodialysis .....

15. For how long have you been receiving treatment in the UCH renal clinic?

..... months

16. Any family history of kidney problems? 1. Yes [ ] 2. No [ ]

SECTION B: PERCEPTION OF RENAL PATIENTS ON THE HEALTHRISKS ASSOCIATED WITH THE USE OF HERBAL REMEDIES

Instruction: ***Please tick as it applies to you***

SN	***Statements***	***Yes***	***No***	***I don't know***
17.	Some herbs could be harmful, especially to renal patients			
18.	Use of herbs, especially in the wrong dosage, could be harmful to the body			
19.	It is better for renal patients to use orthodox medicines rather than herbal remedies			
20.	Herbal remedies are safer than orthodox medicines			
21.	Use of herbal remedies with orthodox medicines can interfere with the effectiveness of the latter			
22.	Combination of herbal remedies and orthodox medicines can lead to complications, especially in patients with renal problems			
23.	Herbs have negative side effects, and when used by patients with renal problems could worsen their condition			
24.	Herbal remedies could be contaminated during preparation and			

	this could cause adverse reactions in the body			
25.	Some herbs could have been contaminated by heavy metalsand other contaminants where they are planted			
26.	Metabolism of herbs, especially in renal patients, can exert more pressure on the kidney, thus damaging them further			
27.	Most herbs are taken in wrong dosage			
28.	Will western-trained doctors allow the use of herbal remedies			
29.	Only herbal remedies not registered by NAFDAC could be harmful for use by humans			
30.	Most herbal products have not been scientifically tested in human beings before they are sold and used, and can therefore cause harm to people using them			

SECTION C: PREVALENCE OF THE USE OF HERBAL REMEDIES AMONG RENAL PATIENTS

31. Have you used herbal remedies in the last six months? 1. Yes [ ] 2. No [ ]
32. How long have you been using herbal remedies? ……..
33. What type of herbal remedies did you use?
    1 …….
    2 …….
    3 ……..…
34. How often did you use these herbal remedies? 1. Daily [ ] 2.Weekly [ ]
    3. Occasionally [ ] 4. Only once [ ]
    …….
35. Have you had to abandon orthodox medications for herbal remedies?
    1. Yes [ ] 2. No [ ]

35b. What was/were your reason(s) for abandoning orthodox medications?
.....
……..

36. Did you inform your doctor that you use herbal remedies?
    1. Yes 2.No

36b. If No, what is the reason for not telling your doctor?
1.I didn't know I had to.[ ] 2.There was no reason for me to tell him[ ] 3.I couldn't bring myself to tell my doctor[ ] 4. Because my doctor would never

approve, even if the herbal remedy was effective [ ] 5. No specific reason for not telling my doctor [ ].

SECTION D: FACTORS ASSOCIATED WITH THE USE OF HERBAL REMEDIES

37. What prompted your use of herbal remedies? (***You may tick more than one option***)
    1. I just wanted to try them [ ]
    2. They are safer than orthodox medicines [ ]
    3. Orthodox medicines are not effective enough [ ]
    4. They are cheaper than orthodox medicines [ ]
    5. They can cure kidney diseases [ ]
    6. Your family and friends recommended them [ ]
    7. Just trying everything that can help [ ]
    8. Other reasons (specify).....

38. How did you obtain information on herbal remedies***? (You may tick more than one option)***
    1. From health personnel [ ]
    2. From friends [ ]
    3. From family members [ ]
    4. From complementary alternative medical practitioners (CAM) [ ]
    5.From the media [ ]
    6. From church/religious group [ ]
    7. From drug vendors [ ]
    8. From other patients [ ]
    9. Other sources (specify).....

39. How did you obtain your herbal remedies? (***You may tick more than one option***)
    1. From friends [ ]
    2. From relations [ ]
    3. From complementary alternative medical practitioners (CAM) [ ]
    4. Purchased from the market [ ]
    5. From church [ ]
    6. Others (specify) ----------

40. Have you had any benefits from the use of herbal remedies?
    1. Yes [ ] 2. No [ ] 3. Unsure [ ] 4. Don't know [ ]

40b. If yes, what were your benefits?

.....

……

……

41. Have you ever had any problems after taking herbal remedies?
    1. Yes [ ] 2. No [ ]

41b. If yes, what were the problems?
    1. Diarrhea [ ]
    2. Vomiting [ ]
    3. Skin rashes [ ]
    4. Others (specify).....

42. Did you stop using the herbal remedies when you had such problems?
    1. Yes [ ] 2.No [ ]

42b. If No, why not……..

43. Would you recommend the use of herbal remedies for someone with kidney disease?
    1. Yes [ ] 2. No [ ]

Thank you for sparing time to participate in this study.

APPENDIX 2

IWE IBEERE

LILO OOGUN EGBÒIGI ATI ERO NIPA EWU RE LORI ÌLERA LAARIN ÀWON ALÁÌSÀN KIDIRIN TI O NGBA ITOJU NI ILÉ EKO ISEGUN TI UCH, IBADAN

S/N .....

Eyin arakunrin/arabinrin,

Afihan:

Mo je ak'eko ti Ile eko Isegun ni fasiti Ibadan. Mo nse iwadi lori **Lilo Oogun Egbòigi ati Imo nipa Ewu re lori Ìlera laarin àwon Aláìsàn Kidirin ti o Ngba Itoju ni Ilé Eko Isegun ti UCH, Ibadan.**

Iwadi yi je ara amuye lati gba oye Masita ninu Ìlera ara ilu, o si wa fun eredi ikeeko nikansoso. Kikopa je tinutinu,ko si ni gba o ni akoko pupo. Idanimo ati alaye re ni a ko ni pin pelu enikeni. Gbogbo alaye ni a o pamo daradara ni aidanimo, a ko si nilo oruko lati dahun àwon ibeere wonyi. A fe ki o fi idahun re lotito kale nitori wipe idahun re ati ti àwon olukopa yoku ni a o lo lati se amuye fun ilosiwaju eto yi.

Ese fun ifowosowopo ti e o fun mi.

ABALA A: ALAYE NIPA ÀWON OLUDAHUN

1. Ojo ori ni iye odun (ni ojo ibi to kẹyin) ..... oludahun
2. (Ewo ni o): 1. Okunrin 2. Obinrin
3. Ipo igbeyawo 1. Emi nikan 2. Moti gbéyàwó 3. Moti gbe yawo sugbon mo ndagbe 4. Mo nda ilemoṣu 5. Opó
4. Igbekale Ìdílé: 1. Ìdílé oniyawo eyokan 2. Ìdílé oniyawo ti o ju eyokan lo

5. Esin woni o nsin? 1. Musulumi 2. Kristiẹniti 3.Esin Ibile 4. Àwon òmíràn (so ní pàtó) .....
6. Eya wo ni o? 1. Igbo 2. Yorùbá 3. Hausa 4. Àwon òmíràn (so ní pàtó) .....
7. Ipo Iwe kika 1.Mi o kawe 2. Ile iwe alakobere 3. Ile iwe mewa 4. Ile iwe giga 5. Akakun iwe giga 6. Àwon òmíràn (so ní pàtó) .....
8. Iru ise ti o nse? 1. Osise ijoba 2. Agbe 3. Awako 4. Onise owo 5. Ountaja 6. Osisefehinti 7. Ojise Olorun 8. Omo ile iwe
9. Iye Owo oṣooṣu 1. Ko to ₦20,000 2. Laarin ₦20,000 ati ₦50,000 3.Laarin ₦50,000 ati ₦100,000 4. Laarin ₦100,000 ati ₦200,000 5. Ju ₦200,000 lo 6. Mi o fe lati so 7. Mi o le si
10. Se o ni aabo fun ìlera? 1. Béèni 2. Béèkó

10b. Ti o ba je Béèni, so pato 1. NHIS 2. Abo ilera aladani 3. Àwon òmíràn (so ní pàtó) .....

Itan ìlera

11. Latigbawo l'etini àárun kídìnrín? Osu ..... seyin
12. Kíni o so wipe o se o nigba ti o bere, ki o to lo si ile iwosan fun itoju?

S/N		Jowo fa ila bi o ti ye
1.	Mi o so ohunkohun ti o jo mo aarun kidinrin pato (mo lo fun idi miran, won wa ri aarun kidinrin)	
2.	Ito kekere	
3.	Eje ninu ito	
4.	Esitanci (inira lati to nigba ti o wu mi)	
5.	Igbeebi	
6.	Bibi	
7.	Oju wiwu	
8.	Ese wiwu	
9.	Rire mi	
10.	Àwon òmíràn (so ní pàtó)	

13. Kíni akosile okunfa fun àárun kídìnrín?

1. Ito suga 2. Eje riru 3. Àárun HIV/AIDS 4. Gilomerulonefiritisi (aarun kidinrin ti a ko le ko ran elomiran) 5. Didi ona ile ito 6. Àárun kidirin polisitiki (wiwu kidirin) 7. Oyun 8. Awon kokoro kidinrin 9. Mi o mo

14. Se itan dayalisi wa bi? 1. Béèni 2. Béèkó

14b. Ti o ba je Béèni, e melo ni asiko fun himodialisi .....

15. Lati igbawo ni o ti wa labe itoju ni ile iwosan kídìnrín ni UCH? .....

16. Se o ni itan isoro kídìnrín ninu ìdílé? 1. Béèni 2. Béèkó

ABALA B: IMO NIPA OKUNFA TI O LEWU FUN ÌLERA TI O WA NINU LILO OOGUN EGBÒIGI LAARIN ÀWONALÁÌSÀN TI O NI ISORO ILE KÍDÌNRÍN

Àkíyèsi: Jowo fala si eyi ti o ba kan o

S/N	Gbolohun	Béèni	Béèkó	Mi o mo
17	Àwon egbòigi miran nse ipalara paapa fun àwonaláìsànkídìnrín			
18	Lilo egbòigi paapa ni iwon ti ko ye nse ipalara fun ara			
19	O dara ki àwonaláìsànkídìnrín ma lo oogun ti a ba ko fun won ju Egbòigi lo			
20	Egbòigi ni aabo ju oogun ti a ko lo			
21	Lilo egbòigi pelu oogun ti a ko le se akoba fun ise oogun na			
22	Dida egbòigi ati oogun po le fa ewu nla paapa fun àwonaláìsànkídìnrín			
23	Egbòigi ma nba eyin yo ti a ba lo o			
24	Bi a se nki egbòigi le fi aye gba idoti ti o le fa aìlera			
25	Àwonegbòigi miran ti le ni àwon metali to lagbara ati àwon idoti miran			
26	Gige egbòigi paapa lara aláìsànkídìnrín le se alekun ise fun kídìnrín			
27	Opo àwonegbòigi ni a ma nlo ni iwon ti ko ye			
28	Se awon dokita oyibo yo gba lilo egbòigi laye			

29	Awon egboigi ti ko fi oruko sile lodo NAFDACle lewu fun lilo fun eniyan			
30	Opo ohun elo egboigi ni a ko ti fi idi re mule ni ona ti saensi ki won to ta won ati fun lilo, nitorina o le lewu fun awon ti o nlo won			

ABALA C: IYE LÍLO EGBÒIGI LAARIN AWON ALAISAN KIDINRIN

31. Se o ti lo egbòigi lati bii osu mefa s'eyin? 1. Béèni 2. Rárá

32.Lati igba wo ni o tin lo won? Osu/Odun .....

33. Àwon egbòigi/elo egbòigi wo lo nlo?

1. .....
2. .....
3. .....

34. Bawo ni o se ma nlo egbòigi si? 1. Lojojumo 2. Osoose 3. Lekookan 4. Eekan

35. Nje o ti ni lati fi àwon itoju/oogun ti o nlo tele sile lati ma lo egbòigi?

1. Béèni 2. Rárá

35b. Kíni àwon idi ti o fi fi àwon oogun ti won ko fun o sile lati ma lo Egbòigi?

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.....

36. Se o so fun dókítà re pe o lo egboigi? 1. Béèni 2. Béèkó

36b. Ti o ba je béèkó, kíni idi ti o ko fi so fun dokita re? 1. Mi o mope o ye kin so 2. Ko si idi fun mi lati so fun 3. Mi o le gbe ara mi wa lati so fun dokita mi 4. Nitoripe dokita mi ko ni fi owo si ko da ti egboigi ba sise 5. Kos i idi kan pato lati ma so fun dokita mi

ABALA D: AWON OKUNFA TI O ROM O LILO OGUN EGBOIGI

37. Kíni eredi ti o fi nlo won?

1. Mo kan fe gbiyanju e wo.
2. Won ko ni ewu bi ogun oyinbo.
3. Ogun oyinbo ko sise to won.
4. Won ko won to ogun oyinbo.
5. Won le wo aisan kidirin san.
6. Awon ara ati ore lo so won fun e.
7. Mo kan nlo gbogbo nkan to le seiranwo.
8. Àwon òmíràn (so ní pàtó) .....

38. Lati ibo l'o ti gbo alaye nipa Egbòigi?

1. Lati odo àwon osise ìlera.
2. Lati odo àwon ore.
3. Lati odo àwon ara ile.
4. Lati odo àwon osise CAM.
5. Lati media.
6. Lati ile ijosin/ipejo esin.
7. Lati odo àwon ountaja okere.

8. Lati odo àwon aláìsàn to yoku

9. Àwon òmíràn (so ní pàtó) .....

39. Bawo ni o se ma nri àwonEgbòigi ati elo Egbòigi?

1. Lati odo àwon ore.
2. Lati odo àwon ebi.
3. Lati odo àwon osise CAM.
4. O ma nra lati oja.
5. Lati ile ijosin.

6. Àwon òmíràn (so ní pàtó).....

40. Nje o ti ri ànfàní kankan lati ara líloegbòigi ati àwon afikun ounje?

1. Béèni 2. Rárá 3. Mi o ro be 4. Mi o mo

40b. Ti o ba je Béèni, kíniàwonànfàní yi?

.....

.....

41. Nje o ti ni isoro kankan lati ara líloegbòigi ati àwon afikun ounje?

1.Béèni 2. Rárá

41b. Ti o ba je Béèni, kíniàwon isoro wonyi?

1. Igbe gbuuru
2. Bibi
3. Kuruna
4. Àwon òmíràn (so ní pàtó) .....

42. Se o ma nda lílo won duro ti o ba ni isoro wonyi? 1. Béèni 2. Rárá

42b. Ti o ba je béèkó, kíni idi? .....

43. Nje wa so fun elomiran ti o ni àárunkídìnrín lati loo?

1. Béèni 2. Rárá

Ese fun akoko lati kopa ninu iwadi yi.