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Herbal Medicines in African Traditional Medicine

Ezekwesili-Ofili Josephine Ozioma and
Okaka Antoinette Nwamaka Chinwe

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Abstract

African traditional medicine is a form of holistic health care system organized into three levels of specialty, namely divination, spiritualism, and herbalism. The traditional healer provides health care services based on culture, religious background, knowledge, attitudes, and beliefs that are prevalent in his community. Illness is regarded as having both natural and supernatural causes and thus must be treated by both physical and spiritual means, using divination, incantations, animal sacrifice, exorcism, and herbs. Herbal medicine is the cornerstone of traditional medicine but may include minerals and animal parts. The adjustment is ok, but may be replaced with – Herbal medicine was once termed primitive by western medicine but through scientific investigations there is a better understanding of its therapeutic activities such that many pharmaceuticals have been modeled on phytochemicals derived from it. Major obstacles to the use of African medicinal plants are their poor quality control and safety. Traditional medical practices are still shrouded with much secrecy, with few reports or documentations of adverse reactions. However, the future of African traditional medicine is bright if viewed in the context of service provision, increase of health care coverage, economic potential, and poverty reduction. Formal recognition and integration of traditional medicine into conventional medicine will hold much promise for the future.

Keywords: African, traditional, medicine, spirituality, divination, herbalism

1. Introduction

The development and use of traditional herbal medicine (THM) have a very long historical background that corresponds to the Stone Age. In the continent of Africa, the practice of traditional healing and magic is much older than some of the other traditional medical sciences [1] and seems to be much more prevalent compared to conventional medicine. African traditional medicine is a

form of holistic health care system that is organized into three levels of specialty, which include divination, spiritualism, and herbalism, though these may overlap in some situations [2, 3].

A traditional healer is one who provides medical care in the community that he lives, using herbs, minerals, animal parts, incantations, and other methods, based on the cultures and beliefs of his people. He must be seen to be competent, versatile, experienced, and trusted [4]. In other definitions, priestesses, high priests, witch doctors, diviners, midwives, seers or spiritualists, and herbalists are included. Traditional medical practitioner (TMP), however, seems to be a modern acceptable concept agreed on by the Scientific Technical and Research Commission (STRC) of the Organization of African Unity (OAU), which is now African Union (AU). In specific cultures, these people go by their local names, depending on their tribe, such as *Sangoma* or *inyanga* in South Africa, *akomfo*, *bokomorwo* in Ghana, *niam-niam*, *shaman*, or *mugwenu* in Tanzania, *nga:nga* in Zambia, *shaman* or *laibon* in Kenya, and *babalawo*, *dibia*, or *boka*, etc. in Nigeria [5]. It is commonplace to see traditional healers dressed in certain peculiar attires, with head bands, feathers, and eyes painted with native chalk.

Figure 1 below is a typically adorned traditional healer from South Africa.

Traditional medicine is viewed as a combination of knowledge and practice used in diagnosing, preventing, and eliminating disease. This may rely on past experience and observations handed down from generation to generation either verbally, frequently in the form of stories, or spiritually by ancestors or, in modern times, in writing [6]. It has also been said that before attaining knowledge in traditional African medicine, one is often required to be initiated into a secret society, as many characteristics of this form of medicine can only be passed down to initiates. The importance of traditional medicine, however, dwindled during the colonial period, whereby it was viewed as inferior to Western medicine. It was thus banned completely in some countries due to its association with witchcraft /voodoo, supernatural, and magical implications, in which case, it was also termed “*juju*” (Nigeria) or “native medicine,” since it made use of charms and symbols which were used to cast or remove spells. Some forms of treatment may also involve ritual practices such as animal sacrifices to appease the gods, if the ailment was envisaged to be caused by afflictions from the gods, especially in the treatment of the mentally ill patients.



Figure 1. Spiritual healer or *Sangoma* from South Africa (Source—Ancient Origins).

2. Concept of illness and disease

In African traditional setting, there was always an explanation as to why someone was suffering from a certain disease at a particular time. According to Ayodele [7], diseases mostly revolve around witchcraft/sorcery, gods or ancestors, natural, as well as inherited. Illness in the African society is different from the allopathic Western medicine point of view. Illness is believed to be of natural, cultural, or social origin [8]. Cultural or social illness is thought to be related to supernatural causes such as angered spirits, witchcraft, or alien/evil spirits, even for conditions now known to be well understood in modern medicine such as hypertension, sickle-cell anemia, cardiomyopathies, and diabetes. African traditional beliefs consider the human being as being made up of physical, spiritual, moral, and social aspects. The functioning of these three aspects in harmony signified good health, while if any aspect should be out of balance, it signified sickness. Thus, the treatment of an ill person involves not only aiding his/her physical being but may also involve the spiritual, moral, and social components of being as well. Many traditional medical practitioners are good psychotherapists, proficient in faith healing (spiritual healing), therapeutic occultism, circumcision of the male and female, tribal marks, treatment of snake bites, treatment of whitlow, removal of tuberculosis lymphadenitis in the neck, cutting the umbilical cord, piercing ear lobes, removal of the uvula, extracting a carious tooth, abdominal surgery, infections, midwifery, and so on. According to Kofi-Tsekpo [9], the term “African traditional medicine” is not synonymous with “alternative and complementary medicine.” African traditional medicine is the African indigenous system of health care and therefore cannot be seen as an alternative.

3. Herbal medicine

Herbal medicine is a part and parcel of and sometimes synonymous with African traditional medicine. It is the oldest and still the most widely used system of medicine in the world today. It is used in all societies and is common to all cultures. Herbal medicines, also called botanical medicines, vegetable medicines, or phytomedicines, as defined by World Health Organization (WHO) refers to herbs, herbal materials, herbal preparations, and finished herbal products that contain whole plants, parts of plants, or other plant materials, including leaves, bark, berries, flowers, and roots, and/or their extracts as active ingredients intended for human therapeutic use or for other benefits in humans and sometimes animals [10, 11].

Herbal medicine is a special and prominent form of traditional medicine, in which the traditional healer, in this case known as the herbalist, specializes in the use of herbs to treat various ailments. Their role is so remarkable since it arises from a thorough knowledge of the medicinal properties of indigenous plants and the pharmaceutical steps necessary in turning such plants into drugs such as the selection, compounding, dosage, efficacy, and toxicity. The use of herbal medicines appears to be universal in different cultures. However, the plants used for the same ailments and the modes of treatment may vary from place to place. The plants used for medicinal purposes are generally referred to as medicinal plants, i.e., any plant in which one or more of its organs/parts contain substances that can be used for therapeutic purposes, or in a more modern concept, the constituents can be used as precursors for the synthesis

of drugs. For example, a number of plants have been used in traditional medicine for many years without scientific data to back up their efficacy. In this case, these plants, whole or parts, which have medicinal properties, are referred to as crude drugs of natural or biological origin. They may further be classified as “organized drugs,” if such drugs are from plant parts with cellular structures such as leaf, bark, roots, etc., and “unorganized drugs,” if they are obtained from acellular portions of plants such as gums, balsams, gels, oils, and exudates. Compared with modern allopathic medicine, herbal medicine is freely available and can easily be accessed by all [12, 13]. As a result, there is limited consultation with traditional healers because there is a fairly good knowledge of common curative herbs especially in the rural areas except in the case of treatment of chronic diseases [12]. Even where consultation is done, there is lack of coherence among traditional healers on the preparation procedures and correct dosage of herbal medicines [14]. However, according to WHO [15], at least 80% of people in Africa still rely on medicinal plants for their health care. In Nigeria, and indeed the entire West Africa, herbal medicine has continued to gain momentum, some of the advantages being low cost, affordability, availability, acceptability, and apparently low toxicity [16, 17].

A detail of plant parts used in herbal medicines is as follows:

1. Roots—i.e., the fleshy or woody roots of many African plant species are medicinal. Most of the active ingredients are usually sequestered in the root bark rather than the woody inner part.
2. Bulbs—A bulb is an underground structure made up of numerous leaves of fleshy scales, e.g., *Allium sativa* (garlic) and *Allium cepa* (onions).
3. Rhizomes—Woody or fleshy underground stem that grows horizontally and brings out their leaves above the ground, e.g., *Zingiber officinale* (ginger), which is used for respiratory problems; *Imperata cylindrica* (spear grass) for potency in men and *Curcuma longa* (turmeric), an antioxidant, anti-inflammatory, and anticancer drug.
4. Tubers—Swollen fleshy underground structures which form from stems/roots, e.g., potatoes and yams such as *Dioscorea dumetorum* (ona-(igbo)) for diabetes and *Gloriosa superba* for cancer.
5. Bark—The outer protective layer of the tree stem or trunk. It contains highly concentrated phytochemicals with profound medicinal properties. A host of plants have barks of high medicinal value.
6. Leaves, stems, and flowers of many plants are also medicinal.
7. Fruits and seeds also contain highly active phytochemicals and essential oils.
8. Gums, exudates, and nectars, which are secreted by plants to deter insects and grazing animals and to seal off wounds, are very useful in the pharmaceutical industries.

Sale of herbs in form of dried or fresh plant parts is as lucrative as the prepared medicines. They are usually displayed in markets and sold with instructions on how to prepare them for maximum efficacy.

Figure 2 is a photograph of an herbalist displaying his herbs for sale.



Figure 2. Herbs on display (Source—Ancient Origins).

In many areas of Africa, the knowledge of plant species used and the methods of preparing and administering the medication, especially for serious ailments, still reside with traditional healers. Secrecy and competition still surround the use of these medications, with the healers often being reluctant to hand down their knowledge to anyone but trusted relatives and initiates [18].

3.1. Methods of preparation and dosage forms

Methods of preparation of herbal medicines may vary according to place and culture. The plant materials may be used fresh or dry. With experience, a particular method is chosen to increase efficiency and decrease toxicity. Generally, different methods of preparation include:

1. Extraction—This is prepared with solvent on a weight by volume basis. Sometimes, the solvent is evaporated to a soft mass.
2. Infusions are prepared by macerating the crude drug for a short period of time in cold or hot water. A preservative such as honey may be added to prevent spoilage.
3. Decoctions are made by boiling woody pieces for a specified period of time and filtered. Potash may be added to aid extraction and as preservative.

4. Tinctures are alcoholic infusions which if concentrated may be diluted before administration.
5. Ashing—The dried parts are incinerated to ash, then sieved and added as such to water or food.
6. Miscellaneous—Other types include liniments for external applications in liquid, semi-liquid, or oily forms containing the active substances; lotions which are liquid preparations intended for skin application. Poultices are prepared from macerated fresh part of plant containing the juice from the plant and applied to skin. Snuffs are powdered dried plant inhaled through the nostrils. Dried plants may be burnt, and their charcoal is used as such. Gruels are cereals/porridges made from grains, to which dried powdered plant or its ash is added to be taken orally. Mixtures are sometimes prepared with more than one plant to give synergistic or potentiating effects of the composite plants.

There are also different methods of administration. Apart from the common routes such as oral, rectal, topical, and nasal, other methods include smoking a crudely prepared cigar containing dried plant materials or by passive inhalation. Others are steaming and inhaling the volatile oils exuding from the boiling plant material. These can be used to relieve congestion, headaches, or pulmonary problems. Sitz baths are used for piles [19, 20].

3.2. Ethnobotanical surveys

Information on plants is obtained through ethnobotanical surveys, which involves the study of plants in relation to the culture of the people. Many plants are used in African traditional medicine, but little information is available on their active ingredients/constituents. Ethnobotanical surveys involve the interaction with the people and their environment and are therefore participatory approaches, in which local people are able to contribute their knowledge on the uses of plants within their environment. This may involve the identification, documentation, conservation, and utilization of medicinal plants. Much of the ethnomedicinal information is largely not validated. In Nigeria, a number of authors have published a lot of data on plants with their curative values [16, 20, 21]. These provide a vast array of information for scientific research and validation. Preliminary scientific knowledge is drawn from studies on *in vitro* and *in vivo* bioassays on crude extracts of various plants.

Using plants as medicine provides significant advantages for treating many chronic conditions. For example, information from folklore medicine in Nigeria has it that *Rauvolfia vomitoria* is used for treating hypertension and other nervous conditions while *Ocimum gratissimum* is used for treating diarrheal diseases. Others include *Citrus paradise* seeds for resistant urinary tract infections, pure honey for chronic wound treatment, *Carica papaya* seeds for intestinal parasites, *Garcinia kola* seeds for pain and inflammation, and *Aloe vera* for skin diseases. The same is also true for plants from other African countries [22]. Knowledge of most of these curative properties was accumulated over time from evidence-based observations. A few examples of some Nigerian plants and their uses are shown in **Table 1**.

Table 1 shows some selected Nigerian medicinal plants and their uses.

The curative properties of herbal medicine are validated through scientific investigations, which seek to understand the active chemistry of the plants [23]. The therapeutic activity of a plant is due to its complex chemical nature with different parts of the plant providing

Family	Specie	Local name	Part used	Medicinal uses
Acanthaceae	<i>Acanthus montanus</i>		Stem, twig	Syphilis, cough, emetic, vaginal discharge
Amaranthaceae	<i>Amaranthus spinosus</i>		Whole plant	Abdominal pain, ulcers, gonorrhea
Apocynaceae	<i>Alstonia boonei</i>		Root, bark, leaves	Breast development, filarial worms
Bombacaceae	<i>Adansonia digitata</i>		leaves, fruit, pulp, bark	Fever, antimicrobial, kidney, and bladder disease
Combretaceae	<i>Combretum grandiflorum</i>	Ikedike	leaves	Jaundice
Euphorbiaceae	<i>Bridelia ferruginea</i>	iri, kirni	leaves, stem, bark, root	insomnia, mouth wash, gonorrhea
Hypericaceae	<i>Harungana madagascariensis</i>	Otoro, alilibarrafi	Stem, bark, root bark	piles, trypanosomiasis
Fabaceae	<i>Afzelia africana</i>	Apa-igbo, akpalata	leaves, roots, bark, seeds	gonorrhea, hernia
Liliaceae	<i>Gloriosa superba</i>	mora, ewe aje, baurere	tubers, leaves	gonorrhea, headlice, antipyretic

Table 1. Some selected Nigerian medicinal plants and their uses. Source: Abd El-Ghani [51].

certain therapeutic effects. Chemical components or phytochemicals found in plants that are responsible for the various therapeutic effects include alkaloids, glycosides, tannins, acids, coumarins, sterols, phenols, etc. Many modern pharmaceuticals have been modeled on or were originally derived from these chemicals, for example, aspirin is synthesized from salicylic acid derived from the bark of *Salix alba* and the meadowsweet plant, *Filipendula ulmaria*. Quinine from *Cinchona pubescens* bark and artemisinin from *Artemisia annua* plant are anti-malarial drugs. Vincristine and vinblastine are anticancer drugs derived from Madagascar periwinkle (*Catharanthus roseus*), used for treating leukemia. Morphine and codeine, derived from the opium poppy (*Papaver somniferum*), are used in the treatment of diarrhea and pain relief, while digitoxin is a cardiac glycoside derived from foxglove plant (*Digitalis purpurea*) [22, 24]. Medicinal plants are also important materials for the cosmetic industries.

The use of herbal drugs dwindled toward the end of the 19th century due to the advent of synthetic chemistry. However, there was a resurgence of interest in plant medicines in more recent years, as synthetic drugs became less effective due to high levels of resistance and also due to higher toxicity and cost. It is estimated that more than half of all synthetic drugs in use are derived from plants [25].

4. Clinical practice of African traditional/herbal medicine

In African traditional medicine, the curative, training, promotive, and rehabilitative services are referred to as clinical practices. Clinical practice can also be viewed as the process of

evaluating conditions of ill-health of an individual and its management. These traditional health care services are provided through tradition and culture prescribed under a particular philosophy, in which the norms and taboos therein are strictly adhered to and form the basis for the acceptability of traditional health practitioners in the community they serve [26].

According to the World Health Organization (WHO), health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [15, 27] and views health as one of the fundamental rights of every human being. The combination of physical, mental/emotional, and social well-being is commonly referred to as the health triangle.

The recognition of disease and illnesses in traditional Africa meant that every society needed to devise means of containing its problem. Worldwide, different societies have different herbal traditions that have evolved over a long period of time. Similar to modern day Western treatment patterns, African traditional societies also involved herbalism, surgery, dietary therapy, and psychotherapy, in addition to traditional exorcism, rituals, and sacrifice [28]. These medical technologies had evolved even before the coming of the “white man” (Arabs and Europeans). Successful treatments became formalized, sometimes with prescriptions of correct methods of preparation and dosage. In addition, the ingredients and the manner of preparation varied with the ailment but were also dependent on various factors such as geographical, sociological, and economic, but the significant point was that in many cases, patients were cured of their physical or psychological ailments [29]. In African traditional medicine, traditional health practitioners (THP) assess patients in order to diagnose, treat, and prevent disease using their expertise by the following methods:

4.1. Divination

Divination means consulting the spirit world. It is a method by which information concerning an individual or circumstance of illness is obtained through the use of randomly arranged symbols in order to gain healing knowledge. It is also viewed as a way to access information that is normally beyond the reach of the rational mind. It is a transpersonal technique in which diviners base their knowledge on communication with the spiritual forces, such as the ancestors, spirits, and deities [30]. It is, therefore, an integral part of an African traditional way of diagnosing diseases. The “spirit world” is consulted to identify the cause of the disease or to discover whether there was a violation of an established order from the side of the sick person. This is established through the use of cowry shells, throwing of bones, shells, money, seeds, dice, domino-like objects, or even dominos themselves, and other objects that have been appointed by the diviner and the spirit to represent certain polarities on strips of leather or flat pieces of wood. The divining bones that form the large majority of the objects include bones from various animals such as lions, hyenas, ant-eaters, baboons, crocodiles, wild pigs, goats, antelopes, etc. The bones represent all the forces that affect any human being anywhere, whatever their culture [31]. Because of the revealing powers of divination, it is usually the first step in African traditional treatment and medicine [32].

4.2. Interviews and medical reports

Oral interviews are sometimes used by some traditional healers to find out the history behind the sickness, where they have been for treatment and how long the person has been in that

condition. This approach enables them to know how to handle the matter at hand. In some cases, the healer might require other family members to speak on behalf of the sick person in cases where the patient is not able to express him/herself. In modern times, after the healing process, they also advise their clients or patients to go for medical diagnoses to confirm that they are healed, and the medical reports sometimes serve for record keeping for future reference and are a way of assuring other clients of their ability and credibility. Due to the holistic approach of the healing process, the healers do not separate the natural from the spiritual or the physical from the supernatural [33]. Thus, health issues are addressed from two major perspectives—spiritual and physical.

4.3. Spiritual perspective

Spiritual-based cases are handled in the following manner:

- i. **Spiritual protection:** If the cause of the disease is perceived to be an attack from evil spirits, the person would be protected by the use of a talisman, charm, amulets, specially designed body marks, and a spiritual bath to drive the evil spirits away. These are rites aimed at driving off evil and dangerous powers, spirits, or elements to eliminate the evils or dangers that may have befallen a family or community [34].
- ii. **Sacrifices:** Sacrifices are sometimes offered at the request of the spirits, gods, and ancestors. Sometimes, animals such as dogs and cats are slaughtered or buried alive at midnight to save the soul of the one at the point of death, with the belief that their spirits are strong enough to replace life [30]. There is also the view that because they are domestic animals and are very close to people, sometimes when they see that someone very close to them is about to die, they offer their lives for that person to live. This is true especially where the animal dies mysteriously; thus, it is believed that it had offered its life in place of the life of its owner. Rituals are sometimes performed in order to consecrate some herbs without which the medicine is meaningless. Divine and ancestral sanctions are considered necessary before and during the preparation and application of medicine [35].
- iii. **Spiritual cleansing:** Spiritual cleansing may be required of the sick person to bathe at specific times for a prescribed number of days either with water or animal blood poured from head to toe. This practice is common among some communities in Ghana [34].
- iv. **Appeasing the gods:** If a disease is perceived to be caused by an invocation of a curse or violation of taboos, the diviner appeases the ancestors, spirits, or the gods according to the severity of the case. The individual is often required to provide certain items for sacrifice and/or libation, such as spotless animals (dove, cat, dog, goat, and fowl), local gin, cola nut, eggs, and plain white, red, or black cloth. These items are usually specified by the gods. The used items may be thrown into the river, left to rot, or placed at strategic places, usually at cross roads at the outskirts of the community, depending on the nature and severity of the case [36].
- v. **Exorcism:** This is a practice of expelling demons or evil spirits from people or places that are possessed or are in danger of being possessed by them. Many of the traditional communities believe that illness, especially mental illness, is mostly caused by evil spirits. Exorcism can only be performed by a religious leader or a priest who has the authorities

and powers to do so. Sometimes, an effigy made of clay or wax would be used to represent the demon and would ultimately be destroyed. Exorcism may be accompanied by dancing to the beating of drums, singing, and sometimes flogging the individual or touching him/her with strange objects such as animal tails and other objects to chase out the spirit. The possessed individual would be somewhat agitated but would only calm down as soon as the spirit is removed from the body. Exorcism is practiced, not only in Africa but also in ancient Babylonian, Greek, and other ancient cultures of the Middle East. This practice is also performed for those who are mentally challenged. In their view, until the possessed person is delivered from the power of that evil spirit, the person will not have his or her freedom. Hence, the practice of exorcism is considered necessary [37].

vi. Libation: Libation involves pouring of some liquid, mostly local gin on the ground or sometimes on objects followed by the chanting or reciting of words. It is usually regarded as a form of prayer. The liquid could also be water or in modern times, wine, whisky, schnapps, or gin. Some cultures also use palm wine, palm oil, and coconut water, while some others use corn flour mixed with water [38]. Libation pouring as is practiced in some communities has three main parts, namely invocation, supplication, and conclusion.

- **Invocation:** They first invoke the presence of the almighty God, mother earth, and the ancestors. According to the practitioners of libation pouring, offering the ancestors and spirits drink is a way of welcoming them
- **Supplication:** After invocation, requests are made to the invoked spirits, gods, or ancestors to intercede on their behalf for mercy and forgiveness of offenses such as taboo violations and to seek for spiritual consecration (cleansing) of either the community or individual(s). The content of the prayer is usually case specific [38].
- **Conclusion:** At the end of the libation pouring, they thank the invoked ancestors and spirits. They finally invoke curses on those who wish them evil or failure, meaning that in the process of prayer, it would be unwise to seek the welfare of one's enemy. Therefore, those who wish evil (i.e., enemies, witches, and people with evil powers) on them should fall and die [8]. In this process, the person pouring the libation would be pouring the drink or liquid on the ground as he is reciting the prayers, followed by responses to each prayer point by observers.

4.4. Physical perspectives

If the illness is of a physical nature, the following approaches are exploited:

- a. **Prescription of herbs:** Herbs are prescribed to the sick person according to the nature of the illness. Each prescription has its own specific instructions on how to prepare the herb, the dose, dosing regimen, and timeframe
- b. **Clay and herbs application:** Application of a mixture of white clay with herbs may be relevant in some of the healing processes. The mixture is applied to the entire body for a number of days, especially in the case of skin diseases. The view is that the human body is

made out of the dust or ground; therefore, if the body has any problem, you would have to go to where it came from to fix it. The use of clay with some special herbs is also sometimes used for preventive rituals to ward off the evil spirits responsible for illness.

- c. **Counseling:** The sick person is sometimes counseled on the dos and don'ts of treatment, the foods to eat or avoid, to be generally of good behavior as established by society and culture, failure of which the good spirits would withdraw their blessings and protection and therefore, open doors for illness, death, drought, and other misfortunes. This is mostly done when it is an issue of a violation of a taboo [39].

The THPs use experience, added to the accumulated knowledge handed down by their ancestors in order to provide effective and affordable remedies for treating the main ailments (such as malaria, stomach infections, respiratory problems, rheumatism, mental problems, bone fracture, infertility, complications of childbirth, etc.) that afflict populations of the African region and in addition offer counseling/advice and solutions to prevent future reoccurrence.

5. Peculiarities in traditional herbal medicine practice from selected African countries

As there is an African way of understanding God, in the same way, there is an African way of understanding the visible world around us—the cattle, trees, people, and cities, as well as the unseen world, the supernatural world of spirits, powers, and diseases [40, 41]. People developed unique indigenous healing traditions adapted and defined by their culture, beliefs, and environment, which satisfied the health needs of their communities over centuries [15]. Different ethnic groups and cultures recognize different illnesses, symptoms, and causes and have developed different health-care systems and treatment strategies. In spite of these, profound similarities exist in the practice of traditional medicine in different African countries. The increasing widespread use of traditional medicine has prompted the WHO to promote the integration of traditional medicine and complementary and alternative medicine into the national health care systems of some countries and to encourage the development of national policy and regulations as essential indicators of the level of integration of such medicine within a national health care system. The peculiar practices of some countries are described below:

5.1. Ghana

In Ghana, herbal medicine is usually the first approach to treat any illness, especially in the rural areas. Lack of access to medical facilities, poor roads/infrastructure, and affordability of treatment are some of the main reasons for the prevalent use of traditional healers. Besides, ratio of medical doctors to the patients is about 1:20000, while for traditional healers, the ratio is 1:200. This plays a major role in health care decision making. Other influencing factors, such as financial situation, education, and advice from friends and family, contribute to choice of type of health care [42]. Traditional medicine has a long history in Ghana. This knowledge is typically in the hands of spiritual healers, but the vast majority of families have some knowledge of traditional medicine, which is often inherited and passed down through the generations via folklore.

Most people in Ghana fully accept modern science-based medicine, but traditional medicine is still held in high regard. They believe in the physical and spiritual aspects of healing. Herbal spiritualists collectively called “*bokomowo*” indulge in occult practices, divinations, and prayers and are common all over the country. Tribal vernacular names of traditional healers include “*gbedela*” (Ewe), “*kpeima*” (Dagomba), “*odunsini*” (Akan), and “*isofatse*” (Ga).

In some Ghanaian communities, especially in the Akan communities, traditional healers and practitioners are of the opinion that disobeying taboos is one of the ways that could lead to severe illness to the person(s) or community involved [43]. Taboos form an important part of African traditional religion. They are things, or a way of life, that are forbidden by a community or a group of people. One could also become sick through invocation of curses in the name of the river deity, *Antoa*, upon the unknown offender.

In today's Ghana, a traditional Medical Directorate has been established in the ministry of health to provide a comprehensive, recognizable, and standardized complementary system of health based on excellence in traditional and alternative medicine. Establishing centers for integrating scientific research into plant medicines and incorporating traditional medicine into university curricular are now the current status in Ghana [44]. Also, degree-awarding traditional medical schools now train and graduate traditional medical doctors.

5.2. Zambia

The first principle is diagnosis followed by complex treatment procedures using plants from the bush, followed by many rituals, the ultimate aim being to cure disease. Serious or chronic illnesses require “*chizimba*,” which means sealing a disease or illness away forever. This involves killing a lizard and burning the heart with roots of certain trees and grinding with charcoal. Tiny cuts are made on the ailing area and left breast and the mixture rubbed into the cuts.

Plants may be used singly or in combination with other plants. The plant parts are harvested fresh, pulverized, and left to dry first, then soaked in water or other solvents like local gin. Some plant materials are burnt as charcoal and used as powder. Six major types of treatment common to the 72 or more ethnic groups in Zambia include drinking, eating, drinking as porridge, making small cut on skin and applying, bathing with herbs, dancing to exorcize spirits, and steaming with boiling herbs. The Zambian traditional healer is called *Nga:nga* [45].

5.3. Tanzania

In Tanzania, traditional medicine has been practiced separately from allopathic medicine since colonial period but is threatened by lack of documentation, coupled with the decline of biodiversity in certain localities due to the discovery of natural resources and excessive mining, climate change, urbanization, and modernization of agriculture. Traditional medicine in Tanzania is used by people of all ages in both urban and rural areas for both simple and chronic diseases. The traditional healers are of four different types: diviners, herbalists, traditional birth attendants, and bone setters. Erosion of indigenous medical knowledge occurred as most of the traditional health practitioners were aging and dying, and the expected youths who would inherit the practice were shying away from it and those in the rural areas dying of

AIDS. Another constraint to the development of traditional medicine in Tanzania was lack of data on seriously threatened or endangered medicinal plant species [46]. As it stands today, the traditional medical practice is under the Ministry of health. Efforts are being made to scale up traditional medical practice by creating awareness of the importance of traditional medicine and medicinal plants in health care and training of traditional health practitioners on good practice, conservation, and sustainable harvesting [47].

5.4. South Africa

Traditional medicine features in the lives of thousands of people in South Africa every day. In fact, it is estimated that 80% of the population uses traditional medicines that are collectively called *muti*. *Muti* is a word derived from medicinal plant and refers to traditionally sourced plant, mineral, and animal-based medicines.

In addition to herbs, traditional medicine may use animal parts and minerals. However, only plant *muti* is considered a sustainable source of medicines. South African traditional plant medicines are fascinating with so many colors, forms, and effects. It is an art to know these and to use them correctly to bring about health and harmony, which is the aim of all true traditional healers. The plant *muti* is commonly sold in specific sections of the open markets in South Africa, as shown in **Figure 3**.



Figure 3. *Muti* market in Johannesburg (Source—Ancient Origins).

Figure 3 shows a muti market in Johannesburg.

The traditional healers known as the *Sangoma* or *Inyanga* are holders of healing power in the southern Bantu society. In a typical practice with a female traditional practitioner, the methods used depended on the nature of the complaint. For example, headaches are cured by snuffing or inhaling burning medicines, bitter tonics are used to increase appetite, sedative medicines for depression, vomiting medicines to clean the digestive system, and antibiotic or immune boosting medicines for weakness or infection. She often counseled patients before administering appropriate healing herbal medicines [48].

5.5. Kenya

As in many countries in Sub-Saharan Africa, Kenya is experiencing a health worker shortage, particularly in rural areas. Anecdotal evidence suggests that globally, traditional medical practitioners (THMPs) are the only point of contact for at least 80% of the rural poor [10]. In Kenya, very little quantitative evidence or literature exists on indigenous medicine and the health practices of alternative healers or the demand for traditional medical practitioners or on the role that they play in providing particular health services for the rural poor. As a result, TMPs currently do not have sufficient formal government recognition and are often sidelined in Human Resources in Health (HRH) planning activities; further, their activities remain unregulated. Community-derived data show that hospitals are preferred if affordable and within reach. There is also significant self-care and use of pharmacies, although THMPs are preferred for worms, respiratory problems, and other conditions that are not as life threatening as infant diarrhea and tuberculosis [49].

Traditional Medicine Practitioners in Kenya generally known as “*laibon*” far outnumber conventional or allopathic providers. Their practices are no different from other African countries. In many cases, they combine both modern and herbal medicines, especially if they are afflicted by chronic ailments such as HIV/AIDS, hypertension, cancer, and diabetes [50].

5.6. Nigeria

The various ethnic groups in Nigeria have different health care practitioners aside their western counterparts, whose mode of practice is not unlike in other tribes. The Yorubas call them “*babalawos*,” the Igbos call them “*dibia*,” while the Northerners or Hausas call them “*boka*” [5]. Traditional/herbal medicines have impacted the lives of people, especially in the rural areas where access to orthodox medicare is limited [51]. Apart from the lack of adequate access and the fear of expired or fake drugs, the prohibitive cost of western medicine makes traditional medicine attractive. Various training schools exist for both herbal medicine and homeopathy, and as such, most modern traditional health practitioners have great knowledge of pharmaceutical properties of herbs and the shared cultural views of diseases in the society and they combine their knowledge with modern skills and techniques in processing and preserving herbal medicines, as well as in the management of diseases. In oral interviews with two modern traditional medicine practitioners, Dr. Anselm Okonkwo of Saint Rita’s Ethnomedical Research Center, Enugu, Nigeria, a Veterinary doctor, and Mr. Uche Omengoli of CGP Herba-Medical

Consultancy and Research, Enugu, Nigeria, a medical laboratory technologist, both revealed that their knowledge and 'gift' of medical practice were handed down by aged relatives who were also in the practice by both tutelage and supernatural means. Knowledge was however improved by further training, interaction, and discussion with colleagues, consultation of books on herbal medicine, and the Internet. They claimed that the practice was very lucrative, especially since some ailments that defied orthodox medicine such as epilepsy and madness could be completely treated by traditional medicine. The two men divulged that the old concept of secrecy and divination is gradually fading away and being taken over by improved skills, understanding, and use of modern equipment where necessary. Both however agreed to the "mystic" or esoteric power of plants, which they sometimes employ in their diagnosis and treatment. An Enugu, Nigeria-based nonprofit organization, the Association for Scientific, Identification, Conservation and Utilization of Medicinal Plants of Nigeria (ASICUMPON), of which the writer is a member, is committed to "highlighting the usefulness of medicinal plant resources and scientific assessment, preparation and application of these for the betterment of humanity and as Africa's contribution to modern medical knowledge," under the chairmanship of Reverend Father Raymond Arazu. Another prominent member of the association, Professor J.C. Okafor, who is a renowned silviculturist and plant taxonomist, is helping members to identify and classify plants. The group also shares and documents evidence-based therapeutic knowledge. Such groups and training schools exist all over Nigeria. ASICUMPON has published a checklist of medicinal plants of Nigeria and their curative values [19]. Other books have likewise produced useful information [16, 21]. The greatest problem still facing herbal medicine in Nigeria is lack of adequate standardization and safety regulations [52]. However, the interest and involvement of educated and scientific-minded people in herbal medicine practice have to a great extent demystified and increased the acceptability of these medicines by a greater percentage of would-be skeptical populace. A photograph of Dr. Anselm Okonkwo is shown here in **Figure 4**, who is a veterinary doctor and a typical educated and knowledgeable herbal practitioner with the writer after interviewing him.



Figure 4. The writer with Dr. Okonkwo of St Rita's Ethnomedical Research Center, Enugu, after the interview.

6. Adverse effects of herbal medicines

An adverse drug reaction is defined as “a harmful or troublesome reaction, due to intervention related to the use of a healing substance, which envisages risk from future administration and requires prevention or explicit treatment, or alteration of dose and method of administration, or withdrawal of the medical substance.” Any substance with a healing effect can generate unwanted or adverse side reactions. As with synthetic drugs, the quality, efficacy, and safety of medicinal plants must also be assured. Despite the widespread use of herbal medicines globally and their reported benefits, they are not completely harmless. In as much as medicinal herbs have established therapeutic effects, they may also have the potential to induce adverse effects if used incorrectly or in overdose. The likelihood of adverse effects becomes more apparent due to indiscriminate, irresponsible, or nonregulated use and lack of proper standardization. These concerns have been the focus of many international forums on medicinal plants research and publications [53]. The rich flora of Africa contains numerous toxic plants, though with interesting medicinal uses. The toxic constituents (e.g., neurotoxins, cytotoxins, and metabolic toxins) from these plants can harm the major systems of the human body (cardiovascular system, digestive system, endocrine system, urinary system, immune system, muscular system, nervous system, reproductive system, respiratory system, etc.) [25].

In a survey in Lagos metropolis, Nigeria, among herbal medicine users, it was found that herbal medicine was popular among the respondents but they appeared to be ignorant of its potential toxicities [22]. Several herbal medicines have been reported to have toxic effects. Current mechanisms to track adverse effects of herbal medicines are inadequate [15, 54, 55]. Consumers generally consider herbal medicines as being natural and therefore safe and view them as alternatives to conventional medications. Only very few people who use herbal medicines informed their primary care physicians. It is therefore likely that many adverse drug reactions go unrecorded with either patients failing to divulge information to health services, and no pharmacovigilance analyses are being carried out, or the observations are not being reported to appropriate quarters such as health regulatory bodies. Establishing a diagnosis of herbal toxicity can be difficult. Even when herbal-related toxicity is suspected, a definitive diagnosis is difficult to establish without proper analysis of the product or plant material. Very few adverse reactions have been reported for herbal medicines, especially when used concurrently with conventional or orthodox medicines [15]. The results of many literature reviews suggest that the reported adverse drug reactions of herbal remedies are often due to a lack of understanding of their preparation and appropriate use.

In a research of liver and kidney functions in medicinal plant users in South-East Nigeria, it was found that liver problems were the most prominent indices of toxicity as a result of chronic use [56]. **Figures 5 and 6** refer to the effect of consumption of herbal medicines and length of usage respectively, on serum enzymes, as an index of liver function. Toxic components in these herbs such as alkaloids, tannins, oxalates, etc., may likely be responsible for such observed toxicities.

Another important source of toxicity of herbal medicines worth mentioning is microbial contamination due to poor sanitary conditions during preparation [57]. Toxicity may also arise as a result of herb-drug interaction in situations where there is co-administration of herbal

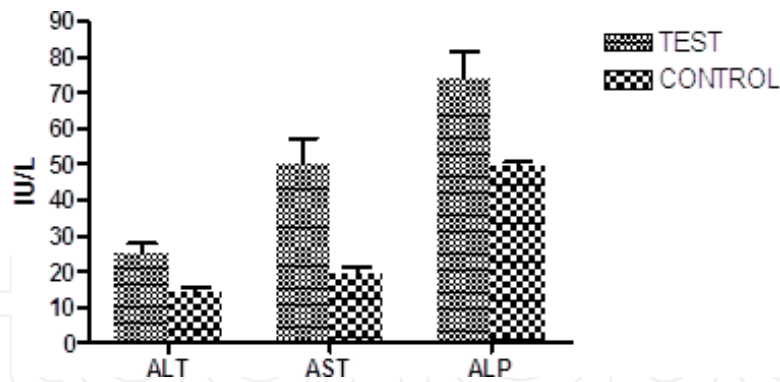


Figure 5. Serum enzyme levels in herbal medicine users (test group) and nonusers (control).

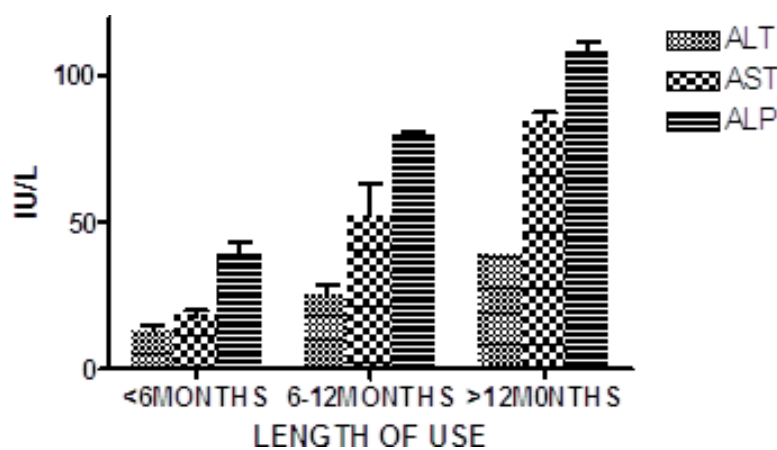


Figure 6. Effect of length of use of herbal medicine on serum enzyme levels.

medicines with some conventional drugs or supplements [11]. Incorrect identification and misuse of plants may also lead to toxicity.

It is therefore pertinent at this time to present correct, timely, and integrated communication of emerging data on risk as an essential part of pharmacovigilance, which could actually improve the health and safety of patients. This calls for improved collaboration between traditional practitioners and modern health care professionals, researchers, and drug regulatory authorities. The latency period between the use of a drug and the occurrence of an adverse reaction, if determined, can also help in its causality assessment in pharmacovigilance management [25]. Such information can be invaluable in the interpretation of drug safety signals, and facilitate decisions on further protective actions to be taken concerning future use.

7. Traditional African medicine and its relationship with modern medicine

Plants have been the primary source of most medicines in the world, and they still continue to provide mankind with new remedies. Natural products and their derivatives represent more than 50% of all drugs in clinical use, of which higher plants contribute more than 25%. These

are no doubt more important in developing countries but quite relevant in industrialized world in the sense that pharmaceutical industries have come to consider them as a source or lead in the chemical synthesis of modern pharmaceuticals [24, 58]. A number of African plants have found their way in modern medicine. These plants which had been used traditionally for ages have through improved scientific expertise been the sources of important drugs. Examples of such drugs and their sources include:

Ajmalicine for the treatment of circulatory disorders and reserpine for high blood pressure and mental illness both from *Rauvolfia serpentina*, L-Dopa for parkinsonism is obtained from *Mucuna* species, vinblastine and vincristine used for the treatment of leukemia from *Catharanthus roseus*, physostigmine from *Physostigma venenosum*, or “Calabar bean,” used as a cholinesterase inhibitor, strychnine from the arrow poison obtained from the plant *Strychnos nux-vomica*, atropine and hyoscyne from *Atropa belladonna* leaves. A host of other African plants with promising pharmaceutical potentials include *Garcinia kola*, *Aframomum melegueta*, *Xylopia aethiopica*, *Nauclea latifolia*, *Sutherlandia frutescens*, *Hypoxis hemerocallidea* (African wild potato), and *Chasmanthera dependens* as potential sources of antiinfective agents, including HIV, with proven activities [59], while *Cajanus cajan*, *Balanites aegyptiaca*, *Acanthospermum hispidum*, *Calotropis procera*, *Jatropha curcas*, among others, as potential sources of anticancer agents [60]. Biflavonoids such as kolaviron from *Garcinia kola* seeds, as well as other plants, have antihepatotoxic activity [61].

8. Advantages and disadvantages of traditional herbal medicine

Both Western or traditional medicine come with their own challenges. Currently, there are many western drugs on the market which have several side effects, in spite of their scientific claims. In like manner, African traditional herbal medicine or healing processes also have their own challenges. The following are reported as some of the advantages and disadvantages:

8.1. Advantages

African herbal medicine is “holistic” in the sense that it addresses issues of the soul, spirit, and body. It is cheap and easily accessible to most people, especially the rural population. It is also considered to be a lot safer than orthodox medicine, being natural in origin.

8.2. Disadvantages

Some of the disadvantages include improper diagnosis which could be misleading. The dosage is most often vague and the medicines are prepared under unhygienic conditions, as evidenced by microbial contamination of many herbal preparations sold in the markets [57]. The knowledge is still shrouded in secrecy and not easily disseminated. Some of the practices which involve rituals and divinations are beyond the scope of nontraditionalists such as Christians who find it incomprehensible, unacceptable, and difficult to access such services [8, 62].

9. Conclusion

Long before the advent of Western medicine, Africans had developed their own effective way of dealing with diseases, whether they had spiritual or physical causes, with little or no side effect [63]. African traditional medicine, of which herbal medicine is the most prevalent form, continues to be a relevant form of primary health care despite the existence of conventional Western medicine. Improved plant identification, methods of preparation, and scientific investigations have increased the credibility and acceptability of herbal drugs. On the other hand, increased awareness and understanding have equally decreased the mysticism and “gimmicks” associated with the curative properties of herbs. As such, a host of herbal medicines have become generally regarded as safe and effective. This, however, has also created room for quackery, massive production, and sales of all sorts of substandard herbal medicines, as the business has been found to be lucrative.

African traditional herbal medicine may have a bright future which can be achieved through collaboration, partnership, and transparency in practice, especially with conventional health practitioners. Such collaboration can increase service and health care provision and increase economic potential and poverty alleviation. Research into traditional medicine will scale up local production of scientifically evaluated traditional medicines and improve access to medications for the rural population. This in turn would reduce the cost of imported medicines and increase the countries’ revenue and employment opportunities in both industry and medical practice. With time, large scale cultivation and harvesting of medicinal plants will provide sufficient raw materials for research, local production, and industrial processing and packaging for export.

The scope of herbal medicines in Africa in the near future is very wide, but the issue of standardization is still paramount [64].

This therefore calls for ensuring that the raw materials should be of high quality, free from contaminations and properly authenticated, and samples deposited in University, National, and Regional herbaria. There is need for pharmacopeia to provide information on botanical description of plants, microscopic details, i.e., pharmacognosy, origin, distribution, ethnobotanical information, chemical constituents and structures, methods of quality control, pharmacological profile and clinical studies, including safety data, adverse effects, and special precautions [21, 62]. Such wealth of information will no doubt bring about uniformity in production quality. Rather than viewing African herbal medicine to be inferior, it may yet turn out to be the answer to the treatment of a host of both existing and emerging diseases such as malaria, HIV/AIDS, ebola, zika, etc., that may defy orthodox medicine.

9.1. Future perspectives

Future perspectives in this area include:

- a. All countries in the African region must seek to recognize traditional medical practice by putting out regulations and policies that will be fully implemented to ensure that the

THPs are qualified and accredited but at the same time respecting their traditions and customs. They must also be issued with authentic licenses to be renewed frequently.

- b. Incorporation of systems that will provide an enabling environment to promote capacity building, research, and development, as well as production of traditional herbal medicines of high standards.
- c. Harnessing the importance of traditional herbal medicine and integrating the conventional medicine to combat priority diseases such as malaria, HIV/AIDS, diabetes, sickle cell anemia, hypertension and tuberculosis.
- d. Raising the standards of African traditional herbal medicine to international standards through intercountry collaboration.

These if achieved would put African herbal medicine in an admirable position in the World health care system.

Author details

Ezekwesili-Ofili Josephine Ozioma* and Okaka Antoinette Nwamaka Chinwe

*Address all correspondence to: ezekjojo@yahoo.com

Department of Applied Biochemistry, Nnamdi Azikiwe University, Awka, Nigeria

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