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Knowledge, Attitudes and Practices among People of RUHANGO District towards Medicinal Plants

Hosee NIYOMPANO, Amon NIYONAGIZE and Dr. Enock NIYONDAMYA

ABSTRACT: This research was directed to the knowledge, attitudes and practices among people of Ruhango District towards medicinal plants. The main objective of our research was to determine the level of knowledge, attitudes and practices of people of Ruhango District towards medicinal plants. The research was designed to give answers to the following research questions: Do people of Ruhango District have enough knowledge about the use of medicinal plants? How do Traditional healers practice dosage? Do Traditional healers have knowledge about hygiene appropriate to the usage? And what are attitudes of Traditional healers towards medicinal plants usage? The objectives pursued while conducting this research were as follows: To verify if the Traditional healers have enough knowledge about use of traditional medicines; to evaluate Traditional healers' practice about dosage; to determine the level of knowledge about hygiene appropriate to the usage and to evaluate attitudes of Traditional healers towards medicinal plants usage. The following hypotheses were framed to guide the research: People of Ruhango District do not have enough knowledge about the use of medicinal plants; Traditional healers do not practice dosage correctly; Traditional healers do not have knowledge about hygiene appropriate to the usage. Based on the results obtained from this study, the people of Ruhango District have knowledge about the use of medicinal plants. Concerning the practice of correct dosage, the producers of traditional medicine know the quantity given to the children and to the adults but they do not know well how to measure the doses. About appropriate hygiene, the Traditional healers do not have knowledge about hygiene appropriate to the usage.

KEY WORDS: *Medicinal plants, Tradition medicine, Traditional Therapy, Phytotherapy and Traditional healer*

I. INTRODUCTION

The entire Earth is a vast garden. Apart from their ornamental role, flowers and plants whose some contain medicinal properties, contribute to health and welfare of human being [1].

World Health Organization considers "Medicinal plants" all plants containing in one or more organs substances that may be used in therapeutic issues in chemical pharmaceutical synthesis [1].

The great wealth of plant world is revealed in medicinal principles that are unequally located in different parts or organs of plants [1].

Medicinal plant species are regarded as the sources of well- known and medically useful secondary products in broad spectrum microbial infections. They act as the pain killers and depressants with high potency in the management of ailments in humans. Generally, drug plants are unique for containing compounds that are end-product of long biosynthetic pathways and are usually not needed in such plants' metabolic processes. David and Heywood (1963) reported that these compounds called secondary metabolites include: alkaloids, flavonoids, glycosides, essential oils and other organic constituents [2]. These constituents are usually produced in different parts of the plants like the roots, leaves, fruits and seeds and then translocated to other parts of plant for storage [3]. It is a habit in developing countries including Rwanda to use herbal medicine just because either it is not easy for them to pay hospitals or they must make a very long distance to go to see a doctor. Some people also have mentalities that traditional drugs are powerful that modern ones.

They are the possible alternatives to chemically synthetic drugs to which many infectious microorganisms become resistant. Similarly, during the last ten years the pace of development of new antimicrobial drugs has slowed down, while prevalence of resistance (especially multiple) has increased astronomically [4].

The increase in number of antibiotic resistant bacteria is no longer matched by expansion in the arsenal of agents available to treat infections.

All drugs of the past were substances with a particular therapeutic action extracted from plants. Thus, medicinal plants may be defined as any plant that can be put to culinary or medicinal use such as fox glove, opium poppy, and garlic [5]. More and more researchers find that food and their individual constituent perform similar fashion to modern drugs and sometimes better without the dreaded side effects [6].

Since time immemorial man has made use of plants in the treatment of diseases. It is a known fact that during Vedic period people used herbs for protecting and promoting their health.
The pharmacopoeias of many countries of the world even today include a large number of drugs of plant origin. There has been fast growing demand on herbal medicine in the last two decades in every branch of medical care. Discovery of ethnic medicine is a fundamental aspect and forms the base of scientific research on medicinal plants in many parts of the world. According to a report of World Health Organization, more than 80% of world's population depends on traditional medicine for their primary health care needs [7].

II. PROBLEM STATEMENT

As it has been discussed above, traditional medicine helps the modern one because it uses medicinal plants to help people unable to pay hospitals. So, it solves some problems that many people face in their daily life.
A very large part of the world's population has inadequate or no access to essential and life-saving medicines. A large proportion of the world's population today still has either only limited access to appropriate medicinal treatment or no access at all[6].
The consequences of this inadequacy include an enormous loss of life from preventable or treatable diseases (such as tuberculosis, pneumonia, acute respiratory infections, malaria, diabetes, and hypertension) and significant human suffering, particularly among the poor and marginalized populations of the world. The lack of access to life-saving and health-supporting medicines for more than 2 billion poor people stands as a direct contradiction to the fundamental principle of health as a human right. Illness is a major reason that the nearly poor slide into profound poverty. Illness decreases people's ability to work. Illness orphans children and prevents them from getting the education they need. Women and children make up the majority of the poor, and their low status in many societies often means that they have even less access to medicines.
The lack of access to medicines in most developing countries reflects both the lack of sufficient incentives for the development of new medicines to target those communicable diseases that disproportionately afflict the poorest countries, as well as the inability to pay for and effectively distribute those that do exist [6].
African tradition healing is part of African culture, and today traditional healers remain essential for the health and well-being of a great part of the black population. Several surveys have shown that between 70% and 80% of South African Blacks use the services of traditional practitioners (South African Medical Journal 1997:268), while approximately 60% of all babies born in South Africa are delivered by traditional birth attendants (Karim, Ziqubu- Page & Arendse 1994: 3). Thus, the introduction of biomedicine has never replaced the indigenous healing system, and traditional healers continue to be consulted for a variety of reasons by the black population. Consequently, dual treatment regularly takes place (Freeman & Motsei 1992:1185).
Different publications indicate that we have huge number medicinal plants in Rwanda but the latter lack of relevant information. Beside this main problem, traditional healers that should provide us information about medicinal plants have been ignored for many years (observatoire de la santé, January-Jun, 2003) and the latter should be obstacles for novel drug compounds research. So to promote research for new drugs, through this study, we will consult those traditional healers in order to indicate the therapeutic role of each plan investigated.
However, the use of medicinal plant creates a lot of problems on part of Traditional healers and End-users. For Traditional healers, they do not have enough knowledge about medicinal plants, how to calculate dosage and hygiene appropriate to the preparation of medicines. For End-users, these ones have mentalities that traditional medicine is more powerful than modern medicine. This research was conducted to see if the Traditional healers have enough knowledge about medicinal plants.
From what we know, there is no detailed report on knowledge, attitudes and practices of people towards medicinal plants in Ruhango District. To overcome the lack of these detailed data, a study was conducted to provide up to date data and evaluate the knowledge, attitudes and practice of people living in Ruhango District towards plants used as traditional medicine.

III. GENERAL OBJECTIVE

The main objective of our research was to determine the level of knowledge, attitudes and practices of people of Ruhango District towards medicinal plants.

IV. SPECIFIC OBJECTIVES

- To verify if the Traditional healers have enough knowledge about use of medicinal plants.
- To evaluate Traditional healers' practice about dosage.
- To determine the level of knowledge about hygiene appropriate to the usage.
- To evaluate attitudes of Traditional healers towards medicinal plants usage

V. RESEARCH QUESTIONS

- Do people of Ruhango District have enough knowledge about the use of medicinal plants?
- How do Traditional healers practice dosage?
- Do Traditional healers have knowledge about hygiene appropriate to the usage?
- What are attitudes of Traditional healers towards medicinal plants usage?

VI. SCOPE OF THE STUDY

The study was conducted in Ruhango District in the following sectors: Bweramana, Byimana, Kabagali and Ruhango. The choice was motivated by the fact that those sectors embed markets where Tradition healers are found.

VII. ORIGIN AND DEVELOPMENT OF ETHNOBOTANY

Traditional people around the world possess unique knowledge of plant resources on which they depend for food, medicine and generals utility including tremendous botanical expertise [11]. This implies that humans are dependent on other organisms for their life.

Although various animal and mineral products contribute to human welfare, the plant kingdom is most essential to human wellbeing especially in supplying his basic needs. This close interaction and dependency of humans on plants is studied under the field of ethnobotany. It is difficult to tell exactly when the term ethnobotany became part of modern science.

However, it can be traced back to the time when humans started making conscious interaction with plants and animals. Ethnobotanical work seems to have started with Christopher Columbus in 1492, at a time when he brought tobacco, maize, spices and other useful plants to Europe from Cuba [12]. John Hershberger proposed the term ethnobotany for the first time in 1895[13]. However, this term has been given different interpretations and definitions depending on the interest of workers involved in the study [12]. Hershberger (1896; cited in Cotton, 1996), defined ethnobotany as the study of the use of plants by aboriginal peoples. Martin (1995) defined ethnobotany as a study of people's classification, management and use of plants. In 1941, Shultes redefined ethnobotany as the study of the relationship, which exists between humans and their ambient vegetation (Castetter, 1944; cited in Cotton, 1996). Bye (1985) stated ethnobotany as a science investigates the biological (including the ecological) basis of interaction and relationship between plants and people over evolutionary time and geological space. Ethnobotanical investigation documents the knowledge on cultural interaction of people with plants. It also tries to find out how local people have traditionally used plants for various purposes, and how they incorporated plants in to their cultural tradition and religions [14]. Therefore, traditional local communities worldwide have a great deal of knowledge about native plants on which they intimately depend [15].

As stated by Martin (1995) to achieve more detailed and reliable information of plants and plant use, ethno botanical study needs involvement of specialists from various disciplines, such as plant taxonomists, plant ecologists, anthropologists, linguists, economic botanists, pharmacologists and others.

With such interdisciplinary and multidisciplinary approaches, ethno botany is aimed at gathering and documenting indigenous botanical knowledge, cultural practice, use and management of botanical resources and discovers benefits from plants.

VIII. TRADITIONAL MEDICINAL PLANTS

The world health organization defined traditional medicine as the total combination of knowledge and practices that can be formally explained or used in prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing[22].

According to Fassil Kibebew (2001), about 75-90 % of the rural population in the world (excluding western countries) relies on traditional medicines as their only health care system. This is not only because of poverty where people cannot afford to buy expensive modern drugs, but traditional systems are also more culturally acceptable and meet the psychological needs in a way modern medicine does not. According to WHO (2001), consultation of medicinal practitioners is very helpful for the development and incorporation of useful approaches in planning and budgeting system for health care provision of most developing nations and indigenous communities. In Africa, traditional medicine plays a central role in health care needs of rural people and urban poor. Here, it is said that, this situation would remain so long as modern medicine continues to be unable to meet the health care of the people of the continent effectively [20]. Their value and role of this health care system will not diminish in the future, because they are both culturally viable and expected to remain affordable, while the modern health care service is both limited and expensive[24].

Indigenous traditional medicinal practices were carried out essentially based on private practice, i.e. private agreement between consenting parties, and the knowledge of traditional practice in most cases has descended through oral folk lore. The secrete of information retained by traditional healers is relatively less susceptible to distortion but less accessible to the public [26].

However, the knowledge is dynamic as the practitioners make every effort to widen their scope by reciprocal exchange of limited information with each other [25, 27].

IX. TYPES OF MEDICINAL PLANTS

There are hundreds of remarkably common herbs, flowers, berries and plants that serve all kinds of important medicinal and health purposes that might surprise you: anti-inflammatory, antifungal, insect repellent, antiseptic, expectorant, antibacterial, detoxification, fever reduction, antihistamine and pain relief. Here are twelve potent medical plants that are mostly found in wide world, these are used to overcome some minor injuries, scrapes, bites and pains.

1. Marijuana (Cannabis sativa)

Health benefits are well documented, from depression and anxiety relief to reduced blood pressure, pain alleviation and glaucoma treatment. It is not addictive, does not kill brain cells and is not a "gateway" drug – in fact, when pot is more available, studies show that the use of hard drugs like heroin and cocaine actually decreases [40].

2. Lady Ferns (Aspidium angustum)

The ferns are good for: treating stinging nettles. The juices released will quickly ease stinging nettle burns and can also ease minor cuts, stings and burns (fresh salt water also works in a pinch for bee stings) [40].

3. California poppy (Eschscholzia californica)

The brilliant blooms of the poppy make this opioid plant an iconic one. The plant is an effective nervine (anxiety reliever) and is safe for use on agitated children. Can be made into a tea for quick relief of nervousness and tension. A stronger decoction will offer pain relief [40].

4. Blood Flower (Asclepias curassavica)

The blood flower (also Mexican butterfly weed) is a type of tropical milkweed with toxic milky sap that is emetic (it makes you hurl). It's also historically favored as a heart stimulant and worm expellant. Pretty useful for a number of potential hiking disasters, if you think about it [40].

5. Tansy (Tanacetum vulgare)

Tansy is an old-world aster and remedy, used for flavoring beer and stews as well as repelling insects. Rubbing the leaves on the skin provides an effective bug repellent, but tansy can also be used to treat worms. It is said to be poisonous when extracted, but a few leaves are not harmful if ingested [40].

6. Catnip (Iboza riparia)

Catnip can relieve cold symptoms. It's useful in breaking a fever as it promotes sweating. Catnip also helps stop excessive bleeding and swelling when applied rather than ingested.

This mint plant is also reportedly helpful in treating gas, stomach aches, and migraines. Catnip can stimulate uterine contractions, so it should not be consumed by pregnant women [40].

7. Sage (Salvia officinalis)

Sage is an incredibly useful herb, widely considered to be perhaps the most valuable herb. It is anti-flammatory, anti-oxidant, and antifungal. Sage aids digestion, relieves cramps, reduces diarrhea, dries up phlegm, fights colds, reduces inflammation and swelling, acts as a salve for cuts and burns, and kills bacteria [40].

8. Blackberries (Rubus fruticosus)

The Blackberries leaves and root can be used as an effective treatment against dysentery and diarrhea as well as serving usefulness as an anti-inflammatory and astringent. Ideal for treating cuts and inflammation in the mouth [40].

9. Wild Quinine (Vernonia amygdalina)

The wild quinine is a potent herb that "is used as an antiperiodic, emmenagogue, kidney, lithontripic, and poultice. It has traditionally been used in alternative medicine to treat debility, fatigue, respiratory infection, gastrointestinal infection, and venereal disease [40].

10. Feverfew (Chrysanthemum parthenium)

Feverfew is a plant that has well-known and documented health properties and medicinal benefits. This anti-inflammatory can treat rheumatism, arthritis and, most famously, migraine headaches and tension headaches [40].

11. Sweet Violet (Viola odoratalinn)

The Sweet Violet is cultivated around the world and is a pleasant, delicate purple color. When brewed into syrup the plant is effective as a treatment for colds, flu and coughs or sore throat. It is wonderfully effective for relieving headaches and muscle and body pain [40].

12. Navajo Tea (Thelesperma subnudum)

This plant has been used for centuries by Native Americans to quickly relieve that most brutal and irritating of infections: the UTI (urinary tract infection). Best when made into a tea or decoction [40].

X. DRUG PREPARATION MODES IN MEDICINAL PLANTS

In the preparation of these drugs, the Rwandan population uses the following modes:

- Infusion: Is the way to obtain herbal tea from the delicate parts of plant such as leaves, flowers, shoot tip and stem pith. Infusion allows the extraction of high quantity of active substances without the change of chemical structure [28].
- Decoction: Is the way to obtain herbal tea by using the plants delicate parts: roots, rhizomes, seeds, bark that requires high boiling in order to obtain the active principles but certain active principles can distorted due to heat [29].
- Maceration: It consists of the extraction of the active principles of plant at an ambient temperature, using water as solvent, alcohol, or oils. It involves soaking the interesting part of plant into the solvent that subsequently enables smooth crushing [30].
- Fumigation: It consists of spraying smoke of a burnt object over a sick person so that he/she breathes it [29].
- Juice: Is prepared by using fresh plants, crushed and filtered [30].
- Ashes: Which are obtained by burning dried plants [31].

XI. THE WAYS OF ADMINISTRATION OF MEDICINAL PLANTS

There are main five administrations of herbal medicines in Rwanda:

- Oral way through drinking liquid solution or chewing some parts of fresh or dried plants [29].
- Epidermis application: Where the preparation of the plant is locally applied across the skin or by bathing the bodily affected part in a recipient containing the medicine or solution [32].
- Dermis way: Where medicinal preparation is applied over wounds or traced scars across the skin [33].
- Inhalation: That is the aspiration of steam or plant powder of a preparation[29].
- Instillation: the liquid is introduced in our body through natural cavities like nose, eye, ears, or vagina. This liquid is generally a decoction or infusion [29].

XII. CONSERVATION OF MEDICINAL PLANTS

Availability of plants in general and medicinal plants in particular has been affected by a dramatic decrease in areas of native vegetation due to agricultural expansion, deforestation and development of urban centers [29].

If these and other precious plant species constituting the flora of the country continue to succumb to manmade and natural calamities, we would be losing potential lifesavers and their environs within short period. Hence, there is an urgent need for conservation and sustainable utilization of these resources.

As a solution, there are some conservation actions that have been undertaken around the world designed to protect threatened medicinal plants from further damage [29].

This includes in-situ and ex-situ conservation measures. Both in-situ and ex-situ conservation efforts are implemented to capture medicinal plant genetic resources and the traditional practice associated with them. In the study at hand, some cultural believes and traditional practices that associated with traditional medicines were found to contribute much to the conservation of medicinal plants in their natural habitat.

XIII. MATERIALS AND METHODS

POPULATION OF THE STUDY

The study targeted the Traditional healers. This study is made up of 50 Traditional healers identified in four sectors of Ruhango District that were concerned by the study. These are:

- Bweramana
- Byimana
- Kabagali
- Ruhango

SAMPLE SELECTION AND SAMPLE SIZE

The sample has been selected using the simple random sampling technique, it means every element under this technique had an equal chance of being selected and research through personal interviews with the respondents filled the questionnaires and researchers did an observation on ground. The choice of sectors was motivated by the fact that those sectors embed the main centers where traditional medicines are sold and due to those sectors are surrounding BWERAMANA Sector where ISPG is located. The total population was considered in the investigation because it is a small number. The total sample size is 50 healers allocated as follows:

Location of Traditional healers according to their sectors:

Table1: The location of Traditional healers

Sectors	Healers	Percentage
Bweramana	12	24
Byimana	8	16
Kabagari	11	22
Ruhango	19	38
Total	50	100

This table shows the location of healers of medicinal plants according to their sectors. Among 50 healers there are 12 healers representing 24% that inhabit in Bweramana sector; 8 healers representing 16% that inhabit in Byimana sector; 11 healers representing 22% that inhabit in Kabagari sector; 11 healers representing 22% that inhabit in Kabagari and 19 healers representing 38% of all healers that inhabit in Ruhango sector.

DATA COLLECTION

A variety of tools was used to collect data from respondents. They include the following:

- Questionnaire

The researchers used questionnaires to gather data from respondents as a practical way of attaining the specified goal.

- Observations (diagnostic visits)

The researchers used personal observations in order to understand fully the respondent's expression and reactions to questions and complete given information. This technique also helped the researchers to acquire information of people who did not reveal clearly the information wanted hence getting first-hand information.

DATA ANALYSIS

The data were analyzed and processed using Microsoft Excel, editing and tabulation. To make the work more reliable, some hypotheses and themes were tested using frequencies or percentages of respondents.

- Editing

During and after collecting data, the researchers corrected errors, repetitions and irrelevances so as to avoid ambiguities in the information provided through the interview and questionnaire. Editing data was done on the basis of the objectives of the study.

- Tabulation

Tables have been used in this research to put together the information that has been revealed by the informants. The frequencies and corresponding percentages of the answers given have been used by the researchers to better analyze and explain the situations that were under study.

XIV. PRESENTATION OF RESULTS

The researchers wanted to investigate, on one hand, basing on the initiators and seniority in medicine of the respondents. On the other hand, basing on the knowledge about the use of medicinal plants, practice of dosage and knowledge about hygiene appropriate to the usage. The following tables show the identification of the respondents.

Identification of respondents

Table2: Identification of respondents by initiator

Initiator	Number of respondents	Percentage
Parents	40	80%
Friends	3	6%
Brothers	7	14%
Total	50	100%

According to the initiators of the respondents, the greater number of respondents is initiated by their parents representing 80% of all respondents whereas the small number is initiated by their brothers representing14% of all respondents.

Table3: Identification of respondents by seniority

Seniority (in years)	Numbers of respondents	Percentage
[0-20]	17	34%
]20-40]	28	56%
]40-60]	5	10%
Total	50	100%

According to the seniority, among 50 respondents, the great majority of respondents is between 20 and 40 years representing 56% whereas the minority of respondents is between 40 and 60 years representing 10%.

Information on the medicinal plants

Table4: The most medicinal plants used to treat diseases

Plants used	Number of respondents (within a total of 50 healers)	Percentage
Iboza riparia (Umuravumba)	29	58%
Vernonia amygdalina (Umubirizi)	21	42%
Aloe vera (Igikakarubamba)	20	40%
Bidens pilosa (Inyabarasanya)	16	32%
Ocimum suave (Umwenya)	14	28%

This table shows that *Iboza riparia* (Umuravumba) is the most plant used to produce medicine with 58% while *Ocimum suave* (Umwenya) is the least plant used to produce medicine with 28%

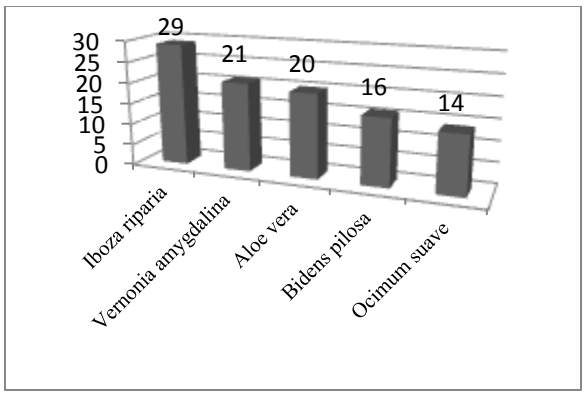

Figure 14: The most plants used to treat diseases

The most illnesses treated by Traditional healers

Table5: The most illnesses treated by Healers

Illnesses	Number of respondents (within a total of 50 healers)	Percentage
Intestinal worms	28	56%
Liver diseases	26	52%
Cough	14	28%
Diseases from poison	13	26%
Stomachache	21	42%
Epidermis diseases	36	72%

This table indicates that the most illnesses treated by traditional healers are epidermis diseases with 72% of all respondents whereas the least illnesses treated are diseases from poison with 26%.

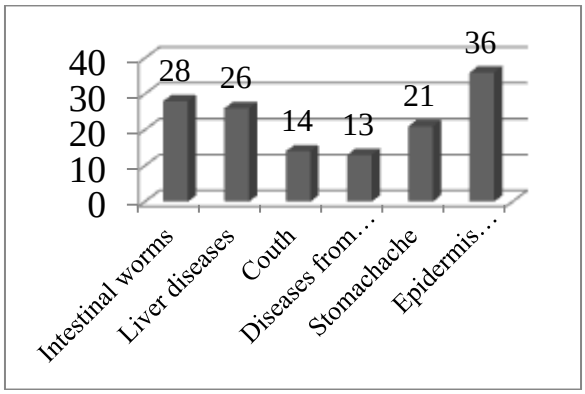

Figure 15: The most illnesses treated by medicinal plants

Table6: The parts of the plants used in the treatment of diseases

Parts	Number of respondents (within a total of 50 healers)	Percentage
Roots	33	66%
Bulbs	28	56%
Stems	45	90%
Leaves	47	94%
Flowers	20	40%
Fruits	34	68%
Others (Seeds)	15	30%

This table shows that the most part of the plant used is the leaves with 94% whereas the least part of plant used is the seeds with 30% of all respondents.

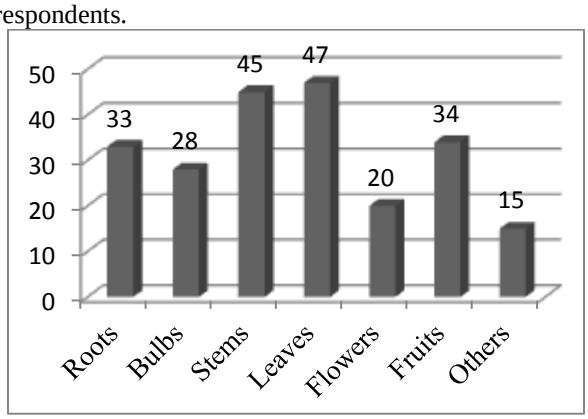

Figure 16: The parts of the plants used in the treatment of disease

Table7: Mode of getting medicine from plants

Modes of getting	Number of respondents (within a total of 50 healers)	Percentage
Fumigation	38	76%
Maceration	48	96%
Infusion	19	38%
Decoction	46	92%
Juice	43	86%
Ashes	27	54%

This table shows that the maceration is the most modes used for getting medicine from plants representing 96% while infusion is the least mode used for getting medicine from plants representing 38%.

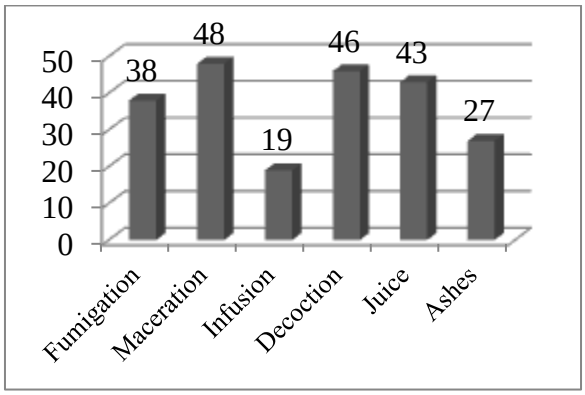

Figure17: Mode of getting medicine from plants

Table8: The medicine prescription for a child

Medicine prescription	Number of respondents (within a total of 50 healers)	Percentage
spoon	50	100%
Glass	24	48%
Others(drops)	32	64%

This table shows the medicine prescription for a child. All respondents representing 100% use a spoon for medicine prescription while few among respondents use glass for medicine prescription representing 48%.

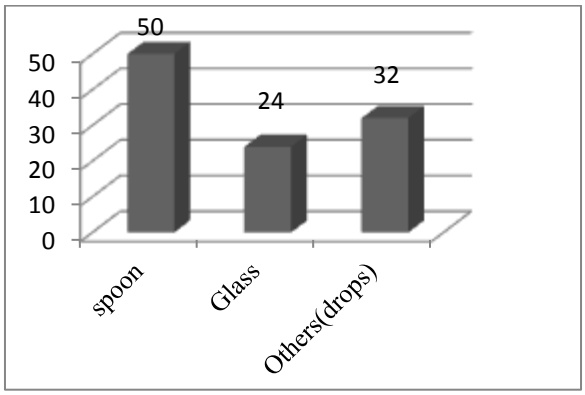

Figure18: The medicine prescription for a child

Table9: The medicine prescription for adult

Medicine prescription	Number of respondents (within a total of 50 healers)	Percentage
Bottle	11	22%
Spoon	40	80%
Glass	49	98%
Others(drops)	22	44%

This table shows the medicine prescription for an adult. The majority of respondents representing 98% use glass as medicine prescription while the minority representing 22% use bottle as medicine prescription.

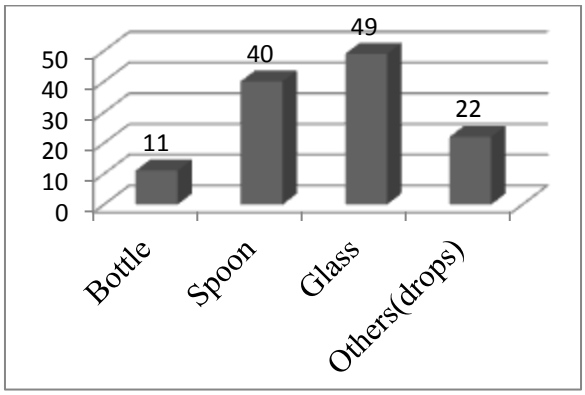

Figure 19: The medicine prescription for adult

Table10: The administration mode of the drug

Ways of administration	Number of respondents (within a total of 50 healers)	Percentage
Oral way	50	100%
Epidermis application	45	90%
Inhalation	30	60%
Instillation	35	70
Ano-rectal way	36	72%

This table shows the administration of the drug. All respondents representing 100% use oral way for drug administration while few respondents representing 60% use inhalation for drug administration.

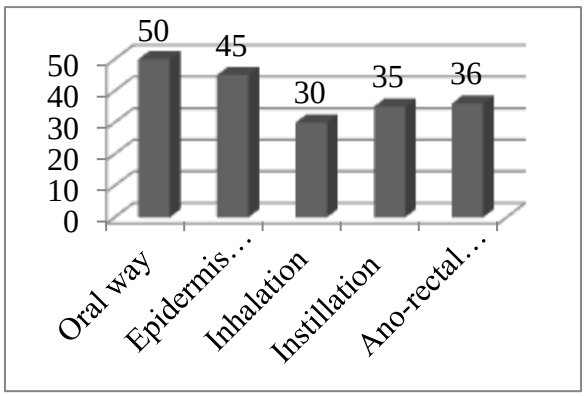

Figure 20: The administration of the drug

Table11: Hygiene related to traditional medicine

Methods	Number of respondents	Percentage
Boiling of medicines	20	40%
Recycling of materials	38	76%
Medicine contained in specific bottle	14	28%
Washing tools before usage with non-boiled water	50	100%

This table shows that all respondents representing 100% wash tools before usage with non-boiled water whereas few respondents representing 28% use specific bottles as containers of medicine.

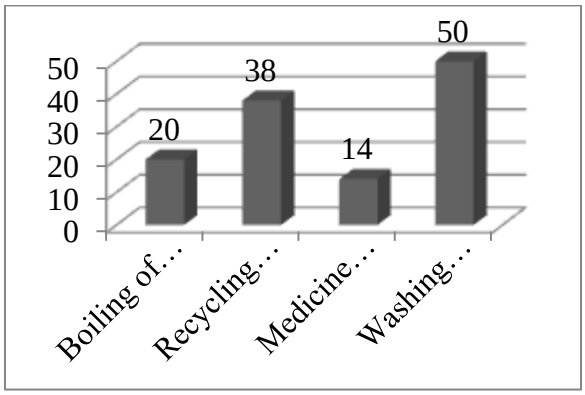

Figure21: Hygiene related to traditional medicine

Table 12: The negative effects of medicinal plants

Negative Effects	Number of Respondents	Percentage
Vomiting	15	30%
Abdominal pain	9	18%
Vertigo	20	40%
Others (fatigue, anorexia, allergy and malaise)	8	16%
Total	50	100%

This table shows the negative effects of medicinal plants. The most negative effect of medicinal plants is vertigo representing 40% while the least negative effect is fatigue representing 16%.

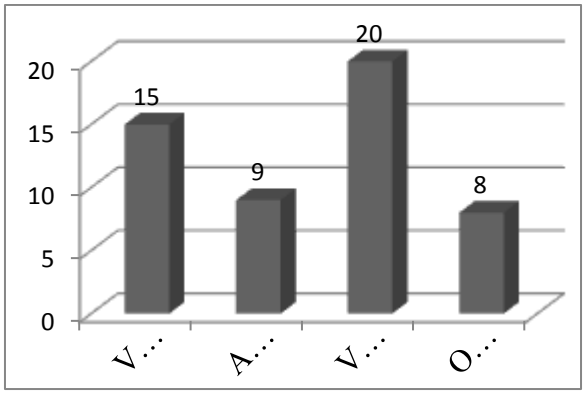

Figure22: The negative effects of medicinal plants

4.1.7. Duration of conservation of drugs

Table13: Duration of conservation

Duration	Number of respondents (within a total of 50 healers)	Percentage
1day to 1 week	36	72%
1 week to 1 month	24	48%
Above 1 month	15	30%

This table shows that the majority of respondent representing 72% conserve medicine from plants from 1 day to 1 week whereas the minority of respondent representing 30% conserves medicine above 1month.

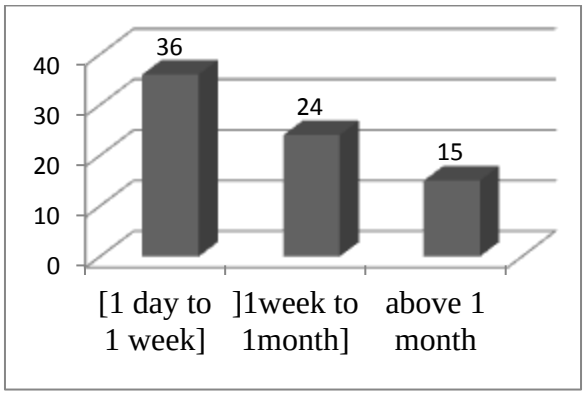

Figure 23: Duration of conservation

Table14: Materials used to conserve medicine

Materials used	Number of respondents (within a total of 50 healers)	Percentage
Bottles	18	36%
Small cans	40	80%
Casserole dishes	20	40%

This table shows that the most material used to conserve medicine is small can representing 80% but the least material used to conserve medicine is bottle representing 36%.

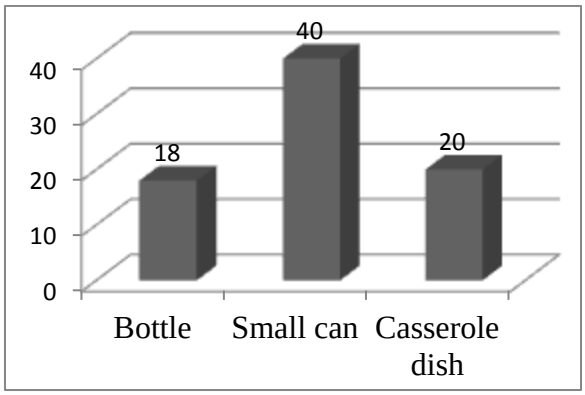

Figure 24: Materials used to conserve medicine

XV. DISCUSSION

The results obtained from this study show that 100% of respondents use medicinal plants in Ruhango District have knowledge about medicinal plants. Comparing to the research done in islands of Bahrain presented by Asfaw D. in 1999, 34-35 p. where95.3% of respondents used medicinal plants and 57% are knowledgeable in herbal medicine. Gap between the use and knowledge values indicated loss of knowledge within the Bahraini population [25].Most respondents, particularly in Ruhango District, were able to identify the traditional medicine using medicinal herbs; and fewer were able to identify non-medicinal herbs and their indications. In this study, knowledge of contraindications and herb-drug interactions was very poor and was similar to a US study which also demonstrated a knowledge deficit as it related to adverse effects of herbs [37].

Concerning the respondents by gender, the research reveals that females are the most participants in traditional medicine with 58% whereas males are 42%. Comparing to the islands of Bahrainin the study of Kemper k. in 2003, 45 p. where both males (75%) and females (82.7%) believe that women are the largest users of medicinal plants. The results also show that 42.3% of females compared to 27.8% of males use medicinal plants frequently or always. Both males and females use these plants to treat ailments related to different organs of the body, particularly the skin and the ear, nose, and throat (ENT) [1].

In Ethiopia, both men and women are known to practice medicine from their homes. It is most commonly the men that dispense herbal medicine similar to an out of home pharmacy [35]. The increasing number of false healers using home based medicines has grown with the rising population. The differences between real and

false healers are almost impossible to distinguish. However, only about 10% of practicing healers are true Ethiopian healers but in our study 100% are true Ruhango healers. It means that all investigated healers living in Ruhango District. Much of the false practice can be attributed to commercialization of medicine and the high demand for healing [36].

Concerning the initiator in carrying out medicinal plants in our study, most healers (80%) using medicinal plants have been taught by their parents. It is also the case in India and China as indicated by Jansen, P.C.M., (1981). About the most used plant to treat diseases in Ruhango District, the research reveals *Iboza riparia* which represents 58% among *Vernonia amygdalina*, *Aloe vera*, *Bidens pilosa* and *Ocimum suave*. Comparing to Amazon rainforest and Indian the most used plant to treat diseases is *Argemore mexicana* which represents 49% among *Evolvulu salsinoides*, *Azadira chtaindica*, *Abrus precatories*, *dithranal* and *paud'arco*in the research presented by Fassil kibebew, 38 p. In Ethiopia the most cited ethnomedicinal plant species was *Alysicarpus quartinianusA A. Rich*., whose roots and leaves were reported by traditional healers to be crushed in fresh and applied as lotion on the lesions of patients [26].

Concerning the most illnesses treated by medicinal plants, the research reveals that in Ruhango District there are intestinal worms with 56%, liver diseases with 52%, epidermis diseases with 72%, cough with 28%, disease from poison with 26% and stomachache with 42%. Comparing to Indian study presented by Abbink J., 26 p. where the most illnesses are diarrhea with 60%, stomach upset with 46%, anxiety with 34%, sleeplessness with 21%,mouth ulcers with 18%and skin ailments with 16%[26].

According to the negative effects due to usage of medicine from plants, the research shows that in Ruhango District there are vomiting 30%, abdominal pain with 18%, vertigo with 40% and anorexia with 16%.

On the contrary, in study appeared in Journal of tradition medicine in Brundi, 18 p. where the negative effect is the maternal death with 31% caused by the use of traditional medicine meant to reduce pain during childbirth. In late 2008 the Burundian President Peter Nkurunziza signed a law that provides pregnant women with free medical services. In spite of this, women in rural areas keep on using wild plants for easing the pain during childbirth. According to the director of health in Ngozi province Mr. Domitian Ndayisavye .this practice is mostly adopted by teenagers who often fear the pain they expect during their first delivery [19].

Concerning the parts of plants used, in this research, the leaves which represent 94% are the most used. It is the same as the study appeared in Journal of Ethnobiology and Ethnomedicine in Ethiopia2009, 22 p. [22].

XVI. CONCLUSION

The principle objective of this study was to determine the level of knowledge, attitudes and practices of people of Ruhango District towards medicinal plants. In conducting this research, the following hypotheses were formulated: People of Ruhango District do not have enough knowledge about the use of medicinal plants; Traditional healers do not practice dosage correctly; Traditional healers do not have knowledge about hygiene appropriate to the usage.

For collecting data, the following tools were used: questionnaire and diagnostic visits.

Based on the results obtained from this study, the first hypothesis was finally rejected because the people of Ruhango District have knowledge about the use of medicinal plants. Firstly, they know to differentiate the plants used to treat diseases with 58%. Secondly, they have knowledge about illnesses treated by medicinal plants with 72%. Thirdly, they know very well the different parts of the plant used in treatment with 94%. Fourthly, they know how to get the medicine from the plants with 96% and finally they know the ways of administering medicines with 90%.

The second and the last hypothesis were accepted. Concerning the practice of correct dosage, the Traditional healers know the quantity given to the children with 70.6% and to the adults with 61% but they do not know well how to measure doses.

According to the appropriate hygiene, the Traditional healers do not have knowledge about hygiene appropriate to the usage because the most traditional healers use the same tool more than once and they haven't appropriate bottles for medicine conservation; 40% of all Traditional healers provide the boiled medicine whereas 60% they do not it.

Even if all Traditional healers wash their tools before usage, they do it without boiled water so the hygiene is not appropriate. The results of this research are not exhaustive. That is why we would like to suggest further researches in this field about extraction of active principles in medicinal plants, clinical application of medicinal plants, phytochemical screening of medicinal plants and antimicrobial activities of medicinal plants.

XVII. RECOMMENDATIONS

This work would not have been worthwhile if it is limited itself exclusively to the level of showing the negative sides in knowledge, attitudes and practices of healers about traditional medicine without suggesting remedial ways. These recommendations were addressed to the Government of Rwanda, to the Ruhango District and to the Traditional healers.

To the Traditional healers

Based on the results obtained from this study, the Traditional healers do not have knowledge about hygiene appropriate and do not practice dosage correctly, we recommend to the Traditional healers:

- To learn how to use the dosage correctly.
- To improve the quality of hygiene in preparing and delivering medicinal plants.
- To work under cooperatives

To the Ruhango District

As our research was conducted in Ruhango District, we recommend Ruhango District:

- To take care for the Traditional healers
- To help them to work within cooperatives in order to take care of customer care to the end users
- To exchange the more information about the role of medicinal plant because there are no appropriate places for transactions.

To the Government of Rwanda

As we have seen, the traditional medicine helps the people who are far away from the Hospitals, we recommend to the Government of Rwanda:

- To support the Traditional healers with regard materials and finance
- To organize the training for the Traditional healers in order to improve their knowledge about traditional medicine.
- To formulate or implement a policy about the protection of medicinal plants

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