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Ethnomedicinal Investigation of Herbs: Evidence from Kafanchan, Nigeria

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Abstract

This research reports an ethnobotanical study that focused on the traditional medicinal plants used in Kafanchan to treat human ailments. The aim of the study is to document medicinal plants used by locals in the study area and the threats currently affecting medicinal plants. Data were collected using well-structured questionnaires from one hundred (100) 66% male, and 34% female, randomly selected respondents. A total of 51 medicinal plant species, distributed in 24 families, were collected together with their medicinal uses. Of the 51 species of medicinal plants collected from the study area, the Mimosaceae came out as a leading family with 5 (10%) medicinal species, while the Solanaceae followed with 4 species (8%). The most frequently used plant parts were leaves (38%), followed by roots (21%), while Tea form, which accounted for 59% and application 16%, were the widely used methods of preparation of traditional herbal medicines. The number of reported medicinal plants and their uses by the local people of the District indicates the depth of the locals' indigenous knowledge on medicinal plants and their application. The documented medicinal plants could serve as a basis for future investigation of modern drugs.

Keywords: Ethnomedicine, Herbs, Traditional Medicine Practitioners (TMPs)

1. Introduction

Over de decade, the investigation of plants and their uses has been one of the most primary concerns by humans and has been practiced by all cultures. Although initially not referred to as 'Ethnobotany' (MacDonald, 2009) [8]. The earliest recorded uses are found in Babylon about 1770 BC and in the code of ancient Egypt about 1550 BC. In the early 1500s, Indian fever bark was one of the first medicinal plants to find appreciative consumers in Europe, which was taken from the Cinchona tree (Cinchona officinalis), the bark of which was used as an infusion by native people of the Andes and Amazon highlands to treat fevers. Jesuit missionaries brought the bark to Europe, and by the early 16th century, the name of this medicine was transformed to "Jesuit fever bark". (Connive & Steven, 1996) [1]. Traditional medicine comprises therapeutic practices that have been in existence for hundreds of years, before the development and spread of modern medicine, and are in use today (WHO, 2008) [17]. These practices vary widely, in keeping with the social and cultural heritage of different countries. Traditional medicine includes a diversity of health practices, approaches, knowledge, and beliefs incorporating plant, animal, and/or mineral-based medicines; spiritual therapies; manual techniques; and exercises, applied singly or in combination to maintain well-being, as well as to treat, diagnose, or prevent illness (WHO, 2008) [17]. Traditional medicine was once again redefined in 2008 as the total of knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve, or treat physical and mental illnesses (WHO, 2008) [17].

A major component of traditional medicine is that which uses medicinal plants. Plant-based traditional medicine plays a key role in the development and advancement of modern studies by serving as a starting point for the development of novelties in drug discovery (Wright, 2005) [18]. Various modern drugs were extracted from traditional medicinal plants through the use of plant material following the ethnobotanical leads from indigenous cures used by traditional medical systems (Verma & Singh, 2008) [15]. On top of their use in fighting various ailments at the local level, different medicinal plants are used as export commodities, which generate considerable income. China takes the lead (45%) by importing the highest number of herbal medicines for the preparation of drugs, and this is followed by the United States of America (15.6%) and Australia (10.5%) (Sammy & Gopalakrishnakone, 2007) [13].

Today, the people who hold indigenous knowledge on the uses of plants are the older generation and the traditional healers. These traditional medicine practitioners (TMPs) at the rural community level are usually farmers, hunters, fishermen, timber workers, among others, and they are predominantly male, usually above 50 years old (Ibrahim *et al*., 2007) [4]. Transfer of knowledge and skills of the practice is mainly through family inheritance, and only very few practitioners developed their skills through apprenticeship. The majority of the TMPs lack formal education; however, some educated persons are developing an interest in the profession. While the number of these TMPs is decimating mainly due to old age and death, there is relatively low knowledge turnover and practice by the younger generation that has become more mobile due to civilization (Ibrahim *et al*., 2007; Kunle, 2009; Kassam *et al*., 2011) [4, 6, 5]. In addition, there is a rapid disappearance of genuine traditional herbalists and a decline in authentic knowledge of traditional treatment (Kassam *et al*., 2011) [5], thus raising concerns for the extinction of indigenous traditional medicine knowledge. Furthermore, secrecy, superstition, and lack of adequate records on the use of herbal medicines may have led to the loss of many invaluable heritages in herbal medicine.

Furthermore, high population pressure, which has led to high demand for medicinal plants and intensive land use for agricultural and livestock expansion, poses a great danger to the very existence of our plant diversity. To preserve the traditional knowledge of plant use or our biodiversity generally, and to be able to suggest ways for their conservation, it is important to have data on medicinal plants that still exist, where to find them, and their uses. Several ethnobotanical surveys have been carried out in Nigeria (Odugbemi *et al*., 2007; Lawal *et al*., 2009; Soladoye *et al*., 2010; Ene & Atawodi, 2012) [9, 7, 14, 2]. These surveys were usually focused on a community sector and addressed the documentation of the uses of medicinal plants and materials and the traditional healing practices of the rural population.

The majority of the African population regularly consults both orthodox and African traditional healing systems. WHO estimates that 60% of the people in sub-Saharan Africa use traditional medicine to alleviate their spiritual, psycho-social, and physical problems (WHO, 2001) [16]. Despite enormous advances in conventional medicines, the use of traditional medicines is encouraged, partly because some conventional drugs have failed to prove effective, have serious side effects, or cannot cure certain new illnesses. The World Bank in recognition of the vital roles of medicinal plants in community sustenance and development, has put up a strong case for the use of herbal in healthcare delivery. The identified vital roles include medicinal, ecological, income generation, cultural, social, and religious roles. There is a need, therefore, not only to carry out ethnobotanical research and document healing methods, but also to encourage propagation and conservation of herbal plants among the local people.

This research work is aimed at undertaking a pilot study to identify, document, and evaluate the local abundance of the etnomedicinal plants used by the Traditional Medicine Practitioners or people residing in Kafanchan, Kaduna State, Nigeria. Identify and document some medicinal plants used in the treatment of some ailments in Kafanchan Area of Kaduna State. investigate the threats affecting medical plant usage and practices in Kafanchan Area of Kaduna State.

1.1 Hypotheses

1. There are no significant differences in the usage of medicinal plants in the treatment of some ailments in Kafanchan Area of Kaduna State.
2. There are no significant threats affecting medicinal plants usage and practices in Kafanchan Area of Kaduna State.

2. Materials and Methods

2.1 Study Area

This research work was carried out and limited to Kafanchan Area of Kaduna State, Nigeria. A reconnaissance survey of the study area was carried out in Kafanchan Local Government Area of Kaduna State. The study site was selected based on the availability of traditional medicine practitioners. A total population of one hundred (100) traditional medicinal practitioners was sampled, representing the larger population of Kafanchan Area, Fig 1.

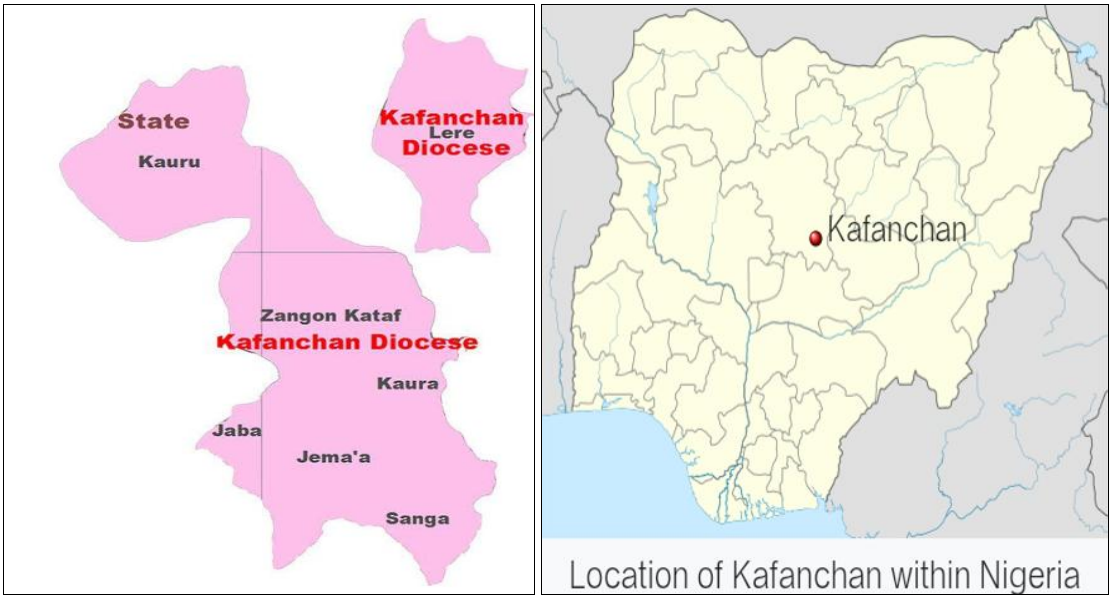

Fig 1: Map of Kafanchan local government area

2.2 Methods of Data Collection

This research focuses on "ethnomedicinal survey of plants, with a limitation to Kafanchan Area of Kaduna State. Therefore, data will be collected with the aid of a well-structured questionnaire, which will contain the age of respondents, gender, educational qualification, length of years of medicinal practice/knowledge, medicinal plants and their local name, common name, family name, part used, preparation, and ailments for which it is recommended. Specimen identification and confirmation were undertaken by using taxonomic keys and various volumes of the Flora of Ethiopia and Eritrea. Finally, the identified specimens will be reconfirmed by a taxonomic expert, and the specimens with their label stored at the Departmental Herbarium, Department of Botany, Faculty of Life Sciences, Ahmadu Bello University, Zaria.

3. Results

Results obtained from this research on an ethnomedicinal survey on plants, which was limited to Kafanchan Area of Kaduna state is are analyzed. Descriptive statistics were used in analyzing the data collected, which includes mean, frequency, and percentages. Tables were used to summarize the data. and results represented in tables and charts below, and further discussed for more clarification.

Table 1: Local, scientific, and common names, parts, and method of preparation of medicinal in Kafanchan

S. No	Family	Common name	Local names	Scientific names	Plant parts	Preparation /application	Disease treated
1.	*Acanthaceae*	Kariya	Kalmegh	*Andrographispaniculata*	Leaves	Taken after Boiling	fever
2.	*Lythraceae*	Henna	Laile	*Lawsoniainermis*	Fruits	Fresh fruits are crushed and taken	Fungal infection
3.	*Rutaceae*	Stone apple	Bael	*Aeglemarmelos*	Fruits	Crushed and juice extracted	Dysentery, diarrhea
4.	*Asparagaceae*	Satavari	Satavari	*Asparagus racemosus*	Root	Boiling to tea form	Cough, chicken pox
5.	*Apocynaceae*	Sarpagandha	Sarpagandha	*Rouvolfiaserpentina*	Root	Boiled	Insomnia
6.	*Apocynaceae*	Tellicherry bark	Kurai	*Holarrhenapubescens*	Stem bark/seed	Extract juice while fresh	Scabies
7.	*Lauraceae*	Cinnamon	Dalchini	*Cinnamomimzeylancium*	Root bark/stem	Extract juice while fresh	Asthma
8.	*Apocynaceae*	Egyptian Carissa	Bagozaki	*Carissa edulis*	Root bark	Boiled to tea form	Chest pain, gonorrhea, abdominal
9.	*Maliaceae*	Neem	Dogonyaro	*Azadirachtaindica*	Leaves/stem	Extracted juice by blending	Malaria, fever
10.	*Rutaceae*	Sweet orange		*Citrus sinensis*	Leaves/stem	Boiling	Malaria, fever
11.	*Poaceae*	Lemon grass	Tsaure	*Cymbopogoncitrates*	Leaves	Boiling to tea form	Cold, catarrh, fever
12.	*Rutaceae*	Lime orange	Lemutsami	*Citrus aurantifolia*	Fruits, stems, leaves	Boiling, sucking to tea form	Constipation, indigestion
13.	*Caricaceae*	Paw-paw	Gwanda	*Carica papaya*	Leaves	Boiling and taken as tea	Fever, typhoid
14.	*Anacardiaceae*	Mango	Mangoro	*Mangiferaindica*	Leaves	Boiling of Fresh or dried leaves	Fever, typhoid
15.	*Myrtaceae*	Guava		*Psidiumguajava*	Leaves	Boiling of fresh or dried leaves	Fever, typhoid
16.	*Fabaceae*	Velvet bean	Kaincha	*Mucunapruriens*	Root, leaves, seed	Taken as tea by boiling	Constipation
17.	*Apiaceae*	Indian pennywort	Mandukdarni	*Centellaasiatica*	Whole plant	Tea form	Diuretic, Jaundice
18.	*Moraceae*	Drumstick tree	Zogalle	*Moringaoleifera*	Leaves	Tea form	Constipation, high blood pressure
19.	*Solanaceae*	Aswagandha	Aswagandha	*Withaniasomnifera*	Root, leaves	Extraction by boiling and	Nervous disorder
20.	*Mimosaceae*	Mimosa/babool		*Acacia nilotica*	Seed	Boiling	Typhoid
21.	*Asclepiadaceae*	Gurmar	Yarydinkura	*Gymnemasylvestre*	Leaves	leaves Boiled	Diabetics
22.	*Scrophulariaceae*	Brahmi	Brahmi	*Bacopamonnieri*	Whole plant		Mental disorder
23.	*Phyllanthaceae*	Gale of wind	Bhumiamila	*Phyllanthusamarus*	Whole plant	Boiling	Jaundice
24.	*Asteraceae*	Bitter leaf	Shuwaka	*Vernoniaamygdalina*	Leaves	Blending or boiling	Fever, wound healing
25.	*Meliaceae*	African mahogany	Madaci	*Khayasenegalensis*	Seeds	Boil into tea form	Diabetes, constipation
26.	*Zingiberaceae*	Ginger	Cittar	*Zingiberofficinale*	Roots	Taken in tea form	Cold
27.	*Zingiberaceae*	Turmeric	Turmeric	*Curcuma longa*	Roots	Taken in tea form	Cough, asthma
28.		Raffia	Tukuwa	*Raphiahookeri*	Fruits	Boiled	Small pox
29.	*Mimosaceae*	Comb tree	Kiryaa	*Prosopis Africana*	Roots, fruit, stem, bark	Taken in tea form	Dysentery
30.	*Caesalpiniaceae*	Tamarind	Tsamiya	*Tamarindusindica*	Fruit	Boiled	Fever
31.	*Liiaceae*	Glory lily	Calihamy	*Gloriosasuperba*	Seed	Blend/pound and apply to the surface	Skin diseases
32.	*Alliaceae*	Garlic	Tafarnuwa	*Allium sativum*	Fruit	Boiled and taken/chewed	Sore throat, cold feet
33.	*Solanaceae*	Black nightshade	Makoi	*Solanumnigrum*	Fruits	Taken as tea	Dropsy
34.	*Asphodelaceae*	Aloe vera	Ruwan aloe	*Aloe vera*	Root/leaves	Boiled/squeezed to extract juice	Typhoid, malaria, skin problems, acne
35.	*Alliaceae*	Onion	Albasa	*Aliumcepa*	Root/bulb	Chewed/boiled as tea	Post-menopausal pain

36.	*Santalaceae*	Sandal wood		*Santalum album*	Stem bark	Apply to the surface	Skin disorder
37.	*Piperaceae*	Long pepper	Pippali	*Piper longum*	Fruits	Cooked/prepared in meal in a larger quantity	Appetizer
38.	*Clusiaceae*	Nag kesar	Nageswar	*Mesuaferrea*	Flower, leaves, stem	Boil and take as prescribed	Piles, asthma
39.	*Araceae*	Sweet flag	Bach	*Acoruscalamus*	Root	Taken in tea form	Epilepsy
40.	*Zygophyllaceae*	Crawling-puncture vine	Gokhur	*Tribulusterrestris*	Whole plant	Boiled	Appetizer, urinary infections
41.	*Mimosaceae*	Gum Arabic	Karoo	*Acacia senegal*	Latex	Apply to the surface	Burns
42.	*Solanaceae*	Yellow night shade	Kantakari	*Solanumvillosum*	Fruit, seed	Cook and eaten	Appetizer
43.	*Celastraceae*	Senegal corattree	Mijiriya	*Erythrinasenegalensis*	Root, leaves, stem bark	Boiled	Malaria, typhoid
44.	*Solanaceae*	Cut leaf ground cherry	Koropo	*Physalisangulata*	Leaves	Taken in tea form	Typhoid, rashes
45.	*Mimosoceae*	Egyptian mimosa	Bagaaruuwaa	*Acacia nilotica*	Leaves	Taken in tea form	Toilet infections
46.	*Moraceae*	Broad leaf fig	Epo obo	*Ficusplatyphylla*	Leaves, stem bark	Boiled	Convulsion
47.	*Malvaceae*	Rosella	Zobo	*Hibiscus sabdariffa*	Flowers, leaves		Diuretic, beverage, cough
48.	*Bombacaceae*	Baobab	Kuka	*Adansoniadigitata*	Bark, leaves, root		Cancer, inflammation,
49.	*Mimosaceae*	Badminton Ball Tree	Daddawa	*Parkiabiglobosa*	Leaves, bark, seeds		Obesity, tonic, malaria, diabetes
50.	*Asclepiadacea*	Crown flower	Tumfafiya	*Calotropisprocera*	Leaves		Scorpion sting
51.	*Lythtraceae*	Henna	Laile	*Lawsoniainermis*	Root		Vomiting, abortion, whitlow

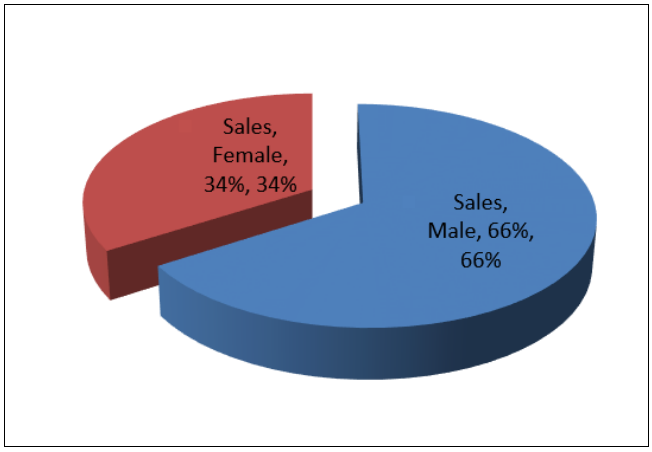

Fig 1: Sex distribution of Respondents

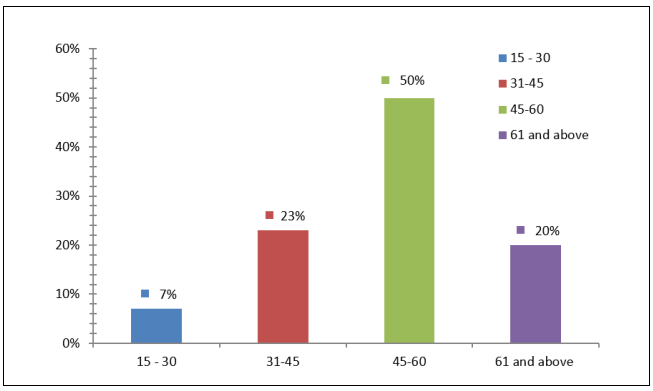

Fig 2: Age group of respondents

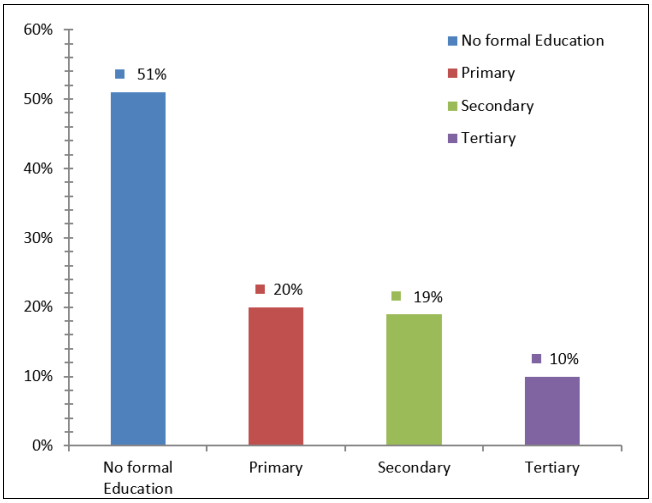

Fig 3: Level of education of practitioners in Kafanchan

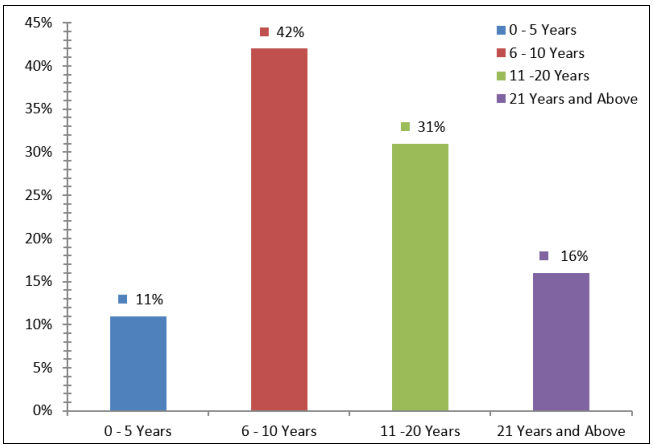

Fig 4: Length of Practice by Respondents

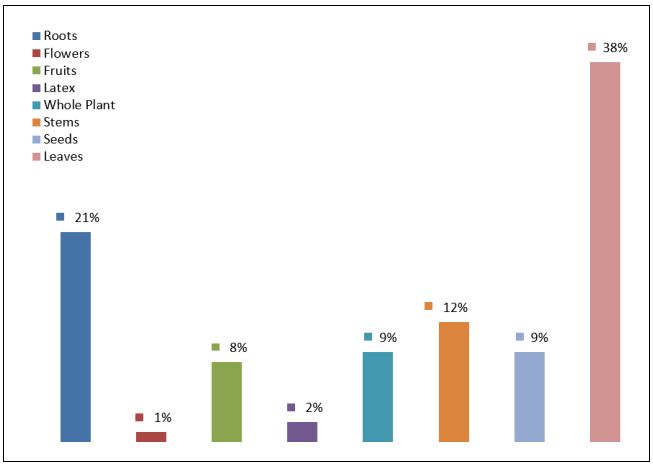

Fig 5: Percentage of plant parts Usage

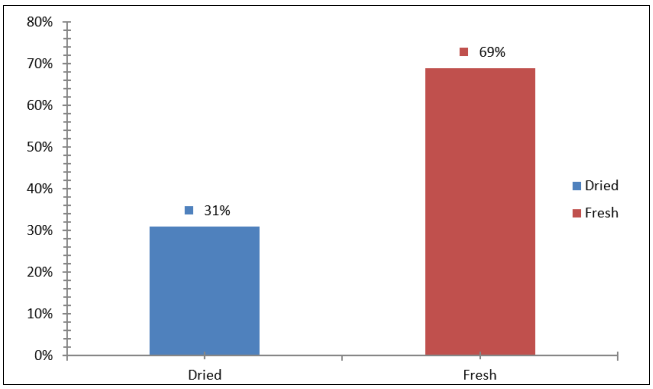

Fig 6: Plant use condition

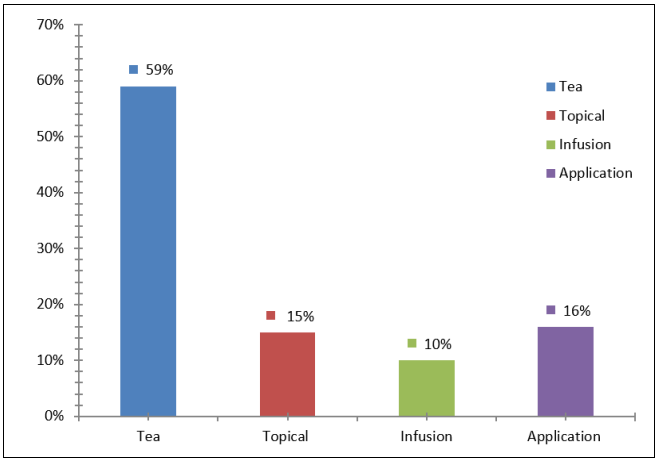

Fig 7: Plant preparation for use

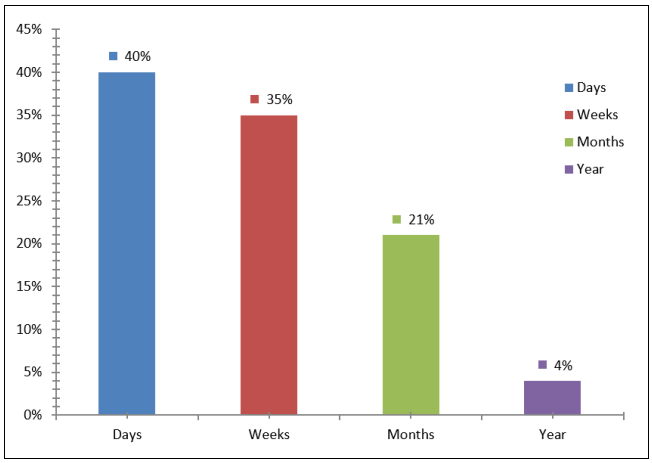

Fig 8: Mixture length of consumption

4. Discussion

For a long time, the bulk of intuitive information on traditional plant uses in the treatment of disease has been disparate and privately held, with limited accessibility to the public or even young practitioners. Considering a sharp decrease in the biological species across the globe and the increasing economic values placed on medicinal plants, documentation on ethnobotanical knowledge is a way to understand the use of different plant species to cure various ailments and means to conserve these natural resources. Globally, there is currently a renaissance of ethno-botanical surveys of medicinal plants and the need to screen specific parts of the plants (Paterson and Anderson, 2005) [10]. The analysis of the Kafanchan biodiversity of medicinal plants showed that the data relating to medicinal plants region are very fragmentary and dispersed, just in line with the works of Quyou (2003) [11] and Reguieg (2011) [12], even the know-how is currently being held by a few people, of who are elderly with the age bracket of 45 and above.

Results obtained from this research showed a total of 51 medicinal plant species and 34 families were collected together with their medicinal uses. Of the 34 families of medicinal plants collected, Mimosaceae came out as a leading family with 10% medicinal species, while the Solanaceae followed with eight species. All plants recorded were acknowledged to be a good source of remedies for different ailments. The most frequently used plant parts were leaves (38%), followed by roots (21%), while Tea forms by boiling, which accounted for 59%, were the widely used methods of preparation of traditional herbal medicines.

It was found that among the 100% respondents who responded to the questionnaire distributed, the majority fall within the age range of 45 - 60 years. This is because most of the traditional medicine practitioners/those who have knowledge of traditional medicine found in the Kafanchan Area, are elderly people. The family names, botanical names, vernacular names, plant forms, parts used, and methods of preparation and administration of treatments for the plants are listed in Table 1. The study revealed fifty-one (51) plant species from thirty-four (34) families that are used for medicinal purposes by the traditional medicine practitioners of the Kafanchan Area, with the Mimosaceae family being the dominant family (10.0%). The leaves (38%) are the plant part most commonly used, followed by the roots (21.9%), stems (12%), the whole plant (9%), seeds (9%), fruits (8%), Latex (2%), and flowers (1%). None of the respondents mentioned any side effects caused by any of the medicinal plants listed in Table 1. All in all, these plants are used for the treatment of numerous types of ailments. Most of the traditional healers obtain their extracts by tea form through boiling the medicinal plants. All plant species identified by this study have local vernacular names.

According to the frequency index, the families Mimosaceae, Solanaceae, Apocynaceae are the most abundant, while families such as Asclepiadacea, Lythraceae, Moraceae and Zingiberaceae frequency of occurrence in the intermediate range. However, some in the families Liliaceae, Poaceae, and Araceae have a low frequency of occurrence. Medicinal plants are most often used for the treatment of stomach ailments, dysmenorrhea, menstrual pains, fever, haemorrhoids (piles), pain, immune system deficiencies, diabetes, blood pressure abnormalities, gonorrhoea, vomiting, diarrhoea, loss of appetite, syncope (dizziness), need for contraception, warts, dry wounds, eye problems, kwashiorkor, oral thrush and ensuring easy child birth, all recorded. Because traditional knowledge of the healing properties of plants over the decades, been transmitted by oral instruction to carefully chosen initiates from one generation to the next, the recording and preservation of that knowledge in writing has become of vital scientific and cultural importance. This need is further underscored by the relatively advanced age of the small number of people with whom the bulk of this knowledge currently resides, because the danger exists that they may pass away perhaps without transmitting their unique knowledge to the younger generation: indeed, the study showed that local adults in the age bracket 15–30 and 31-45 had very little knowledge about the craft of traditional healing. The sources of information in the research are from herbalists, herb sellers, traders, and civil servants. The herb sellers are the major source of the information, while the herbalists and civil servants gave less information, as extracted from the occupation of respondents from the distributed questionnaires.

5. Conclusion

The result of the study revealed that there was a high diversity of medicinal plants and traditional knowledge about the use, preparation, and application of which is still maintained in the Kafanchan Area of Kaduna State. However, the knowledge of herbal medicine was held by elders. The decline in the use of plants by the younger generation may gradually lead to the fading away of indigenous knowledge associated with the plants. This study has identified a number of important medicinal plants used by the traditional healers of the Kafanchan area for the treatment of various human ailments. It provides a baseline for future phytochemical and pharmacological investigations into the beneficial medicinal properties of such plants. Instead of relying on trial and error occasioned by random screening procedures, properly documented traditional knowledge could help scientists to target those plants whose medicinal properties may find new applications for the benefit of all mankind (Fennell *et al*., 2004) [3].

6. Recommendations

There is a need for validation and standardization of phytomedicines and traditional medical practices so that this sector can be accorded its rightful place in the health care system. The government should provide a global forum for growers, traders, manufacturers of herbal medicine, and professionals in the field of traditional and alternative therapies to share knowledge, experiences, and ideas. There should also be a law set against indiscriminate or illegal cutting down of medicinal plants, as this will affect their biodiversity and cause depletion in their availability in the near future if not controlled.

The information on medicinal plants found in this study will help us to make a catalog of these plants in this part of Algeria and gather the most information about the therapeutic uses' practices by the local population. (Valdes, 2002). Scientists, therefore, should rise to get the knowledge from the elders and encourage the herb sellers to register with the government agency and make them available so that herbal medicine can easily be accessible and cheap for the less privileged. Further research should be carried out to confirm the efficacy of some of the most commonly used anti-viral herbs against bacterial infections.

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