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ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TRADITIONALLY FOR THE MANAGEMENT OF VARIOUS AILMENTS IN KAURA NAMODA, ZAMFARA STATE, NIGERIA

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ABSTRACT

The research was carried out between December 2022 and March 2023. Eighty-eight (88) informants provided information on traditional knowledge via a semi-structured questionnaire. The demographic data of the respondents was presented using descriptive statistics. The popularity of the referenced species was examined using Use Consensus Values (UCs) and Relative Frequency of Citation (RFC). There were 88 informants, of which 27% were women and 73% were men. Most respondents (35 percent) are between the ages of 51 and 60. Just 6.8% of the respondents were single, while the majority, 80.7%, were married of the responders, and 64.8% had never attended college. Herbalists made up 42 percent of the respondents. A total of twenty-four (24) families' worth of plant species were collected. The dominant family is called Fabaceae with eighteen (18) members, and malvaceae, with three (3) and four (4) members, in order of precedence. There was one (1) member in each of the following families: SolanaceaeAsteraceae, Asclepiadaceae, Zingiberaceae, Curcubitaceae, Convulvolaceae, Amaryllidaceae, Apocynaceae, Ebanaceae, Rutaceae, Moringaceae, Rubiaceae, Zygophylaceae, and Annonaceae The plant *Azadirachta indica* exhibited the greatest Use Concensus Value (UC) of 0.40 and Relative Frequency of Citation (RFC) of 0.20. Most plants are used to treat a variety of conditions, including piles, diabetes etc., asthma, malaria, typhoid, stomachaches, anti-snake bites, diarrhea, yellow fever, whereas certain herbs arouse libidinal urges.

Keywords: Medicinal Plants, Semi-structured, Use Consensus Values (UCs), Relative Frequency of Citation (RFC), Kaura Namoda

INTRODUCTION

According to the World Health Organization (WHO, 1998), medicinal plants are any plant part that is regularly or occasionally used to treat a specific illness, even if it is not easily accessible on the open market. Any plant that has compounds that have therapeutic value is considered medicinal (Sofowora 2008; Evans 2008). Plants offered a variety of compounds that have extensive application in the field of medicine (Dias *et al*., 2012). It is reported that out of the 250,000 number of different species of higher plants, 50,000 of them were identified to have medicinal importance (Govaerts, 2001). The main source of healthcare of large individual in many of the progressing countries is reported to be plants (Adnan *et al*., 2014). Herbal medicine is becoming widely used in urban areas, despites the presence of advance healthcare, (Kaushik *et al*., 2015). Medicinal plants are considered as a famous and oldest type of therapy (Halberstein, 2015). The therapeutics activities of medicinal plants have also been recognized by other mammals such as Apes and Monkeys as they solely depended on plants for their healthcares delivery (Aikman, 1997). Plant residues of many medicinal herbs indicated several biological activities, for example *Pelargonium zonale* (Kim *et al*., 2006), *Terminalia bellerica* (Bajpai *et al*., 2005), *Terminalia arjuna* (Bajpai *et al*., 2005; Pinmai *et al*., 2008). Ethnobotany studies are crucial for understanding native knowledge and customs surrounding medicinal plants, which have been used for centuries to treat various illnesses. Nigeria, with its abundant biodiversity and cultural diversity, is an ideal location for these studies. Kaura Namoda, in Zamfara State, is renowned for its traditional medicine, which is deeply rooted in the cultural fabric. However, scientific documentation and knowledge of the medicinal flora used in these areas are still lacking. Conducting ethnobotanical surveys can help close this gap by providing insights into the plant species used, preparation methods, and cure conditions. Traditional medicine remains the primary healthcare choice for a significant portion of the population in Zamfara State, particularly in Kaura Namoda. Understanding the medicinal plants used in this area could lead to alternative healthcare approaches and the discovery of novel therapeutic compounds (Gras et al., 2020). Therefore, the objective of this study was to conduct a comprehensive ethnobotanical assessment of medicinal plants in Kaura Namoda, aiming to support sustainable plant resource utilization, preserve traditional medicine, and identify new bioactive compounds for future scientific study.

MATERIALS AND METHODS

Data collection

The research was carried out between December 2022 and March 2023. Information on ethnobotany was gathered using semi-structured questionnaires. Respondents with extensive traditional knowledge, including herbalists, farmers, small-scale traders, civil servants, and others, were the target group.

Data analysis

The socio-demographic data was analyzed using a descriptive statistical method utilizing frequency and percentage, and the ethnobotanical survey findings were analyzed using Relative Frequency of Citation (RFC) and Use Consensus Value (UCs).

Relative Citation Frequency (RFC)

To ascertain the relative significance of a certain species, this was computed. The formula RFC = Fc/N was used to calculate it (Tardio and Pardo-de-Santayana, 2008). Where N

is the total number of respondents and Fc is the number of respondents that cited a certain species.

Use Consensus Value (UCs)

This gauges how much agreement there is among informants on whether or not they think a species is valuable (Byg and Balslev, 2001). It was used to decide on the utilization of some plants and identify those with special cross-cultural significance. UCV is equal to 2ns/n-1, where n is the total number of informants and ns is the number of individuals utilizing a species. The value of ns varies from 0 to +1.

RESULTS AND DISCUSSION

Demographic characteristics of the respondents showed above (Figure 1) males have the highest number of respondents (73%) then females (27%).

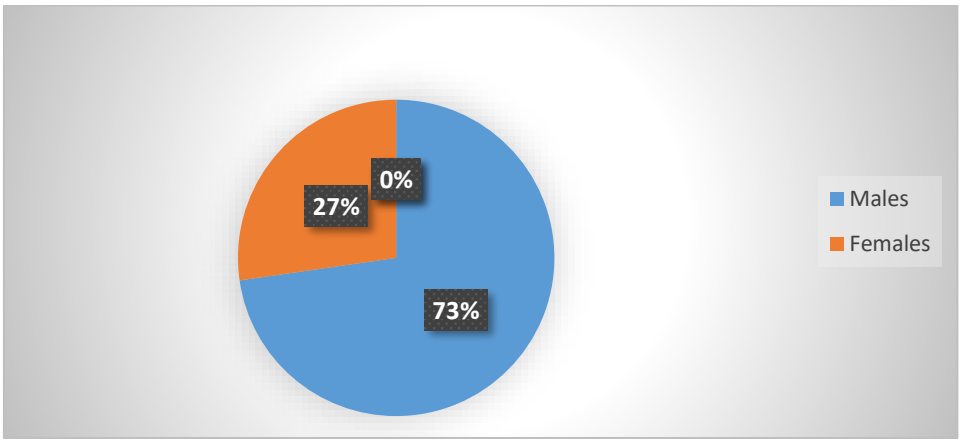

Figure 1: The traditional respondents that were questioned had the above demographics:

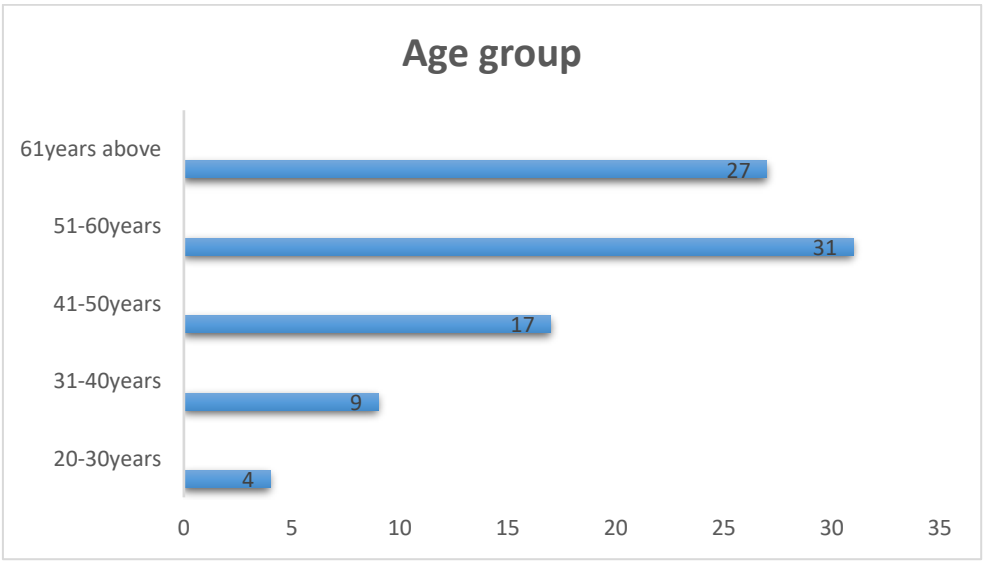

Figure 2: Age group of the respondents

According to the above statistic, the age group of respondents with the largest number (31), age 61 years and older (27), age 41–50 years (17), age 31–40 years (9), and age 20–30 years (4) is the one with the least number of respondents.

Table 1: Medicinal plants obtained from the study area

Family	Scientific name	Local name	Common name	Part used	RFC	UCs	Medicinal uses
Amaryllidaceae	*Allium cepa* L	Albasa	Onion	FR	0.02	0.04	Use to treat Ear problem
Anacadiaceae	*Anacardium occidentale*	Yazawa	Cashew	FR	0.02	0.04	Skin stimulants, ulcers
Anacadiaceae	*Mangifera indica*	Mangwaro	Mango	L, SD	0.03	0.06	Cancer, eyes and asthma
Anacardiaceae	*Lannea acida A. Rich.*	Faru	Plum mango	L, S	0.03	0.06	Treatment of hemorrhoids/piles, menstrual cramp, Child diarrhea and headache.
Annonaceae	*Carica papaya*	Gwanda	Paw-paw	R, L	0.05	0.11	Fever, stomach, breast cancer
Apocynaceae	*Carissa spinartum*	Gizaki	Bush plum	S	0.02	0.04	Treat abdominal pain and erectile dysfunction
Arecaceae	*Borossus aethiopum*	Giginya	Deleb palm	S	0.01	0.03	Use in the treatments of piles, diabetes and enhance sexual desire.
Arecaceae	*Hyphaene thebaica*	Goriba	Doum palm, ginger bread tree	R, L	0.01	0.03	Use to treat Fever, gout, asthma and back pains, it also enhance sexual desire.
Asclepiadaceae	*Leptadenia hastate* (Pers)	Yadiya		L	0.02	0.04	Use in the treatments of hemorrhoid, serves as blood tonic.
Asteraceae	*Vernonia amygdalina*	Shuwaka	Bitter leaf	L	0.09	0.18	Breast milk, stomach pain and abdominal pain
Bignoniaceae	*Stereospermum kunthianum* Cham.	Sansami	Pink jacaranda	WP	0.02	0.04	Use to treat Hemorrhoid/Piles
Capparaceae	*Maerna angolensis* DC.	Ciciwa	Bead bean	L	0.02	0.04	Use for the treatments of rashes.
Capparaceae	*Boscia solicifolia* Olive.	Zure	Willow leaved shepherd tree	L	0.02	0.04	Use to treat hemorrhoid/ piles.
Combretaceae	*Anogeissus leocarpa*	Marke	African birch	R	0.01	0.03	Antimicrobial and anti-helminth activity
Combretaceae	*Combretum micranthum* G,Don.	Farar geza	Kinkeliba	L	0.01	0.02	Use to treat erectile dysfunction
Convolvulaceae	*Ipomea batatas*	Dankali	Sweet potato	R, FR.	0.03	0.06	Use for the treatments of cancer, diabetes and anti-inflammatory.
Curcubitaceae	*Citrillus lanatus*	Kankana	Watermelon	FR, L	0.02	0.04	Aids digestion, prevents constipation
Ebenaceae	*Diospyrus mespiliformis*	Kanya, Kaiwa	African ebony	L	0.05	0.11	Dysentery and fevers
Euphorbiaceae	*Ricinus communis* L.	Zurma	Castor bean	SD	0.02	0.04	Use for birth control, enhance breast milk and labour, also is used to treat syphilis and leprosy.
Euphorbiaceae	*Jatropha curcas* L	Binizugu	Barbados	L	0.03	0.06	Address impotency, Asthma, hemorrhoid, stomach ache, menstrual cramp, tooth ache.
Fabaceae	*Parkia biglobosa*	Dorowa	African locust bean	R	~~004~~	~~0.09~~	Use in the treatment of hemorrhoids, Yellow fever and Coccidiosis in poultry
Fabaceae	*Vachelia ataxacantha*	Sarkakiya	Flame thorn	B,R,P	0.03	0.06	Cold, pneumonia, diarrhea and fever

Family	Scientific name	Local name	Common name	Part used	RFC	UCs	Medicinal uses
Fabaceae	*Tamarindus indica*	Tsamiya	Indian date	F,SD	0.03	0.06	Stomach pain, use to treat cancer.
Fabaceae	*Vachellia nilotica*	Bagaruwa		R, FR,L	0.11	0.22	Rashes, diarrhea, dysentery and leprosy
Fabaceae	*Senna occidentalis*	Tafasa	Sickle pod	L	0.03	0.06	Ulcer, stomach pain
Fabaceae	*Indigofera pilosa* Poir	Kasa kaifi	Softhairy indigo	R	0.01	0.02	Enhance sexual desires
Fabaceae	*Senna italica* Mill.	Filasko	Italian senna	L	0.02	0.04	Use for the treatments of Malaria, diarrhea, piles and also aids sight
Fabaceae	*Faidherbia albida*	Gawo	Winder thorn	B, R, L	0.02	0.04	Use in the treatments of Cold, Pneumonia, Diarrhea and Malaria
Fabaceae	*Albizia lebbeck*	Kachau kachau		B	0.02	0.04	Promotes sexual desire, Control piles
Fabaceae	*Crotalaria pallida* Alton	Farar biya rana	Smooth rattlepod	WP	0.02	0.04	It is used in the treatments of eyes problem
Fabaceae	*Tephrosia pedicellata* Baker	Kunnen kusu	Hoarypea	WP	0.03	0.06	Treatments of piles, yellow fever, heart disease.
Fabaceae	*Uraria picta* (Jacq.) Dc.	Ka cira	Dabra	WP	0.02	0.04	Treatment of gonorrhea, Anti snake bites, serves as sedatives.
Fabaceae	*Mimosa pudica* L.	Karka tabani	Sensitive plant	L	0.03	0.06	Use to treat infertility, piles, dysentery and uro genital disorder
Fabaceae	*Senegalia Senegal (*L.)Britton.	Dakwara	Gum Arabic tree	L	0.02	0.04	Use to treat ulcer, rashes and prolong labour.
Fabaceae	*Piliostigma reticulatum DC.* Hosch	Kalgo		L	0.02	0.04	Use to treats cancer, piles.
Fabaceae	*Erythrina senegalensis* DC.	Munjirya	Coral tree	S	0.02	0.04	Use to treats yellow fever, piles and typhoid.
Fabaceae	*Alysicarpus vaginalis* (L.) DC.	Gadagi	Oneleaf clover	WP	0.02	0.04	Use to treat whitlow, enhance activity.
Fabaceae	*Detarium microcarpum* Guill. Perr.	Taura	Sweet dattock	S	0.02	0.04	Use to treats hemorrhoid, Asthma,wound, tooth ache
Lamiaceae	*Leucas martinicense* (Jacq.). R. Br.	Bunsurun fadama	White wort	WP	0.02	0.04	Headache, spiritual.
Malvaceae	*Hibiscus safdariffa* L.	Yakuwa	Roselle	FR	0.02	0.04	Enhance digestion, use to treat liver problem
Malvaceae	*Sida ovata* Forssk.	Miyar tsanya		L	0.01	0.02	Use for the treatments of Oedema.
Malvaceae	*Adansonia digitata* L.	Kuka	Baobab	L	0.02	0.04	Use to treat hemorrhoid, menstrual cramps, ulcer and heart disease.
Meliaceae	*Khaya senegalensis*	Madaci	Mahogany	SD, S	0.04	0.09	Hypertension, diabetes, dysentery
Meliaceae	*Azadirachta indica*	Dogon yaro	Neem	L	0.20	0.40	Dysentery, malaria, typhoid, stomach pain
Moraceae	*Ficus sycomoras* L.	Bauren hausa	Common cluster fig.	S, L	0.03	0.06	Hemorrhoid, stomach ache, whitlow, yellow fever, asthma.

Family	Scientific name	Local name	Common name	Part used	RFC	UCs	Medicinal uses
Moringaceae	*Moringa oleifera*	Zogale	Horse raddish	L	0.10	0.20	Hypertension, malaria, typhoid and diabetes
Myrtaceae	*Psidium guajava*	Gwaiba	Guava	FR,L	0.05	0.11	Prevent blood sugar from getting high, used during breast feeding.
Myrtaceae	*Vitex doniana*	Dinya	Red-river gum	SD, FR	0.02	0.04	Cold and cough
Myrtaceae	*Syzygium guineense* (Willd.). DC.	Malmo	Bicolar water berry	R	0.02	0.04	Treats erectile dysfunction, heart disease, rheumatism.
Mytrtaceae	*Eucalyptus camaldulensis*	Turare	Red-river gum	SD	0.04	0.09	Antiseptic, cough and cold, witch craft and geans
Onagraceae	*Ludwigia octovalvis (*Jack.*)* P. H. Raven	Shatau	Willow primrose	L	0.01	0.02	Use to treats cough, breast infection.
Poaceae	*Eragrostis tremula* Hosch. ex Steud.	Buburwa	Love grass	WP	0.01	0.02	Use to treats rashes and for spirituals
Rhamnaceae	*Ziziphus abbysinica*	Magarya	Jujube	S,L,SD,R	0.08	0.16	Regulates blood pressure, milk production in women
Rhamnaceae	*Zizipus spina-christi*	Kurna	Christ thorn	SD	0.02	0.04	Catarrh
Rubiaceae	*Catunaregam nilotica* Stapf.	Chibra	Catunaregam	R	0.01	0.03	Anti-snake
Rutaceae	*Citrus sinensis*	Lemu	Orange	FR	0.06	0.13	Prevent high blood pressure, stroke, catalyst, softening of stool.
Solanaceae	*Solanum incanum* L	Gauta		SD	0.05	0.11	Stomach pain.
Zingiberaceae	*Zingiber officinale* Rosc.	Chitta	Ginger	SD	0.05	0.11	Blood sugar, cough, catarrh
Zygophyllaceae	*Balanites aegyptiaca*	Aduwa	Desert date	FR,SD	0.03	0.06	Ant diabetic, stomach ache

Key; RFC= Relative Frequency of Citation, UCs= Use Consensus Value, L= Leaves. S= Stem, R= Roots, SD= Seeds, FR= Fruits, WP= Whole plants

The findings showed that the majority of people in Kaura Namoda Local Government employed 54 plant species, divided into 24 groups, to cure a variety of human diseases. Table 1 included the plant species along with their family names, botanical names, local names, common names, parts utilized, consensus values used, relative frequency of citations, and medicinal applications. With eighteen (18) members, the Fabaceae family is the most numerous of the 24 families that have been used to treat various human maladies. Myrtaceae and Malvaceae, with four (4) and three (3) members, respectively, are the next two most numerous families. There was one (1) member in each of the following families: Solanaceae, Asteraceae, Asclepiadaceae, Zingiberaceae, Curcubitaceae, Convulvolaceae, Amaryllidaceae, Apocynaceae, Ebanaceae, Rutaceae, Moringaceae, Rubiaceae, Zygophylaceae, and Annonaceae. The most commonly used and somewhat frequently cited plant was *Azadirachta indica* with respective Use Concensus Values (UCs) of 0.20 and 0.40. The majority of plants are used to cure stomachaches, diarrhea, anti-snake bites, yellow fever, diabetes, asthma, malaria, typhoid, piles, and certain herbs that increase libido. The percentage of plant components utilized is displayed in Figure 3 below, with leaves accounting for the largest amount at 37%. Seeds (16%), roots (15%), fruit and stem (11%), and the entire plant (10%) are the next most common plant parts.

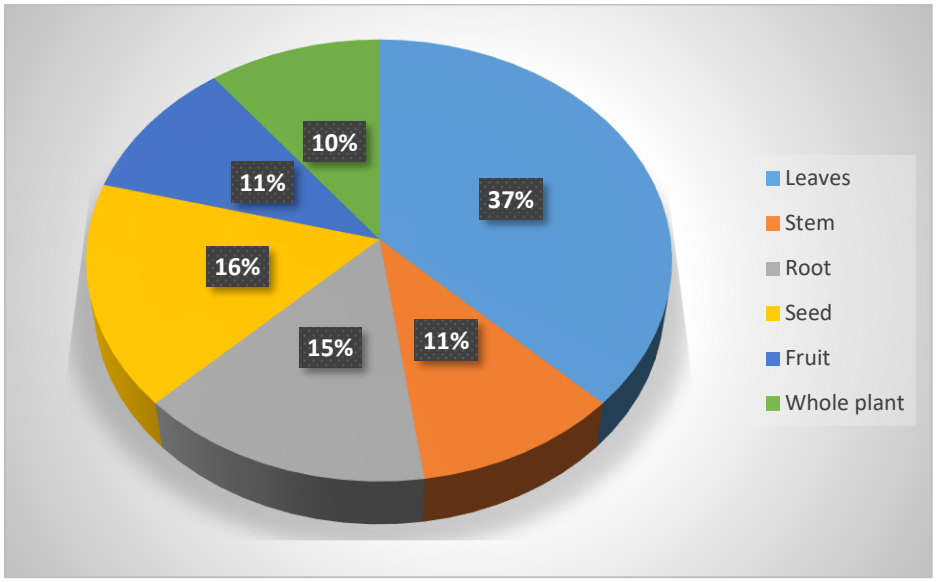

Figure 3: Percentage occurrence of the plant parts used

Discussions

Nigeria is blessed with a wide variety of naturally occurring plant species, including several very valuable medicinal plants such as mosses, ferns, grasses, herbs, epiphytes, vines, grasses, broad-leaved oaks, shrubs, and trees. A variety of human ailments are treated using different plant components. Traditional medicine used for the treatment of human ailments at Kaura Namoda Local Government was studied. The information obtained from the socio-demographic information (Figure 1) was analyzed and clearly shown that most of the respondents were males (73%); this is also consistent with the findings of Togola *et al*. (2005; Kankara *et al*., 2019), who reported that men are in dominant practice of traditional medicine and women seem to have less knowledge than men about traditional medicine. The truth is that men view traditional medicine as a business or as a way to make money. Figure 2 shows that the least number of informants were in the 20–30 age brackets, while 35% of respondents were between the ages of 51 and 60. It is noted that elderly residents of the research region possess a greater degree of traditional knowledge about the usage of plants for medical purposes. This is likely owing to their extended direct interaction with plant resources; also, traditional medicine knowledge is inherited in Hausa communities. This also highlighted the serious risk to indigenous knowledge, as it might eventually disappear with the passing of the elders.

The majority of respondents (80.7%) were married, while the least number (6.8%) were single, according to the data. Sixty-eight percent of the respondents had no formal education, which is in line with findings from Aliyu and Abubakar (2016), Bourhia *et al*., (2019), and Samouah *et al*., (2019). Forty-two percent of those questioned were herbalists. This suggested that since indigenous people depended on plants for subsistence, it would be ideal to get ethnobotanical data from them (Ohnishi and Takeda, 2015).

According to some ethnobotanical research, the majority of the plants that were reportedly utilized locally to treat different illnesses belonged to the Fabaceae family (Kankara *et al*., 2015; Sulaiman *et al*., 2018). According to another study, the Fabaceae family includes the plants that are reportedly used in northeastern Nigeria to treat cancer (Aliyu and Abubakar, 2016). According to the researcher's observations, the fabaceae family's dominance in the study region is linked to their potential for rapid growth, resilience to adverse weather, and ability to sprout, all of which enable them to struggle effectively.

According to the results, traditional healers utilizedleaves the most (37%), which is consistent with other research (Regassa, 2013; Teklay *et al*., 2013; Bekalo *et al*., 2009; Chekole, 2015; Busia, 2016; Augustine and Alex, 2017). Because leaves are the side of plants where photosynthetic activity occurs and because they contain very high quantities of bioactive compounds, leaves are usually employed in ethnomedicine. The fact that a large percentage of leaves are used is significant since, in contrast to the harvesting of roots and bark, the harm to the variety of the plant community is negligible. Different bioactive substances that are produced by plants and referred to as secondary metabolites are not directly related to their growth and development. Because plant leaves are more exposed to adversaries, these substances

according to Olivoto *et al*., (2017), Bartwal *et al*., (2013), and Nigatu et al., (2018), serve a protective role.

CONCLUSION

The current investigation found fifty-four (54) plant species in Kaura Namoda Local Government that are important for the treatment of medical conditions in humans. very much like other parts of Nigeria. The findings of this research showed the breadth of knowledge on traditional medicine possessed by the local traditional healers as well as the significance of traditional herbal medicine in the healthcare system. With few modern healthcare facilities in the Kaura Namoda area and the inhabitants unable to pay for the available modern healthcare services, traditional medicine is the most trustworthy source of healthcare services for the community.

There are a variety of variables that pose a threat to medicinal plants, but the primary hazard to plant species in general and the method of collecting medicinal plants in particular has been identified as human driving forces. In the research region, fire, deforestation, the use of firewood, charcoal, building materials, and agricultural development in connection with population growth are the primary causes of plant species loss. The younger generation's reluctance, contemporary education's impact, secrecy, and oral information transfer are further issues endangering medicinal plants.

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