

Study on Medicinal Forest Plants in Ifo, Ogun State, Nigeria, and Factors Shaping Usage Patterns

Studi tentang Tanaman Obat Hutan di Ifo, Ogun State, Nigeria, dan Faktor yang Membentuk Pola Penggunaan

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ABSTRACT

The utilization of medicinal plants in Nigeria is not solely associated with availability and accessibility but also reflects cultural heritage and local knowledge regarding natural resources. This research addresses the pressing issue of the medicinal utilization of selected forest plants in the Ifo Local Government Area of Ogun State, Nigeria. Commencing with a succinct presentation of the identified problem, the study aims to explore solutions to formulated research questions and test hypotheses at a significance level of 0.05 alpha. Employing a descriptive survey research design, the study involves one hundred respondents randomly selected from Ifo Local Government Area. Five communities, i.e., Alagbole, Lambe, Ibogun, Onihale, and Igbusi, were purposively sampled, with 20 randomly chosen respondents. Data collection utilized a self-structured questionnaire to gather pertinent responses on the variables central to the study. Analysis methods included simple percentages, tables, Pearson Product-Moment Correlation Coefficient (PPMCC), and independent Student's T-test statistic. The research findings highlight, among other insights, the frequent use of forest plant-derived herbs for treating or preventing various health issues in the study area. As a recommendation, the study suggests the need for effective legislation to regulate the harvesting and trade of medicinal plants.

ABSTRAK

Pemanfaatan tanaman obat di Nigeria tidak semata-mata terkait dengan ketersediaan dan aksesibilitas, tetapi juga mencerminkan warisan budaya dan pengetahuan lokal mengenai sumber daya alam. Penelitian ini menangani isu mendesak penggunaan tanaman hutan tertentu dalam pengobatan di Wilayah Pemerintah Lokal Ifo, Ogun State, Nigeria. Dimulai dengan penyajian singkat mengenai permasalahan yang diidentifikasi, penelitian ini bertujuan untuk mengeksplorasi solusi terhadap pertanyaan penelitian yang dirumuskan dan menguji hipotesis pada tingkat signifikansi $\alpha=0.05$. Menggunakan desain penelitian survei deskriptif, penelitian ini melibatkan seratus responden. dipilih secara acak dari Wilayah Pemerintah Lokal Ifo. Lima komunitas, yaitu Alagbole, Lambe, Ibogun, Onihale, dan Igbusi, dipilih secara sengaja, dengan 20 responden dari masing-masing komunitas yang dipilih secara acak. Pengumpulan data menggunakan kuesioner terstruktur yang dirancang untuk mengumpulkan tanggapan yang relevan mengenai variabel yang menjadi pusat studi ini. Metode analisis melibatkan persentase sederhana, tabel, Koefisien Korelasi Pearson Product-Moment (PPMCC), dan statistik uji T independen. Temuan penelitian menyoroti, antara lain, penggunaan yang sering dari tanaman obat di kawasan hutan untuk mengobati atau mencegah berbagai masalah kesehatan di lokasi penelitian. Sebagai rekomendasi, penelitian ini menyarankan perlunya legislasi yang efektif untuk mengatur pemanenan dan perdagangan tanaman obat.

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INTRODUCTION

Plants are a significant medication source and crucial to global health (Howes et al., 2020). It has long been known that medicinal herbs or plants can be a valuable source of therapies or curative help. All around the world, the usage of medicinal herbs has come to dominate the healthcare system (Rahayu et al., 2020). This entails the use of medicinal plants as potential tools for preserving health and conditions as well as for the treatment of diseases (Ssenku et al., 2022). The primary form of healthcare in many nations worldwide is provided via herbal medicine. Nigeria, a country rich in biodiversity and cultural diversity, stands as a noteworthy example where the utilization of medicinal plants intertwines with the cultural heritage and local knowledge of its diverse communities (Akunna et al., 2023).

The traditional use of medicinal plants in Nigeria dates back centuries and is deeply rooted in the indigenous knowledge of different ethnic groups (Adodo & Iwu, 2020). The diversity of ecosystems within the country, ranging from tropical rainforests to savannas, contributes to the abundance of plant species with potential medicinal value. The utilization of these plants is often deeply embedded in cultural practices and traditional healing systems, making them an integral part of the daily lives of many Nigerians. Nigeria is home to a myriad of ethnic groups, each with its own unique cultural practices and traditional medicine systems (Iyiola & Wahab, 2023). The Yoruba people, one of the prominent ethnic groups in Nigeria, have a rich tradition of herbal medicine known as "Ewe Osanyin." This tradition involves using various plant materials to prepare remedies for different health conditions (Oyewole & Israel, 2021). The Hausa and Igbo ethnic groups also have distinct herbal medicine practices, showcasing the diversity of traditional healing knowledge across the country (Nweke & Mbama, 2023; Jidong et al., 2021). The relevance of medicinal plants extends beyond cultural practices; these plants are often considered alternative healthcare sources, especially in rural and economically disadvantaged areas where access to modern medicine may be limited (Nsagha et al., 2020). Furthermore, medicinal plant use aligns with sustainable and traditional agriculture principles, as it relies on the natural environment without compromising its integrity.

Despite medicinal plants' cultural and therapeutic significance, emerging challenges threaten their sustainability and conservation. Rapid urbanization, deforestation, and overharvesting pose significant threats to the availability and biodiversity of these plants (Hazrati et al., 2023; Shafi et al., 2021). Additionally, there is a pressing need to address issues related to the equitable sharing of benefits derived from commercializing traditional knowledge associated with medicinal plants. Notably, while ethnobotanical studies have been conducted in various regions of Nigeria, research specifically focused on the Ifo Local Government Area in Ogun State remains scarce. The Ifo Local Government Area serves as a microcosm for exploring the intricate relationships between medicinal plant utilization, cultural heritage, and local ecological knowledge. This study aims to fill this gap by delving into the pressing issue of the region's medicinal utilization of selected forest plants. By focusing on Ifo, we can gain insights into the specific challenges and opportunities that a distinct local community faces.

MATERIALS & METHODS

Study area

The study was conducted in the Nigerian state of Ogun, Ifo Local Government Area. Ifo Local Government Area in Nigeria's Ogun State. Its headquarters are located at 6049'00" N 31012'00" E in the town of Ifo. It has a 521km² (210 sq mi) area, and the 2006 census found 698,837 people living there. The neighborhood's postal code is 112. The location is 6049'N31012'E. A railway with a length of 77 kilometers (48 miles) that was finished in 1899 connects Ifo to adjacent Lagos. It is connected by roads to Abeokuta, Illaro, Shagamu, Itori, and Ketou as well as Lagos. The Egba language is widely spoken in Ifo. Igbusi, Ilepa, Onihale, Pakoto, Kajola, Seriki, Coker, Ibogun, Matogun, Lambe, Alagbole, Ajuwon, and Akute are also significant nearby towns. These regions collectively make up Ifo division. A sizable industrial region with various factories is located in the Ifo division. Ifo is a fast-growing area of the Ogun metropolis, thanks in part to increased influxes of people from Ifo surrounding towns and villages who are drawn to the town's proximity to Ogun. Ifo is home to branches of numerous well-established Nigerian banks.

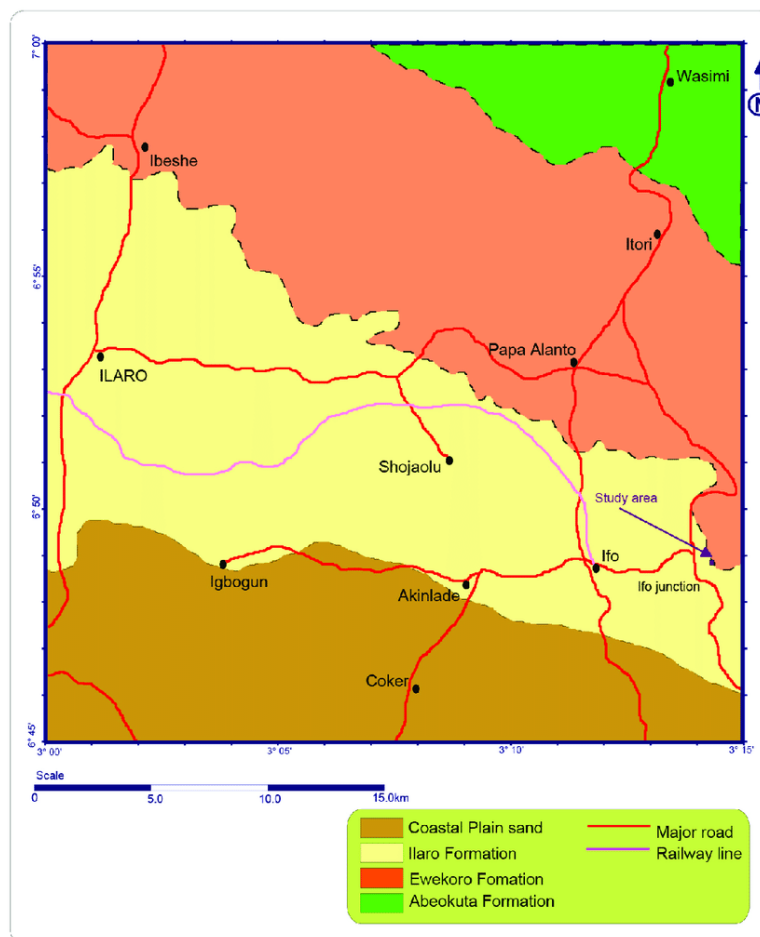


Figure 1. Location of this study
 Source: Google 2022

Population of the study

The population of this study consisted of all traditional healers, medicine traders, civil servants, and farmers who are quite knowledgeable about herbal medicine and the utilization of plant and animal species in traditional medicine in Ifo Local Government Area of Ogun State.

Sample and sampling techniques

The sample size for this study comprised 100 traditional healers, medicine traders, civil servants, and farmers from Ifo Local Government Area of Ogun State. Purposive sampling was used to select five (5) communities, i.e., Alagbole, Lambe, Ibojun, Onihale and Igbusi. 20 respondents were selected from each of the communities. In all, 100 respondents were selected for the study and structured questionnaire was administered to them.

Research Instrument

The research instrument used in this study was questionnaire tagged "Medicinal Utilization of forest of Forest Plant questionnaire (MURFPQ)" which was developed by the researcher through the review of related literature to the study. This questionnaire which comprised 3 sections A - C was designed to obtain relevant information on the variables of interest to the study. Section A was the bio-data of the participants, section B consisted of 11 items, while section C consisted of 11 items.

Validity of the instrument

Face and content validity of the instrument was determined by the research supervisor who vetted, corrected and approved the drafted copy which was affected by the researcher before proceeding to the field work.

Reliability of the instrument

The reliability of the instrument was determined in a pilot study using the Split half method. The instrument was pilot tested on twenty (20) traditional healers, medicine traders, civil servants, and farmers in Ifo Local Government Area of Ogun State which were not part of the Locust Beans operators used for the main study. Their mean scores were grouped into odd and even numbers to facilitate correlation analysis. The two numbers were correlated using Spearman Rank Order and the result got was 0.78. This indicated that the instrument was adjudged to be reliable because of its high coefficient of reliability.

Administrations of the instrument

The researcher used direct delivery technique in the administration of the instrument. The researcher administered the instrument on the respondents through the employment of research assistant who are trained in advance of the exercise. The researcher also interpreted the content of the questionnaire to non-educated members of the respondents. This made the respondents to fill them appropriately. The exercise resulted in 100% return rate.

Data analysis

Data collected from the field were sorted and analyzed using Pearson Product Moment Coefficient of Correlation (inferential) statistics for testing the research hypotheses formulated at 0.05 level of significance (which implies that if the study is replicated 100 times, the same outcome will occur 95 out of 100, and ≤ 5 out of 100 may vary due to chance).

RESULTS & DISCUSSION

Table 1 showed socio-economic characteristics of the rural households. In terms of sex distribution, majority of the actors 76% were female while 24% were male. This implies that forest and herbs seller's business was predominantly conducted by females.

Table 1. Socio-economic characteristics of respondents

Variables	Frequency	Percentage (%)	Maximum Value
SEX			
Male	24	24	
Female	76	76	Female
Total	100	100	
AGE			
18 – 24 Years	15	15	
25 – 31 Years	30	30	
32 - 38 Years	25	25	
39-45 Years	12	12	25 – 31 Years
46-52 Years	10	10	
Above 52 Years	8	8	
Total	100	100	
MARITAL STATUS			
Single	17	17	
Married	57	57	
Divorced	12	12	Married
Widow(er)	10	10	
Separated	4	4	
Total	100	100	
EDUCATIONAL STATUS			
Primary education	39	39	Primary education

Variables	Frequency	Percentage (%)	Maximum Value
Secondary education	21	21	
Tertiary education	10	10	
None educated	30	30	
Total	100	100	
MAJOR OCCUPATION			
Farming	62	62	
Trading	11	11	
Civil Servant	7	7	Farming
Artisan	15	15	
Others	5	5	
Total	100	100	
Aims of establishing the business			
Profit maximization	30	30	
Provision of family needs	15	15	
Hobby	7	7	Employment
Employment	43	43	
Others	5	5	
Total	100	100	
Experience in forest and herbal business			
1-5 years	18	18	
6-15 years	22	22	16-25 years
16-25 years	44	44	
Above 25 years	16	16	
Total	100	100	
Methods of preparation of the herbs by respondents			
Decoction (boiling)	15	15	
Infusion (soaking)	25	25	Grinding, mixing
Grinding, mixing and/or taking directly with soft drink or meal	55	55	and/or taking directly with soft drink or meal
Bathing with herb-soaked water	5	5	
Total	100	100	
Income Realized per month			
Less than ₹10,000	15	15	
₹10,000 - ₹20,000	65	65	₹10,000 - ₹20,000
Above ₹20,000	20	20	
Total	100	100	
Sources of Finance			
Self-finance	67	67	
Supports from family and friends	33	33	Self-finance
Support from government	0	0	
Total	100	100	

Table 2. Medicinal forest plant used for treating various diseases in the study area

No	Plant forest Botanical name	Common name	Local name	Ailments	Use method
1	<i>Alternanthera nodiflora</i>	Joyweeds or Joseph's coat	Dagunro (Yoruba)	Pains	Ground and mixed with native (black) soap and use to bath every day.
2	<i>Kalanchoe genata</i>	Miracle plant, Hand-life plant	Odundun (Yoruba), onwa (Ibo)	Concussion	Cooked with water and taken 2 times a day.
3	<i>Cassia alata</i>	Candle bush, acapulo	Asunwon (Yoruba), ogala (Ibo)	Constipation	Ground and squeeze its water and then drink twice a day.
4	<i>Pupalia lappacea</i>		Emo-agbo (Yoruba), ose (Ibo), marin-kusu (Hausa)	sterility or infertility in women	Ground and mixed with native (black) soap and use to wash the private part every day.
5	<i>Nicotiana tabacum</i>	Tobacco	Ewe taba (Yoruba), an were (Ibo), taba (Hausa)	Convulsion	Ground, mixed with small water and drink.
6	<i>Carica papaya</i>	Pawpaw	Ibepe (Yoruba), ojo (Ibo), gwanda (Hausa)	constipation, catarrh, abortion and cough	Cooked with 10 litres water and taken 3 times a day.
7	<i>Byrsocarpus coccineus</i>	Schellent		sore throat and tooth-ache	Ground, extract the oil and apply on the affected areas.
8	<i>Phyllanthus amarus</i>	stone breaker	Eyin-olobe	Hypertensive, liver diseases	Cooked with water and taken 2 times a day.
9	<i>Euphrasia officinalis</i>	Eyebright	Ewe oju	Eye diseases, runny nose	Ground, extract the oil and apply on the affected areas.
10	<i>Uncaria tomentosa</i>	Cat's Claw	Eekanna Ekun	Asthma, intestinal problem	Cooked with water and taken 3 times a day.
11	<i>Ageratum conyzoides</i>	Goat weed	Imi-esu	Gonorrhoea, wound healing	Ground, extract the oil and apply on the wound. Boil with water and drink 3 times a day.

Age distribution of the respondents showed that majority 30% of the respondents were between 25 – 31 years of age, 25% were within the age range of 32 - 38 years of age, 15% were within the age range of 18 – 24 years of age, 12% were within the age range of 39-45 years of age. Those that were within the age range of 46-52 years and above 52 years accounted for 10% and 8% respectively. On the whole, 70% of actors fall into the economically active age group of 18–48 years showing that the majority of forest and herbs sellers business actors are in the physically active age group. About 57% of the respondents were married, 17%, 12%, 10% and 4% were single, divorced, widow(er) and separated respectively. This assured that married households have a significant influence on forest and herbs seller's business activities as compared

to other participants. The study showed that majority 39% of the respondents had primary education; 30% had no formal school education, 21% had secondary school education while 10% had tertiary education. This situation of illiteracy had serious consequences on the level of participants in the study area.

Majority 62% of the respondents engaged solely on forest and herbs sellers' business, 15% were artisans who engaged in forest and herbs sellers' business to supplement their incomes, 11% were traders who engaged in forest and herbs sellers' business to supplement their incomes, 7% were civil servants who engaged in forest and herbs sellers' business to supplement their salary while 5% who belong to other occupations also engaged in forest and herbs sellers' business. About 43% of the respondents engaged in forest and herbs seller's business as a source of employment, 30% engaged in it to maximize their profits, 15% engaged in it to provide for family needs, 7% engaged in it as their hobby while 5% chose to engage in forest and herbs sellers' business for other reasons known to them.

Experience distribution of the respondents showed that majority 44% of the respondents were between 16-25 experience bracket, 22% accounted for between 6-15 years of experience bracket. Those that were within the experience bracket of 1-5 years and above 25 years of experience accounted for 18% and 16% respectively. On the whole, 66% of actors fall into the experience brackets of 6–25 years showing that the majority of forest and herbs sellers business actors were experienced marketers. Majority of the respondents (55%) prepared their herbs by grinding, mixing and/or taking directly with soft drink or meal, 25% prepared theirs by infusion, 15% prepared theirs by decoction while 5% prepared their herbs by bathing with herb-soaked water.

Monthly income from income distribution showed that majority 65% of the respondents earned incomes between #10,000-20,000, 20% of the forest and herbs sellers' actors earned above ₦20,000 weekly while 15% of the respondents earned less than #10,000 per week. On the whole 85% of the actors in the study area earned incomes between #10,000 and above weekly. Majority (67%) of the respondents sourced their finance through self-efforts, 33% sourced theirs through supports from family and friends while none of the respondents got finance through government support. Experience distribution of the respondents showed that majority 44% of the respondents were between 16-25 experience bracket, 22% accounted for between 6-15 years of experience bracket. Those that were within the experience bracket of 1-5 years and above 25 years of experience accounted for 18% and 16% respectively. On the whole, 66% of actors fall into the experience brackets of 6–25 years showing that the majority of forest and herbs sellers business actors were experienced marketers. Majority of the respondents (55%) prepared their herbs by grinding, mixing and/or taking directly with soft drink or meal, 25% prepared theirs by infusion, 15% prepared theirs by decoction while 5% prepared their herbs by bathing with herb-soaked water.

Table 2 presents the various species of plant utilized for herbal treatment by the respondents, and household's method of preparing the herb for use in the study area. The most common method of preparation is the extraction of the phytochemicals by grinding and mixture. grinding and mixture is simple and can easily be carried out by most households irrespective of their profession or educational background. Besides, the plants can easily be sourced at little or no cost. The respondents use forest of a wide range of plants from about eleven families for medicinal purpose (Table 2). The family of *Ageratum conyzoides* is more frequently utilized due to its diversity and relative abundance in the study area. The study revealed that a total of eleven families of forest plant were identified with the ability to control and cure various ailments.

Testing of hypotheses

Testing of hypotheses only deals with probability of something being accepted or rejected and when the hypothesis tested is supported with sufficient evidence we reject the null hypothesis (H₀) and accept the alternative hypothesis (H₁) but if otherwise we uphold the null hypothesis (H₀) and reject the alternative hypothesis (H₁). It is interested in making an inference or decision about how the value of a parameter relates to a specific numerical value. That is, is it less than, equal

to or greater than the specific number? It helps the researchers to make predictions and not to establish causation as it does not provide absolute proof.

Table 3. Families of forest plant utilized for various treatments in the study area

No	Plant forest Botanical name	Common name	Local name	Frequency
1	<i>Alternantheranodiflora</i>	Joyweeds or Joseph's coat	Dagunro (Yoruba)	2
2	<i>Kalanchoegenata</i>	Miracle plant, Hand-life plant	Odundun (Yoruba), onwa (Ibo)	3
3	<i>Cassia alataor</i>	Candle bush, acapulo	Asunwon (Yoruba), ogala (Ibo)	2
4	<i>Pupalialappacea</i>		Emo-agbo (Yoruba), ose (Ibo), marin-kusu (Hausa)	1
5	<i>Nicotiana tabacum</i>	Tobacco	Ewe taba (Yoruba), and were (Ibo), taba (Hausa)	2
6	<i>Carica papaya</i>	Pawpaw	Ibepe (Yoruba), ojo (Ibo), gwanda (Hausa)	4
7	<i>Byrsocarpuscoccineus</i>	Schellent		2
8	<i>Phyllantusamarusschum</i>	stone breaker	Eyin-olobe	1
9	<i>Euphrasia officinalis</i>	Eyebright	Ewe oju	2
10	<i>Uncariatomentosa</i>	Cat's Claw	EekannaEkun	1
11	<i>Ageratum conyzoides</i>	Goat weed	Imi-esu	80
Total				100

Hypothesis One

H0: There is no significant relationship between respondents' sex and uses of herbs in the study area

H1: There is significant relationship between respondents' sex and uses of herbs in the study area

Table 4. Summary of PPMCC statistics on sex variable and uses of herbs

Variables	PPMCC(r)	T-cal	T-crit	Sig	Decision
Sex variable (x)	0.853	3.216	1.96	0.001	Reject Ho
Uses of herbs (y)					

$\alpha = 0.05$

$P > 0.05$ (insignificant) where sig in column 5 = observed level of significance or p-value

The asterisk indicates that there is significant relationship between respondents' sex and uses of herbs in the study area.

Decision rule: If the test computed or calculated value (absolute value of t-cal) is higher than the tabulated or critical value (critical value of t-crit), reject H0 and accepted alternative hypothesis H1.

The Table 4 shows that the calculated value is 3.216 while the tabulated or critical value is 1.96. Since the calculated value 3.216 is higher than the tabulated value 1.96, therefore, the null hypothesis (H0) that there is no significant relationship between respondents' sex and uses of herbs in the study area is rejected while the alternative hypothesis that there is significant relationship between respondents' sex and uses of herbs in the study area is accepted. This indicates that there is significant relationship between respondents' sex and uses of herbs in the study area. This hypothesis showed that there is significant relationship between respondents' sex and uses of herbs in the study area. The result showed that T-Test statistic computed was 3.216 (significant 0.001) at 0.05 level of significant, this indicated that there is significant

relationship between respondents' sex and uses of herbs in the study area ($T=3.216, p<0.05$). This finding was contrasted by Faleyimu et al. (2011) who reported that Chi square test of relationship showed no significant relationship between sex of households and uses of the herbs. There is no gender biasness in their finding.

Hypothesis two

H0: There is no significant relationship between respondents' educational level and uses of the herbs

H1: There is significant relationship between respondents' educational level and uses of the herbs

Table 5. Summary of PPMCC statistics on educational variable and uses of herbs

Variables	PPMCC(r)	T-cal	T-crit	Sig	Decision
Education variable (x)	0.754	4.856	1.96	0.001	Reject Ho
Uses of herbs (y)					

$P > 0.05$ (insignificant) where sig in column 5 = observed level of significance or p-value

The asterisk indicated that there is significant relationship between respondents' education and uses of herbs in the study area.

Decision rule: If the test computed or calculated value (absolute value of t-cal) is higher than the tabulated or critical value (critical value of t-crit), reject H0 and accepted alternative hypothesis.

The Table 5 shows that the calculated value is 4.856 while the tabulated or critical value is 1.96. Since the calculated value 4.856 is higher than the tabulated value 1.96, therefore, the null hypothesis (H0) that there is no significant relationship between respondents' education and uses of herbs in the study area is rejected while the alternative hypothesis that there is significant relationship between respondents' education and uses of herbs in the study area is accepted. This indicates that there is significant relationship between respondents' education and uses of herbs in the study area. According to hypothesis two, there is a strong correlation between respondents' educational levels and the use of herbs in the study area. The outcome revealed that the computed T-test's absolute value was 4.856 (significant 0.001) at the 0.05 alpha level, indicating a significant link between respondents' educational levels and the research area's use of herbs ($T=4.856$ at $p0.05$). The results were at odds with those of Faleyimu et al. (2011), who came to the conclusion that the Chi square test of connection did not demonstrate a significant relationship between educational attainment and herb usage. Additionally, it suggests that both educated and uneducated individuals are aware of the success of herbal remedies in the research region. The use of herbs and educational level do not significantly correlate. This suggests that although there are differences in how herbs are used based on educational background, the differences are not scientifically significant.

CONCLUSIONS

The following conclusions were made from the study: that there are many medicinal plant forests in the study area that are used for treating various diseases, that there is a significant relationship between respondents' sex and uses of herbs in the study area, and that there is a significant relationship between respondents' education and uses of herbs in the study area. Herbs from plant forests are frequently used to treat or prevent a variety of health problems in the study area. Finally, the results of this investigation should now be taken into consideration. First of all, the fact that participants were only chosen from one Local Government reduced the external validity. This indicates that just Ifo Local Government Area in Ogun State is affected by the outcome. The results' generalizability must be determined by further study, which will use practitioners of plants and trees from various Local Government Areas of the Federation as samples.

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