Original Research Article

Use of Herbal Medicine Among Adult Residents in Calabar Metropolis, Cross River State, Nigeria

Abstract

Aim: This study was aimed at determining the use of herbal medicine among adult residents in Calabar metropolis, Cross River State, Nigeria.

Study design: Cross-sectional descriptive study design

Place and duration of study: Calabar metropolis, Cross River State Nigeria between June 2016 to August 2016

Methodology: A 20-itemed, semi-structured questionnaire was used to generate data from 208 respondents which were drawn using multi-stage random sampling technique. Data generated were analyzed using Statistical Package for Social Sciences (SPSS version 22.0) and results were presented in tables and charts. Pearson product moment correlation coefficient was used to test the four hypotheses at 0.05 level of significance.

Results: The results obtained in this study showed that out of 200 respondents, 128 (64.0%) reported to have used herbal medicine/herbs in the past 12 months, 102 (51%) six months, 86 (43%) three months and 75 (37.5%) one month preceding the time of survey. While 78 (35.5%) respondents reported that the herbal medicine/herbs used was self-made, 55 (25%) herbal vendors and 30 (13.6%) parents constituted major sources of herbal medicine for respondents. Respondents highlighted that 44 (20.1%) treatment of diseases, 39 (17.8%) food supplements, 31 (14.1%) laxative and 24 (11.0%) skin care were their reasons for the use of herbal medicine. Reasons for preference to herbal medicine than other types of medications as indicated by the respondents were predominantly because herbs are 68 (37.8%) very affordable, 50 (27.8%) very effective and 38 (21.1%) readily available. Out of 161 respondents who reported to have used herbs/herbal medicine, only 24 (12%) reported to have experienced side effects of which 9 (37.5%) dizziness, 6 (25%) watery stool, 4 (16.7%) abdominal pain and 3 (12.5%) vomiting were the most highlighted.

Conclusion: A pharmaceutical regulatory body should be instituted to monitor the activities of herbal practitioners and ensure that herbal medicine products are standardized, quantified and safe for consumption.

Keywords: Herbs, Herbal medicine, Adult residents, Calabar metropolis

1. INTRODUCTION

Even with the encroachment and establishment of pharmaceutical companies who are engaged in the constant production of orthodox medicine, the belief in the healing power of herbal medicine is still upheld in most countries, continents and societies. To substantiate this argument, ever since the outbreak of malaria (also called *Plasmodiasis*) which has been responsible for high disease morbidity and mortality of individuals across all age and sex groups, several chemoprophylaxis have emerged but none have successfully eradicated malaria or completely suppress its emergence. People are still susceptibility to malaria and the orthodox medicine is seen not to have the sufficient power to suppress, eliminate or eradicate the disease. Herbal medicine on the other hand is believed to provide a long-lasting healing power to malaria before the individual suffers the next episode. Belonwu [1] observed in his study that 30.2% of respondents affirmed that traditional medicine cures malaria faster and 15.6% confirmed that it takes longer duration before the reoccurrence of another episode of malaria. This argument obviously creates the platform for herbal medicine to contest favourably with the conventional medicine.

In Nigeria, the use of herbal medicine has been the dominant method of health care system in all cultural and traditional societies. Even in most urban and rural settings today, there is still high patronage of herbal medicine. Most people utilize herbal medicine essentially for therapeutic purpose with the ultimate goal of treatment of diseases or disorders as well as restoring health to normalcy. Hence, the human health becomes the central point of high use of herbal medicine. Calabar metropolis, one of the major cities in Nigeria is inhabited mainly by civil servant, business tycoons and students. Even though a larger proportion of these residents utilize the formal health care system, the use of herbal medicine is ubiquitous and widely practiced. Unfortunately, due to increase in population, rapid urbanization and industrialization, the plants and materials where most of these herbal

medicines are derived from have been annihilated. As a result, people travel to rural areas where the forest and plants are still conserved to obtain these herbs. It has also been documented that despite the technological advancement and sophistication in medical care especially in urban settings, the subscription to herbal medicine is still very high. Increase in out-of-pocket expenditure on health care services further propels people's reliance on herbal treatment. A study carried out by Duru, et al [2] found out that 77.5% of respondents use traditional medicine while 63.7% combine orthodox and traditional medicine to get cure. Belonwu [1] also confirmed that 54.7% subscribe to traditional medicine to treat malaria. These days, people now combine both the conventional and traditional methods of treatment to stay healthy [2, 3]. Hence, the importance of herbal medication in maintenance, restoration and preservation of health cannot be overemphasized. The dynamics of studying the trend in the use of herbal medicine would guide policy makers, scholars, researches, pharmaceutical companies, governmental and non-governmental organizations to establish a framework that would incorporate herbal medicine into the national health care system in order to fervently meet the health needs of the populace.

1.1 Objectives of the study

The general objective of this study was to determine the trend in the use of herbal medicine among adult residents in Calabar metropolis, Cross River State, Nigeria.

The specific objectives were to;

1. identify the type of herbal medicine used by adult residents in Calabar metropolis;
2. determine the trend in the use of herbal medicine ;
3. determine the purpose for which adults use herbal medicine;
4. determine the reasons for preference to herbal medicine than other types of medication and
5. determine the proportion of herbal medicine users who have experienced side effects.

1.2 Research questions

1. What are the types of herbal medicine used by adult residents in Calabar metropolis?
2. What is the trend in the use of herbal medicine among adult residents in Calabar metropolis?
3. For what purpose do people use herbal medicine?
4. Why do people prefer herbal medicine to other types of medication?
5. What is the proportion of herbal medicine users who have experienced side effects?

1.3 Research hypotheses

Ho_1: There is no significant relationship between age of respondents and herbal medicine use in Calabar metropolis

Ho_2: There is no significant relationship between sex of respondents and herbal medicine use

Ho_3: There is no significant relationship between educational status of respondents and herbal medicine use

Ho_4: There is no significant relationship between income level of respondents and herbal medicine use

2 LITERATURE REVIEW

Traditional herbal medicines are naturally occurring plant-derived substances with minimal or no industrial processing that have been used to treat illness within local or regional healing practices. Traditional herbal medicines are receiving significant attention in global health debates. In most African countries, the re-emergence and endemicity of some health problems has elevated the use of herbal medicine but the standardization and quantification of these herbal products becomes the bone of contention [4]. Evidence-based studies have shown a high uptake in the use of herbal medicine. A recent cross-sectional study carried out in Imo State, Nigeria reported that 77.5% use traditional medicine while 63.7% combine both traditional medicine and orthodox medicine [2]. Duru et al [3]

confirmed that 36.8% of pregnant women use herbal medicine. Abodunrin, et al [5] in their study observed that 67.7% use alternative medicine while 44.8% use traditional medicine. Belonwu [1] reported that 54.7% of respondents subscribe to the use of herbal medicine in the treatment of malaria. Empirical studies have also indicated that these herbal medicine are basically plant-derivatives such as leaves, bark of trees, roots, seeds, fruits, steam, flower, bulb, juice/sap, tuber, rhizome and latex of pants most of which are obtained in forested environment. During preparation, these parts of plants are grinded, pounded, boiled so as to extract the juice and it is usually administered either orally, topically, via incision or through enema [6]. Okoli et al [7] also confirmed that herbal medicines were primarily administered orally and topically. However, the manner and way these herbal medicine are prepared are usually kept secret and is only known by the herbalists themselves and their apprentices. The practice of herbalism are predominantly showcased by herbalist, diviners, spiritualists, native doctors, witch doctors, local healers and herbal medical practitioners. Most studies have shown that the types of herbal medicine used are numerous. It has been documented that one herbal concoction can be used to cure many health conditions [2, 3, 6, 7, 8]. The affordability, availability and efficacy of most herbal concoction proliferates the level of their patronage. The safety of the herbs obtained in its natural form also propels its usage. Nevertheless, aside from the magnificent benefits of herbal medicine especially to rural dwellers and those individual who cannot afford formal health care services, scholars and researchers have been worried about the safety of these herbal medicine. In some cases, the inappropriate use of theses herbal medicine may bring about attendant adverse consequences on the users. Duru et al [3] in their study observed that vomiting, nausea, abdominal pain and dizziness were the side effect experienced by pregnant women who used herbal medicine. It is therefore highly imperative that herbal products be scrutinized and assessed to ascertain its safety, efficacy and appropriate doses before it is marketed to consumers.

2.1 Theoretical Framework

The theory adopted for this study is the Young choice-making model proposed in 1981 which is based on his ethnographic studies of health services utilization in Mexico. This model incorporates four components that are most essential to the individual's health service choice: 1) perceptions of gravity. This category includes both the individual's perception and their social network's consideration of illness severity. Gravity is based on the assumption that the culture classifies illnesses by level of severity; 2) the knowledge of a home treatment. If a person knows of a home remedy that is efficacious, they will be likely to utilize that treatment before utilizing a professional health care system. Home remedy knowledge is based on lay referral; 3) the faith in remedy. This component incorporates the individual's belief of efficacy of treatment for the present illness. An individual will not utilize the treatment if they do not believe the treatment is

effective; 4) the accessibility of treatment. Accessibility incorporates the individuals' evaluation

of the cost of health services and the availability of those services. According to Young, access may be the most important influence on health care utilization (Wolinsky, 1988b).The summation of this model holds that an individual understands the gravity of illness and subscribe to the use of herbal medicine as the first choice of treatment before utilizing the formal health care. His believe in the efficacy and safety of the home remedy play a substantial role in his/her quick recovery from illness.

3 METHODOLOGY

3.1 Study area

The study area is Calabar metropolis. It is situated in the southern part of Nigeria. Calabar metropolis is made up of two Local Government Areas, Calabar Municipality and Calabar South Local Government Area with an estimated population of 196,630 for Calabar South and 176,218 for Calabar Municipality [9]. Calabar Municipal council has 10 political

wards while Calabar South has 12 political wards making a total of 22 political wards. The Calabar Municipality has a land mass of 141,33 square kilometer while the South which lies in the coastal area empty into the Atlantic ocean and located between latitude 4055 and 8030 East of the Green Meridian, it has a land mass of 181,42. The metropolis is bounded by Calabar River to the west, Akpabuyo Local Government Area to the east, Odukpani Local Government Area to the North and Atlantic Ocean to the South. It is a cosmopolitan city which embraces all ethnic groups in Nigeria. The three dominant ethnic groups are the Efiks, Quas and the Efuts which share common culture and religion. English and Efik are the languages widely spoken. The metropolis is predominantly a Christian city with few Muslims and traditional religious groups and mainly occupied by civil servants, businessmen and traders. It also has industries and establishments such as airport, export processing zone, Naval and Army base, Tinapa, NNPC depot, cement factory etc.

3.2 Study design and study population

A cross-sectional descriptive study design was adopted and the study population comprised adult male and female residents (18 years and above) in Calabar metropolis, Cross River State, Nigeria. This study was carried out within a period of three months from June 2016 to August 2016.

3.3 Sample size and sampling procedure

Yaro Yamane [10] formula was used to determine the sample size thus:

Where:

n = the sample size

N = the population size

e = the acceptable sample error (0.07).

According to the 2006 population census, the population of Calabar metropolis, (which is a combination of Calabar South and Calabar Municipal local government areas) was set at 372,848 inhabitants approximately. Therefore,

N = 372,848

e = 0.07

Hence,

Sample = n = $372848/1+372848(0.07)^2$ = 208.04 = 208 respondents approximately.

Multi-stage random sampling technique adopted from a study conducted by Osuchukwu, et al [11] was employed in the selection of wards, streets, household and respondents and the procedure is described as follows:

Stage 1: Selection of Local Government Area: Since Calabar metropolis constitutes two Local Government Areas; Calabar South and Calabar municipality, each of the Local Government Areas were divided into clusters giving a total of two clusters.

Stage 2: Selection of wards

In each cluster, simple random sampling technique would be used to select two wards using the lottery method. This gave a total of four wards (i.e. 2 wards from Calabar South + 2 wards from Calabar municipal = 4 wards).

Stage 3: Selection of streets

In each selected ward, simple random sampling technique was employed to select four streets using the lottery method. This gave a total of 24 streets (i.e. 4 wards x 4 streets = 16 streets)

Stage 4: Selection of households

In each selected street, systematic sampling technique was employed to select 13 households that have an adult that is 18 years and above who was willing to partake in the study. To get the sampling interval, the total number of households in the street was divided by the desired number of households to be sampled. The outcome became the sampling interval. The sampling interval used ranges from 2 for shorter streets to 4 for longer streets. This means that the sampling interval was not the same for all streets sampled. This procedure continued until 13 households were duly selected from 16 streets (i.e. 13 households x 16 streets = 208 elderly persons).

Stage 5: Selection of respondents: In each household, one adult was enrolled in the study. This procedure continued until 208 adults were recruited to participate in the study. In households where there were more than one adult, the lottery method was used to select one adult. Also, in household where there was no adult present as at the time of survey, the next household was sampled in replacement.

3.4 Instrument for data collection

A structured questionnaire was designed to generate quantitative data from the respondents. The questionnaire was administered to respondents that gave their consent to participate in the study. The questionnaire was used to elicit information based on their socio-demographic characteristics, types of herbal medicine use, trend in the use of herbal medicine, sources of herbal medicine, reasons for using herbal medicine and side effect experienced by herbal medicine users.

3.5 Method of data analysis and presentation

Data entry and analysis were done using the Statistical Package for Social Sciences Software (SPSS 22.0 version, 2014) while charts were designed using Microsoft Excel 2010.

Results were expressed in simple frequencies, percentages and presented in tables and charts. Pearson product moment correlation coefficient was used to test for relationship between categorical variables at 0.05 level of significance. Verbal informed consent was duly sought and obtained from the respondents that took part in the study. Participation in this study was strictly voluntary and confidentiality of information provided was maintained.

4 RESULTS

4.1 Socio-demographic characteristics of the respondents

Out of 208 questionnaires that were administered to the respondents, 200 questionnaires were retrieved for analysis representing a response rate of 96%. The results obtained in this study showed that most respondents 5 (37.5%) were within the age bracket of 28-37 years followed by 44 (22.0%) who were within 38-47 years of age. A greater proportion of the respondents 118 (59.0%) were males while the remaining 82 (41.0%) respondents were females. Most respondents were 100 (50%) single, 183 (91.5%) Christians and 96 (48%) had attained tertiary level of education. In terms of occupation, respondents were predominantly 72 (36%) civil/public servant, 48 (24%) trader/business and 33 (16.5%) students. A reasonable proportion of the respondents 81 (40.5%) were low income earners (Less than N20,000) while 83 (40.5%) respondents reported a household size of 4-6 persons (Table 1).

TABLE 1: Socio-demographic characteristics of the respondents

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Age (in years)		
18-27	36	18.0
28-37	75	37.5
38-47	44	22.0
48-57	24	12.0
58 & above	21	10.5
Total	**200**	**100**
Sex		
Male	118	59.0
Female	82	41.0
Total	**200**	**100**
Marital status		
Married	73	36.5
Single	100	50.0
Divorced	5	2.5
Widow/widower	8	4.0

Co-habiting	14	7.0
Total	**200**	**100**
Religion		
Christianity	183	91.5
Muslim/Islam	12	6.0
Traditional religion	5	2.5
Total	**200**	**100**
Education		
No formal education	13	6.5
Primary	36	18.0
Secondary	55	27.5
Tertiary	96	48.0
Total	**200**	**100**
Occupation		
Trader/business	48	24.0
Civil/public servant	72	36.0
Housewife/unemployed	23	11.5
Artisan	24	12.0
Student	33	16.5
Total	**200**	**100**
Monthly income		
<N20,000	81	40.5
N20,000-N50,000	75	37.5
Above N50,000	44	22.0
Total	**200**	**100**
Household size		
1-3	70	35.0
4-6	83	41.5
7-9	32	16.0
10 & above	15	7.5
Total	**200**	**100**

Source: Field work, 2016

4.2 Types of herbal medicine used by the respondents

Majority of the respondents 161 (80.5%) admitted that they have used herbal medicine before at least once in their lifetime. Types of herbal medicine/herbs used by the respondents were majorly 48 (14.5%) Bitter kola, 40 (12.1%) Dogoyaro, 45 (13.6%) shea butter, 24 (7.2%) pumpkin leaves, 22 (6.6%) Aloe vera and 21 (6.3%) Garlic (Table 2).

TABLE 2: Types of herbal medicine used by the respondents

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Ever used any herbal medicine before		
Yes	161	80.5
No	39	19.5
Total	**200**	**100**
Types of herbal medicine used*		
Bitter leaf/iron weed plant	16	4.8
Palm kernel oil	8	2.4
Bitter kola	48	14.5

Dogoyaro	40	12.1
Garlic	21	6.3
Utazi	17	5.1
Ginger	13	3.9
Aloe vera	22	6.6
Lime juice	12	3.6
Moringa (drum stick tree)	9	2.7
Bitter lemon	10	3.0
Pumpkin leaves	24	7.2
Shea butter	45	13.6
Pepper/species	6	1.8
Calabash chalk	4	1.2
Eradyplus	4	1.2
Gello cleanser	2	0.6
Yoyo bitter	6	1.8
Dr Iguedo	2	0.6
Godo ginger cleanser	3	0.9
Paw-paw leaves	8	2.4
Lemon grass	11	3.3
Total	**331**	**100**

*Multiple responses Source: Field work, 2016

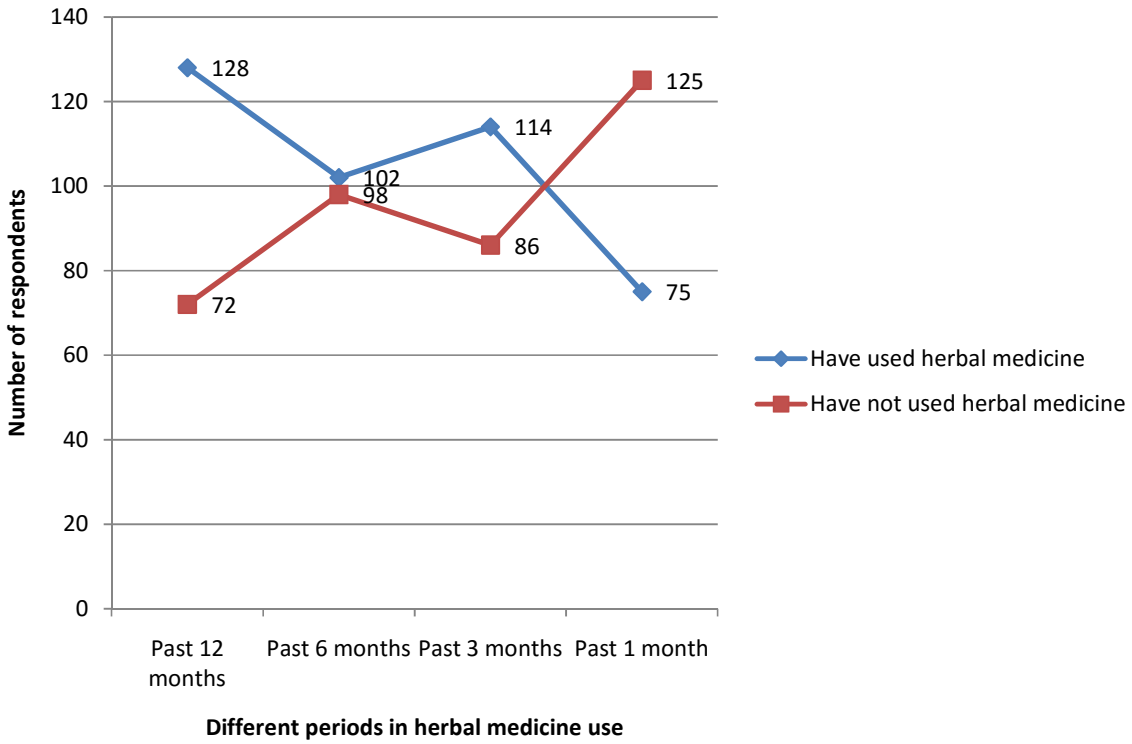
4.3 Use and sources of herbal medicine among respondents

From the graph as shown in figure 1, it is observed that out of 200 respondents, 128 (64.0%) reported to have used herbal medicine/herbs in the past 12 months, 102 (51%) six months, 86 (43%) three months and 75 (37.5%) one month preceding the time of survey (Figure 1). While one-third of the respondents 78 (35.5%) reported that the herbal medicine/herbs used was self-made, 55 (25%) herbal vendors, 30 (13.6%) parents and 20 (9%) friends constituted major sources of herbal medicine for respondents (Table 3).

TABLE 3: Sources of herbal medicine among respondents

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Sources of herbal medicine*		
Herbalist	18	8.2
Self-made	78	35.5
Traditional birth attendants	14	6.4
Parents	30	13.6
Friend	20	9.0
Local healer	5	2.3
Herbal vendors	55	25.0
Total	**220**	**100**

*Multiple responses Source: Field work, 2016



Source: Field work, 2016

FIG 1: Trend in the use of herbal medicine among respondents

4.4 Purpose for use of herbal medicine among respondents

Most respondents highlighted that 44 (20.1%) treatment of diseases, 39 (17.8%) food supplement, 31 (14.1%) laxative, 24 (11.0%) skin care and 18 (8.2%) blood enrichment were the reasons for the use of herbal medicine (Table 4).

TABLE 4: Purpose for use of herbal medicine among respondents

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Reasons for use of herbal medicine*		
Ritual/traditional cleansing	9	4.1
Treatment of diseases	44	20.1
Food supplement	39	17.8
Protection	11	5.0
Sexual enhancement	16	7.3
Skin care	24	11.0
Blood enrichment	18	8.2
Weight loss	15	6.8

Fertility/reproduction	12	5.5
Laxative	31	14.1
Total	**219**	**100**

*Multiple responses Source: Field work, 2016

4.5 Type of diseases treated using herbal medicine

Diseases treated with herbal medicine as highlighted by the respondents were predominantly 40 (28.8%) malaria, 25 (18%) skin infection, 22 (15.8%) typhoid, 16 (11.5%) joint/muscle pains and 11 (7.9%) diabetes mellitus (Table 5).

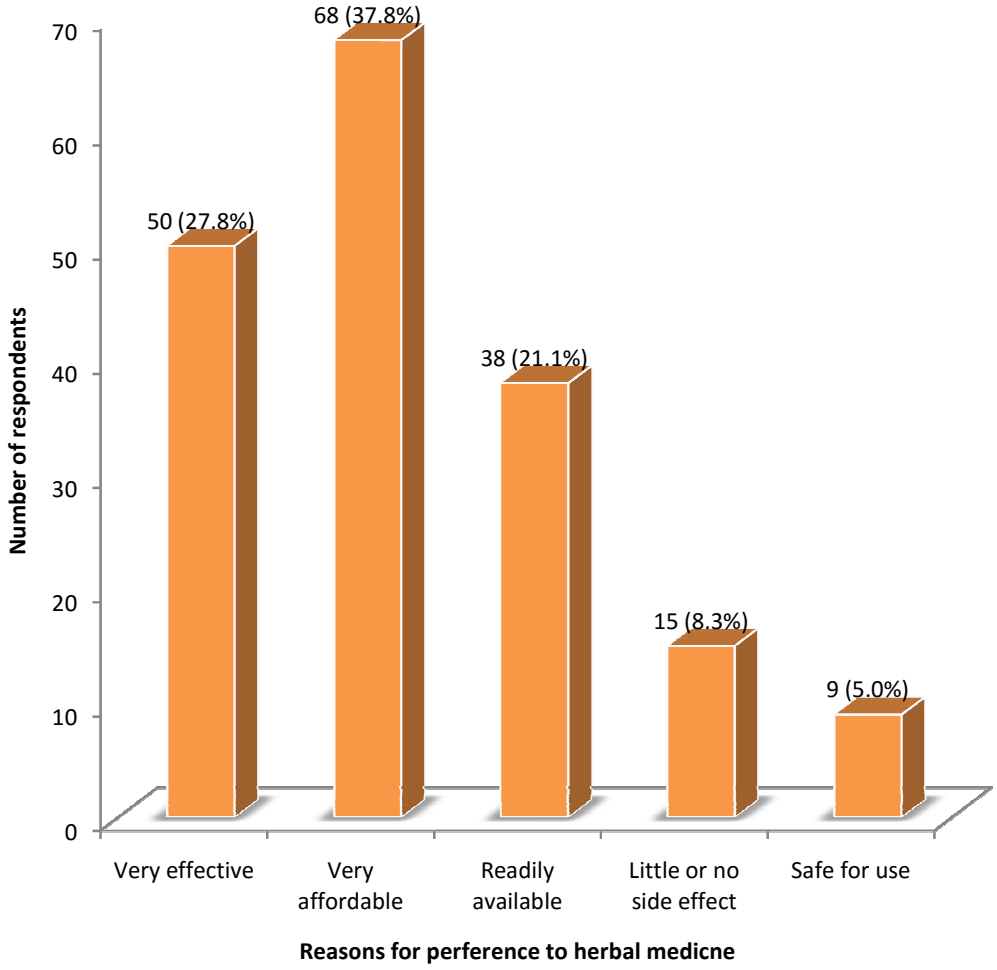
TABLE 5: Respondents' view on type of diseases treated using herbal medicine

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Type of diseases treated using herbal medicine*		
Malaria	40	28.8
Cancer	5	3.6
Skin infection/rashes (eczema,acne,rashes)	25	18.0
Joint/muscle pains	16	11.5
Diarrhea	8	5.8
Menstrual pain	5	3.6
Diabetes mellitus	11	7.9
Typhoid	22	15.8
Digestive problem	7	5.0
Total	**139**	**100**

*Multiple responses Source: Field work, 2016

4.6 Reasons for preference to herbal medicine than other types of medication

Reasons for preference to herbal medicine than other types of medication as indicated by the respondents were predominantly because herbs are 68 (37.8%) very affordable, 50 (27.8%) very effective, 38 (21.1%) readily available and 15 (8.3%) has little or no side effects (Figure 2).



Source: Field work, 2016

FIG 2: Reasons for preference to herbal medicine use than other types of medication

4.7 Side effects of herbal medicine experienced by the respondents

Out of 161 respondents who reported to have used herbs/herbal medicine, only 24 (12%) reported to have experienced side effects while 137 (68.5%) respondents have not experienced any side effects ever since they have been using herbs. Side effects mostly highlighted by the 24 respondents were 9 (37.5%) dizziness, 6 (25%) watery stool, 4 (16.7%) abdominal pain and 3 (12.5%) vomiting (Table 6).

TABLE 6: Side effects of herbal medicine experienced by the respondents

VARIABLES	NUMBER OF RESPONDENTS	PERCENTAGE
Ever experienced side effects after using herbal medicine		
Yes	24	12.0
No	137	68.5
No response	39	19.5
Total	**200**	**100**
Nature of side effects experienced by users of herbal medicine*		
Vomiting	3	12.5
Skin rashes	1	4.2
Abdominal pains	4	16.7
Nausea	1	4.2
Dizness	9	37.5
Watery stool	6	25.0
Total	**24**	**100**

*Multiple responses Source: Field work, 2016

5.Test of hypotheses

Hypotheses one:

As shown in Table 7, age of respondents (r= .789; p= .000) was strongly and positively correlated with the use of herbal medicine and the relationship was statistically significant at .05 α level. Hence, the null hypothesis was rejected and the alternative accepted which states that there is a relationship between age of respondents and the use of herbal medicine.

TABLE 7: Pearson product moment correlation between age of respondents and use of herbal medicine

Variables	N	Mean	Standard deviation	r-value	Sig.
Age (in years)	200	2.60	1.216	.789	.000*
Use of herbal medicine	200	1.20	0.397		

*Significant at P<.05 ; df = 198 Source: Field work, 2016

Hypotheses two:

As shown in Table 8, the correlation between sex of respondents (r= .590; p= .000) and the use of herbal medicine was strong and positive at .05 α level. Hence, the null hypothesis was rejected and the

alternative accepted which states that there is a relationship between sex of respondents and the use of herbal medicine**.**

TABLE 8: Pearson product moment correlation between sex of respondents and use of herbal medicine

Variables	N	Mean	Standard deviation	r-value	Sig.
Sex	200	1.41	.493	.590	.000*
Use of herbal medicine	200	1.20	0.397		

*Significant at P<.05 ; df = 198 Source: Field work, 2016

Hypotheses three:

As shown in Table 9, educational status of respondents (r= -.784; p= .000) was strongly and negatively correlated with the use of herbal medicine and the relationship was statistically significant at .05 α level. Hence, the null hypothesis was rejected and the alternative accepted which states that there is a relationship between educational status of respondents and the use of herbal medicine.

TABLE 9: Pearson product moment correlation between educational status of respondents and use of herbal medicine

Variables	N	Mean	Standard deviation	r-value	Sig.
Education	200	3.17	.946	-.784	.000*
Use of herbal medicine	200	1.20	0.397		

*Significant at P<.05 ; df = 198 Source: Field work, 2016

Hypotheses four:

As shown in Table 10, monthly income level of respondents (r= .759; p= .000) was strongly and positively correlated with the use of herbal medicine and the relationship was statistically significant at .05 α level. Hence, the null hypothesis was rejected and the alternative accepted which states that there is a relationship between monthly income level of respondents and the use of herbal medicine.

TABLE 10: Pearson product moment correlation between monthly income level of respondents and use of herbal medicine

Variables	N	Mean	Standard deviation	r-value	Sig.
Income	200	1.82	0.771	.759	.000*
Use of herbal medicine	200	1.20	0.397		

*Significant at P<.05 ; df = 198 Source: Field work, 2016

6. Discussion

Majority of the respondents 161 (80.5%) admitted that they have used herbal medicine before at least once in their lifetime. Types of herbal medicine/herbs used by the respondents were majorly 48 (14.5%) Bitter kola, 40 (12.1%) Dogoyaro, 45 (13.6%) shea butter, 24 (7.2%) pumpkin leaves, 22 (6.6%) Aloe vera and 21 (6.3%) Garlic. This finding corroborates with that of Oreagba et al [12] where 66.8% of the respondents use of herbal medicine and Agbo jedi-jedi', 'agbo-iba' and Oroki herbal mixture were the most commonly used herbal medicine. This finding however, contradicts a recent study carried out by Duru et al [2] where only 36.8% used herbal medicine and bitter leaf/iron weed plant (vernonia Amygdalina) was the most widely used herbal medicine. The high rate of use of herbal medicine reported in the current study may be attributed to the fact that herbal medicine are widely advertised, accepted and in most cases preferred to orthodox medicine. It is difficult to ascertain that a particular family or household in Nigeria as well as in Africa have not used herbal medicine before. This is because, the practice of herbal medication has long been an old therapeutic approach to many health problems before the introduction of orthodox medication and the herbal medication is often seen to be very effective and cost effective even till date. Also, the wide awareness and revelation that approximately 80% of orthodox medicines are derivatives of herbal plants/medicine also accounts for the high usage of herbal medicine in the study area. Bitter Kola (*Garcinia* Kola) is the most widely used herbs in the current study. The importance of bitter kola in the Nigerian culture cannot be

overemphasized. It is often used as social beverage and usually the first thing offered to guest when they visit a particular household. Aside its usage as the "*first food for visitors"* people use bitter kola for other medicinal purpose such as detoxification, anti-microbial substance, cold remedy (eliminate nasal congestion, pains, cough, sore throat, etc), boost immune system, sexual/libido enhancement, improves lung function, weight loss, relieve joint pains and prevent alcohol-induced hangover [13]. This therefore proves that imbedded in bitter kola are substantial health benefits which largely account for its wide usage in this study. Also, from time memorial till today, bitter kola is used in social and traditional ceremonies such as naming ceremonies, traditional marriage, social gathering, parties, etc. This also substantiates its wide use across cultural settings, traditions and societies. Dogoyaro *(Azadirachta indica) also called Neem tree* was also highlighted as the second most commonly used herbal medicine in the current study. This is because of its divergent properties and extreme usefulness to the health of humans. In most cases, if people have a symptomatic experience or feeling of malaria, their first choice of treatment would be the Dogoyaro leaves. This is because, users of the leave extract have testified about its effectiveness and fast yielding of expected result. Ogbuehi et al [8] observed that *Azadirachta indica* is the second most used plant for treatment for malaria. It is usually grinded, squeezed and the leave extract is used for enema as detoxification agent. Beyond its primary usage for malaria treatment, Dogoyaro is now widely used for other therapeutic purposes such as skin health, indigestion, anti-microbial agent, fungal infection, dysentery, jaundice, rheumatism, heartburn, reduce cholesterol level and high blood pressure, etc. Shea butter is the third most commonly used herbal medicine in this study. It is primarily used for skin or hair-related problems. People who suffer from skin diseases such as acne, eczema, rashes, itching, sunburns, wrinkles, insect bites, frost bites and skin allergies. Some people use it to moisture

388 the skin and protect it from environmental hazard especially during harmattan season. Tella
389 [14] observed that shea butter can be used in nasal decongestion and management of sinusitis.
390 Out of 200 respondents, 128 (64.0%) reported to have used herbal medicine/herbs in
391 the past 12 months, 102 (51%) past six months, 86 (43%) past three months and 75 (37.5%)
392 past one month preceding the time of survey. From the result, there is a noticeable decrease in
393 the level of herbal medicine use among respondents (Figure 1). This decrease from 64% to
394 37% may be attributable to the fact that some respondents practice the combination of
395 orthodox and traditional medication in the treatment of diseases as reported by Duru et al [2]
396 where 63.7% combined both orthodox and traditional medication to treat diseases. So their
397 complete reliance on herbal medicine alone is limited. Also, considering the fact that the
398 Calabar metropolis is an urban centre, most resident may find it difficult to obtain herbal
399 medicine or herbs due to deforestation and rapid industrialization. In this case, during illness,
400 their first choice of treatment would be self-medication with orthodox medicine obtained
401 from a nearby chemist/pharmacist shop. Where that fails, he/she then proceed to seek
402 treatment at the health care facilities whether government or privately owned facilities. If the
403 sickness perseveres, they eventually resort to traditional treatment which most times are
404 obtained in the rural settings. This clearly may account for the decline in the use of herbal
405 medicine among respondents in this study. It was also observed in the current study that age,
406 sex, educational status and income level of respondents was correlated with the use of herbal
407 medicine ($P<.05$). In terms of age, findings from Kelly et al [15] and Hoist et al [16] supports
408 the assertion that the use of herbal medicine increases with age. However, the opposite was
409 reported in Imo State, Nigeria where the use of herbal medicine decreases with age [3]. The
410 age differential in the use of herbal medicine could be attributed the level of exposure to the
411 type of herbs, method of preparation and their usefulness. In contemporary societies, it is
412 often observed that while the older persons engage primarily in herbal medicine, the younger

ones use more of orthodox medication. So, therefore it can be asserted that older individuals are twice likely to use herbal medicine than their younger counterparts.

Educational status was also found to influence the use of herbal medicine [2, 3]. Education has a greater role to play in a persons' informed choice of using herbal medicine because people who are better informed about the nature of herbal mixture, its uses, its applicability and the ability to detect substandard products are more likely to use the herbal mixture appropriately to achieve the desired result as compared to those who have less knowledge about herbal medication and their uses. In the current study, a negative correlation was established between educational status of respondents and use of herbal medication (Table 9). This result obviously means that the higher the educational status the lower the use of herbal medication. Income level of respondents was also reported to be strongly and positively correlated with the use of herbal medicine. This is consistent with that of Duru et al [2, 3] in their study where higher income earners were more likely to use herbal medicine than the lower income earners. This assertion is built on the fact that in certain metropolis, most herbal mixture is marketed by vendors and its accessibility is dependent on its affordability. Also, in cases where people self-prepare their herbal medicine, they will need money to travel to a long distance specifically to rural areas where they can acquire sufficient plant. In such practical scenario, lack of money can affect the individual usage of herbal medicine. The situation differs for those residing in the rural areas where there is sure availability of herbal medicine, and its access and use is quite cost-effectiveness. Hence, income level of individual is a strong determinant of herbal medicine use. Sex of respondents was also a major determinant of herbal medicine use in the current study. According to Duru et al [2] males were found to be 2.6times likely to combine herbal medicine than their female counterparts. This may be attributed to the fact that males visit the health facilities less regularly than their female counterparts who may have reasons for patronizing the health

facilities on regular basis (either for ANC, postnatal care, treatment, body checkup, screening, scanning, etc). As a result, male tend to subscribe to self-medication with local herbs than females. Also, it is often observed that most herbalist/herbal practitioners/local healers are males which encourage the male non-practitioners to patronize them. The Traditional Birth Attendants are visited by females mostly when a woman is pregnancy and ready to give birth which happens occasionally.

While one-third of the respondents 78 (35.5%) reported that the herbal medicine/herbs used was self-made, 55 (25%) herbal vendors, 30 (13.6%) parents and 20 (9%) friends constituted major sources of herbal medicine for respondents. The practice of self-medication is promoted as a norm in most societies especially as regards to herbal medicine. This is because, people tend to be aware of the type of herbal mixture to apply in curing certain diseases. The information on herbal medicine and methods of preparation are transferred from parents to offspring or through consultation of local healers and advice from friends. This makes individuals self-reliance in subsequent occasion whenever they are ill. However, in contemporary societies, herbalist no longer wait for people to go to them, instead they now take this herbal concoction to the door-step of the people in need via herbal marketing. The herbal vendors are saddle with the responsibilities of marketing the products to whoever needs it. Parents sometimes treat their children using herbal mixture especially for enema. Consequently, the children now grow up to practice the style of treatment learnt from their parents. This accounts for why 13.6% respondents claimed that their sources of herbal medicine were their parents. Even till today, people still rely on their parents and grandparents for herbal prescription peculiar to the illness then suffer especially if the parents were herbalist/local healers. Through broad consultation and inquiry, friends could be reliable sources of herbal medicine as reported by 9% of the respondents in the study.

Most respondents highlighted that 44 (20.1%) treatment of diseases, 39 (17.8%) food supplements, 31 (14.1%) laxative and 24 (11.0%) skin care were the reasons for the use of herbal medicine. The four top reasons indicated can be subsumed to the fact that restoration, promotion, prevention, treatment and maintenance of health were their main reason for using herbal medicine. This means that health is the central point that propels the use of herbal medicine. For instance, Dogoyaro is used as a laxative to detoxify the body via using enema; kola nut or bitter kola are used as food supplements and Alove vera and Shea butter are used for skin care. Each of these herbal medicines is design to treat one illness or the other. In some cases, one herbal medicine is used to treat many health problem effectively such as the ones already highlighted in this study.

Reasons for preference to herbal medicine than other types of medication as indicated by the respondents were predominantly because herbs are 68 (37.8%) very affordable, 50 (27.8%) very effective, 38 (21.1%) readily available and 15 (8.3%) has little or no side effects. This finding is congruent with that of Okwuonu et al [17] where herbal medicine was one of the top three choices of alternative medicine for the treatment of kidney diseases. Comparatively, herbal medicine is by far more readily available, easily accessible, cost-effective and in most cases has little or no side effect as compared to the orthodox medicine where it is expensive to get, not readily available and not easily accessible in most cases. Herbal medicine remains relevant especially for individuals who are low income earners and are least educated. Out of 161 respondents who reported to have used herbs/herbal medicine, only 24 (12%) reported to have experienced side effects of which 9 (37.5%) dizziness, 6 (25%) watery stool, 4 (16.7%) abdominal pain and 3 (12.5%) vomiting were the most highlighted. This result is in accordance with that of Duru et al [3] where herbal medicine users reported similar side effects. These side effects may arise from the method of

preparation, erroneous application of the herbal medicine and over-dosage of herbal medicine consumed.

7. Conclusion and recommendations

Even with the widely advertised orthodox medication which is predominant in the pharmaceutical industries, it is evident that the use of herbal medicine in Nigeria is still highly preferred both among urban and rural dwellers. This is due to the fact that, herbal medicine is readily available, easy accessible, cost-effective and yield fast results. Finding from this study showed that most respondents use herbal medicine but the trend gradually diminishes from the past 12 months to the past 1 month preceding the survey. Based on the above findings, it is recommended that

1. A pharmaceutical regulatory body should be instituted to monitor the activities of herbal practitioners and ensure that herbal medicine products meet global standard in terms of efficacy, safety and dosage.
2. The government at all levels should in collaboration with relevant organizations sponsor researches in medicinal plants from which most herbal medicines are derived from. This would help discover more reliably facts about each plant extract and their usefulness to human health.
3. Public health experts in conjunction with herbal specialists should enlightened the general public on the need to scrutinize the herbal products purchased or acquired before use to avoid complications and side effects.

CONSENT

All authors declare that verbal informed consent was obtained from the study participants (or other approved parties) for publication of this paper and accompanying images.

REFERENCES

[1] Belonwu, M. C. Attitudes to and use of traditional medicine in the treatment and management of malaria in Nigeria: Case study of anambra state. Degree of

Master of Science (Msc) in Development Studies (IDS) University of Nigeria, Enugu campus. 2011.

[2] Duru, C.B., Diwe, K. C., Uwakwe, K. A., Duru, C. A.,. Merenu, I. A., Iwu, A. C., Oluoha, U. R., Ohanle, I. Combined orthodox and traditional medicine use among households in Orlu, Imo State, Nigeria: Prevalence and Determinants. *World Journal of Preventive Medicine*. 2016b; 4(1): 5-11.

[3] Duru, C. B., Uwakwe, K. A., Chinomnso, N. C., Mbachi, I. I., Diwe, K. C., Agunwa, C. C.,. Iwu, A. C., & Merenu, I. A. Socio-demographic determinants of herbal medicine use in pregnancy among Nigerian women attending clinics in a tertiary hospital in Imo State, South-East, Nigeria. *American Journal of Medicine Studies;* 2016a; 4(1):1-10

[5] Abodunrin, O. L., Omojasola, T. P., & Rojugbokan, O. O. Utilization of alternative medical services in an urban centre of North Central Nigeria. *The Nigerian Health Journal*, 2011; 11(2):51-55

[4] Falodun , A. Herbal medicine in Africa-distribution, standardization and prospects. *Research Journal of Phytochemistry,* 2010; 4: 154-161

[6] Ita, P. B. & Offiong, E. E. Medicinal plants used in traditional medicine by rural communities in Cross River State, Nigeria. *Journal of Health, Medicine and Nursing*; 2013; 1(1):23-29

[7] Okoli, R. I, Agbe, O, Ohaju – Obodo, J. O, Mensah, J. K. Medical herbs used for managing some common ailments among Esan people of Edo State, Nigeria. *Pakstan Journal of Nutrition*. 2007; 6(5): 490-496

[8] Ogbuehi, I.H., & Ebong, O.O. Traditional medicine treatment of malaria in Onitsha, South East Nigeria. *Greener Journal of Medical Sciences*; 2015; 5(1):011-018.

[9] National population commission. Projected population of Calabar South and Calabar municipal Local Government Areas of Cross River State, Nigeria; 2006; Retrieved on January 14, 2012 from http//www.citypopulation.de

[10] Yamane, T. *Statistics, An Introductory Analysis*, 2nd Ed., New York: Harper and Row. 1967.

[11] Osuchukwu, N. C., Osuchukwu, E. C., Eko, J. E., & Ekum, M. A. HIV-AIDS knowledge and accessibility to hiv information among women in Obudu Local Government Area of Cross River State, Nigeria. *International Journal of Ebola, AIDS, HIV and Infectious Diseases and Immunity;* 2016; 2(1):12-28

[12] Oreagba, I. A., Oshikoya, K. A., & Amachree, M. Herbal medicine use among urban residents in Lagos, Nigeria. *BMC Complementary and Alternative Medicine*; 2011; 11:117

[13] Okafor, C. The Many Benefits of Bitter Kola. Retrived Aug. 18, 2014 from http://realnewsmagazine.net/health/the-many-benefits-of-bitter-kola/ 2014.

[14] Tella, A, Br. Preliminary studies on nasal decongestant activity from the seed of the shea butter tree, Butyrospermum parkii. *J Clin Pharmacol.* 1979; 7 (5): 495–497

[15] Kelly, J, Kaufman, D, & Kelley K. Recent trends in use of herbal and other natural products. *Archives of Internal Medicine*; 2005; 165: 281-286.

[16] Hoist, L, Nordeng, H, & Honvik, S. Use of herbal drugs during early pregnancy in relation to maternal characteristics and pregnancy outcome. *Pharmacoepidemiol Drug Saf.;* 2008; 17(2): 151-159

[17] Okwuonu, C. G, Ezeani, I. U, Olokor, A. B, & Aniede, E. F. Belief in complementary and alternative medicine in the management of kidney diseases in a rural population of South-East Nigeria. *International Journal of Medicine and Biomedical Research*; 2014; 3(3):168-177