



## The use of herbal medicines amongst outpatients at the University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State – Nigeria



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### ABSTRACT

**Background:** In Africa, particularly Nigeria, there is an increasing interest in natural product remedies with a basic approach towards nature. This research studies the prevalence of use, pattern of use and awareness of outpatients at the University of Ilorin Teaching Hospital, Ilorin, Nigeria on the use of herbal medicines.

**Methodology:** Based on an informed consent, semi-structured questionnaires were used to collect data from a total of 112 outpatients attending different outpatient clinics of the hospital about the use of herbs. This sample size was derived from the Kish formula. Data obtained were analyzed by IBM SPSS Statistics software V23 and inferences made accordingly.

**Results:** All (100.00%) of the outpatients were familiar with herbal medicines, 67.86% had used herbal medicines in the past and 25.00% were currently taking herbal medicines as at the time of study. It was also found that 54.35% of the respondents use herbal medicines in no specific dose, 47.83% use the herbs with various additives, and 39.13% take their herbs concurrently with orthodox medicines. A total of 13.73% of the respondents prefer to use herbs when sick and another 35.29% prefer a combination of herbs and orthodox medicines.

**Conclusions:** Most of the patient-respondents prefer to include herbal medicines in their therapies. It is concerning that over one-third of the respondents concomitantly use herbal and orthodox medicines, some others use the herbs inappropriately. More efforts should be geared towards ensuring general improved use of herbal medicines.

### 1. Introduction

Despite the non debatable efficacies of synthetic drugs in the management of various medical conditions, their side effects and challenges of affordability remain limitations that cannot be neglected, thereby causing a rapidly growing interest in natural remedies.<sup>1</sup> In the world today, as the people are becoming aware of the side effects of synthetic drugs, there is an increasing interest in the natural product remedies with a basic approach towards the nature.<sup>1</sup> Plant metabolites and plant-based medicines appear to be one of the better alternatives as they are known to have minimal danger to consumers in contrast to synthetic counterparts.<sup>2</sup> The abundance of plants on the earth's surface has led to an increasing interest in the investigation of different extracts obtained from traditional medicinal plants as potential sources of new drugs.<sup>3</sup> Biologically active compounds present in the medicinal plants have always been of great interest to scientists. There are well-documented problems regarding the harmful side effects and the continuous increase

in the number of microorganisms that are resistant to chemical antibiotics. This highlights the need for new strategies and new classes of drugs with low toxicity and high selectivity in their action.<sup>4</sup> The prospects of availability, affordability, reduced side effects and resistance have favored the use of herbal medicine recently. In Africa, particularly Nigeria, the standards of nutrition, health infrastructures and environmental sanitation are declining by the day contributing significantly to the intensity of the damages caused by diseases.<sup>5,6</sup> This has made communities in these greatly disturbed societies seek better and more effective solutions to enhance the treatment and management of infections and diseases.

Traditional medicine, according to World Health Organization (WHO), is defined as “health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses and maintain well-being”.<sup>7</sup> Among the traditional medicine practices, the use of

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herbal medicines which is defined as plant-derived preparations claimed to have therapeutic benefits, is the most popular and used by the general population as well as pregnant women around the globe.<sup>8</sup>

While these traditional medications constitute first line treatment for malaria with high fever in 60% of children in Ghana, Mali, Nigeria and Zambia, 75% of people living with HIV/AIDS use traditional medicine in San Francisco, London and South Africa.<sup>9</sup> Factors such as proximity and easy accessibility of the traditional practitioners to the community, cost, availability of the medicines and traditional beliefs have been implicated as some of the reasons for the patronage of these services<sup>10</sup>. In addition, there is an increasing interest in the use of herbal medicines due to the everyday consumer's preference of products of natural origin resulting in a growing number of national traditional medicine research institutes in developing countries such as Nigeria, China, Ghana, India, Madagascar and Vietnam.<sup>11</sup> Indeed, there is scientific evidence supporting the use of some herbal medicines. It is estimated that 25% of modern medicines are made from plants first used traditionally.<sup>9</sup> However, the inappropriate use of traditional medicines can result in hazardous effects, which is why the World Health Organization (WHO) advised that researches be carried out to ascertain the safety and efficacy of these products before making them available to consumers.

Herbal medicines contain a combination of pharmacologically active plant constituents that are claimed to work synergistically to produce an effect greater than the sum of the effects of the single constituents.<sup>12</sup> In line with this, there is a general belief by the public that herbal medicines are all safe because they are natural. However, this is a hazardous oversimplification. Since all herbal medicines are mixtures of more than one active ingredient, such combinations of many substances obviously increase the likelihood of interactions taking place.<sup>12</sup> These interactions may be traced to the tendency of induction or inhibition of liver enzymes by metabolites of these herbs or direct pharmacological actions of the herbs. In any case, there is need for more care and professional interventions geared towards minimizing interactions caused by medicinal plants.

This study is aimed at determining the pattern and prevalence of use of herbal medications among outpatients in the University of Ilorin Teaching Hospital, Kwara State. In 2016, a team of researchers studied the prevalence and pattern of use of herbal medicines in pregnancy among women attending clinics in a tertiary hospital in south-east Nigeria. It was concluded in this study that the prevalence of herbal medicine use was high among pregnant women in this region<sup>13</sup>. This research builds on the outcomes of the previous study by expanding the coverage of the participants and providing more detailed information from the north-central zone of Nigeria regarding the use of herbs. This can be useful in making comparisons and generalized inferences pertaining to the use of herbal medicines in Nigeria. Knowledge gained from this study may be useful in the management of these patients. Pharmacists during the dispensing of medications will be more enlightened and guided with regards to counselling patients to minimize negative effects due to traditional drugs. Inferences from this study can aid the development of health policies on traditional medicine practice. The goal is to improve healthcare; and ensure the safety and well-being of patients.

## 2. Method

### 2.1. Operational definition of terms/concepts

- Awareness:** In the context of this study, 'awareness' about the use of herbs refers to the extent of knowledge and consciousness the respondents have regarding herbal medicines either from personal use or experience.
- Pattern of Use:** As used in this study, the 'pattern of use' of herbal medicines entails how the medicines are procured, prepared and administered. It also extends to include how these herbal medicines

are stored and the regimen (if any) of use.

### 2.2. Study area and study population

The study was conducted at the University of Ilorin Teaching Hospital, Ilorin, Kwara State. Ilorin is the state capital of Kwara in North-Central Nigeria. As of the 2006 census, it had a population of 777,667, making it the 6th largest city by population in Nigeria.<sup>14</sup> Ilorin is an urban centre of Kwara state and has a good presence of traditional medicine practitioners scattered around the town, especially in and around major markets. Consequently, residents patronize these markets and the practitioners for treatment of various ailments, especially pile.<sup>15</sup> The University of Ilorin Teaching Hospital (UITH) belongs to the second generation of Teaching Hospitals which were established by law on the 2nd May 1980. The hospital has 17 clinical departments that render specialist care in pediatrics, obstetrics and gynecology, internal medicine and surgery. It serves as a referral center for other primary, secondary health care facilities and also as a training facility for undergraduate and postgraduate programs in Medicine and allied courses.

The pharmacy department is a department of the hospital and is as old as the hospital. The department, headed by a Director of Pharmaceutical Services, currently has thirty two registered pharmacists supported by pharmacy interns and technicians. The department is decentralized into 17 units, 14 of which are within the main hospital premises. Among these units are the Accident and Emergency Pharmacy, Main Pharmacy, Oncology Pharmacy, Behavioural Pharmacy Unit, Drug Information Unit, Pharmacovigilance Unit among others. The department renders services and pharmaceutical care spanning through drug dispensing, patient counselling, drug information provision, compounding, pharmacovigilance, training and research.

The study population comprised individuals of different ages and gender who are outpatients attending various clinics of the hospital.

### 2.3. Study design

The study is a hospital-based cross-sectional descriptive study.

### 2.4. Inclusion criteria

Only outpatients attending various outpatients' clinics were voluntarily enrolled.

### 2.5. Exclusion criteria

- Individuals who are not attending outpatients' clinics of the hospital
- Individuals who refused to give consent as volunteers for the study
- Individuals that are deaf and could not communicate verbally

### 2.6. Sampling technique

The sampling method used in this study was convenience sampling. Using the sampling fraction;  $n/N$ , patients who attended the clinics in each day were selected and interviewed. Selection was unbiased and was done to accommodate as many enrollees as possible in each day within the duration of the study till the target sample size was realized. For every selected participant, information regarding the study was provided after which informed consent was sought before administering questionnaire.

### 2.7. Simple size determination

The Kish formula ( $N = Z^2pq/d^2$ )<sup>16,17</sup> was deployed for determining adequate sample size and further correcting was done for the population which was less than 10,000 using  $N_F = n/(1 + (n/N))$ . (Where,

Z = standard normal deviate set at 1.96, p = Prevalence of herbal use among patients as in a previous study (40%),<sup>18</sup> d = level of precision set at 0.05, q = 1-p, N = desired population size (taking sample size to be greater than 10,000)

$$N = \frac{1.96^2 \times 0.4 \times 0.6}{0.05^2}$$

N = 369 (if sample size is greater than 10,000)

However for sample sizes below 10, 000;

$$N_F = \frac{n}{1+(n/N)}$$

Where,

$N_F$  = desired population size if population size is less than 10,000

n = desired population size when sample size is greater than 10,000

N = sample size (estimating sample size of 150 patients over the study duration)

$N_F = 369 / (1 + (369/150))N_F = 107$  patients

Assuming an attrition rate of 5%, a total of 112 outpatients were enrolled for the study

## 2.8. Data collection and analysis

Data was collected using an interviewer-administered, semi-structured questionnaire. Questionnaires were administered by the researcher with assistance from three research assistants who were pharmacy interns. The help of interpreters was sought to pass on information in native languages. The questionnaire; designed by the researchers, had four sections; section A, contained questions on socio-demographic characteristics and clinical information of participants, section B, contained questions on awareness and knowledge of participants on herbal medicines, section C contained questions on utilization of herbal medicine while section D contained questions on attitude of participants towards herbal medicine use. Data collection which was carried out for three weeks spanned through the 5th of March to the 26th of March, 2018. The questionnaires were coded before entering the data into the computer and all data was organized and analyzed using the IBM SPSS Statistics software V23. Descriptive statistics was presented as frequency and percentages, mean where necessary. Some of the socio-demographic data obtained were compared to selected categorical results of the study by the use of Chi-square tests. Levels of significance were assessed by setting p-value at < 0.05 (for significance) and the presence of significant associations used to make further deductions.

## 2.9. Ethical approval

Ethical approval was sought from the Ethical Committee of the University of Ilorin Teaching Hospital, Ilorin, Nigeria before proceeding with the study. Informed consent was obtained from each participant before questionnaire interviews were administered and participation in this study was voluntary as participants were free to opt out at any level of the study.

## 3. Results and discussion

A greater percentage of the respondents that participated in this study were females. The patients were mostly married and educated. Specific results of socio-demographic characterization are presented in Table 1. Fig. 1 shows the clinics visited by the patient-respondents. Responses pertaining to the prevalence of use and awareness of patients on herbal medicines are presented in Table 2. Tables 3–6 show results of the different patterns of use of herbal medicines covered in this study, while Table 7 presents the opinions of the patient-respondents on the use of herbal medicines.

The Family Medicine clinic produced the highest number of

**Table 1**  
Socio-Demographic Characteristics of Patients (n = 112).

Variables	Frequency	Percentage (%)
<b>Gender</b>		
Male	46	41.07
Female	66	58.93
<b>Age</b>		
20–30 years	38	33.93
31–40 years	18	16.07
41–50 years	26	23.21
51–60 years	16	14.28
61–70 years	10	8.93
> 70 years	4	3.57
<b>Marital Status</b>		
Single	38	33.93
Married	60	53.57
Widowed	14	12.50
<b>Educational Background</b>		
None	12	10.71
Primary Education	20	17.86
Secondary Education	20	17.86
Tertiary Education	60	53.57
<b>Occupation</b>		
Trading	30	26.79
Student	24	21.43
Pharmacist	12	10.71
Civil Servant	20	17.86
Farmer	6	5.36
Clergyman	6	5.36
Retired	6	5.36
Unemployed	8	7.14
<b>Monthly Income</b>		
< 50, 000 Naira (< 138 USD)	60	53.57
50, 000 - 99,999 Naira (138 - 275 USD)	24	21.43
100, 000 - 199,999 Naira (275 - 550 USD)	16	14.29
≥ 200,000 Naira (≥ 550 USD)	12	10.71

outpatients recruited to participate in the study. Other patients that partook in the study were from the eye clinic, behavioral unit, the ears, nose and throat (ENT) clinic. Pregnant women from the ante natal unit were also involved as patient-respondents in the study. The coverage accommodated various groups of outpatients making the results obtained a better representation of the outpatients of the hospital.

In subsequent research, efforts will be channeled towards identifying these prevalently consumed herbs scientifically, investigating specific interactions with orthodox medicines due to them in a bid to standardizing these herbal medicines for use.

Using the Chi-square method, some demographic data obtained from the patient-respondents were compared with related results of herbal use and opinions about the use of herbal medicines. There were no significant associations on comparison between the gender, age and educational background of the respondents and their current status of herbal medicine use, their preferences for herbal medicines or otherwise and their opinions about the use of herbal medicines in the various specific scenarios compared as summarized in Table 8 and indicated by p-values greater than 0.05. However on comparing the monthly income of the patients with results of their preference for herbal medicines, a significant level of association was observed as reflected by a p-value less than 0.05 in Table 8.

## 4. Discussion

Herbal medicines are not entirely new in West Africa<sup>12</sup> as different communities employ plants and their derivatives, usually in their crude

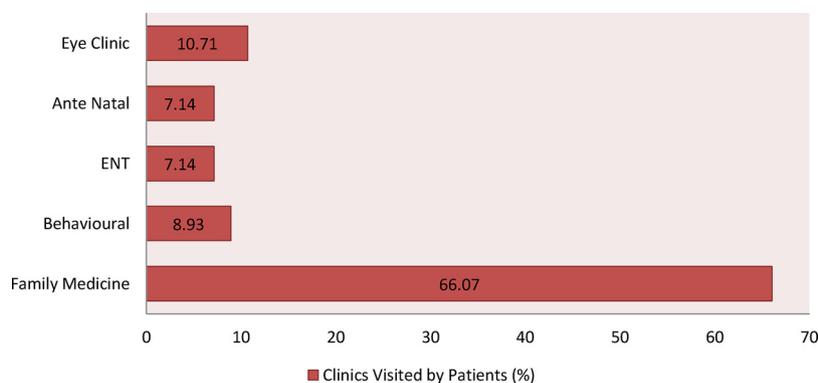


Fig. 1. Clinics Visited by the Outpatients.

**Table 2**  
Prevalence of Use and Awareness on Herbs.

Response	Frequency	Percentage (%)
Patients' distribution according to whether they have heard of the term 'herbs' or 'herbal medicines' (n = 112)		
Heard of 'herbs' or 'herbal medicines'	112	100.00
Not heard of 'herbs' or 'herbal medicines'	0	0.00
Patients' distribution based on past usage of herbal medicines		
Have used herbal medicines in the past	76	67.86
Not used herbal medicines before	36	32.12
Patients' distribution based on current use of herbal medicines		
Currently using herbal medicines	28	25.00
Not currently using herbal medicines	84	75.00

**Table 3**  
Pattern of Use of Herbal Medicines by Patients (I).

Named presentations, methods of procurement, use and storage of herbal medicines by patients	
Presentations	Liquids
	Powders
	Creams
	Capsules
	Soaps
Methods of Use	Leaves and barks macerated in solvent and decanted
	Powders, capsules and some liquids taken orally
	Creams applied on skin
	Other liquids and soaps used to bath
Storage	In bottles, kegs
	In local clay pots, boxes
	Some refrigerated
	Others kept at room temperature
Procurement	Bought from open markets
	Cut from road side and bushes
	Cultivated lands
	Purchased from pharmacies

forms to resolve their health challenges and deficiencies. This research was conducted to determine the awareness and prevalence, pattern of utilization and opinions of outpatients of the University of Ilorin Teaching Hospital (UIITH), Nigeria about the use of herbal medicines. The choice of outpatients for this study was based on the relatively greater access these patients have to herbs considering their location outside the hospital. Also a good spectrum of patients cutting across various outpatient clinics as shown in Fig. 1 was considered to ensure adequate coverage. The use of herbs may have various implications for each of these considered categories of outpatients. In a similar work

**Table 4**  
Pattern of Use of Herbal Medicines by Patients (II).

Response	Frequency	Percentage (%)
Patients' distribution based on whether the herbal medicines are taken at specified doses (n = 92)		
Dosed	42	45.65
Not dosed	50	54.35
Patients' distribution based on whether additives are added to herbal medicines in preparation or not		
Add additives	44	47.83
No additives	48	52.17
Patients' distribution according to whether they take herbal medicines with orthodox medicines concurrently		
Take herbs with orthodox	36	39.13
Do not take herbs with orthodox	56	60.87

Common additives mentioned by patients include: Carbonated drinks, water, lime alcohol, pap, and honey.

**Table 5**  
Pattern of Use of Herbal Medicines by Patients (III).

Response	Frequency	Percentage (%)
Patients' distribution based on whether they got relief from ailments after using herbal medicines (n = 92)		
Herb resolved ailment	62	67.39
Herbs did not resolve ailment	12	13.04
Ailment resurfaced after temporary resolution	18	19.57
Patients' distribution based on whether they have suffered adverse effects caused by herbal medicines		
Suffered adverse reactions	36	39.13
Have not suffered adverse reactions	56	60.87

Common adverse reactions mentioned by patients: vomiting, diarrhea, dizziness, rashes, cough, fever, headache, and vertigo.

**Table 6**  
Opinions on the Use of Herbal Medicines.

Response	Frequency	Percentage (%)
Patients' distribution based on their preference for herbs or orthodox medicines when ill (n = 102)		
Prefer herbs only	14	13.73
Prefer orthodox only	42	41.17
Prefer to take both	36	35.29
None	10	9.80
Patients' distribution on whether it is appropriate to take herbal medicines concurrently with orthodox medicines		
Appropriate	24	23.53
Not appropriate	60	58.82
I don't know	18	17.65

**Table 7**

The herbal medicines recollected by patients from previous and current use include the following, as mentioned.

Agumu	Agbo Jedi	Agbo Iba	Garlic
Awopa	Kakadoro	Kanafuru	Kafra
Ginseng	Agbo Ile Tutu	Mango leaves	Gbogbonise
Opa Eyin	Epa Ijebu	Eva Flusher	Bitter leaf

conducted by Tamuno et al in 2011, it was concluded that the high prevalence of use of herbal medicines by pregnant women in Northern Nigeria bears potentials for toxicity.<sup>19</sup> Outpatients visiting the antenatal clinic of the Teaching Hospital were therefore considered as part of the outpatients' categories.

Herbal medicines are an aggregate of multiple constituents. While they are no doubt affordable and available, their safety has remained a concern. Some of these medicines are generally dangerous; others may interact with orthodox medications significantly to produce negative effects. There is therefore a crucial need to determine the prevalence and pattern of use of these traditional medicines by patients, and suggest ways of reducing inappropriate use. Information regarding herbs' consumption can guide pharmacists in counselling appropriately in a bid to reducing negative effects due to herbal medicines, policies can be instituted to ensure safety and stability of these traditional medicines. All the patients interviewed affirmed that they have heard of the term 'herbal medicines' at one point in time or the other indicating a full level of awareness in these patients about herbal medicines. The knowledge about herbs as alternatives to orthodox medications is on the increase,<sup>1</sup> with 25% of the outpatients currently taking one herbal medicine or another at the time this study was conducted, despite seeking orthodox interventions at the clinics. It can be deduced therefore that tendencies exist for an overlap in the activities of these consumed herbs and the orthodox medicines prescribed. This is in line with the conclusions of Pius et al in a study conducted in 2012 to examine evidences and mechanisms of herb-drug interactions.<sup>20</sup> The liver enzyme Cytochrome P450 is very much involved in the possibilities of pharmacodynamic and pharmacokinetic overlap in the actions of herbs and drugs.<sup>20</sup>

As reflected in Table 3, some of the respondents described storage for the used herbal medicines as being clay pots, boxes and kegs. These modes of storage make the medicines susceptible to physical degradation and microbial contamination over time. Medicines not prepared and stored in hygienic and disinfected media are not safe and fit for use,<sup>21</sup> as they could worsen patients' conditions. For the herbs that exist in or are prepared in liquid media especially without preservatives, the tendencies for contamination and instability are greater, as the presence of moisture creates conducive environments for microorganisms to thrive. The need for sensitization in this regard cannot be over-emphasized. Regarding the pattern of use of herbal medicines, a whopping 54.35% of the sampled population as shown in Table 4 does not use herbs in fixed quantities or regimens. They mostly self-medicate these herbal medicines. This poses great concerns as continued use in this manner may put the users at risks of organ toxicities.<sup>22</sup>

Herbal medicines are made up of phytochemicals belonging to different chemical classifications<sup>12</sup> The addition of solvents to these herbs

as additives, diluents or extracting solvent as done by 47.83% of the patient-respondents aid the convenient preparation and use of these herbal medicines. However not all additives mentioned in Table 4 are safe and adequate for use. Alcohol for instance has detrimental effects on many organs and systems of the body, it interacts with a lot of medications heightening or relegating their effects.<sup>23</sup> In the case of herbs, these interactions have not been fully understood, and hence not predictable. On accounts of the potentials of alcohol to induce negative effects, its use is greatly discouraged as additives to herbs. These negative effects which may present as toxicity and organ damages may occur via the liver-enzyme inducing and inhibition tendencies of alcohol and its multisystemic effects on various physiological units of the body.<sup>23</sup> Caution should also be exercised with other additives. While the various adverse effects reported in Table 5 can be consequences of contaminations, they could also be due to effects caused by these additives or the inherent nature of the herbal components.

It has been established in a research conducted by Sarah, 2011 that herbal medicines can interact positively or negatively with orthodox medicines when used concomitantly.<sup>24</sup> The trend observed in Table 4 with 39.13% of respondents confirming that they use herbal medicines concurrently with orthodox medicines is not desirable. With emphasis on the possibilities of therapeutic failure, exaggerated effects, adverse reactions; pharmaceutical care interventions are required in patients that require orthodox medicines while on herbal medicines. Table 6 shows 13.73% of patients preferring the use of herbs only when sick, and another 35.29% preferring the combination of herbal and orthodox medicines. It is evident based on these that patient-populations in North-central Nigeria are getting more comfortable with the use of herbs to resolve their medical problems. While this is encouraging considering the benefits of affordability and availability of these herbs, there is great need for caution in their use to get optimal benefits from them without causing more harm. Furthermore, the correlation observed in Table 8 of the results can be explained to imply that the level of income of the patients might influence their preference for herbal medicines. The affordability of many of these herbs may be an explanation for this pattern of association.

## 5. Conclusion

This research proves that the awareness of outpatients in the University of Ilorin Teaching Hospital, Nigeria on herbal medicines is very high. A large percentage of outpatients in the hospital use herbal medicines. However, they are not usually used in specified doses; they are also used concomitantly with orthodox medicines. These practices pose threats to the health and long term well-being of patients. The process and conditions of preparation, presentation and storage of the herbal medicines are mostly not optimal. The use of varieties of additives was found to be involved in the preparation and use of herbs by these patients, some of them not very safe and appropriate. Most of the patient-respondents prefer to involve herbal medicines in their therapies. To this end, more efforts should be focused on general improved use of herbal medicines.

**Table 8**

Summary of Results of Data Analysis Using Chi-square Test.

Demographics compared	Category 1	Category 2	Category 3	Category 4	Chi-square Statistics	p-values
Gender	Currently Using Herbs	Not Currently Using Herbs	–	–	0.0000	1.0000
Gender	Take Herbs With Orthodox	Do Not Take Herbs With Orthodox	–	–	0.0517	0.8202
Age	Prefer Herbs Only	Prefer Orthodox Only	Prefer Both	Prefer Non	0.3976	1.0000
Educational Background	Appropriate	Not Appropriate	Do Not Know	–	0.1923	0.0999
Monthly Income	Prefer Herbs Only	Prefer Orthodox Only	Prefer Both	Prefer Non	30.5361	<b>0.0003 (significant)</b>

With p set at 0.05 for measure of significance.

## 6. Recommendations

- Public enlightenment on the facts that ‘herbal or natural does not always imply safe’ should be intensified. Herbal medicines should be stored appropriately in hygienic areas, away from direct light and heat. Additives should not be used indiscriminately in preparations. Purified water is a good solvent to use. Care should be taken to use herbs in doses recommended by manufacturers.
- The government should institute policies that regulate the safe and organized production and procurement of herbal medicines. A co-ordinated synergy between herbal medicine practitioners, hospital bodies and research communities in Nigeria is strongly recommended. Better funding and grants for natural medicines-themed researches should be instituted.
- Research communities should channel more efforts into improved characterization, standardization and enhanced delivery of commonly used herbs for more effective and safe use
- Clinical pharmacists should enhance pharmaceutical care interventions. Patients should be counseled on the need for sufficient spacing if they must take both herbal and orthodox medicines. Other counselling for optimum yields should be dispensed.

## 7. Limitations to study

Interpreters were used as needed to deliver the contents of the data collection instruments to some of the respondents as applicable. We acknowledge that the differing languages in these instances may have bearing influences on some of the results described as there can be inaccuracies in translation by the interpreters or in the understanding of the respondents concerned. This constitutes a limitation to this study.

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