

# The Study of Pattern of Use of Orthodox and Herbal Medicine among Non-academic Staff of a Nigerian University

Ajoke Constance Akanmu<sup>1,2\*</sup> and Kofowora Abimbola Odeyemi<sup>1</sup>

<sup>1</sup>Department of Community Health, College of Medicine, University of Lagos, Lagos, Nigeria.

<sup>2</sup>University of Lagos Medical Centre, Akoka, Lagos, Nigeria.

## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/JOCAMR/2018/45359

### Editor(s):

(1) Dr. Francisco Cruz-Sosa, Metropolitan Autonomous University, Iztapalapa Campus Av. San Rafael Atlixco, Mexico.

(2) Dr. Sachin Kumar Jain, Associate Professor, IPS Academy College of Pharmacy, India.

### Reviewers:

(1) Weng Ching-Feng, National Dong Hwa University, Taiwan.

(2) Edmund J. Kayombo, Muhimbili University of Health and Allied Sciences, Dar-es-Salaam, Tanzania.

Complete Peer review History: <http://www.sciencedomain.org/review-history/28117>

Original Research Article

Received 07 September 2018

Accepted 22 December 2018

Published 04 January 2019

## ABSTRACT

**Aim:** To study the pattern of use of orthodox and herbal medicine among non-academic staff of a Nigerian University.

**Study Design:** It was a descriptive cross-sectional study in which a multistage sampling technique was employed.

**Place and Duration of Study:** The study was conducted at the main campus of University of Lagos, Akoka, Lagos State, Nigeria between January and June, 2017.

**Methods:** A total of 425 respondents were recruited in this investigation. Information gathered through the use of structured self-administered questionnaire was subjected to descriptive analysis.

**Results:** Hypertension (39.81%) was the common health condition recorded. Only 42.8% of the population sampled visits clinic when sick, 33.41% engage in orthodox self-medication, 19.4% practice herbal self-medication while 3.8% consults herbal practitioners for treatments. A total of 42.2% respondents do combine herbal and orthodox medicine to achieve better cure (60.7%) or

\*Corresponding author: E-mail: conisol2017@gmail.com;

quick recovery (38%). More than 87% had history of herbal medicine use, in treating ailments such as malaria and pile (78.3%) while 21.1% used both orthodox and herbal treatment simultaneously. 54% showed preference for orthodox drugs compared to 46% that preferred herbal treatments. The respondents were mostly introduced to the use of herbal medicine by family (44.2%) and friends (15.5%). However, 76.7.5% was optimistic of possible drug interaction in the combined herbal and orthodox drugs use but only 12.1% intimated their doctors of the initial herbal medicine used.

**Conclusion:** This study showed the practice of combined herbal-orthodox drug use among the participants, despite their knowledge of the associated risk. Therefore, there is need to further educate the populace about the health risk of herbal-orthodox drug combination while the health professionals have to proactively enquire and counsel patients regarding the potentials of adverse effect, drug toxicities and drug interaction.

*Keywords: Herbal-orthodox drug; drug combination; drug interaction; adverse effect.*

## 1. INTRODUCTION

Traditional medicine as a major African socio-cultural heritage comprises therapeutic practices that have been in existence for hundreds of years before the development of modern scientific medicine [1,2]. In Africa, traditional medicine experienced restrictions and obstacles in the face of the introduction of western medicine during the era of colonialism [2]. Despite the proved efficacy and safety in the use of orthodox medicines, some of these traditional medicines are still included as part of the habitual treatments of various maladies [3-5]. The use of herbal drugs cuts across patients with; cardiovascular diseases, diabetes, cancers, digestive disorders, HIV, respiratory disorders, skin disorders, insomnia, circulatory disorders, fatigue and exhaustion [6,7]. However, there is rarely a well-controlled double-blind clinical and toxicological study to prove their efficacy and safety [8,9]. More so the lack of pharmacological and clinical data on the majority of herbal medicinal products is a major impediment to the integration of herbal medicines into orthodox medical practices [10].

The development and implementation of scientific methods and techniques in medicine have brought enormous improvements, especially, in all those cases in which material phenomena, including infection, injury, poisoning, nutrition and hygiene, are major factors in the disease etiology [11]. Therefore, modern medicine has substantially contributed to the decrease and eradication of some major epidemic diseases such as typhoid, cholera, bacterial infections, parasitic diseases, smallpox and polio [12]. However, these western types of health institutions are out of the reach of most people in terms of distance and costs, especially

at the village setting [13,14]. Therefore, the stiff opposition to traditional medical practice from official quarters has not whittled down its level of patronage by the people simply because it was developed in response to the dictates of their environment, it is affordable, accessible and considered efficacious by the people. Traditional medicine has thus survived great pressure and condemnation from westernized professionals [2].

Traditional medicine is an age long practice that involves prevention of illness, development of natural resistance to diseases and general promotion of well-being [15], while modern or orthodox system of medicine is based on sound experimental data, toxicity studies and human clinical studies [10]. However, the widespread use of herbal remedies and pattern of drug use among people has created the possibility of drug interaction between herbal and orthodox drugs when used simultaneously [11,16,17]. Therefore, this investigation was set to study the prevalence of herbal drug use among the staff of university of Lagos, to assess the staff knowledge of possible side effects and interaction of orthodox drugs with herbal medicines and also to identify factors responsible for choice of use of herbal drugs.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

This study was carried out in the University of Lagos, Lagos state, Nigeria. The total numbers of non-academic staff were 2,550 members (senior, junior and casual workers). The senior staff comprises of senior administrative and technical staff while junior staff are lower cadre members of the non-academic staff (the

administrative and technical staff) of the university.

## 2.2 Study Type and Population

This study is a descriptive cross-sectional study of the pattern of use of orthodox and herbal medicines among the non-academic staff of the University of Lagos, Akoka. The non-academic staff of the University was the targeted population in this research.

## 2.3 Sample Size Determination

The sample size was calculated in this study according to Cochran's formula [18].

$$n = z^2pq/d^2$$

Where,

n = The desired sample size

Z = The standard normal deviation (set at 1.96 which corresponds to the 95% confidence level).

p = The proportion in the target population estimated to have a characteristic, (Prevalence rate = 40% of herbal medicine usage.

q = 1.0 – p (1-0.4 = 0.6)

d = Margin of sampling error acceptable (5% = 0.05)

The sample size is thus calculated;

$$\begin{aligned}n &= (1.96)^2 \times 0.4 \times 0.6 / (0.05)^2 \\n &= 3.84 \times 0.24 / 0.0025 \\&= 0.92 / 0.0025 = 368.64\end{aligned}$$

The sample size used for the study was set at 425 as to make room for possible error during data collection.

## 2.4 Sampling Method

A multistage sampling method was applied in the study conducted at Akoka campus of the University of Lagos, Nigeria. The Akoka campus consisted of eight faculties alongside other centers, schools and the administrative block. The sample frame was stratified into 8 faculties, 4 schools, 1 administrative block, 8 centers. Simple random sampling was used to select 1 faculty, 1 centre and the administrative block with corresponding number of non-academic staff as; Faculty of Law 13, Administrative block 330 and the Medical Centre staff strength of 82. This gave a total of 425 non-academic staff recruited to participate in this study. The structured

questionnaires developed were administered to the participants after obtaining their consents.

## 2.5 Pretest

The questionnaire was administered to a group of 10 respondents in Federal College of Education to assess its suitability. Necessary adjustment was carried out before its use in the course of this study.

## 2.6 Ethical Consideration

Ethical approval was sought and obtained from the University of Lagos Ethical Committee before the commencement of this study.

## 2.7 Data Collection

The questionnaire was self-administered by the researcher who also supervised the activities of research assistants recruited and specially trained for this purpose.

## 2.8 Data Analysis

Data collected in this research was processed using SPSS 20.0 [19]. Frequency and percentage distribution were analyzed to describe the socio-demographic characteristics and to assess the herbal drug use among the respondents.

## 3. RESULTS

There were more males (54.59%) than females (45.41%) participants whose mean age was 42.5±10.2 in this study. Of the two religions commonly practiced in Nigeria, majority of the participants were Christian (86.12%) and Yorubas' (78.82%) were the prevalent ethnic group interviewed. In addition, nearly all the respondents (81.18%) were married and more than half of them were graduates while 22.8% had post graduate qualifications. The respondents mainly comprised of senior staff (63.76%) and junior staff (30.59%) employee of the university (Table 1).

The opinion of 422 respondents sampled on their initial actions when sick showed that most of them visits clinic (42.9%), a total of 33.41% engaged in orthodox self-medication, 19.53% practice herbal self-medications while 3.76% consults herbal practitioner for treatments (Fig. 1). As at the time of this investigation, 280 (65.88%) respondents claimed to be without any

ailments while others suffered from hypertension (10.12%), diabetes (0.94%), peptic ulcer (3.76%) and 45 respondents (10.6%) stated other ailments (Table 2). However, the treatment measures adopted against their ailments varied from orthodox only (57.30%), herbal only (19.50%), combined herbal and orthodox (16/80%) treatments (Fig. 2).

**Table 1. Sociodemographic characteristics of the respondents**

Variables	Frequency (n = 425)	Percentage
<b>Age (Years)</b>		
21-30	78	18.35
31-40	169	39.76
41-50	132	31.06
51-60	46	10.82
Mean age = 42.5±10.2		
<b>Sex</b>		
Female	193	45.41
Male	232	54.59
<b>Religion</b>		
Christians	366	86.12
Islam	59	13.88
<b>Ethnic group</b>		
Yoruba	335	78.82
Hausa	1	0.24
Igbo	55	12.94
Others	34	8.00
<b>Marital status</b>		
Married	345	81.18
Single	73	17.18
Divorced	4	0.94
Widowed	3	0.71
<b>Education</b>		
Primary	10	2.4
Secondary	50	11.8
Graduate	228	53.6
Postgraduate	97	22.8
Not indicated	40	9.4
<b>Staff category</b>		
Senior staff	271	63.76
Junior staff	130	30.59
Casual staff	24	5.65

More than 40% of the population studied do practice combine herbal and orthodox treatments of their ailments. Paracetamol or panadol (50.9%) were the type of orthodox medicine commonly used. Mostly, the herbal practitioners (36.1%), friends or family members (39.4%) were the sources of the herbal medicine used by the respondents (Table 3). Among 163 respondents that reported the combined herbal-orthodox drug use, majority were engaged in such practice to

achieve better cure (60.70%) and for quick recovery (38%) (Fig. 3).

**Table 2. Type of illness experienced by the respondents**

Illness currently experienced by respondents	Frequency (n = 108)	Percentage
Hypertension	43	39.81
Diabetes	4	3.7
Peptic ulcer	16	14.81
Other ailments	45	41.67

**Table 3. Pattern of herbal and orthodox medicine drug utilization**

Variables	Frequency	Percent
<b>Combination of herbal and orthodox medicine for treating ailments (n = 396)</b>		
Yes	167	42.2
No	229	57.8
<b>Type of orthodox drug currently in use (n=57)</b>		
Paracetamol, panadol	29	50.9
Others	28	49.1
<b>Sources of the herbal medicine used (n=216)</b>		
Traditional drug vendor	40	18.5
Herbal practitioner drug shop	78	36.1
From friend or family member	85	39.4
Others	13	6

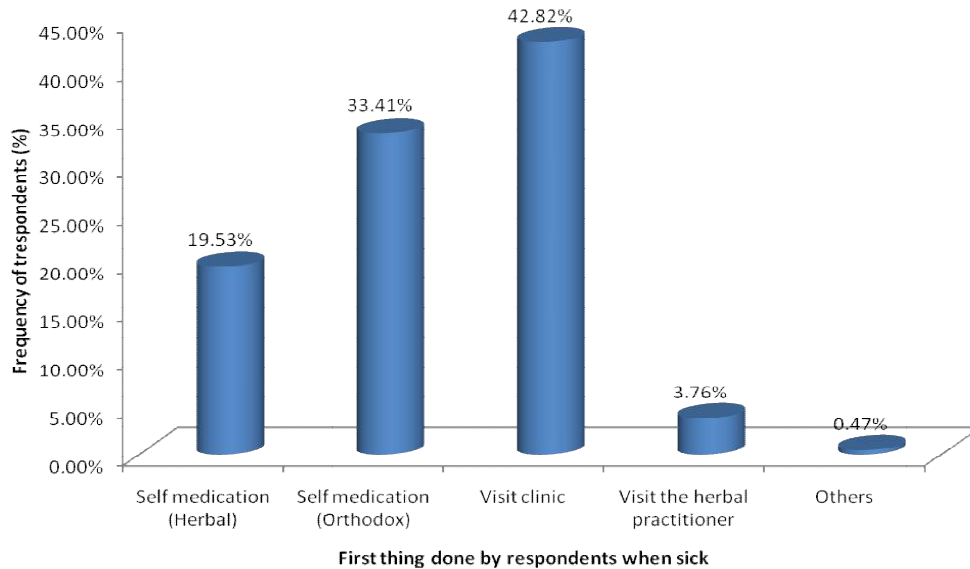
Nearly 90% of the respondents have had the history of herbal medicine (87.4%), with most using it for treating malaria and pile (78.3%). Majority did not indicate their combined orthodox and herbal drugs use except 4.2% who indicated the use of one combination, however, the more often used mode of treatments was mostly orthodox (61.1%) while a total of 38.9% preferred herbal. The respondents were introduced to the use of herbal medicine mostly by family (44.2%) and friends (15.5%) (Table 4). However, 21.1% were recorded practicing concurrent use of orthodox and herbal drugs (Fig. 4).

Reason for the use of herbal medicine among the respondents varied from the purpose of health promotion (25.6%), treatment of disease (25.9%), disease prevention (19.3%), to stress management (9.6%) among others. Majority showed preference to traditional herbal drugs (77.2%) than the foreign ones such as Chinese herbal drug (4.3%), GLND (5.8%) and Forever living product (3.3%) while 26 respondents (9.4%) uses other form of herbal products. Bitter

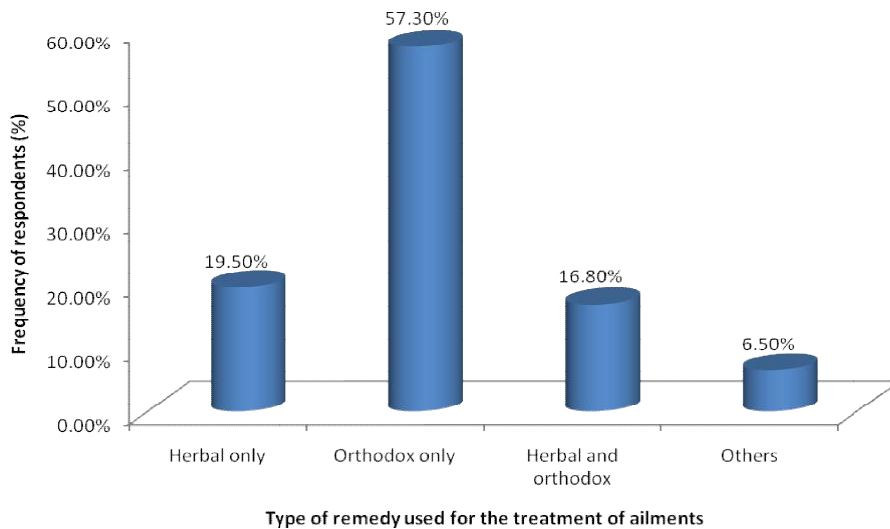
leaf (*Vernonia amygdalina*) is the most commonly natural medicine by the respondents (38.6%), this was followed by Ginger (*Zingiber officinale*) (21.7%), Garlic (*Zingiber officinale*) (18.7%) and *Aloe vera* (8%) among others (Table 5).

preferred orthodox medicines. Reasons for the preference of herbal to orthodox treatments is majorly based on the believe that herbal drugs have no side effects (65.6%) and are easier to take (17.9%) while some preferred it because they don't like going to hospital (13.8%) or they dislike orthodox drugs (0.9%) (Table 6).

A total of 46% of the respondents showed preference for herbal treatments while 54.0%



**Fig. 1. Percentage frequency of respondents with respect to their health seeking behavior (n = 422)**



**Fig. 2. Percentage frequency of respondents with respect to the type of remedy used for treatment of ailments (n = 185)**

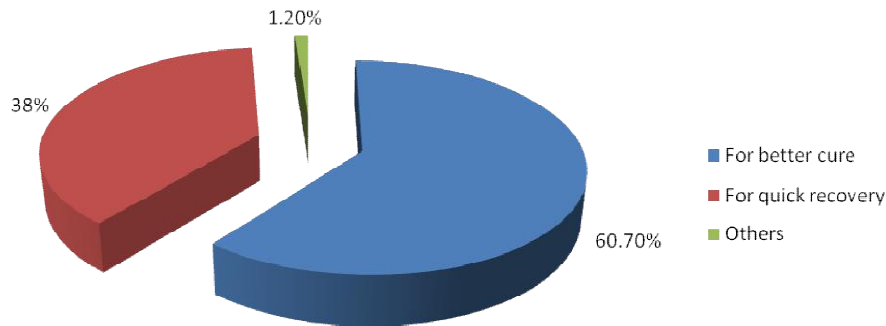


Fig. 3. Reasons for respondents' combined herbal-orthodox drug use (n= 163)

Table 4. Prevalence of use of herbal medicine

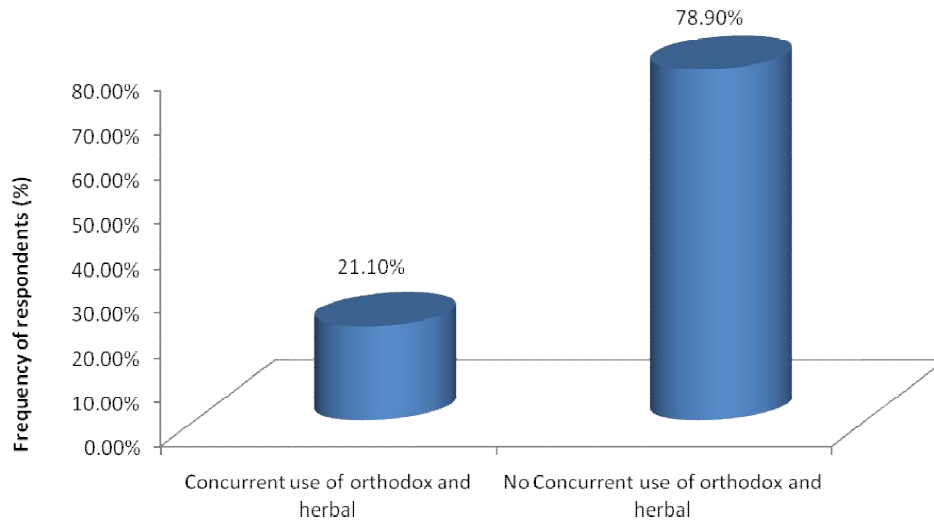
Variables	Frequency	Percentage
<b>History of use of herbal medicine (n = 414)</b>		
Yes	362	87.4
No	52	12.6
<b>Ailments treated with herbal medicine (n=314)</b>		
Malaria and pile	246	78.3
Others	68	21.7
<b>Orthodox and herbal drugs respondents use together (n=425)</b>		
At least one combination	18	4.2
Not indicated	407	95.8
<b>More often used mode of treatments (n=342)</b>		
Herbal	133	38.9
Orthodox	209	61.1
<b>Sources of information on the use of herbal medicines (n=323)</b>		
Friend	66	15.5
Family	188	44.2
Doctor	4	0.9
Herbal practitioners	37	8.7
Pharmacist	4	0.9
Media	24	5.6

In this investigation only 2.5% of the respondents had experienced side effect with the use of herbal drugs but majority (76.7%) believe the possibility of drug interactions between the herbal and orthodox drugs. However, only 40.1% intimate their Doctors of the initial herbal drugs they had taken before drug prescription (Table 7). Those who did not inform their Doctors prior to drug prescriptions mostly claimed it was because Doctors will not approve it (63.20%) (Fig. 5).

#### 4. DISCUSSION

In the recent times, modern and traditional medicine are practiced though independently, and the government allows for that, although not equal weight is given to both [20,21]. The pattern of herbal-orthodox drug use was therefore

investigated among the non-academic staff of University of Lagos, Nigeria. The population studied consisted of people who were guided by similar ethics, norms and belief as observed in their socio-demographic characteristics [22]. The higher proportion of Yoruba ethnic group could be associated with the study setting being south western Nigeria, thus ethnicity is one of the keys to understanding Nigeria's pluralistic society, since it distinguishes groupings of people who for historical reasons have come to be seen as distinctive on the bases of location origins and a series of other cultural markers [23,24,25]. Hypertension and peptic ulcer which were ailments mostly experienced by the population studied has been identified as the most common ailments recorded in developing countries [26,27].



**Fig. 4. Pattern of herbal-orthodox drug use among the respondents (%) (n = 384)**

**Table 5. Utilization of herbal medicine**

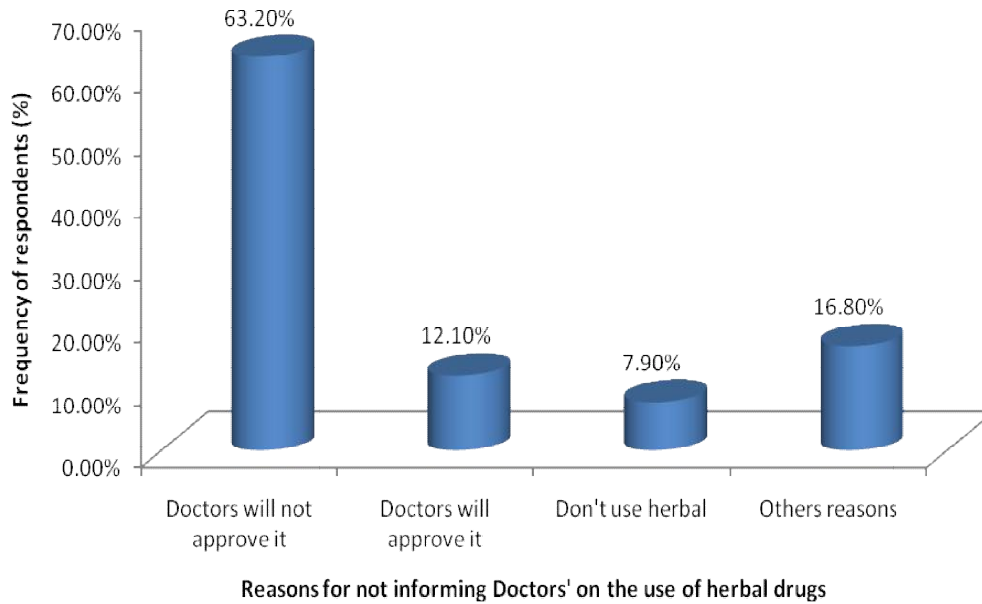
Variables	Frequency	Percent
<b>Ailments mainly treated by herbal medicine (n=301)</b>		
Stress management	29	9.6
Disease prevention	58	19.3
Anti-aging	4	1.3
weight reduction	2	0.7
Health promotion	77	25.6
Disease treatment	76	25.9
Others	55	17.6
<b>Form of herbal products used by respondents (n=276)</b>		
Traditional herbal drugs	213	77.2
Chinese herbal drug	12	4.3
GLND	16	5.8
Forever living product	9	3.3
Others	26	9.4
<b>Type of natural medicine used by respondents (n=337)</b>		
Ginger ( <i>Zingiber officinale</i> )	73	21.7
Garlic ( <i>Allium sativum</i> )	63	18.7
<i>Aloe vera</i>	34	10.1
Bitter leaf ( <i>Vernonia amygdalina</i> )	130	38.6
Others	37	11.0

**Table 6. Determinants of choice of drug use**

Variables	Frequency	Percent
<b>The preferred treatment of ailment (n=350)</b>		
Herbal	161	46.0
Orthodox	189	54.0
<b>Reasons for the preference of herbal drug to orthodox drugs (n=218)</b>		
I believe they have no side effect	143	65.6
I don't like going to hospital	30	13.8
I don't like taking orthodox drugs	2	0.90
Herbal drugs are easier to take	39	17.9
Others	4	1.80

**Table 7. Side effects and interaction with orthodox medications**

Side effects and interaction with orthodox medications	Yes	No	Total
Side effect experienced with herbal drug usage (n=333)	41 (12.3%)	292 (87.7%)	100%
Respondents opinion about possible drug interaction between herbal and orthodox drugs (n=335)	257 (76.7%)	78 (23.3%)	100%
Respondents relating the initial herbal drugs taken to their Doctors before drug prescription (n=314)	126 (40.1%)	188 (59.9%)	100%



**Fig. 5. Reasons respondents did not inform the Doctor's on their use of herbal drugs**

Despite the fact that majority of the participants were well educated, more than half of the population were observed to indulge in self-medication with almost 20% using herbal medicine while some actually visit the herbal practitioners, similar cases of self-medication had earlier been reported [28-30]. Nearly 90% of the respondents had used herbal medicine in treating ailments such as malaria and pile in the past, while herbal was still the preferred choice for almost 40% of the participants. This verified the World Health Organization report cited by Adjei [31] that an approximately 80% of the world's population, 80% of the people in developing countries and 80% of Africans rely on herbal medicine for their primary healthcare. Also, in Ghana, Mali, Nigeria and Zambia, the first line of treatment for 60% of children with high fever resulting from malaria is the use of herbal medicine at home [32,33]. Thus, justifying the claim that traditional medicine has been developed and used to serve humanity on its own, independent of the orthodox one [24].

A total of 42.2% respondents who combined herbal and orthodox medicine in the treatment of their ailments, held on to this practice because of their perceived efficacy of the combination [34]. More so, easy access to over the counter drugs such as paracetamol or panadol and the readily availability of herbal plants are possibly some of the factors that encouraged this practice [35,36]. Aside from the easy access to treatments, the prohibitive cost of western medications makes traditional medicine attractive [34]. Friends, family members and herbal practitioners were the major sources of herbal medicine used as also found in an earlier report [37]. The reasons for use of herbal drugs by the respondents varied from; health promotion, disease treatment and prevention, stress management among others [38,39]. Majority of the respondents had preference for indigenous traditional herbal medicine over the imported ones. This supported the claim that herbal medicine is traditional because it is deeply rooted in a specific socio-cultural context [40,41].



In spite of its acceptability and popularity, traditional medical practice has been challenged on many grounds. This can be deduced from the preference of larger percentage of respondents for orthodox drugs possibly because traditional medicine have not been subjected to scientific verifications, thus, making it difficult to ascertain legitimate and effective therapy [2,42]. Also, perception of nearly 70% of the respondents that herbal medicine has less side effects could possibly arise from incorrect diagnosis, imprecise dosage, low hygiene standards, the secrecy of some healing methods and the absence of written records about the patients [14,43]. Hence, majority of the respondents did not intimate their doctors of their prior use of herbal medication since they were sure that doctors would not approve of such practice [37].

Almost, 80% of respondents in this study were positive that herbal-orthodox drug combination could result in drug interaction. This was affirmed in the review of Awortwe et al. [44] where over 70% adverse drug-herb reactions were reported in 51 studies as caused by the interactions between prescription drugs and herbal remedies. This agreed with the report which stated that herbal therapies may produce adverse effects, cause toxicity, or interact with conventional medicines [14,45]. In addition, many plants are highly toxic and herbal medicine probably presents a greater risk of adverse effects and interactions than any other complementary therapy [46].

## 5. CONCLUSION

This study showed the practice of combined herbal-orthodox drug use among the participants, despite their knowledge of the associated risk. Therefore, there is need to further educate the populace about the health risk of herbal-orthodox drug combination while the health professionals have to proactively enquire and counsel patients regarding the potentials of adverse effect, drug toxicities and drug interaction.

## DISCLAIMER

This paper is based on preliminary dataset. Readers are requested to consider this paper as preliminary research article, as authors wanted to publish the initial data as early as possible. Authors are aware that detailed statistical analysis is required to get a scientifically

established conclusion. Readers are requested to use the conclusion of this paper judiciously as statistical analysis is absent. Authors also recommend detailed statistical analysis for similar future studies.

## CONSENT

Consent of respondents was sought and obtained before the commencement of data collection.

## ETHICAL APPROVAL

Ethical approval was sought and obtained from the University of Lagos ethical committee before the commencement of this study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Elujoba AA, Odeleye OM, Ogunyemi CM. Traditional medical development for medical and dental primary health care delivery system in Africa. *Afri. J Traditional, Complementary and Alternative Medicine*. 2005;2:46-61.
2. Adefolaju T. Traditional and orthodox medical systems in Nigeria: The Imperative of a synthesis. *American Journal of Health Research*. 2014;2(4)118-124. DOI: 10.11648/j.ajhr.20140204.13
3. Rios JL, Recio MC. Medicinal plants and antimicrobial activity. *J. Ethnopharmacol*. 2005;100, 80-81.
4. Barnes J, Anderson LA, Phillipson JD. *Herbal medicines*, 3rd Ed. Pharmaceutical Press, London; 2007.
5. Oreagba IA, Oshikoya KA, Amachree M. Herbal medicine use among urban residents in Lagos, Nigeria. *BMC Complementary and Alternative Medicine*. 2011;11(1):117. Available:<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3252251&tool=pmcentrez&rendertype=abstract>
6. Amira OC, Okubadejo NU. Frequency of complementary and alternative medicine utilization in hypertension patients attending an Urban Tertiary Care Centre in

- Nigeria. BMC Complement Altern Medicine. 2007;(7):30.
7. Pferschy-Wenzig, Eva Maria, Rudolf Bauer. The relevance of pharmacognosy in pharmacological research on herbal medicinal products. *Epilepsy and Behavior*. 2015;52:344–62.
  8. Calixo JB. Efficacy, safety, quality control, marketing and regulatory guideline for herbal medicine. *Braz. J Med. Bio. Res.* 2000;33(2):179-189.
  9. Gureje O, Nortje G, Makanjuola V, Oladeji B, Seedat S, Jenkins R. The role of global traditional and complementary systems of medicine in treating mental health problems. *Lancet Psychiatry*. 2015; 2(2):168-177.
  10. Duru Chukwuma B, Kevin C. Diwe, Kenechi A. Uwakwe, Chioma A. Duru, Irene A. Merenu, Anthony C. Iwu, Uche R. Oluoha, Ikechi Ohanle. Combined orthodox and traditional medicine use among households in Orlu, Imo State, Nigeria: Prevalence and determinants. *World Journal of Preventive Medicine*. 2016;4(1):5-11.  
Available:<http://pubs.sciepub.com/jpm/4/1/2>
  11. Garland SN, Valentine D, Desai K, Li S, Langer C, Evans T, Mao JJ. Complementary and alternative medicine use and benefit finding among cancer patients. *Journal of alternative and complementary medicine (New York, N.Y.)*. 2013;19(11):876–81.  
Available:<http://www.ncbi.nlm.nih.gov/pubmed/23777242>
  12. Misra L. Review: Traditional phytomedicinal systems, scientific validations and current popularity as nutraceuticals. *International Journal of Traditional and Natural Medicines*. 2013; 2(1):27-75.
  13. Adefolaju T. The dynamics and changing structure of traditional healing system in Nigeria. *International Journal of Health Research*. 2011;4(2):99-106.
  14. Zhang J, Wider B, Shang H, Li X, Ernst E. Quality of herbal medicines: Challenges and solutions. *Complementary Therapies in Medicine*. 2012;20(1–2):100–106.
  15. Dama MS, Akhand AP, Rajender S. Nature versus nurture – plant resources in management of male infertility. *Frontiers in Biosciences*. June 1, 2010; E2. 1001-1014, from Endocrinology Division, Central Drug Research Institute, Council of Scientific and Industrial Research, Lucknow, India-226001.
  16. Singh YN. Potential for Interaction of Kava and St John's Wort with Drugs. *J Ethnopharmacol*. 2005;100(1-2):108-13.
  17. Nottidge TE, Akpanudo EI, Akinbami O. Traditional versus Orthodox Fracture Care in Uyo, Nigeria. *Journal of the West African College of Surgeons*. 2011;1(1): 53–67.
  18. Cochran WG. Sampling techniques. Second Ed. New York. John Wiley and Sons Inc.; 1963.
  19. SPSS 20 for windows (SPSS Inc., Chicago). IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.
  20. Adesina SK. Traditional Medical Care in Nigeria; 2007.  
Available:<http://www.onlinenigeria.com/health/?blurb=574>  
[Last accessed on 2018 Feb 03].
  21. Othman C, Farooqui M. Traditional and complementary medicine. *Procedia - Social and Behavioral Sciences*. 2015; 170:262–71.  
Available:<http://www.sciencedirect.com/science/article/pii/S1877042815000518>
  22. Ali-Khan Sarah E, Tomasz Krakowski, Rabia Tahir, Abdallah S. Daar. The use of race, ethnicity and ancestry in human genetic research. *HUGO Journal*. 2011; 5(1–4):47–63.
  23. Oyelakin RT. Yoruba traditional medicine and the challenge of integration. Part of a special issue: Nigeria: The Giant of Africa. 2009;3(3):73–90.
  24. Nur N. Knowledge and behaviours related to herbal remedies: A cross-sectional epidemiological study in adults in Middle Anatolia, Turkey. *Health and Social Care in the Community*. 2010;18(4):389–395.
  25. Rooks RN, Wiltshire JC, Elder K, BeLue R, Garry LC. Health information seeking and use outside of the medical encounter: Is it associated with race and ethnicity?" *Social Science and Medicine*. 2012;74(2):176–84.
  26. Ogbera A, Fasanmade O, Ohwovoriole A. High costs, low awareness and a lack of care— the diabetic foot in Nigeria. *Diabetes Voice*. 2006;51:30–32.

27. Ogbera AO, Chinenye S, Onyekwere A, Fasanmade O. Prognostic indices of diabetes mortality, Ethnicity & Disease; 2007;17:Autumn.
28. Lennox PH, Henderson CL. Herbal medicine use is frequent in ambulatory surgery patients in Vancouver Canada. Canadian Journal of Anesthesia. 2003; 50(1):21–25.
29. Omolase CO, Adeleke OE, Afolabi AO, Afolabi OT. Self-medication amongst general outpatients in a Nigerian Community hospital. Annals of Ibadan Postgraduate Medicine. 2007;5(2).
30. Eichhorn T, A Greten HJ, Efferth T. Self-medication with nutritional supplements and herbal over-the-counter products. Nat. Prod. Bioprospect. 2011;1:62–70.
31. Adjei B. Utilization of traditional herbal medicine and its role in health care delivery In Ghana: The case of Wassa Amenfi West District. A Master of Philosophy Thesis submitted to the Department of Geography and Rural Development, Kwame Nkrumah University of Science and Technology, Ghana. 2013. Available:<http://ir.knust.edu.gh/bitstream/123456789/5332/1/Bright%20Adjei%20B.A.%20%28Hons.%29.pdf> (Last accessed: 26/11/2018)
32. WHO. Promoting the Role of Traditional Medicine in Health System: A Strategy for the African Region. World Health Organization Regional Office for Africa; 2001.
33. Singh S, Singh R. Herbal medicinal treatment of malaria in Aliero Local Government Area, Kebbi, Nigeria. Journal of Medicinal Plants Studies. 2014;2(2):117 – 126.
34. Deng S, May BH, Zhang AL, Lu C, Xue CCL. Topical herbal medicine combined with pharmacotherapy for psoriasis: A systematic review and meta-analysis. Archives of Dermatological Research. 2013;305(3):179–89.
35. Moody JO. Traditional medicine. Paper Delivered at the Mandatory Continuing Professional Development (MCPD) Programme, Module V, Faculty Pharmacy, University of Ibadan; Nov. 21-22. 2007;1-6.
36. Osemene KP, Ilori MO, Elujoba AA. Generation and acceptability of herbal medicine research and development outputs in Nigeria. Res. J. Pharm. Technol. 2011;4:121-130.
37. Behice Erci. Medical Herbalism and Frequency of Use, A Compendium of Essays on Alternative Therapy, Dr. Arup Bhattacharya (Ed.); 2012. ISBN: 978-953-307-863-2, InTech, Available:<http://www.intechopen.com/books/a-compendium-of-essays-on-alternative-therapy/medical-herbalism-and-frequency-of-use>
38. Katz DL, Ali A. Integrating complementary & alternative practices into conventional care. In Putting Patients First: Designing and Practicing Patient-Centered Care, 2008 edited by S. B. Frampton and P. A. Charmel. San Francisco, CA: Jossey-Bass Publishers, Inc.
39. Kim HG, Oh MS. Herbal medicines for the prevention and treatment of alzheimer's disease. Curr Pharm Des. 2012;18(1):57–75.
40. Rukangira Ernest. The African herbal industry: Constraints and challenges. Paper presented at; The natural Products and Cosmeceuticals 2001 conference. Published in Erboristeria Domani., CA126/04/04.
41. Sen, Saikat, Raja Chakraborty, and Biplab De. Challenges and opportunities in the advancement of herbal medicine: India's position and role in a global context. Journal of Herbal Medicine. 2011;1(3–4): 67–75.
42. Atindanbila Samuel, Chalmer E. Thompson. The role of African traditional healers in the management of mental challenges in Africa. Journal of Emerging Trends in Educational Research and Policy Studies (JETERAPS). 2011;2(6): 457-464.
43. Akinleye OB. Plants and their products: Natural wealth for better economic and primary health care delivery in Nigeria. Prof. E. K. Obiakor Lecture Series. The Federal Polytechnic, Ado-Ekiti; 2008.
44. Awortwe C, Makiwane M, Reuter H, Muller C, Louw J, Rosenkranz B. Critical evaluation of causality assessment of herb-drug interactions in Patients British Journal of Clinical Pharmacology. Published online January 24, 2018.
45. Nicholson T. Complementary and alternative medicines (including traditional

- Maori treatments) used by presenters to an emergency department in New Zealand: A survey of prevalence and toxicity. Journal of the New Zealand Medical Association. 2006;119:1233.
46. Herbal Medicine. Facts and Statistics, Importance of Herbal Medicine; 2013. Available:<http://www.herbtreatment.com/importance-of-herbal-medicine/page1.html> (Last accessed: 27/06/2018)

---

© 2018 Akanmu and Odeyemi; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://www.sciencedomain.org/review-history/28117>