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A Comparative Assessment of Herbal and Orthodox Medicines in Nigeria

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Abstract: This study assessed attributes of herbal and orthodox medicines such as affordability, packaging, availability, efficacy, safety, side-effects and level of advertisement in print and electronic media which were hitherto neglected. Structured questionnaires and interview schedule were the instruments used to elicit information from 300 herbal and orthodox medicine consumers selected from six geo-political zones in Nigeria through a purposive and convenient sampling method. Data were analyzed with appropriate descriptive and inferential statistics. Results showed that the respondents rated herbal medicines higher than orthodox medicines in terms of safety and the degree of advertisement. Other parameters were rated higher for orthodox medicines. The mean values of all parameters were significant at $p \leq 0.05$. Also only 41% of the respondents took herbal medicines as their first drug of choice. This is contrary to the widely held view in literature that >80% of the population in developing countries takes only herbal medicines.

Key words: Assessment, herbal and orthodox medicines, Sahara, remedies, plant, Nigeria

INTRODUCTION

In Nigeria, South of the Sahara, two distinct types of medicines are known and extensively used namely, herbal and orthodox medicines. The former is defined as drugs made from herbs or plants and can be said to possess several synonyms all of which refer to plants as the raw materials for medicine namely: phytomedicines, plant medicines, green medicines, traditional medicine potions, traditional remedies, plant drugs and forest health products among others (Elujoba, 1998). The World Health Organization (WHO, 1996) also defined herbal medicine as finished labeled medicinal products that contain as active ingredients aerial or underground parts of plants or other plant materials or combinations thereof whether in the crude state or as plant preparations. Plant materials include juices, gums, fatty oils and any other substances of this nature. Herbal medicine may contain standard excipients in addition to the active ingredients. Medicines containing plant material combined with chemically defined active substances including chemically defined isolated constituents of plants are not considered to be herbal medicine. Exceptionally, in some countries herbal medicine may also contain by tradition, natural organic or inorganic active ingredients which are not of plant origin (WHO, 1996). Orthodox medicines may be defined as any substance of vegetable, animal or mineral origin or any preparation or admixture thereof or chemical compounds which are used for internal or external application to the human body in the treatment of disease. Herbal medicines remain part of the history of the people despite the fact that orthodox medicines which came with civilization, appear to have occupied the centre stage in the treatment of diseases states especially in modern medical practice. Meanwhile, the present unprecedented global upsurge of interest in herbal medicine is perhaps a measure of a more realistic perception of the limitations of orthodox medicines in terms of cost, accessibility, effectiveness and safety (Moody, 2007). Even in developed countries, resurgence of interest in herbal medicine has been due to the preference of many consumers for products of natural origin (Wambebe, 1998). Again there is this widely held view that over 80% of people in developing countries use herbal medicines as their first line of choice in the treatment of diseases (Moody, 2007). In Nigeria, medical practitioners especially Physicians still have some reservations prescribing herbal medicines for their patients (Pharmanews, 2010).

Unlike orthodox medicines, herbal medicine in the African setting is generally employed to remedy disrupted physiological processes in order to restore homoeostasis rather than meet disease head on. By enhancing the body's own healing mechanisms, disease may be eliminated in a process that is usually slow, requiring the patients to be very patient. Herbal medicines are by far

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less concentrated, less toxic and are used in much lower doses than orthodox medicine which in its concentrated drug formulations are designed to target and reverse specific pathologies in the minimum of time (Ohuabunwa, 1998; Moody, 2007). The plants used in herbal medicine carry their own in-built safety mechanisms. Furthermore, they are ideal tools to restore damaged physiological processes since, they consist of a multiplicity of chemical components which act synergistically to make active constituents bio available or to buffer the otherwise potentially powerful active principles thus preventing harmful side effects (Moody, 2007). However, Adisa and Fakeye (2006) posited that efficacy of most herbal medicines were due to the presence of orthodox medicines as adulterants in herbal mixtures.

Orthodox medicines refer to the knowledge, practices, organization and social roles of medicine in westernized cultures (Good *et al*., 1979). Disease is viewed as a physical or mechanical disorder with little relationship to a person's psychological, social and spiritual afflictions. Treatment usually involves reacting to and suppressing symptoms rather than encouraging self-healing or disease prevention (Thomas, 2002). Orthodox medicine is an outgrowth of scientific inquiry and the technological revolution with its test tubes, use of laboratory-synthesized chemicals and high-tech diagnostic equipments (Pharmanews, 2006). Meanwhile, the assessment of attributes of herbal and orthodox medicines in academic discourse had over the years revolved around the weather-beaten paths of regulation and standardization with emphasis on quality assessment based on certain quality assurance parameters of quality itself, safety and efficacy without recourse to obtaining first hand information from their users about certain salient but common physical attributes such as level of acceptability, packaging, cost (affordability), availability, level of advertisement in print and electronic media, among others.

This study therefore, is designed to undertake such assessment based on the above-mentioned physical parameters for herbal and orthodox medicines from the perception and attitudes of their consumers. This is important because it has been established elsewhere that the degree of generation, commercialization and acceptability of herbal and orthodox medicines were influenced by the attitudes and perceptions of their consumers (Osemene *et al*., 2011).

Literature review: Herbal medicine has its root in prehistory making every bit as ancient tradition as farming or cooking. In the Graeco-Roman era, Hippocrates (father of medicine), Theophrastus (father of botany), Galen (originator of pharmaceutical galenicals) and Dioscoroides were all herbalists (Moody, 2007). Also about one-quarter of the prescription drugs dispensed by community pharmacy in the United States contain at least one active ingredient derived from plants (Farnsworth and Morries, 1976). Also in Nigeria, around 205 medicinal plant species are endemic in nature in the Northern, Western, Central and Eastern zones of the country (FEPA, 1992). Beyond the problem of trying to test herbal preparations that may contain active ingredients is the question of whether the research eventually will lead to the isolation of single active ingredient that can be packaged and sold separately. Intense debate surrounds the issue of how to conduct clinical trials of herbal medicine according to western pharmaceutical clinical standards. Critics say there is an inherent problem with the single active ingredient approach preferred by pharmaceutical companies that are actively involved in herbal medicine research. It is argued that isolating a single compound may not be the most appropriate approach in situations where a plant's activity decreases on further fractionation (separation of active ingredients by using solvents) or where the plants contain two or three active ingredients that must be taken together to produce the full effect (Chaudhurry, 1992). Beckstrom-Sternber and Duke (1994) have documented several cases where synergy has been lost by using the single ingredient approach to developing drugs from plants. Other notable problems associated with herbal medicines include but not limited to how to conduct clinical trials of herbal medicine according to western pharmaceutical clinical standards, issue of dosage specifications, prominent doubts about herbal preparations such as lack of proof of their efficacy, safety, proper packaging problems, appropriateness of their degree or level of hygiene, cost of production and their level of acceptability especially among the elites in the healthcare team who continues to prescribe only orthodox medicines in hospitals and clinics (Pharmanews, 2010).

Nevertheless, the public pay high prices for orthodox medicines because the cost for experimental techniques through research and development (R and D) is enormous. Another common perception is that orthodox medicine which is scientifically based is more reliable, safer and more effective. This notion may be wrong because drugs once thought to be safe are often withdrawn from the market for causing severe side effects and even fatalities. The thalidomide fiasco of the 1950s and 60s was a tragic example when hundreds of women given thalidomide for early morning sickness gave birth to deformed babies. Again, antibiotics which created false hope that modern medical science could eradicate diseases caused by bacteria, ended up killing bacteria that are beneficial to human body thereby reduces the body's resistance to harmful bacteria (Bradstreet, 1998). Recently in Nigeria, the National Agency for Food Drug Administration and Control (NAFDAC) banned the use of Novalgin (a potent analgesic and an antipyretic agent)

because of its severe side effects that led to the death of children. Although, the history of orthodox medicine traces its root back to Hippocrates, the father of medicine, the practice of orthodox medicine today is not strictly in line with the principles of the fathers of medicine (Rees and Shuter, 1996). Orthodox medicine began over a century ago during the period of Renaissance. As at then the objective thinking of the causative theory of modern science replaced the ecological model which had predominated for over 2000 years (Bhikha, 2004). The new paradigm is often termed the Cartesian model being named after the French philosopher, Rene Descartes (1596-1650). This model, it was claimed, invalidated the humoral concepts of the holistic principles of Hippocrates. Galen and Ibn Sina promoted the ideology that man was separate from nature could be viewed objectively through experiment (Boussel *et al*., 1982). This heralded the birth of scientific or orthodox medicine. The frontiers of orthodox medicine were further broadened by Rudolph Virdow (1821-1902) who demonstrated that disease begins with changes in living cells and by Louis Pasteur (1822-1895) whose role in the development of the germ theory of infection was of key importance (Rees and Shuter, 1996; Gilbert *et al*., 1998, Bhikha and Haq, 2000). Under the germ theory, disease was associated with specific micro-organisms. Since, then technology through research and development (R and D) had played tremendous roles in the propagation of orthodox medicine which is scientifically based and evolve along certain specifications or routes. These routes led to the manifestations of plethora of specialists in disorders of specific organs, tissue and cells such as cardiologists, dermatologists and neurologists among others. Hence, it has been advocated that patients should be regarded as collections of separate body parts and organ systems (Thomas, 2002). Generally, the philosophy of orthodox medicine is exclusively based on the physical world and excludes any explanation that goes beyond this (Hammond-Tooke, 1989; Gilbert *et al*., 1998). For instance, health and illness are seen as a relationship between the body's components and sub-structure while the mind is considered independent of the body. The causes of disease are therefore, scientific and presented in terms of such concepts as chemical imbalance, virus replication, serum level overload and so on (Bhikha, 2004).

Technology based scientific research in herbal medicine perhaps has made some significant impact in addressing some prominent doubts about herbal preparations such as packaging problems, level of hygiene and dosage regimen. Presently, most herbal medicines sold in Nigeria come with well specified dosage regimen, packed in pharmaceutically approved forms such as ointments, creams, tablets, capsules and coloured but flavoured syrups (Sampson, 1995). However, unlike orthodox medicines, no inject able form of herbal medicine is available in Nigeria. Furthermore, there has been marked improvement in the packaging of most herbal medicines. Also the rate of advertisement of herbal medicines in both the print and electronic media is high and unrestricted unlike for orthodox medicines where only some Over The Counter (OTC) drugs are advertised especially if they are listed or registered by National Agency for Food and Drug Administration and Control (NAFDAC).

MATERIALS AND METHODS

The study covered the six geopolitical zones in Nigeria. These six geographical zones were North West, North Central, North East, South West, South East and South-South. Sixty respondents were drawn from each of the six geopolitical zones which gave a total of three hundred and sixty respondents. However, sixty questionnaires were not properly filled and therefore, not used for analysis. Hence, a total of three hundred herbal and orthodox medicine consumers were finally selected for the study through a purposive and convenience sampling process. Furthermore with the aid of six research assistance each from the six geopolitical zones, questionnaires were administered to the respondents whose opinions were sort on the attributes of herbal and orthodox medicines based on certain parameters such as affordability, availability, packaging, level of advertisement, safety, efficacy and side effects on a 5 point Likert scale. This was backed by oral interview. Structured questionnaires were the main instrument used to collect information from the respondents. The questionnaires had two components: Classification questions and questions on core issues. The questions covering the implicated variables were structured, scaled and mostly close ended and presented in multiple choice forms. The choice of any particular type of question was based on its appropriateness and power to elicit precise response to questions. The classification questions assisted in classifying the respondents by age, sex, marital status, tribe, geopolitical zones, religion, qualification, income among others for the purpose of analysis. The questions on core issues had to do with the respondent's perception of the attributes of herbal and orthodox medicines based on the hitherto mentioned parameters. Questions were also raised on whether the respondents did take herbal medications alongside orthodox medicines at one time or the other. All research instruments namely, questionnaires and interview schedules were pre-tested in four of the six geopolitical zones. The results of the pre-tested questionnaires were used to make necessary modifications and corrections on the questionnaires and interview guides. A reliability coefficient of 0.83 was calculated using test-retest method for reliability. Data were analyzed using descriptive statistics such as frequency, percentages and mean.

While t-test statistics which is an inferential statistical tool was employed to test whether there were any significant differences between the means of the variables that were used to do a comparative assessment of some of the attributes of herbal and orthodox medicines at 5 and 10% levels of significance.

RESULTS AND DISCUSSION

Response analysis: The overall response rate for questionnaire administered to herbal and orthodox medicine consumers was approximately 83% (Table 1). The southern geopolitical zones had the largest number of respondents. The exploration of the six geopolitical zones was informed by the notion that around 205 medicinal plant species are endemic in nature in the Northern, Western, Central and Eastern zones of the country (FEPA, 1992). Since, this had been proven to be true, it is therefore, a matter of necessity to comprehensively explore the entire six geopolitical zones in the country because it is natural that in that kind of setting, a sizable number of people would have been taking drugs from medicinal plants granted that the exposure to orthodox medicines by the same inhabitants exist too. The larger number of respondents obtained from the Southern geopolitical zones may be due to their level of awareness which was indeed very high as discovered from the interaction with the respondents during the oral interview section. The socio-demographic characteristics of herbal and orthodox medicines consumers showed that out of the 300 respondents, majority (64%) were females while the remaining (36%) were males. About 14 and 20% were in the age ranges of 21-30 and 31-40 years, respectively.

Majority (25%) of them were in the age range of 41-50 years while about 23% fell between the age brackets of 51-60 years. Only about 19% were above the age of 60 years. Most (56%) of the respondents were married while only (11%) were single. In addition, 25% were divorced from previous marriages while 7% were separated. Majority (42%) lived in the rural areas while 39% lived in sub-rural areas. Only 19% lived in the urban centres. About 28% of the respondents were Moslems while 60% were Christians. Only 12% were traditionalists. Most (44%) of the respondents were Yorubas while 34% were Ibos. Only 23% were Hausas. Majorities (54%) of the respondents were farmers and about 19% were traders. Only 8% and about 19% were either in the managerial cadre or professionals in various fields, respectively. About 46% of the respondents earned a monthly income of above $330 while about (7%) earned the least monthly income of between $7-60. The rest (46%) earned about $67-330 monthly. The respondents had different educational backgrounds. About 60% had post secondary education, 8% primary school, 10% secondary school and 23% had non-formal education (Table 2). The

Table 1: Questionnaire response analysis

Geopolitical zones in Nigeria	No. of questionnaire administered	No. of responses (%)
North West	60	46 (76.67)
North East	60	48 (80.00)
North Central	60	49 (81.67)
South West	60	55 (91.67)
South East	60	50 (83.33)
South South	60	52 (86.67)
Total	360	300 (83.33)

Field survey (2010)

Table 2: Characteristic distribution of respondents

Characteristics	No. of respondents	Percentage of respondents
Geographical location		
Urban	58	19.30
Sub-urban	177	39.00
Rural	125	41.70
Total	300	100.00
Gender		
Male	108	36.00
Female	192	64.00
Total	300	100.00
Age (years)		
21-30	43	14.30
31-40	59	19.70
41-50	74	24.70
51-60	68	22.70
Above 60	56	18.60
Total	300	100.00
Marital status		
Single	32	10.70
Married	167	55.70
Separated	26	8.60
Divorced	75	25.00
Total	300	100.00
Religion		
Christianity	181	60.3
Islam	83	27.7
Traditional	36	12.0
Total	300	100.00
Ethnicity		
Yourba	131	43.60
Igbo	101	33.70
Hausa	68	22.70
Total	300	100.00
Occupation		
Farming	162	54.00
Trading	58	19.30
Managerial	24	8.00
Professional	56	18.70
Total	300	100.00
Education		
Non-formal	68	22.70
Primary	24	8.00
Secondary	29	9.60
Post Secondary	179	59.70
Total	300	100.00
Income level (per month in Naira)		
1000-9000	20	6.67
10,000-19,000	44	14.67
20,000-29,000	26	8.67
30,000-39,000	31	10.33
40,000-49,000	42	14.00
Above 50,000	137	45.67
Total	300	100.00

Field survey (2010)

Table 3: Respondents' assessment of some attributes of herbal and orthodox medicines

	Orthodox medicine						Herbal medicine					
Variables	Very low (1)	Low (2)	Fairly high (3)	High (4)	Very high (5)	Mean	Very low (1)	Low (2)	Fairly high (3)	High (4)	Very high (5)	Mean
Affordability	22	13	27	49	189	s4.23	89	47	44	59	61	2.85
Packaging	45	17	31	49	179	4.21	64	40	41	49	100	3.28
Availability	33	33	24	55	155	3.89	109	28	31	37	48	2.15
Efficacy	31	26	32	39	168	3.92	121	27	32	44	51	2.34
Side effects	22	33	43	52	139	3.72	194	78	41	36	31	2.57
Safety	55	52	67	61	93	3.38	37	39	53	62	109	3.56
Level of advertising campaign in print and electronic media	90	69	59	47	35	2.56	30	42	47	65	87	3.17

Field survey (2010)

comparative assessment of the attributes of herbal and orthodox medicines by their consumers based on hitherto listed criteria is shown in Table 3. The respondents rated the attributes of herbal and orthodox medicine on a 5 point Likert scale based on the mean scores obtained for each of the following variables namely, for orthodox medicines, safety (3.38), affordability (4.23), packaging (4.21), side effects (3.72), efficacy (3.92) availability (3.89) and degree of advertisement (2.56). And for herbal medicines, respondents rated these attributes as follows namely safety (3.56), affordability (2.85), packaging (3.28), side effects (2.57), efficacy (2.34) availability (2.15) and degree of advertisement (3.17). From this finding, respondents believed that herbal drugs were safer, relatively affordable, less available and less efficacious with minimal side effects when compared to orthodox medicines. Also packaging was rated very high (3.28) by the respondents for herbal medicines when compared with orthodox medicines with a rating of (4.21) on a 5 point Likert scale. This result has further re-enforced the assertion that technology-based scientific research had indeed improved the packaging, the level of hygiene and dosage regimen of herbal medicines which comes in different dosage forms such as tablets, capsules, coloured and flavoured syrups (Sampson, 1995). Also the rate of advertisement of herbal medicines (3.17) in both the print and electronic media was rated higher than the rate of advertisement for orthodox medicines (2.56). In Nigeria, there is no restriction to the extent of advertisement for herbal medicines unlike orthodox medicines where only some Over The Counter (OTC) drugs are permitted by law, to be advertised. Hence, proprietors of herbal medicines seem to be having a field day in this regard.

The statistical paired sample test for differences in the means of attributes of orthodox and herbal medicines showed that the means were significant at $p \leq 0.05$ and therefore, not due to chance with a t-value of 2.646 which was greater than the tabulated t-value of 1.96 (Table 4). In addition, most manufacturers of herbal medicines usually

Table 4: Paired sample test for differences in means of attributes of herbal and orthodox medicines

Paired difference	t	df	Sig. (2 tailed)
Confidence interval of the difference 95%			
0.07036	2.646	6	0.038
1.79821	-	-	-

Table 5: Type of medication used by the respondents when ill

Medication type used	No of respondents	Response (%)
Herbal medicine	30	10
Orthodox medicine	177	59
Herbal and orthodox medicine	93	31
Total	300	100

Field survey (2010)

make bogus claims on the therapeutic capabilities or competences of herbal preparations with respect to the range of disease conditions that they could handle. Nevertheless, past studies revealed that many patients who had used herbal medicines with good therapeutic outcomes later discovered that the benefits were actually due to the presence of other orthodox medicines that were adulterants in the herbal preparations hitherto taken (Adisa and Fakeye, 2006). The limited knowledge of most herbal medicine consumers on the pharmacology of drugs as it relates to safety, efficacy, drug-drug interactions among others could pose a great challenge in evaluating drug performance. It has also been argued elsewhere that even conventional healthcare providers in Nigeria have shallow knowledge of the pharmacology of most herbal medicines available in the country (Adisa and Fakeye, 2006). However, on oral interview, some herbal medicine consumers agreed that they actually took herbal medicines alongside orthodox medicines (Table 5). This could also pose a great challenge in assessing the performance of these medicines. In this regard, the implicated performance parameters are safety, efficacy and side effects. Therefore, since, the study has been able to establish that 93 (31%) of the respondents co-administered orthodox and herbal medicines when ill, it becomes difficult to affirm with utmost certainty which one of the two types of medicines was responsible for whatever action or which one of them performed better in terms of the above mentioned performance parameters.

CONCLUSION

In Nigeria, herbal and orthodox medicines are sometimes used interchangeably and concomitantly for treating same diseases. Hence, some attributes of the two types of medicines such as efficacy, safety and side effects in this case cannot be practically isolated and analyzed in order to arrive at objective deduction. Nevertheless, herbal medicines have acquired some degree of sophistication sequel to innovations through modern technology especially in packaging and dosage forms. However, results showed that only 41% of the respondents went for herbal medicines as first choice medication for cure. This is contrary to the widely held view in literature that >80% of the population of in a developing country takes only herbal medicines to cure ailments.

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