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The Contributions of Information Management in Promoting Indigenous Medicine Use to Enhance Public Healthcare Systems

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ABSTRACT This paper debates the contributions of an efficient information management in promoting the use of indigenous plants and ethnomedicinal treatment that is capable of preventing diseases as alternative ways to improve public healthcare systems deliveries. Africa is rich in ethnopharmacological products, but lack of clinical information on its effectiveness, dosage, and success rate in treatments is hindering its use to promote public healthcare deliveries. There are products for curing diabetes, blood poising, malaria, bacteria and fungi infections but these products are not known to most people because of lack of sufficient information dissemination of the products. The paper used bibliometrics survey techniques, observation through interactions with vendors, and uses of medicinal plants to gather data. Findings showed increase in academic publications of uses of indigenous plants, but this information is not available to most people. There is no accessible information to establish herbal products quality and efficacies of the products and most vendors do not have sufficient information to educate the users. Some orthodox health workers are willing to provide information on the use of herbal products with conventional medical treatments. The challenges identified include the following: Lack of regulatory body to inspect and test the efficacies of the products, information on dosage administration is not available. There is lack of access to information on products and ailment classification, no online sources to get clinical trial data and information on products success rate is not available to the public. The paper recommends that government must provide screening facilities to eliminate pathogens and toxic substances in plants, and help in publishing information on products that are effective and safe for use.

INTRODUCTION

Healthcare deliveries in African continent have been under tremendous pressure for people to get access to quality healthcare services and treatments that enhance and improve their quality of life. Ethno-pharmacological uses of various plants and herbs have been studied in Nigeria and South Africa (Attah et al. 2016). The term "ethnopharmacology" in this paper refers to the use of local sources of indigenous plants and herbs that is commonly used as sources of treatment of illnesses and/or as being used as an antiseptic for treating wounds. In various ethnic communities, plants are often used to treat wide range of illnesses. Plants and herbs are useful for curing a stomach ache, food poisoning, skin diseases, and sexual health and fertility problems are amongst 122 treatments examined in South Africa by Williams and Whiting (2016). Efficacies of indigenous herbal treatment through ethnomedicinal method have been documented as antibacterial treatments in Nigeria (Ogbole et al. 2018) and as a preventive antidote for fungi infections in babies' respiratory tracts (Etim et al. 2016). Medicinal plants such as "Oruwo - Morinda lucida", "Ahun – Alstonia boonei", and most popular in the Yoruba land of western Nigeria for treating malaria "Dongoyaro – Azadirachta indica" have potent properties for treating malaria (Asnake et al. 2016; Emmanuel et al. 2016; Odugbemi et al. 2007). However, information about these plants and its usefulness are not known to the public across the continent. Furthermore, there are other medicinal plants that have been screened for its antioxidant activities and potential disease management (Nwidu et al. 2016). One of the reasons the plants must be

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screened is to eliminate toxic substances and separate potent remedies that may be used for treatment, as well as to provide clinical information and displaying possible side effects for different categories of people such as infants, aged and pregnant users. Medicinal plants have shown significant potencies in the treatment of various diseases and illnesses such as respiratory and blood infections. Indigenous plants and herbs are useful and have been reported efficacious for preventive and curative purposes such as preventing diarrhoea (de Wet et al. 2010; Semenya and Maroyi 2012), antimalarial drugs (Odugbemi et al. 2007) and treat sexually transmitted infections (de wet et al. 2012), respiratory infections (York et al. 2011), treatment of skin disorder and hypertension (de Wet et al. 2013; de Wet et al. 2016). Despite the potential successful use of these medicinal plants, lack of information on the treatment potentials and side effects are not readily available to ordinary consumers. It was stated that there is insufficient information and under-reporting of uses of indigenous and medicinal herbs in Africa (Asowata-Ayodele et al. 2016) for various uses and this lack of information is counterproductive for full appreciation of African rich biodiversity. Lack of information implies that African communities where these plants are found may not be able to own or claim the intellectual properties of these potent alternative medicines for treatments for primary healthcare. However, registering and providing information on the owners of the intellectual properties allows the host communities and government to receive recognition of their products, and breakthrough emanating from the plants uses as well as perpetual royalties for the products ingenuity.

Problem Statement

The quantity and quality of public information on organic herbs and medicinal plants as means of improving public healthcare system is essential as the majority of people prefers this means of public health remedy. Although some people believe that ethnomedicine is effective in the treatment of diseases, one of the problems remains constant lack of information on how some of the products are processed, and procedure of treatments, dosage, treatment duration, side effects and clinical trials information for the public. Even though people attached huge significance to the ethnomedicine as an alternative way to combat epidemic phenomenon attacking human health in the recent years, but lack of information on facilities to screen products being sold to users remain a problem. In the past, societies applaud our forefather's fitness vis-à-vis this modern era adolescent psychosomatic or mental agility of an adolescent which seemed could not withstand strenuous environment for a long period. However, some plants are useful for maintaining vigour and treating lack of concentration and shallow thinking which may be the inability of the students to study for an extended period, because interactions between human mind and body are not synchronised. Accreditation of alternative primary healthcare givers and the potencies of their medicine have not been well established or catalogued. There is still lack of nexus between traditional and scientific approaches for testing herbal treatments and potencies of traditional plants that exist within most African communities and inaccessible dosage administration information is one of the hurdles that must be eliminated. Furthermore, it appears there is a lack of regulatory framework to guide how information on plants that are used for treatments are packaged as most traditional medicines being sold across the streets are not labelled, and information provided by the vendors have not be verified by any institutions or agencies.

However, the lack of information dissemination is one of the significant challenges inhibiting acceptance and use of ethnomedicine by the majority of the educated public in Nigeria and South Africa. Acceptance and use of ethnomedicine as an alternative source of treatment have not been promoted, yet people need clinical information. As it was reported that "traditional medicine clinical" information must be regularly updated (Mahomoodally et al. 2016: 20) as the quality of information provided may influence the behaviour of users and patient. "There is usually a lack of dosage instructions to guide patients to avoid toxicity" (Mahomoodally et al. 2016: 20). Hence, appropriate, well-packaged information must be debated as one of the potential barriers to the success of ethnomedicinal uses. It was established that doctors and nurses that recommended traditional medical treatments to their patients "expressed a need to have access to more information and for patients to seek medical advice before trying alternative therapy" (Mahomoodally et al. 2016: 21), but the information must be simply packaged in such a way that it is easy for the people to understand its usefulness (Kang'ethe and Ajibade 2016). However, there is still limited information on diseases and credibly documented information on available traditional treatments. Also, to

substantiate the need for accessible information, a study carried out in Rwanda pointed out that, "there is a lack of epidemiological information on Type 1 diabetes (T1DM) in Africa" (Marshall et al. 2016: 2). It is against this background that this paper attempted to advocate improved ways of managing relevant information on local plants and herbs as a panacea to improve public perceptions towards the efficacies of the natural methods of health-related treatment deliveries.

METHODOLOGY

The paper carried out a bibliometrics survey which is an analysis of some publications on a subject to uncover information governance patterns and trends of publications, in this case on ethnomedicine and natural herbs as preventive and curative treatments strategies. The justification for using bibliometrics technique was the ability to review collections of relevant articles that have been published and aggregated on various databases on the subject of interest. The paper used five information retrieval techniques to filter and delineate the total recall and precision ratio of relevant results on scholarly articles indexed on multiple scholarly databases. Since the limitation of using a single database is that, other articles and sources that is not indexed in their databases will not be retrieved, and this will present biases as this will constitute data sampling exclusion criteria. However, the Google scholar cannot be classified as a single database, since it is a metadata crawler/software capabilities to aggregate and retrieve information from various scholarly databases such as journals and books publishers, as well as universities repositories indexes and platforms that are linked to the internet such as; e-print, digital commons and other institutions that use DSpace software to host their work. The retrieval software also returns searches on the established journal publishers hosting services databases of Scopus, Highwire, Press, and MetaPress. Furthermore, it contained contents and articles aggregators that host journal on their e-platform; JSTOR, ScieELO and other scholarly web interfaces such as Open Journal Systems.

OBSERVATIONS AND DISCUSSION

Public Health Contribution

Some authorities are responsible for public health and their ability to guarantee quality assurance can unprecedentedly sway the ethnomedicine sceptics to reconsider stance on the usefulness and acceptance of natural herbs as effective alternative treatments. Thus, it is essential to propagate an improved information packaging and dissemination channels on the efficacy and the use of traditional herbs which may improve patient behaviour towards the use of herbal medicines to curb HIV prevalence (Friend-du Preez et al. 2015; Kang'ethe and Ajibade 2016). It is imperative to gain public confidence, but this can be improved if herbal products standardisation can be achieved as a sign of quality assurance. This will entail that product sampling and quality control mechanism be established, and subsequent trials are conducted on patients and the medicine after that, products should be issued with a certificate of potency based on the merit of the experimental results. For example, in South Africa with a high rate of HIV infections and other diseases such as malaria and yellow fever in other parts of the continent, there are assumptions that potent herbal remedies might be available to cure some of these illnesses such as announced in Nigeria by "Dr Abalaka's" claim on HIV cure. Yet, there were no procedures to investigate the claims or published information to validate the veracity of the claim or information provided. There is lack of institutionalising procedure and information governance to connect the "ethnic-centric" locally sourced natural remedies and medication with patients that may need such herbal treatments. However, those who might want to use this alternative therapy, or natural products are not enlightened due to lack of inaccessible information, yet most of the educated people want a definitive proof of such drugs potency and its safe consumption guaranteed. It has been established that traditional medicine has been administered concurrently with ART in Durban South Africa (Appelbaum et al. 2015). However, the public may not be able to benefit without sound and published clinical results based on tests carried out on the medicine with improved success-rate information made available to them. It is becoming particularly important in this era where appreciation of traditional medicine has increased as necessary medical treatments (Mohankumar and McFarlane 2015), as traditional plants have been reportedly used in Venda to treat candidiasis-related infections (Masevhe et al. 2015). Similarly, in Nigeria,

"ataare" – Aframomum melegueta (alligator pepper) is used continuously for local soup which is reported to be useful in managing diabetes, and it also contained anti fungi and antibacterial, antiviral properties, and it can be used to reduce cholesterol levels (Ene-Obong et al. 2018).

Information Packaging on Ethnomedicine Potency and Dosage

One of the current challenges in the use of traditional herbs and herbal products in Africa is the lack of structured and reliable sources of information on herbal products. The results of the prevailing trends and success rates of herbal products that have been empirically tested and information on the dosage administration of such herbal products is not readily available. The current approach allows individual with products to sell and prescribe dosage with little knowledge on how to verify the potencies level of the products. Dosage administration is very critical in case of any potential adverse effects resulting from overdose and the implication on individuals due to body physiology or different body anatomy or immune system. Since dosage administers to patient "A" could prove fatal to patient "B" when the same dosage is administered, which is why a process should be established to package local medicinal drugs. Unfortunately, little emphasis is placed on dosage administrations for various categories of individual, since body mass is not the same. Findings from South Africa on traditional medicine uses examined and categorized 122 different uses, but dosage of administration was not provided, and this was stated thus; "we were only able to gather data on their perceived uses and no data on dosages, efficacy, or individual turnover of products" Williams and Whiting (2016: 265).

Furthermore, the findings of Williams and Whiting (2016) indicated that the traditional products obtained from the herbal market in South Africa were tested, but it involved animals use. The use was examined, and it is a known fact that animal resistance level is higher than most humans. Peradventure the dosage is administered ignorantly by a human without proper information packaging and dosage administration which could result in fatal outcome. Dosage information examination must be a prerequisite for traditional active ingredient intake as an overdose may lead to toxicity implications as findings show lack of information governance on the most product on the streets. As finding in South Africa reported "another ethnomedicine with active ingredients, this time, dangerous and potentially fatal, found in the blister beetle (Mylabris sp)" which is one of the products in the local herbs and plants being sold in the market (Williams and Whiting 2016: 266). Despite all these beneficial effects of the traditional means of primary healthcare and wellness, lack of regulated information and essential information packaging poses a serious threat to wider acceptance amongst the most elite population in Africa. So far, it was reported that traditional medicines and herbal products have not be regulated, even though some of the practices require stringent regulations (Daghman 2016). For the reason that regulatory or government oversight will protect consumers from consuming local medicine with little or no power to cure or manage illnesses why customers may have been cheated to purchase such medicine. Moreover, herbal medicines may not entirely be used to treat diabetes, while a fictitious vendor may be claiming such curative potencies of their herbal products. However, providing information on the number of people that have used the products and their health report as a result of taking a particular herbal medicine should be available, while government must assist in testing or running the clinical analysis of such products for making the information accessible to the public. Orthodox drugs and herbal product combination for treating patients may be exploited if clinical or trials information of herbal products are evaluated and made public which may be used to promote public health system deliveries. Many companies claim to be selling herbal medicines, but these may be just marketing strategies to increase sales. It is important to be able to read labels correctly so that patients are not misguided (Mahomoodally et al. 2016: 20).

Nexus between Empirical Data and Social Reality

Based on the available data, it is clear that focus is on the ways to best utilise natural riches of herbs found in Africa and herbal products as therapeutic and preventive medicine by customers. It is of vital importance not to get carried away by the number of the available publica-

Table 1: Search phrases on ethnomedicine publications and retrieval techniques used, and the numbers of returns

Year of publication	*Construct variables*	*Filtering techniques*	*Total recall*
1990-1995	"Ethno-medicine" south Africa	Truncation/ Boolean	124
1996-2000	"Ethno-medicine" south Africa	Truncation/ Boolean	384
2000-2005	"Ethno-medicine" south Africa	Truncation/ Boolean	528
2006-2010	"Ethno-medicine" south Africa	Truncation/ Boolean	1600
2011-2015	"Ethno-medicine" south Africa	Truncation/ Boolean	3870
2016	"Ethno-medicine" south Africa	Truncation/ Boolean	459
Total Recall			6,965

Source: Author

tions, but the application of the knowledge to solve day to day health challenges and how the products can complement the existing health-care products and treatments. The data in Table 1 indicated the increase in publications on the importance and use of indigenous herbal plants. However, there is lack of information regarding the products being sold daily in the streets without sufficient data concerning the effectiveness and clinical data about the sources of the plants and herbs. Also, it appears that the vendors are not equipped to educate the users about products effectiveness, dosage, the level of toxicity (if any), and likely side-effects for various age groups and people living with special conditions.

Since the year 1990 till date, the upward traction of the findings suggests that herbal or traditional medicine users have come to appreciate the contribution of the ethnomedicinal products as a nexus between healthy living by using herbs and plants for treating ailments. However, from the result in (Fig. 1), the gaps that have not been adequately covered in solving the current challenges is the issue of quality control and verification of potencies of the medicinal plant's products that have been presented to customers or individual using these products. Although from 2011 to 2015, findings indicated that 3,870 publications have emerged in South African context, but what is lacking is information on the potencies and efficacies of the products drawn from the actual patients who have used the natural medicinal products. The other concern is the quality assurance from any regulatory body to succinctly verify claims of potency by the individual whether uttermost hygiene has been observed in collecting, processing and preparation of the products. It is apparent that data and

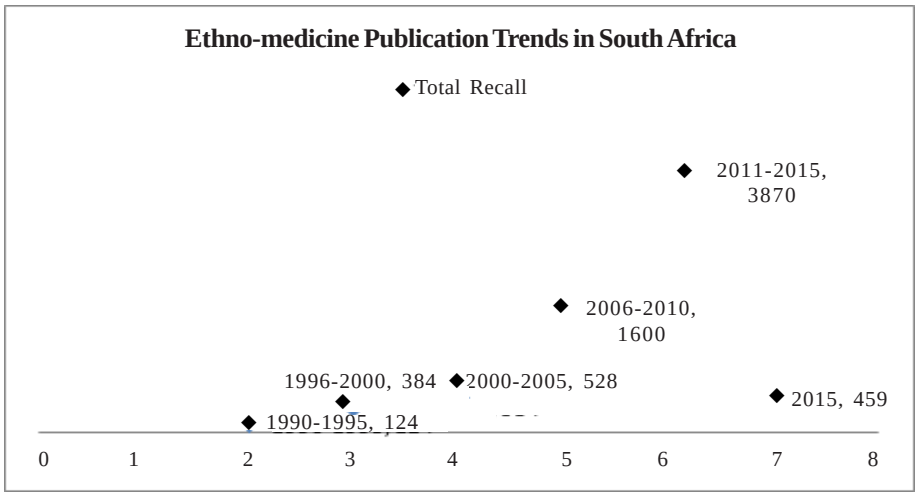

Fig. 1. Publications on ethnomedicinal studies from 1990- 2016 (contextually in South Africa)
Source: Author

information derived from the practical use from local medicine users who have been cured or those who are using the products to manage their health consistently will provide vital information necessary to inform the public. But, there is still lack of verifiable information on most of the products being sold to the people on the streets. However, there are some well-packaged herbal products in the most chemist and pharmacist outlets in South Africa, but there are disclaimers indicating that some of them had not been clinically tested or recommended for treatment by the medical institutions.

Comparatively, the data on the ethnomedicine in Nigeria is lower than the findings in South Africa. There are different *"alagbo"* (local herbs vendors) and herbal production in Nigeria. Some of the vendors have a common marketplace at *Ojoo* market, Sango market, *"Oja Bodija"*, *"Agbeni Ogunpa"* market just to name but few within Ibadan metropolitan area. Some of the vendors sell *"agunmu"* (dried herbs) and herbal products that have been processed into powder forms that can be taken with *"ogi"* soft pap made from corn starch, or any other edible liquid drink. The ethnomedicinal publications and articles have experienced steady increases in Nigeria as can be seen in Table 2 from 2011 and 2015. Although the abundance of people hawking herbal products in Nigeria, not all the *"agbo"* or *"agunmu (dried medicinal extracts)"* being hawked on the streets are very helpful or seemed to present results that have been promised by the vendors at times, with exceptions to some regular vendors one usually consult for purchase. Often, people refer their loved ones to consult some vendors they have tried their products, and most information is spread through (words of mouth) before one purchase herbs *"agbo"* from hawkers on the streets in Nigeria. Often, the quality assurance of most of the herbal products is based on testimonials and recommendation from relatives or colleagues who have used the products. This is necessary because of fear of consuming products that may be potentially fatal and poses health risks arising from using herbal products which have not been tested or in which level of toxicity is not known. The data in Table 2 present the peer reviewed articles on ethnomedicine importance in Nigeria but there is still lack of information on products, and use for users on the streets from vendors.

There is a need to accomplish more in the continent in the area of promoting products and services as significant products that may be useful for various purposes in the continents are not professionally packaged and made available online. Cataloguing this products information online and its effectiveness in treating health-related problems may encourage patient globally to access the products, which in return will increase the economic advantage for the vendors. However, the increase in the number of articles published in Nigeria (see Fig. 2) does not reflect a proportionate amount of information available to daily users since the information is packaged for the scientific communities. However, the government should mandate information packaging and dissemination for average users about the screening, processing, and effectiveness of medicinal plants which is being sold in the markets to the public.

Furthermore, a lot needs to be achieved in Nigeria as available data showed that South Africa is ahead of Nigeria based on empirical studies conducted or retrieved through this online platforms. In 2011 to 2015 alone, Nigeria's published work were 2,680 as against 3,870 in South

Table 2: Search phrases on ethnomedicine publications and retrieval techniques used, and the numbers of returns

Year of publication	*Construct variables*	*Filtering techniques*	*Total recall*
1990-1995	"Ethno-medicine" Nigeria	Truncation/ Boolean	128
1996 -2000	"Ethno-medicine" Nigeria	Truncation/ Boolean	183
2001-2005	"Ethno-medicine" Nigeria	Truncation/ Boolean	286
2006-2010	"Ethno-medicine" Nigeria	Truncation/ Boolean	925
2011-2015	"Ethno-medicine" Nigeria	Truncation/ Boolean	2,680
2016	"Ethno-medicine" Nigeria	Truncation/ Boolean	290
Total Recall			4492

Source: Author

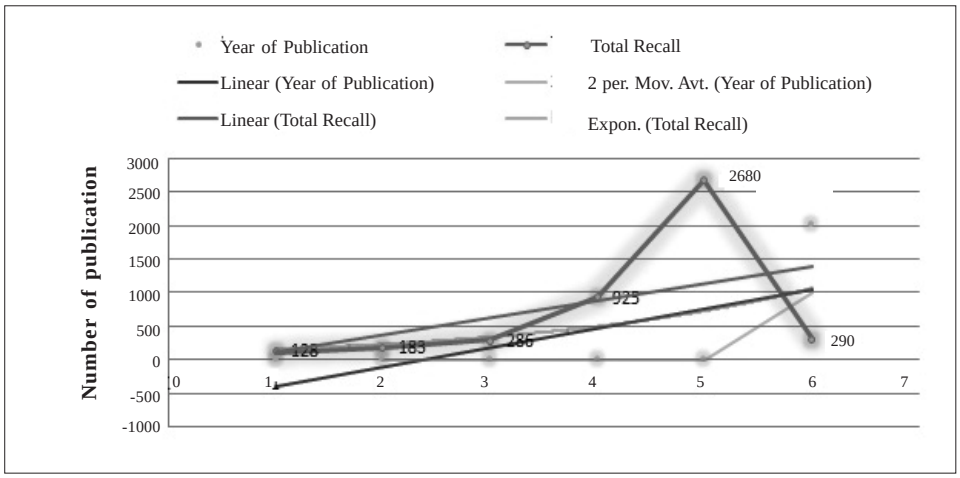

Fig. 2. Ethnomedicinal studies publications from 1990- 2016 (in Nigeria)
Source: Author

Africa. While it is not enough to draw a quantitative comparison, yet, it is a clear pattern that information governance on the human use and application, dosage administration is lacking. Another pattern synonymous with both countries is a lack of well-structured information on sourcing this alternative treatment products and quality assurance on clinical human use/test results on the efficacies of these products have not been established. However, the government must establish institutes that could assist local farmers, communities to document and provide information on phytochemical analysis of their locally sourced products and how the communities use their plants. The analysis and information on the products can be further screened for pathogens, toxic properties as well as providing clinical tests information for potential users, as this will improve confidence in the user while providing alternative economic activities for the people and reduce Africa's dependence on chemical-based drugs from giant drugs corporations.

CONCLUSION

The paper concluded that some success had been achieved in the field of traditional medicine as an alternative trajectory to serve as primary healthcare services in various societies. It is notable that the public and research interest in this area is gaining more ground in finding a solution and documenting the potencies of the African herbal products in treating different ailments. The other successes recorded are the combination of the ethnomedicinal treatments, acceptance, and recommendation by mainstream health workers and orthodox doctors and nurses to their patients. However, the primary constraint inhibiting wider public acceptability as for day to day point of references for treatment is the lack of regulatory and standardisation procedures. There have not been sufficient clinical trials known to the public with the actual success rates recorded in the results even though the number of publications in the recent years has tremendously improved and various uses of indigenous plants and herbs have been established and documented. Lack of information regarding monitored trials on human patients and unavailability of dosage administration have posed as major challenges. Information governance on traditional herbs/plants quality assurance is not readily available and success rate of locally sourced and processed herbal medicine information is not aggregated, indexed and made available online. The implication of this lack of information for the public primary healthcare system is that the citizen who is desperately in need of help may not be able to access this information because there is no information available that can be used to make informed decisions.

RECOMMENDATIONS

The paper recommends that government can play a significant role to help an individual with potent traditional treatment ingredient to facilitate and monitor trials and dosage administra-

tion to the patient. The success rate and potencies of tested ethnomedicine should be documented and made available to techno-savvy generation in this information age. It is possible that broader coverage of information packaging and dissemination on the efficacies of ethnomedicine will create a wider public acceptance as source of viable primary/public healthcare services. The government can establish a body responsible for quality assurance of the traditional medicines and herbs, which will in the long run increase patronage and the use of ethnomedicine and an improved income generation for the stakeholder and the economy. The paper recommends that in Africa, the focus should be shifted from theoretical, ethnomedicinal tacit knowledge and information packaging to practical, tested experimental use as this will improve public confidence and adoption side by side the orthodox medical treatments.

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