



Trends and challenges toward integration of traditional medicine in formal health-care system: Historical perspectives and appraisal of education curricula in Sub-Sahara Africa

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ABSTRACT

The population residing Sub-Sahara Africa (SSA) continues to suffer from communicable health problems such as HIV/AIDS, malaria, tuberculosis, and various neglected tropical as well as non-communicable diseases. The disease burden is aggravated by shortage of medical personnel and medical supplies such as medical devices and minimal access to essential medicine. For long time, human beings through observation and practical experiences learned to use different plant species that led to the emergence of traditional medicine (TM) systems. The ancient Pharaonic Egyptian TM system is one of the oldest documented forms of TM practice in Africa and the pioneer of world's medical science. However, the medical practices diffused very fast to other continents being accelerated by advancement of technologies while leaving Africa lagging behind in the integration of the practice in formal health-care system. Challenging issues that drag back integration is the development of education curricula for training TM experts as the way of disseminating the traditional medical knowledge and practices imbedded in African culture. The few African countries such as Ghana managed to integrate TM products in the National Essential Medicine List while South Africa, Sierra Leone, and Tanzania have TM products being sold over the counters due to the availability of education training programs facilitated by research. This paper analyses the contribution of TM practice and products in modern medicine and gives recommendations that Africa should take in the integration process to safeguard the SSA population from disease burdens.

KEY WORDS: Bantu, curricula, formal system, integration, practice, products, Sub-Sahara Africa, traditional medicine

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INTRODUCTION

The Contribution of Ancient African Traditional Medicine (TM) Practices in Modern Medicine

The Sub-Sahara Africa (SSA) continues suffering from the burden of diseases despite being a rich source of biodiversity from which many hospital medicines have been tapped, and a lot more are untapped. This untapped avenue has contributed minimally in solving health problems since TM has not yet been formally integrated into the existing conventional health-care delivery [1]. The reasons being partly because there are few TM curricula that are geared to trained human resources to undertake quality services and development of *materia medica* used in treatments in this region. However, different countries or continents elsewhere have their TM practices supported by documented *materia medica* and the underlying philosophy for disease diagnosis and treatments such as Unani TM, Chinese

TM, Ayurvedic medicine, Naturopathy, Homoeopathy, and Korean oriental medicine [2-4]. Therefore, the philosophy and theories of disease symptoms, diagnosis, and treatment used in African TM need to be established and learned because the surge for the use of TM is now not limited to countries of origin rather a trans-territory and a choice of many people even in developed countries [5-8]. African TM practices are imbedded in the indigenous knowledge of one's culture or society thus also serves as backups of what the local communities have maintained for centuries for their survival and prosper within their ecosystem.

In the written record, the ancient Pharaonic Egyptians medical practices are the oldest documented form of TM practice in Africa. From the beginning of the civilization in about 3300 BC until the Persian invasion in 525 BC, Egyptian medical practices were highly advanced for its time including simple non-invasive surgery, bones setting, and an extensive set of pharmacopeia in

the form of papyri. The Ebers Papyrus (c. 1500 BC) is among the oldest preserved medical documents and contains some 700 magical formulas and remedies. Records show that the diagnosis of diabetes disease was described in Ebers Papyrus as disease of “urine pass through” [9]. The Edwin Smith papyrus (c. 1600 BC) includes a description of simple non-invasive surgery whereby the position of diagnosis of breast cancer and its management is described as a “tumor do thou nothing there against” [10]. Several other papyri collected in Egypt influenced TM of other traditions, including the Greeks and Romans, but later other parts of the world [11].

No much is recorded about TM practices in Africa until the 19th century when Africa was partitioned and missionaries' works started. For example in by then Germany East Africa and British East Africa, which compose the current East Africa Community countries, one British traveller [12] witnessed cesarean section being performed by Ugandan people to serve the baby and mother. Similar reports of surgical practices were reported from Rwanda, whereby botanical preparations were used to anesthetize the patient to perform a cesarean and promote wound healing [12]. In Tanzania, the German ship's doctor Dr. Weck, Adolf Bastian (1826-1905), W. H. R. Rivers (1864-1922), and C. G. Seligman (1873-1940) observed and wrote a number of diseases being managed by TM in the Hehe community [13,14]. These few examples of ancient indigenous practices show the significant contribution to the modern practices of diagnosis and disease management since some still hold to date.

TM in SSA

In Africa, the Bantu-speaking peoples make up a major part of the population of nearly all African countries south of the Sahara. They belong to over 300 groups, each with its own language or dialect [15]. Despite the diverse culture and ethnic groups in SSA, still, most societies are dominated by the Bantu culture and believe [15]. Therefore, TM in the SSA region is rational in the context of Bantu cultures and is like theories in western medicine. The Bantu believes a human being is holistic yet corporate, in terms of the family, clan and whole ethnic group. Therefore, it is required never to do harm to the patient unless it is in his or her best interests or for the good of the community because if he suffers, he does not suffer alone but with his corporate group: When he rejoices, he is not alone but with his kinsmen, neighbors, and relatives. In the modern health-care system, this is a principle worth emulating; never to do harm to a patient unless the nurse or doctor, after serious consideration, believes that it is in the interests of the patient or it is necessary for the protection of other patients or the public [16-18]. The African Union Commission adopted the WHO/Afro (1976) definition of African TM as the total of all practices, measures, ingredients, and procedures of all kind whether material or not which guard against disease/illness to alleviate suffering and cure himself [19]. Thus, African TM does not regard man as a purely physical entity but also takes into consideration the sociological (family or other), whether

living or dead (ancestors) and the “intangible forces” (God, gods,) of the universe [19,20]. Thus, disease is not merely a result of dysfunction of an organ caused by the invasion of microscopic organisms (Germ theory) but also may be due to intangible forces. Therefore, treatment in African TM is by use of both material substances and resources drawn from the cosmic world all together not separated (Holistic theory) in an attempts to restore a state of wholesomeness using various methods including plant remedies [19,20].

Interdependence of Traditional and Modern Medicine

The pharaonic pharmacopeia papyri described several plants including the bark of the willow tree, in which Hippocrates (~ 460-370 B.C.) who is acknowledged as a father of western medicine used to control headaches and other body pains [21]. It was through chemistry, the active molecule which is salicylic acid was identified, in 1889, and later aspirin, paracetamol, diclofenac, mefenamic acid, ibuprofen, etc., were synthesized based on the structure of salicylic acid [21,22]. Several other useful hospitals medicines and vaccination, such as quinine, ephedrine, amodiaquine, primaquine, chloroquine, mefloquine, atropine, reserpine, digoxin, tubocurarine, metformin, Scopolamine, taxol, and calanolide A, are now synthetically made from a structure of an initial naturally isolated compound from medicinal plants while others are semi-synthetically derived from the natural product precursors [22,23]. Several medicinal plants, such as Madagascar's rosy periwinkle *Catharansus roseus*, remain the basic source of anticancer drugs vincristine and vinblastine [23]. This indicates the potential of medicinal plants and its current contribution to hospital medicine, in which most of these are an essential medicine dispensed worldwide for treatment of different diseases. This confirms the contribution of both modern and TM in the advancement of the current health systems not only in SSA but worldwide.

Opportunities and Challenges to Promote TM Practices and Products in SSA

The contribution of TM and its practitioners was recognized, in 1978, by the Alma-Ata Declaration as important resources in achieving health for all by the year 2000 [24]. A number of resolutions and declarations have been adopted by the WHO governing bodies at regional and global levels including Resolution AFR/RC49/R5 on Essential Drugs in the WHO African Region. The resolution required the WHO to support Member States to carry out research on medicinal plants and to promote their use in health-care delivery systems [25]. The Regional Committee that adopted resolution AFR/RC49/R5 also called on the WHO to develop a comprehensive strategy on African TM with the focus on producing evidence [25-27]. Since then, African countries have been supporting these initiatives in different ways such as documenting ethnobiomedical information, scientific evidence/research, media promotion, implementing international and national plans and policies including the plan of action on the decade of TM for (2001-2010) that was extended to cover the period 2010-2020 [28,29]. Indeed, African Nations are aligning to these

international plans to pull efforts of promoting TM uses including developing robust policies and legislatives. Further, many African countries are signatories to the TRIPs 1994, CBD 1998, and Nagoya Protocol 2010, which require governments to put mechanisms for recognition and protection of the vast available local knowledge and associated used genetic materials including those in TM. This is the commendable direction taken in addressing the rights of traditional knowledge holders whom for centuries have transmitted this knowledge orally thus continued exposing the region in a risk of biopiracy and that some knowledge became forgotten or lost during oral transmission. The ethnobiomedical information originating from African culture could be appropriately coordinated and disseminated through formal training and research to bring about reliability and allow adoption for sustainability of the TM services that benefit the majority of the SSA population. Notably, only a few apprenticeships and formal training can be traced in SSA.

METHODOLOGY

The current review intends to appraise the trend and situation of African TM education training curricula in SSA as one element in the integration process in the formal health-care system. Analytical methodology used for this appraisal was through internet search from Google, Google Scholar, PubMed, HINARI, ISI, Global health training center, and Popline (K4 Health) database using the terms or key words: Curriculum or courses, or program in traditional or herbal medicine in Africa alone and combination. In additional terms such as degree, college, SSA, or country names were used in combination with the search titles. A manual evaluation of searched titles and reference lists of relevant studies and reviews was also conducted. Furthermore, all articles related to the subject were selected and web-link or the authors' affiliation to view the institutional webpage whether they offer any course or training program in TM. Basic courses or program in phytochemistry, pharmacognosy, natural products chemistry, and phytomedicine are not included in this appraisal because it is a science of the *materia medica* without necessarily having a reflection on two key characteristic aspects of TM, that is, practices accompanied with the use of *materia medica*.

RESULTS RETRIEVED

The analytical review of the information related to the subject on "curriculum or courses, or program in traditional or herbal medicine in Africa" revealed only a few institutions mostly universities or colleges in the countries residing SSA that undertake training in TM or complementary and alternative medicine [Table 1]. Many of the retrievable information indicated TM training to be tailor-made short courses geared to develop professional skills for a specific community of professionals. Furthermore, noted that, funds for most of the short courses were donor-based thus not sustainable beyond funding period, e.g., the Multi-disciplinary University Traditional Health Initiative project of South Africa. Some private owned colleges do conduct

alternative and complementary medicine education training such as homeopathy as shown in Table 1. Most of the TM education programs in public universities are geared at analyzing the efficacy, safety, and quality of TM products while the clinical practices were being mostly left to private sector entities. Notably, several universities and research institutions in SSA countries are running some basic courses in phytochemistry, pharmacognosy, natural products chemistry, and phytomedicine. However, those universities/colleges are not listed as they are out of the scope of the present appraisal.

DISCUSSION

Previously Chitindingu *et al.*, 2014 pointed out the training components in African TM that was offered in South Africa to have a theoretical approach rather than problem-solving approach [32]. Further, reports indicated difficulties in the initial stages of introducing TM curriculum in biomedical universities for undergraduates [4,30,32,33]. Nevertheless, the importance of TM in SSA call for setting priorities of developing medicines from *materia medica* while streamlining TM practices alongside with other health professional training and services. There only limited huddles on TM products that are used in treatments as many are crude extracts or are in the form of raw materials containing the therapeutic active ingredients [34]. Some may have been used for centuries by individuals within their environment in the communities, and their efficacy and safety is well-known by the entire community and may be acceptable. These can be a good start-up that may proceed to be essential medicines to be streamlined in formal health system delivery services if they satisfy the health care needs of the majority of the population and the prescribers are made aware of their efficacy and safety. The few African countries that have managed to integrate TM products in the National Essential Medicine List such as Ghana is because it was able to develop curriculum which is used to train TM experts as the way of disseminating the indigenous medical knowledge and practices to several health professionals [35]. Several African countries such as South Africa, Sierra Leone, and Tanzania have TM products being sold over the counters facilitated by the research and training programs undertaken in these countries [30,31,32,36-39].

FUTURE PROSPECTS AND RECOMMENDATIONS

Notably, few on-going attempt to integrate TM in formal health care can be spotted in some SSA countries whereby collaborative initiatives of some Traditional Health Practitioners Organization such THETA-Uganda; TAWG-Tanzania; and ZINATHA-Zimbabwe work closely with the Ministry of Health in addressing the prevention and care of HIV/AIDS patients [40,41]. These attempts are good model toward integration of TM to the formal system if embraced by formal training of practitioners that participate in such collaboration. The training program will instill skills and confidence to Traditional Health Practitioners to work in partnership with modern doctors in the existing formal health system. Other areas that need improvement in the integration process are modernization of TM to allow

Table 1: Some universities and colleges in Sub-Sahara Africa that offer formal education training in traditional medicine

*Country	*Institution	Academic program or course offered	Citation
Ghana	The Kwame Nkrumah University of Science and Technology, Department of Herbal Medicine	Bachelor of Science Degree in Herbal Medicine	https://www.knust.edu.gh/admissions/prospective/ugprogrammes
	University of Ghana, Department of Pharmacognosy and Herbal Medicine	A Course for Bachelor of Pharmacy	http://pharmacy.ug.edu.gh/overview
	Endpoint homeopathic training institute	Diploma and Degree in Alternative Medicine	http://www.endpointcollege.com/
	The college of integrated medicine	Program in Complementary Health Care at Certificate Level	https://www.villagevolunteers.org/village-news/ghana-college-of-integrated-medicine/ http://www.wahooas.org/spip.php?article1017
	University of Ibadan, College of Medicine	Training Curricula for Undergraduate	
Kenya	Kenyatta University, Department of Pharmacy and Complementary/Alternative Medicine	Courses for Undergraduate and Graduate Pharmacy	http://medicine.ku.ac.ke/index.php/department/pharmacy-and-complementary-medicine
	University of Nairobi, Department of Pharmacology and Pharmacognosy	Master of Science in Pharmacognosy and Complementary Medicines Course	http://pharmacology.uonbi.ac.ke/uon_degrees_details/733
Sierra Leone	University of Sierra Leone, Department of Pharmacognosy and Phytochemistry	Masters Degree Program in Traditional Medicine Pharmacy Courses in Traditional Medicine For Pharmacy Medical Undergraduate	[30,31]
South Africa	University of KwaZulu-Natal, The Department of Science and Technology-National Research Foundation Centre	IKS Research and Postgraduate Training in Traditional Medicine	http://aiks.ukzn.ac.za/about-dst-nrf-ciks
	University of the Western Cape South African, Herbal Science and Medicine Institute	Postgraduate Programs in Herbal Medicine Tailor-made short courses geared to develop professional skills for a specific health professionals community, e.g., courses for Clinical trials in herbal medicine	https://www.uwc.ac.za/Faculties/NS/SAHSMI/Pages/Programmes.aspx#.UMBzYqyxhP4
	College of Natural Therapies	Postgraduate and Co-graduate Educational Programs	http://www.collegeofnaturalhealth.co.za/
	Blackford Centre for Herbal Medicine	Diploma in Medical Herbalist	http://www.studyonline.co.za/herbal/enrol.php
Tanzania	Muhimbili University of Health and Allied Sciences Institute of Traditional Medicine	Postgraduate (MSc and Ph.D.) Program in Traditional Medicine Development Module for Undergraduate and Graduate Medical Students	http://www.muhas.ac.tz/index.php/academics/muhas-institutes/110-itm http://itm.muhas.ac.tz/index.php/training-programmes
	Department of Veterinary Medicine, Sokoine University of Agriculture	Master of Science in Natural Products Technology and value addition	http://www.suanet.ac.tz/index.php/education/programmes-offered-at-sua

*Listed universities/colleges are not exhaustive rather most retrievable list from SSA countries with curricula in traditional medicine. SSA: Sub-Sahara Africa

easy keeping, dispensing, and transportation in bulk; Clinical studies of herbal formulas need to be advocated to overcome the fear of being poisoned; Biodiversity depletion due to use of herbal material from wild source has to be addressed by engaging into extensive cultivation while adhering to Good Agricultural Practices. It is equally important that traditional practices and the philosophy for disease diagnosis and treatment be disseminated through education curricula, and the relevant research should be promoted sustainably.

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