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Telemedicine and mobile health with integrative medicine in developing countries

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Abstract
African Home-based Care (AHC) and African Traditional Medicine (ATM) provide a number of self-sustainable primary health care workers in a rural region with the appreciation of ancestral knowledge and its contextual management. Even though most urban residents are able to afford and use conventional medicine to large extent, the implementations of modern medicine in rural areas and in poor peri-urban areas are limited. Our proposal is on how telemedicine solutions could enhance AHC and ATM practices and facilitate simultaneous delivery of both modern and traditional healthcare with evident added value to the recipients. This is indeed a fresh angle, as information and communication technologies (ICTs) could play an important role in developing countries in the management of patients and enhance quality care for patients in particular and healthcare (both traditional and modern heath systems) in general. This delivers comprehensive insights concerning the implementation on telemedicine where integrative medicine and African traditional medicine is in the back seat.

Objective

The term African Home-based Care (AHC) is used differently in different parts of Africa. In some cases it is managed by public health department and offers primary care, health promotion and prevention programs. In other cases, it is a traditional community health center that serves as the point of contact between the community members and the traditional health care provider for counseling and traditional medicine.

African Home-based Care (AHC) offers self-sustainable primary healthcare workers in a rural region with the appreciation of ancestral knowledge and its contextual management. Even though most urban residents are able to afford and use conventional medicine to a large extent, the implementation of modern medicine in remote rural or poor peri-urban African areas is limited. Especially in rural communities where there are few or no doctors, AHC or ATM are usually the primary source of medical care. Many local communities consider ATM as a complementary medical system. The activities of an AHC are supported by informal and formal primary caregivers that deliver extensive basic nursing services, such as physical, educational, psychological and spiritual care for both patients and their relatives [1].

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In Africa, African Traditional Medicine (ATM) is believed to sometimes offer unsuspected efficacy where the practices of modern medicine fail or are powerless to supply treatment, particularly for routine ailments such as tropical diseases, allergies or psychiatric diseases. The spirit of ATM is human interaction using indigenous knowledge that is gained experientially, externalized and transmitted mostly through verbal expressions and gestures with some secret initiatic traditions [2]. At present, the practice of ATM is evolving; for instance, some urban Traditional Practitioners (TP) use conventional medicine facilities including medical tests for diagnosis and/or post-treatment checking [3]. However, this is not the generally reported experience, especially in rural communities throughout Africa.

Telemedicine is a sub-set of eHealth electronic process in health using information and communication technologies (ICT) for [4]:

- *Teleconsultation*, a procedure whereby medical professionals can consult a patient remotely and interpret the necessary data remotely. This consists of explanations and their rationale for suggested diagnosis and management plans with counseling in risk factor control and indications of treatment designed to reduce problem. After it is possible to make actions for medical follow-up.
- *Medical Second Opinion Service or Teleexpertise*, whereby a medical professional can seek remotely an opinion of other medical professionals who have the relevant training or skills. It allows people to obtain a valuable medical second opinion in the case of the diagnosis and treatment of non-critical and critical illnesses (e.g. skin and respiratory diseases, as well as nephrology disorders). This telemedicine service is intended to assist patients and their attending physician to improve healthcare outcome by a diagnostic revision and treatment enhancement.
- *Telemonitoring*, the ability to monitor and supervise patients remotely. The medical data can be obtained automatically on a pre-defined periodic basis (remote follow-up) or on a daily basis (remote monitoring) by the device which dispatches them from the patient's home to the medical doctor.
- *Remote handling or Teleassistance*, a procedure which enables a medical professional to assist remotely another healthcare professional during the realization of a medical act. This would correspond to two typical situations. First case: it may concern *robotic telesurgery* in which the expert surgeon performs the surgery form a distance through a robotic device. Second case: *remote ultrasound examination* in which the expert physician remotely directs the local ultrasonographer as to how to position the probe, and sometimes the expert may control the movements of a medical probe using ultrasonographic visualizations to perform useful assessments.

The objectives of telemedicine and its applications are to enhance the availability of various medical services and healthcare despite geographical and economic barriers, to reduce direct and indirect cost to patients and the healthcare industry, to save travel time and costs for both practitioners and patients from one geographical location to another, and to improve consultation and co-operation among various units of healthcare in both special cases and primary care by bridging the distance between practitioners and specialists [5,6]. There is an expectation that mobile phones will facilitate a range of telemedicine activities (cardiology, radiology, dermatology, obstetrics, psychiatry and ophthalmology) in Africa with a deep cultural immersion experience that generates a better understanding of local cultures' values, activities and prerequisites [7].

It is crucial to make this medical framework a systemic and very well locally integrated model by ensuring that practices are suited to the patient's belief and cultural environment. In primary care the concept “holistic”, has been used to describe models that take into account social reflections and other contextual approaches [8]. Our research interest with telemedicine in Africa speaks most pointedly to this, as it indicates the possible way to embed the holistic concept into the management practices. As the informal and formal primary caregivers offer cultural and social insights to conventional medical staff (including information regarding local traditional medical activities), the cultural immersion they experience makes it easier for them to adapt allopathic medicine by integrating some cultural elements from ATM environment. Looking at it from the alternate aspect, these holistic medical practices play an important role for caregivers and patients in AHC, as they could use the facilities to stay in touch with their cultural background. Patient care tends to become more comprehensive when complementary medicine is integrated conventional healthcare organizations [9].

Traditional medicine is now offered alongside allopathic medicine at several locations in the African countries. Supply and distribution of medicinal products is mainly through the informal sector (e.g. traveling vendors of drugs (hucksters and peddlers), traditional health units or other informal drug-stores). So, in these contextual situations, treatment is a broad concept and includes western, allopathic medicine as well as traditional medicine (complementary and alternative medicine). All these forms of conventional or traditional treatments, to some levels in their composition and properties, rely on natural substances, or elements synthesized from the natural environment.

The application of information and communication technologies can facilitate knowledge and information exchanges within the different actors with a view to improve patient health care services. It could stimulate information transfer in both directions, opens opportunities and improves experience feedbacks through possible useful collaborations and helps organize primary health care needs. Therefore this offers exceptional value to collaborative activities between informal and formal primary caregivers by creating networking opportunities, supporting and augmenting the visibility of initiatives that help sustain Western health and traditional practitioners' participation in efficient and safe practices.

Proposed approach to eHealth (telemedicine and mHealth) in Africa

According to World Health Organization (WHO) and International Telecommunication Union (ITU), eHealth (electronic