

## Clinical relevance and application of traditional complementary and alternative medicine for the management of diabetes and hypertension on the African continent, 2000-2017: A narrative review

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Evidence based Traditional complementary and alternative medicine (TCAM) in the management of diabetes and hypertension is essential for its general acceptance in the scientific community. The aim of this study was to find clinical relevance and use of TCAM in the management of diabetes and hypertension on the African continent. To achieve our aim Google scholar, web of science, Pub-med and Cochrane library electronic databases were searched for the period 2000-2017 using specific keywords related to the study. Based on our search criteria regarding the use of TCAM in the management of these chronic conditions (diabetes and hypertension) 24 papers were finally selected and analyzed in this study. The results suggest a prevalence rate of 17-84 % TCAM use among the studied population with the use of mainly herbs and medicinal plants in the management of diabetes and hypertension. Our findings have shown that there is ample evidence of TCAM use in the management of diabetes and hypertension on the African continent. There is an urgent need to conduct research into the potency of medicinal plants as well as find the effect of concurrent use of TCAM and conventional drugs in human beings suggested by WHO in its health policy document released in 2002.

**Keywords:** African Traditional Medicine, Disease management, Traditional health practitioners, Indigenous knowledge

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People living in developing countries depend on traditional medicine (TM) for their healthcare needs<sup>1</sup>. The use of traditional complementary and alternative medicine (TCAM) among a population varies from one country to the other. The prevalence rate of the use of complementary and alternative medicine (CAM) was estimated at 40 % among the general population in the USA<sup>2</sup> while a prevalence rate of CAM use was reported at (63.9 %) in India<sup>3</sup>. These above rates are almost similar to those reported in the use of TM in Guinea (33 %)<sup>4</sup> and South Africa (52.79 %) among the general population<sup>4,5</sup>. According to World Health Organization (WHO), 'Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being'. Furthermore, the WHO defines

(CAM) as a "broad set of healthcare practices that are not part of a country's own tradition, or not integrated into its dominant healthcare systems"<sup>1</sup>.

TM has contributed a lot to modern day medicine; most of the modern medical products are obtained from medicinal plants<sup>6</sup>. It has been reported that 11 % of prescribed drugs classified as essential drugs by the WHO are obtained from the plant<sup>7</sup>. Poor health outcomes associated with allopathic medicine for chronic conditions encourage many people to rely on alternative medicine<sup>8,9</sup>. Despite a well organised health system and accessibility and availability of conventional medicine to inhabitants in developed countries the use of alternative medicine is on the increase; relatively high percentages of consumption have been reported in countries such as England (47 %), Canada (70 %), Germany (75 %), 48.5 % Australia and 40 % USA<sup>10</sup>.

African Traditional Medicine (ATM) incorporates herbs and spiritual means in curing diseases<sup>11</sup>. Causes of illnesses and diseases may be associated with

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social or spiritual realms from anthropology perspective; physical things may show themselves in the spiritual realms before they become physical<sup>12</sup>. It has been reported that many people resort to alternative medicine for their healthcare and spiritual problems<sup>13</sup>. TM practise is associated with socio-cultural and environmental settings of the people. To most Africans, TM leads to the preservation and transfer of cultural heritage from one generation to the other<sup>14</sup>. In traditional African settings traditional health practitioners occupy enviable positions because of accessibility of their treatment methods and cost effectiveness of their medicinal products<sup>15</sup>. People usually consult them because they are readily available and accessible, they do understand the culture of the people in the communities they live and are able to assist patients accordingly<sup>16</sup>. Furthermore, people usually consult practitioners who takes time to listen, understand and deal with their health condition at all times<sup>17</sup>.

An estimated 380 million people are projected to be diabetic by 2025<sup>18</sup>. There has been an increase in diabetes mellitus patients in sub Saharan Africa<sup>19</sup>. A prevalence rate of 7 % has been reported for countries such as Nigeria, Ghana, South Africa, Kenya, Guinea and Cameroon due to poor dietary habit, obesity and deficiency of physical activity as main causative factors for type 2 diabetes amongst the adult population<sup>20</sup>.

Diabetes is a disease associated with hyperglycemia and ineffective lipid, carbohydrate or protein metabolism. Type 1 (insulin dependent) and type 2 (non-insulin dependent) are the two major types of diabetes mellitus. The major complications of diabetes include the following: nephropathy, hyperlipidemia and ketoacidosis. As a result of the above mentioned complications, there is a reduction of life expectancy of a diabetic patient as well as increment in his or her medical expenses<sup>21,22</sup>. Type 1 diabetes is mostly treated with insulin; hypoglycaemia and weight gain are some of the side effects<sup>23</sup>. Metformin, glibenclamide, statins and fibrates are used by patients to treat type 2 diabetes<sup>24,25</sup>.

One of the most important risk factors for heart disease is hypertension<sup>26</sup>; it affects about one billion people on this planet<sup>27,28</sup>. Hypertension has been identified as one of the leading risk factors (globally) for mortality<sup>26</sup>. The African Union (AU) described hypertension as a major health challenge facing the continent; approximately 20 million people living in sub-Saharan Africa is hypertensive<sup>29</sup>.

According to a guideline developed for hypertension as a disease, an individual is hypertensive when on multiple occasions his or her systolic pressure ( $\geq 140$  mm Hg) and diastolic blood pressure is ( $\geq 90$  mm Hg). Primary and essential are the two major types of hypertension with the former not associated with any causative factor (likely to be caused by a combination of environment and genetic factors) and the latter caused by another medical condition<sup>30</sup>. Hypertension is treated mostly with Angiotensin Conversion inhibitors (ACE), diuretics, beta blockers and calcium antagonists<sup>31</sup>. Side effects of usage of anti-hypertensive drugs have been reported which include: depression, headache and swollen ankles<sup>32</sup>.

Several studies had been conducted regarding the usage of alternative medicine by people in the management of chronic conditions such as diabetes and hypertension around the globe. A research carried out in Pakistan (randomized placebo-controlled clinical trials) involving type 2 hyperlipidemic diabetic patients showed a decrease in fasting serum glucose level ( $p < 0.05$ ) when their blood samples were analyzed, after they were administered with medication of these plants (*Artemisia absinthium*, *Citrullus colocynthis* and *Gymnena sylvestre*) within a 40 day period<sup>33</sup>. The use of Unani medicines *Sankhahuli* (*Convolvulus pluricaulis*) and *Gokhru* (*Tribulus terrestris*) by patients in India revealed a significant improvement in both their systolic ( $p < 0.0001$ ) and diastolic pressures ( $p < 0.0001$ ) after 28 days of using these therapies<sup>34</sup>.

A meta-analysis of randomized controlled trials published in literature (between January 1966 and December 2013) indicated the effect of yogic exercise on lipid profiles and glycemic control in Type 2 diabetic patients<sup>35</sup>.

In a survey conducted in Nigeria, about 21 % of the urban population used garlic (*Allivum sativum*) in the management of hypertension<sup>36</sup>. In Ivory Coast, *Allivum sativum* was identified as one of the 33 species of plants used by inhabitants in Agboville district for the management of hypertension<sup>37</sup>.

The general acceptance of TM in modern science is still not encouraging yet little has been done to ascertain its reliability and effectiveness in terms of practice<sup>38</sup>. Even though TM legitimacy and treatment approaches have been challenged<sup>39</sup>, its usage in modern day Africa is on the ascendancy without much documented adverse effects<sup>40</sup>.

Although clinical trials are the gold standard for western modern medicine and are essential for its general acceptability around the globe, there is some evidence of the use of TCAM in the management of diabetes and hypertension across the African continent among the general population. This study aimed to explore clinical relevance and application of traditional complementary and alternative medicine for the management of diabetes and hypertension on the African continent in order to inform policy makers in the health sector, general public, education and research.

## Methods

### *Databases and specific keywords*

Google scholar, web of science, Pub-med and Cochrane library electronic databases were searched for the period 2000-2017. Specific keywords used in carrying out the search were traditional medicine and diabetes in Africa, traditional medicine and hypertension in Africa, clinical evidence and usage of TCAM in the management of diabetes and hypertension in Africa. Citations from identified published papers relevant to our study were tracked and found.

Inclusion criteria were clinical relevance (observational, randomized, non-randomized control trials under the supervision of biomedically trained healthcare professionals) and use of TCAM in the management of diabetes and hypertension. Exclusion criteria applied to publications (related to CAM use in the management of diabetes and hypertension) in a language other than English and not reported in the 21<sup>st</sup> century.

### **Selection of potential research papers**

About a hundred potential papers were produced according to the search criteria implemented via online. This number was reduced to 24 papers because they were related to TCAM usage on the management of diabetes and hypertension on the African continent. According to the National Institute of Health<sup>41</sup> classification of CAM includes the following:

- a) Alternative medical systems (i.e. *Ayurveda*, Naturopathy, Homeopathy, Acupuncture and Tibetan medicine).
- b) Mind and body associated interventions (i.e. music therapy, meditation, prayer and spiritual healing).

- c) Biologically based therapies (i.e. herbal therapy, dietary supplements and unique diets).
- d) Manipulative and body-based methods (i.e. massage, chiropractic and osteopathic medicine).
- e) Energy based therapies (i.e. therapeutic touch and different methods which affects bioelectric field of the body).

Much emphasis was placed on randomized controlled, non-randomized and observational studies which involves the management of diabetes and hypertension by the usage of TCAM self-administered or with the help of BHPs and THPs.

Standardized definitions of TCAM by both NIH and WHO (stated in text) helped us to access and selected potential research papers for this study.

### **Analysis of Data extracted from search criteria**

Selected papers taken into consideration for this review were analyzed based on the following:

Country, year of study, TCAM type, study design, number of participants, main reasons of using TCAM, prevalence rate of TCAM as well as reported outcomes among a studied population in the various countries across the African continent.

### **Review findings**

Research articles that made the list were grouped under this two main themes:

a) Self-administered or THPs prescribed TCAM used by respondents in the various studies published online according to our search criteria as described in section 2 above (Table 1).

b) TCAM used by people under the supervision of BHPs in the studies that met our search criteria (Table 2).

Twenty four published articles out of a nearly 100 were included based on our search criteria. In general papers reporting TCAM use whether self-administered, THPs prescribed or recommendations from family and friends were included in this study.

### **Discussion**

This review found that participants in studies (Table 1) mainly indicated spiritual, cultural, family influence, accessibility of TM, approachability of THPs and inadequate hospitals as some of the reasons why they opted for TCAM instead of conventional medicine for the management of diabetes and hypertension. This is in agreement with other studies conducted in United States of America. In a survey

Table 1 — Articles reporting use of TCAM in the management of diabetes and hypertension on the African continent

Author and year of publication	Research time frame	Country	Study design	Sample size of participants included in the study	Treatment modalities	Reasons of TCAM use	Outcomes	Prevalence Rate of TCAM use
<sup>46</sup> Rutebemberwa, <i>et al.</i> , 2013	July-August 2011	Uganda	Exploratory with FGDs and key informants interview	32	Herbs (NS)	Affordability and scarcity of diabetic drugs in clinics.	NS	NS
<sup>4</sup> Baldé, <i>et al.</i> , 2006	April 1-30 June 2003	Guinea	Cross sectional, Questionnaire	397	Medicinal plants ( <i>Pileostigma thorningii</i> , <i>Xylopi aethiopica</i> , <i>Ficus capensis</i> )	Participants believed in the efficacy of medicinal plants.	Improvement in their conditions	33%
<sup>55</sup> Dièye <i>et al.</i> , 2008	May-30 June 2006	Senegal	Cross sectional survey, direct interview	220	Medicinal plants ( <i>Morenga oleifera</i> , <i>Sclerocarya birrea</i> )	Believed in the efficacy of medicinal plants.	Improvement in their conditions	65%
<sup>61</sup> Ogbera, <i>et al.</i> , 2010	September 2008-December 2008	Nigeria	Cross sectional survey, questionnaire	263	Bitter leaf, <i>Aloe vera</i> , garlic	Cost effective.	Reduction in blood sugar levels	46%
<sup>8</sup> Hughes, <i>et al.</i> , 2013	May-November 2010	South Africa	Cross sectional, face to face interview	135	Tea with other mixtures (NS)	Family and friends recommendations.	NS	21%
<sup>36</sup> Osamor & Owumi, 2010	NS	Nigeria	Cross sectional Semi-structured survey	440	Herbs (NS) and garlic	Hypertension caused by supernatural forces only CAM can cure the condition.	NS	29%
<sup>44</sup> Rachid, <i>et al.</i> , 2012	October 2009 to June 2011	Algeria	Ethnobotanical study survey, Interview guide	470	Medicinal plants ( <i>Trigonella foenum</i> , <i>Rosmarinus officinalis</i> , <i>Artemisia herba alba</i> )	Accustomed with traditional knowledge.	NS	28.3%
<sup>62</sup> Singh, <i>et al.</i> , 2004	2000-2001	South Africa	Cross sectional, face to face structured interviews	200	Spiritual healing, Vitamin E and herbs (NS)	Friends advice and efficacy.	Reduction in blood sugar levels and blood pressures	38.5%
<sup>56</sup> Laadim, <i>et al.</i> , 2017	September 2013-April 2014	Morocco	Ethnopharmacological survey, predetermined questionnaire	700	Medicinal plants ( <i>Trigonella foenum</i> , <i>Oreganum vulgare</i> , <i>Olea europaea</i> )	Satisfied with CAM usage.	Decrease in blood pressure, reported side effects (sore stomach, vomiting)	61%
<sup>63</sup> Negbenebor, <i>et al.</i> , 2017	NS	Nigeria	Cross sectional, self-structured questionnaire	100	Medicinal plants ( <i>Allium cepa</i> , <i>Allium sativum</i> , <i>Azadirachta indica</i> )	Believed in the efficacy of medicinal plants.	Improvement in their conditions	69%
<sup>51</sup> Olisa & Oyelola, 2009	2 April to 26 June 2007	Nigeria	Cross sectional, questionnaire	500	<i>Allium sativa</i> , <i>Aloe vera</i> , <i>Azadirachta indica</i>	Perceived failure of conventional medicine.	Reduction in blood pressure, gastrointestinal side effects	25%

(Contd.)

Table 1 — Articles reporting use of TCAM in the management of diabetes and hypertension on the African continent (Contd.)

Author and year of publication	Research time frame	Country	Study design	Sample size of participants included in the study	Treatment modalities	Reasons of TCAM use	Outcomes	Prevalence Rate of TCAM use
<sup>48</sup> Eddouks, <i>et al.</i> , 2002	NS	Morocco	Interview guide	700	Medicinal plants ( <i>Nigella sativa</i> , <i>Allium sativum</i> and <i>Olea europaea</i> )	Believed in the efficacy of medicinal plants.	NS	80%
<sup>49</sup> Jouad, <i>et al.</i> , 2001	May1997-NS	Morocco	Interview guide		<i>Artemisia herba alba</i> , <i>Nigella sativa</i> , <i>Allium sativum</i>	Efficacy and less costly of phototherapy use.	NS	76%
<sup>64</sup> Kretchy, <i>et al.</i> , 2014	May-October 2012	Ghana	Cross sectional descriptive (qualitative & quantitative)	400	Herbal preparations (NS), moringa & garlic	Cheaper alternative compared to conventional medicine.	NS	19.5%
<sup>65</sup> Peltzer, 2004	NS	South Africa	Cross sectional, Interview guide	100	Herbs (NS), Prayers, Tea, holy water	Belief that hypertension can be cured.	NS	75%
<sup>66</sup> Hjelm & Atwine, 2011	NS	Uganda	Descriptive studies	24	Herbs (NS) and prayers	Failure of the mainstream healthcare system.	NS	NS
<sup>67</sup> Nuwaha & Musinguzi, 2013	NS	Uganda	Cross sectional survey	258	Herbal therapies (NS), life style interventions (reduction in salt intake, increase in physical activities, reduction in alcohol intake)	Effectiveness of alternative medicine.	NS	56.2%
<sup>5</sup> Davids, <i>et al.</i> , 2016	August 2014- september 2015	South Africa	A cross sectional study in depth interview	112	Medicinal plants ( <i>Lessertia frutescens</i> , <i>Leonotis leonurus</i> , <i>Artemisia afra</i> )	Limited side effects.	Relief of symptoms	52.79%
<sup>68</sup> Amel, 2013	January-June 2010	Algeria	Interview, questionnaire	200	Medicinal plants ( <i>Allium cepa</i> , <i>Allium sativum</i> , <i>Olea europea</i> )	Religious influence based on Holy Quran readings about plants.	NS	15.5%
<sup>47</sup> Atwine, <i>et al.</i> , 2015	February-April 2011	Uganda	Descriptive, FGDs	17	Extracts of <i>Aloe vera</i> and <i>Eucalyptus</i> leaves	Failure of conventional medicine.	NS	NS

a) Legend: NS: not stated, Per cent (%) given per publication (prevalence rate)

As shown in Table 2 a total of 4 papers met our search criteria. Two out of the four studies reported were randomized control trials studies conducted in Mauritius. An observational study conducted in Cameroun made the list because it was done under the supervision of BHPs. A research work carried out by these authors (Amira & Okubadejo)<sup>2</sup> in Nigeria made the list even though part of the studies were descriptive (interview guide) patients blood pressures and compliance to prescribed under BHPs were documented over a 3 month period.

Table 2 — Published articles representing the use of TCAM in the management of diabetes and hypertension under BHPs supervision.

Author & year of publication	Research time frame	Country	Study design	Participants	Treatment modality	Control for study	Outcomes of TCAM use based on clinical data
<sup>60</sup> Somanah, <i>et al.</i> , 2012	November 2010-Mrch 2011	Mauritius	RCT	127	Fermented papaya supplement	Water regimen	Improved the effect of oxidated tension on targeted organs. Decrease in C reactive protein, cholestrol, uric and serum ferritin levels.

(Contd.)

Table 2 — Published articles representing the use of TCAM in the management of diabetes and hypertension under BHPs supervision. (*Contd.*)

Author & year of publication	Research time frame	Country	Study design	Participants	Treatment modality	Control for study	Outcomes of TCAM use based on clinical data
<sup>59</sup> Toolsee, <i>et al.</i> , 2013	November 2010-Mrch 2011	Mauritius	RCT	300	Green tea	Water regimen	Improvement of mean arterial blood pressure. 2.7 % and 5.1 % anti-oxidant potential in men and women sera.
<sup>58</sup> Tsabang, <i>et al.</i> , 2015	NS	Cameroun	Observational	182	Herbal remedies	NS	64.17 % (decrease and blood pressures and regulation of sugar levels).
<sup>2</sup> Amira & Okubadejo, 2007	NS	Nigeria	Descriptive, Observational	225	Garlic, native herbs, ginger, bitter leaf, <i>Aloe vera</i> , prayers and fasting	NS	Average initial systolic/diastolic pressure (158.3/100.9), average final systolic/diastolic pressure (140.4/87.7).

a) Legend: NS: not stated

conducted in the North-American country involving 1035 participants to find out their perspectives about alternative medicine, respondents (69 %) mentioned cultural beliefs and philosophical orientations towards health as some of the reasons why they depend on alternative medicine for their primary healthcare goals. Findings by these two authors, Kaptchuk & Eisenberg (1998)<sup>42</sup> revealed the significance of cultural beliefs and spirituality dependence as some of the reasons why people use alternative medicine in the management of diseases<sup>42,43</sup>. Another finding in this review revealed that traditional knowledge in congruent with cultural beliefs about diabetes influenced usage of TCAM amongst studied population in Algeria<sup>44</sup>. Drozd (2000)<sup>45</sup> argued that perceptions and interpretation of illness are influenced by the culture of an individual. The author reported that in the management of diseases such as diabetes, understanding the culture of a diabetic patient by a healthcare professional is critical because cultural values influence the choices patients make every day<sup>45</sup>.

Findings from this study have shown that increasing cost of conventional medicine and poor economic conditions lead people to rely on alternative medicine for their primary healthcare needs. The usage of TM amongst inhabitants in the Iganga and Bugiri districts due to its affordability and the scarcity of diabetic drugs in clinics and pharmacies were reported in Uganda<sup>46</sup>. This is an agreement with findings from a research work carried out in Ghana

where accessibility and affordability of TM than western biomedicine were cited as some of the reasons why people rely on alternative medicine<sup>13</sup>. Moreover, poor accessibility of modern medicine to people living in developing (low and middle) countries was revealed in a survey conducted by WHO and Health Action International (HAI). It has been established that failure of conventional medicine to completely eradicate health problem encourages people to lean on alternative medicine<sup>42</sup>.

Findings from this study revealed that most of the hypertensive patients using CAM alongside conventional medicine, in Ghana, withheld this information from BHPs they consulted for the management of this chronic condition citing reasons such as lack of interest shown by BHPs regarding the use of alternative medicine for the disease other than allopathic medicine. This is in agreement with a study conducted in Uganda where type 2 diabetic patients refused to disclose information about their use of CAM to the relevant BHPs because they had limited information on the medicinal products they were using to manage the disease<sup>47</sup>.

In this study, an average prevalence rate of the TCAM use by people on the continent recorded were as follows: Guinea (33 %), Senegal (65 %), Nigeria (69 %) Morocco (80 %), Algeria (28.3 %), South Africa (52.79 %). The above mentioned figures were relatively higher or slightly lower compared to findings documented by researchers in different parts of the globe. A prevalence rate of 48.5 % and 40 % of

CAM use in the general population were reported in Australia and USA, respectively<sup>2</sup>. Findings from these studies revealed a high prevalence rates of 80 % and 76 % (CAM usage) among studied populations in Morocco in 2001 and 2002 respectively<sup>48,49</sup>. These figures (80 % and 76 % prevalence rates) reported from studies conducted in Morocco are quite higher than what have been reported (63.9 %) prevalence rate of CAM use by the general population in the management of hypertension in India<sup>3</sup>.

In this study, concurrent use of CAM and conventional medicine by majority of the people were noted in Moroccan settings. About 75 % of type 2 diabetic patients used medicinal plants alongside conventional medicine to treat diabetes<sup>48</sup>. This is in agreement with findings from other studies conducted in countries such as India and Jamaica. A research conducted in Jamaica involving 743 patients revealed that 80 % of the respondents used natural products alongside prescribed medication in the management of diabetes and hypertension diseases<sup>50</sup>. In India, 521 patients who visited a hypertensive clinic over a 6 month period admitted concurrent usage of prescribed medication, *Ayurveda* and herbal medicines in the management of this chronic condition<sup>3</sup>. It is significant to point out the concurrent use of traditional medicine and conventional medicine by people has not been extensively researched into by the scientific community<sup>51</sup>. Research have shown that use of conventional medicine for the management of diabetes and hypertension has side effects such as severe headache, visceral pain and fatigue<sup>23,32</sup>. These side effects associated with conventional medicine encourages people to rely on TM which is known to be relatively safer<sup>8,9</sup>. Awang & Fugh-Berman (2002)<sup>52</sup> found that some herbs (st John worth, garlic) and supplements (ephedra) have been proven scientifically to have influence on concurrent administered drugs. These same authors Awang & Fugh-Berman (2002)<sup>52</sup> indicated that herbal medicines may increase or decrease pharmacological actions of prescribed drugs in older adults and people with weak immune systems. Rahman (2001)<sup>53</sup> suggested the need to standardize formulations of garlic for the treatment of disease since different formulations of garlic might affect its efficacy in the prevention of cardiovascular diseases<sup>52,53</sup>. However, research has shown the possibility of compatibility of conventional and alternative medicine in acting against diseases. Aiyegoro & Okoh (2009)<sup>54</sup> found out that plant could

be used as synergist enhancers when prescribed in combination with conventional medicine to mitigate the effects of antimicrobial therapy.

Findings from this study revealed that 20 % of the respondents using CAM for the management of diabetes in Senegal complained about side effects such as: hypoglycemic and hyperglycemic coma<sup>55</sup>. This could be attributed to CAM abuse owing to the fact that about 50 % of diabetic patients who took part in the survey were not well informed or had no information on the doses to take to manage this chronic condition (diabetes)<sup>55</sup>. Moreover, in Morocco diabetic patients (74 %) were not aware about toxicity of medicinal plants and only 24 % of respondents in a survey took that into consideration<sup>56</sup>. The documented plants and their side effects cited were as follows : *Lavandula stoeckas* (sore stomach); *Rosmarinus officinalis* (body pain) *Origanum vulgare* (abdominal pain); *Tetraclinis articulata* (abdominal pain) *Olea europaea* (vomiting) *Artemisia absinthium* (vomiting) and *Allium sativum* (decrease in BP)<sup>56</sup>. This is in agreement with a similar study carried out in a middle East country (Jordan) where 35 % of diabetic patients using herbal medicine complained about side effects such as headache, itching and sweating<sup>57</sup>.

This study (Table 2) has shown that there is scarcity of information on clinical trials on the effectiveness of TM in the management of diabetes and hypertension in Africa. World Health Organisation (WHO) suggested the need to research more into TM backed by clinical trials in its strategic policy document on alternative medicine<sup>1</sup>. The use of herbal therapies in clinical settings (observational studies or randomized clinical trials) for the management of diabetes and hypertension on the African continent is not well documented. In Cameroun, about 182 diabetic and hypertensive patients were given herbal remedies over a 10 day period and their conditions were evaluated which showed reduction in the blood sugar levels and arterial blood pressures in patients<sup>58</sup>. In Mauritius, a study conducted revealed the effect of green tea in the improvement of mean arterial blood pressure of pre-diabetes adults over a 14 week period<sup>59</sup>. In the same country (Mauritius), clinical evidence showed that fermented papaya could improve the effect of oxidated tension on targeted organs in diabetic patients<sup>60</sup>. In Nigeria, 88 out of a total 225 hypertension patients attending a hypertension clinic were observed and interviewed by BHPs within a 3

month period<sup>2</sup>. There was no significant difference in the BP control of both CAM users and those depending solely on conventional medicine for the management of diabetes and hypertension. The figures reported were as follows: average initial systolic/diastolic pressure (158.3/100.9) and 161.0(103.5) for CAM and non-CAM users, respectively. At the end of the 3 month study period these figures (average initial systolic/diastolic pressure) were reported for CAM users (140.4/87.7) and non-CAM users (142.8/90.1).

### Implications of findings for future research into TCAM

Increasing levels of TCAM use in the management of diabetes and hypertension on the African continent as reported in Tables 1&2 climax the urgent need for evidence base support of TCAM. Even though TM legitimacy and treatment approaches have been challenged<sup>39</sup>, its usage in modern day Africa is on the ascendancy without much documented adverse effects<sup>40</sup>. It is significant to evaluate the safety, potency and efficacy of herbs and medicinal plants before use by people. Efforts must be made to standardize medicinal plants (doses, its interactions with conventional drugs and side effects) and supplement used by the general population. WHO policy document suggested the need to ensure the safety and efficacy of herbal medicines by the application of suitable standards and following Good Manufacturing Practices<sup>1</sup>. Moreover, scientific research into the possible effect of interactions between prescribed drugs and TCAM inside humans requires urgent attention.

### Limitations of this review

This review is about research based studies on the usage of TCAM in the management of diabetes and hypertension on the African continent. Studies included in this review were based on formal quality of assessment since this was not systematic review which rely on expert judgement. All identified articles were retrieved from different kinds of journals and include both quantitative and qualitative work. A bias towards work published in English cannot be overstated.

### Conclusion

This review has shown that herbal therapies are the most preferred mode of treatment for diabetes and hypertension for many people on the African

continent. However, most of the people who used herbal therapies in the management of these chronic conditions (diabetes and hypertension) were not aware about the constituents of these herbal therapies administered to them by THPs. Standardization of medicinal plants, herbal products, dosage, packaging, storage and product life are essential to ensure safety and efficacy of TM. In order to transform the potential of TM for the benefit of the entire population on the African continent, RCT using indispensable standardized products (herbs, plant extracts, etc.) in humans must be given the needed consideration.

THPs involved in the management of diabetes and hypertension must be given the needed recognition by incorporating their practices into the healthcare stream. They must be given special orientation about safe preparation of different herbal therapies, formulation of doses, storage of medicinal products and follow up with patients about treatment outcomes. Universities across the continent should offer both undergraduate and graduate courses in TM. There must be efforts to fully recognize and incorporate TCAM into the healthcare system in the various countries across the African continent as recommended by WHO in its policy document on TCAM, released in 2002.

Governments in Africa must enact laws to make medical insurance accessible to users of TM.

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