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Traditional, complementary and alternative medicine use in Sub-Saharan Africa: a systematic review

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ABSTRACT

Background The WHO estimates that a considerable number of people in Sub-Saharan Africa (SSA) rely on traditional, complementary and alternative medicine (TCAM) to meet their primary healthcare needs, yet there remains a dearth of research evidence on the overall picture of TCAM utilisation in the region.

Methods We conducted a literature search of original articles examining TCAM use in SSA between 1 January 2006 and 28 February 2017, employing Medline, Cumulative Index to Nursing and Allied Health Literature, Allied and Complementary Medicine Database, Scopus, ProQuest, PubMed, Embase and African Journals Online databases. A critical appraisal of relevant articles reporting a quantitative or mixed-method design was undertaken.

Results Despite the heterogeneity and general low quality of the identified literature, the review highlights a relatively high use of TCAM alone or in combination with orthodox medicine, in both general population and in specific health conditions in SSA. TCAM users compared with non-TCAM users are more likely to be of low socioeconomic and educational status, while there were inconsistencies in age, sex, spatial location and religious affiliation between TCAM users and non-TCAM users. Most TCAM users (55.8%–100%) in SSA fail to disclose TCAM use to their healthcare providers, with the main reasons for non-disclosure being fear of receiving improper care, healthcare providers' negative attitude and a lack of enquiry about TCAM use from healthcare providers.

Conclusion TCAM use in SSA is significant, although most studies emerge from a few countries. Factors associated with TCAM use in SSA are similar to those observed in other regions, but further research may be required to further elucidate challenges and opportunities related to TCAM use specific to SSA.

Key questions

What is already known?

- There remains a dearth of research evidence in Sub-Saharan Africa (SSA) on the drivers and facilitators of traditional, complementary and alternative medicine (TCAM) use, factors associated with TCAM use, and the impact of TCAM use on broader healthcare.

What are the new findings?

- Studies suggest a high use of TCAM (particularly TCAM products) in SSA, although most studies are limited to few countries, and there is a significant heterogeneity and low quality of some of the current scholarship.
- TCAM is used due to its perceived low cost, alignment of TCAM with sociocultural, religious and spiritual values, and dissatisfaction with conventional healthcare.
- Non-disclosure of TCAM use to healthcare providers is common among TCAM users in SSA, primarily due to the fear of receiving improper care from hospitals, negative attitude of healthcare providers towards TCAM and a lack of enquiry about TCAM use from healthcare providers.

What do the new findings imply?

- Widespread TCAM use in SSA necessitates health departments and governments across the region to consider and familiarise themselves with the current role of TCAM and its future possibilities within the wider healthcare system.

INTRODUCTION

Traditional, complementary and alternative medicine (TCAM) refers to a set of healthcare practices (indigenous or imported) that are delivered outside of the mainstream healthcare system.[1] In the African setting it may encompass local herbal medicines or products, indigenous healthcare practices (traditional bone setting), as well as imported complementary and alternative medicine products and practices (eg, acupuncture or chiropractic). Sub-Saharan Africa is one region of the world in which TCAM has long been held to be widespread, with a considerable number of its population relying on it to maintain their health or prevent and treat communicable and non-communicable diseases.[2 3] The economic influence of TCAM is extensive, contributing at least R2.9 billion (US$2.2 million) to the South African economy alone.[4]

The increasing uptake of TCAM services across the continent in recent decades has attracted the attention of policy makers,

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researchers and healthcare professionals. In the past 20 years, the WHO regional office for Africa spearheaded the implementation of a regional strategy endorsed by African Heads of State in Lusaka, Zambia[5] to promote the role of TCAM in health systems in the African region. The gains experienced since the adoption of the regional plan include policy formation in 36 countries and research promotion, including the establishment of TCAM research centres in some countries like Nigeria, Ghana and South Africa. The regional plan has also promoted the inclusion of TCAM courses into the curricula of healthcare training institutions in countries across the continent. For instance, such plan has seen the inclusion of TCAM courses in some South African[6] and Ghanian[7] universities. It has also promoted the training of TCAM practitioners and the local production and cultivation of medicinal plants, as well as the establishment of intellectual property rights for traditional medicine knowledge in few nations.[5] Despite such progress, African countries continue to grapple with an absence of TCAM policy or its implementation, inadequate TCAM research infrastructure and insufficient regulation of TCAM products and practices.[5 8] For instance, by 2005, only 32% and 27% of the African countries who responded to the WHO global survey had a national policy and law or regulation on TCAM.[9]

A steady rise in the prevalence of chronic non-communicable diseases is significantly contributing to Africa's disease burden, and is adding burden to healthcare systems already strained due to the high incidence of infectious diseases.[10] With high TCAM use for chronic health conditions reported outside of Africa,[11] it is postulated that TCAM will play an integral role in the health and well-being of people suffering from chronic diseases in Africa as well.[12 13] TCAM's role in the provision of primary healthcare is recognised in some Sub-Saharan Africa countries' health policy documents within the context of limited access to essential health services, especially among the rural poor.[14 15]

Considering the high utilisation of TCAM across Sub-Saharan Africa, it is necessary for policy decision makers, researchers and health professionals to recognise TCAM healthcare practices as integral to the health-seeking of populations and develop an effective response that safeguards their health and well-being. A proper policy and practice response to increasing TCAM use requires an indepth insight into the nature of TCAM use, including the profile of TCAM users as well as the drivers and barriers that facilitate and limit the use of TCAM. In direct response, this paper reports findings from the first comprehensive critical review of the prevalence of TCAM use alone and in combination with conventional medicine, sociodemographic characteristics of TCAM users, motivators of and barriers to TCAM use, safety and cost associated with TCAM use, as well as details around non-disclosure of TCAM use to health providers.

METHODOLOGY

Research design

The systematic review analyses the contemporary scholarship using an established approach developed for a number of health research topics.[16–18]

Search strategy

Peer-reviewed articles reporting on TCAM use in Sub-Saharan Africa were searched using the following databases: Cumulative Index to Nursing and Allied Health Literature, Allied and Complementary Medicine Database, Scopus, ProQuest, Medline, PubMed, African Journals Online, Embase and Google Scholar. Hand searching in the bibliography of relevant articles was also employed to help ensure the capture of all relevant peer-reviewed literature. Table 1 shows a summary of the search strategy employed. The definition of TCAM in our review was based on the definitions of traditional medicine and complementary medicine put forward by WHO.[1] It encompasses local herbal medicines or products, indigenous healthcare practices (traditional bone setting), as well as imported complementary and alternative medicine products and practices (such as Chinese medicine and chiropractic). Vitamins and mineral supplements were not considered as TCAM products in our study, as these are usually used for general health prevention rather than for specific health purposes.

The results from the databases and hand searches were imported into EndNote V.X8. Duplicates were removed, and the remaining articles were screened based on the title, abstract and full text. Figure 1 gives a detailed algorithm of how papers were excluded and included.

Search outcomes

We initially identified 1916 articles from the database search and from other sources. These papers were further screened using our inclusion criteria. One hundred and eighty papers met the inclusion criteria and were included in the critical review. A summary of the search process and categorical analysis of the reviewed studies are shown in figure 1 and online supplementary file 1, respectively.

Quality appraisal system

We employed an analytical tool adapted from previous critical reviews on complementary and alternative medicine use[17 19] to evaluate the quality of the papers that met the review criteria. The tool appraised study methodology, participant characteristics and TCAM use, with 1 point given to each aspect under the three domains (methodology, reporting of participant characteristics and reporting TCAM use). A maximum potential score of 12 was tallied if all aspects of the three domains were met. Two authors separately analysed and allocated scores. Differences in the final score were resolved through discussion among the four authors, with the most senior author having to make the final decision. Only articles using mixed and quantitative designs were considered

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Table 1 Search strategy

Databases	Cumulative Index to Nursing and Allied Health Literature Allied and Complementary Medicine Database Embase PubMed Medline Scopus ProQuest African Journals Online
Other sources searched	Google Scholar, bibliographies of searched articles
Key searched terms	Traditional medicine OR traditional therapy OR African traditional medicine OR traditional healer OR traditional medicine practitioner OR traditional medicine healer OR traditional birth attendant OR bonesetter OR faith healer OR spiritualist OR Complementary therapies OR Complementary and alternative medicine (CAM) OR Herbal medicine OR herbal therapy OR medicinal herbs OR herbal extract OR herbal product OR herbal supplements OR herbal remedies OR home remedies OR medicinal plants OR herbalist OR medical herbalist, folklore medicine OR folklore therapy OR indigenous therapy OR indigenous medicine OR indigenous health AND Africa OR sub-Saharan Africa, Western Africa(including all countries in that region) OR Central Africa(including all countries in that region) OR eastern Africa(including all countries in that region) OR Southern Africa(including all countries in that region) AND use OR prevalence OR Pattern OR utilization OR attitude OR knowledge OR practice OR perception OR health seeking behaviour OR Health care utilization AND Adverse Drug Event OR Adverse Drug Reaction OR Drug Side Effects OR Drug Toxicity AND Cost OR Expenditure OR Income
Search limit	
Duration	1 January 2006 and 28 February 2017
Language	English
Population	Humans of all age groups
Location	Sub-Saharan Africa (SSA)
Types of study	All studies that report empirical findings in all population groups for the treatment and prevention of health conditions, in SSA using traditional, complementary and alternative medicine products and/or practitioners.
Type of publication	Peer-reviewed research articles.
Exclusion criteria	Review articles including systematic reviews and meta-analysis, editorial, commentaries, letter to the editor, clinical case studies, studies conducted outside SSA, clinical studies using randomised control trial design, and articles that failed to use systematic research design and reporting procedures.

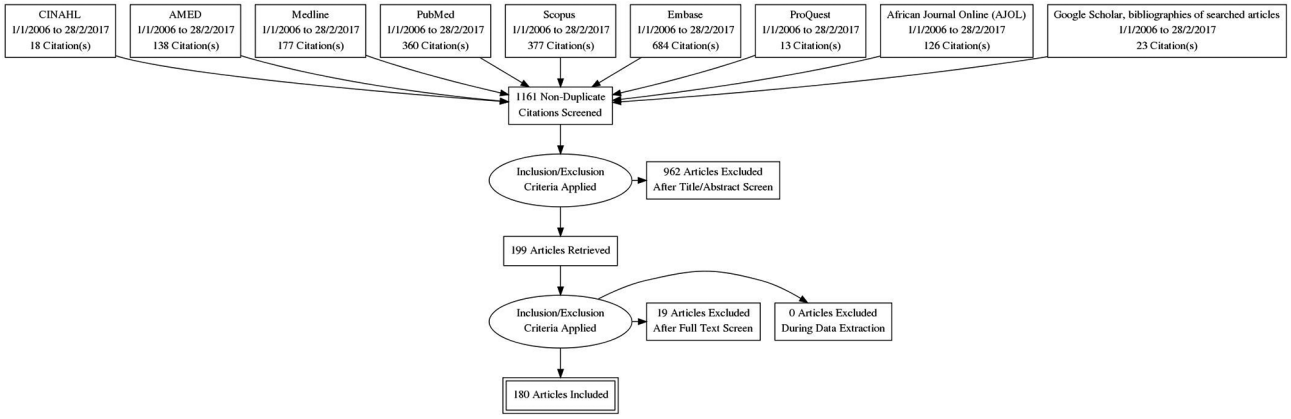

Figure 1 PRISMA flow diagram of included and excluded articles. AMED, Allied and Complementary Medicine Database; CINAHL, Cumulative Index to Nursing and Allied Health Literature.

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Table 2 Quality appraisal scoring system

Dimensions of quality appraisal	Codes	Points awarded
Methodology		
Representative sampling strategy	A	1
Sample size ≥500	B	1
Response rate >75%	C	1
Low recall bias on TCAM use within the past 12 months or less	D	1
Reporting participants' characteristics		
Age	E	1
Gender	F	1
Socioeconomic status (income or education)	G	1
Ethnicity/tribe	H	1
Location (urban or rural or district or region)	I	1
Reporting TCAM use		
Definition of TCAM to respondents	J	1
Assessed use of TCAM	K	1
Type of TCAM	L	1
Total		12

TCAM, traditional, complementary and alternative medicine.

as they formed the greater part of the reviewed papers. For mixed-method studies, only the quantitative study component was appraised. Table 2 and the online supplementary file 2 provide the details of the quality appraisal tool and the summated score of each paper, respectively. Articles with summated scores ranging from 9 to 12, 6–8 and 0–5 were considered of good, fair and poor quality, respectively.

RESULTS

A total of 180 articles met the criteria for review. The included articles employed mixed-method (n=14), qualitative (n=12) and quantitative (n=154) research designs. Based on our search strategy, we were able to identify studies from 25 out of the total 48 countries which constitute Sub-Saharan Africa. Nearly three-quarters (72.8%) of included papers reported research conducted in just four countries: Nigeria (n=72, 40.0%), South Africa (n=26, 14.4%), Ghana (n=20, 11.1%) and Uganda (n=13, 7.2%). A summary of the included articles is shown in online supplementary file 1. There were very few articles with high methodological quality. Of the 165 articles that met the requirement for critical appraisal, 2 articles from South Africa[20 21] had a total score of 11, and 7 papers from different countries had a score of 10.[22–28] Less than a quarter (n=30, 18.2%) and close to two-thirds (n=106, 64.2%) of the articles appraised had total scores ranging from 9 to 12 and from 6 to 8, respectively. Methodological flaws were discovered in the selected articles, with only 8 (4.8%) of studies employing a nationally representative sampling strategy. Two-thirds (n=110, 66.7%) of the identified articles reported a sample size less than 500. Also, the tendency for recall bias based on whether TCAM was used within the past 12 months or less was identified in almost half (n=82, 49.7%) of the papers appraised. With regard to the reporting of TCAM use, close to two-thirds (66.1%) of the articles reviewed failed to provide a definition of TCAM. Details of the results of the critical appraisal scoring system are shown in online supplementary file 2. In general, the reviewed articles reported eight major themes: types of TCAM used, prevalence of use of TCAM, prevalence of concurrent use of TCAM and allopathic medicine, and sociodemographic profile of TCAM users, drivers and barriers to TCAM use, non-disclosure of TCAM use to healthcare providers, TCAM costs and reported adverse effects of TCAM use. In reporting the findings of our review, the prevalence of TCAM and the sociodemographic profile of TCAM users were categorised into general population studies (including both adult male and adult female participants and not limited to examining any single specific disease or condition) and subhealth or disease-specific populations. The categorisation was done to highlight the TCAM utilisation in the general population and in diseases or conditions and specific populations that are considered a public health or clinical issue in Sub-Saharan Africa. Disease conditions or populations with single publication were grouped as others.

Types of TCAM use

Based on the literature reviewed, biological-based therapies such as herbal therapy are the most common TCAM used in Sub-Saharan Africa, followed by faith-based healing methods (prayer/spirituality) and mind-body therapies (massage, traditional bone setting relaxation, mediation and yoga).[29–53] A few studies examining TCAM use among university staff, patients with HIV/AIDS and patients with cancer reported homeopathy,[54] prayer/spirituality[21 55] and massage[56] as the most common TCAM modalities used, respectively.

Prevalence of TCAM use in Sub-Saharan Africa

One hundred and twenty-six of the reviewed articles reported the prevalence of TCAM product (self-care and over-the-counter use) and practitioner use. Papers were divided into two main categories: those reporting TCAM use in the general population (including both adult male and adult female participants and not limited to examining any single specific disease or condition) and TCAM use in subpopulations (such as a specific clinical population). For reporting TCAM prevalence, articles were categorised as reporting on large sample studies (n≥500) and small sample studies (n<500). In general, the current literature suggests a varied prevalence but substantial use of TCAM in both general and subhealth populations

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(despite methodological limitations in many of the articles reviewed, including no formal or standardised definition of timeframe of use).

Prevalence of TCAM use in the general population

Twenty-six articles reported TCAM product use in the general population,[12 44 45 48 49 57–77] reporting substantial prevalence rates ranging from 4.6% (urban settlement in Ethiopia)[65] to 94% (semiurban settlements in Nigeria and Ethiopia),[49 72] with an estimated average of 58.2%. At least half (n=23) of the study population in majority of the studies reported using TCAM products. Similar utilisation rates were observed among large sample size (≥500) studies[44 45 57–60 65 68 76] and small sample size (<500) studies.[12 48 49 61–64 66 67 69–75]

A varied prevalence was also observed among the 10 articles[20 27 28 58 63 78–81] that reported on TCAM practitioner utilisation (1.2%–67% (mean, 28.8%)). Among studies with large samples,[20 27 28 58 79] a lower use of TCAM practitioner services was observed (1.2%–44.1% (average, 12.6%)) compared with studies[63 78 80 81] with smaller samples (37.5%–67% (mean, 53.0%)).

Prevalence of TCAM use in health subpopulations

Pregnancy, childbirth, abortion and infertility

Eighteen studies reported the prevalence rates of TCAM use during pregnancy,[24 82–95] childbirth[94–96] and for pregnancy termination.[97] Between 12% and 90.3% (mean, 48.4%) of pregnant women were reported to use a TCAM product during pregnancy, a rate consistent across studies drawn from large sample sizes[84 85 93–95] (25.5%–67.5% (average, 45.3%)) and from small sample sizes[24 83 86–92] (12%–90.3% (average, 50.1%)). There is limited literature concerning TCAM practitioner service utilisation during pregnancy, with only one Zambian[82] and Nigerian[98] study reporting the proportion of women seeking the service of a traditional medicine practitioner during their pregnancy (Zambia: 21%; Nigerian: 44.6%). A study of Ghanaian women[94] (n=611) reported 11.7% used TCAM products during childbirth, while two Nigerian studies reporting large sample sizes identified 24.1% and 42.5% of postpartum women used the services of TCAM practitioners during childbirth, respectively.[95 96] Close to a quarter (22%) of urban Tanzanian women seek help from a traditional medicine practitioner for pregnancy termination compared with 16.9% of their rural counterparts.[97] There is also a limited literature with regards TCAM use for infertility, with only one Ugandan study reporting high use (76.2%) of herbal medicine among women seeking infertility care[99] and a Nigerian study reporting high use (69%) of TCAM practitioner service among infertile couples.[100] There is also a dearth of research evidence of TCAM use among menopausal women, with only one Nigerian study reporting a lower use (3.8%) TCAM practitioner service among menopausal women.[101]

Sexual health conditions

Three papers, of which two were drawn from large sample sizes (≥500), reported Zambian (68%) women used TCAM products to dry up and constrict the vaginal passage prior to sexual intercourse,[102] and Ghanaian (56.3%) women used TCAM to manage gynaecological conditions.[94] The third study (n=224) reported 54.9% of male and female Ugandans presenting with various types of sexually transmitted infections used TCAM.[103]

Hypertension, diabetes, cancer and asthma

Seven articles reported TCAM product utilisation rates among patients with hypertension[32 33 39 46 104–106] and indicate a rate of between 19.5% and 67.8% (mean, 27.1%). Only one of the seven studies was drawn from a large sample of patients with hypertension (n=500) and the reported prevalence in this case was 24%.[106]

TCAM product use by patients with diabetes varied across the four identified studies drawn from smaller samples, with a higher rate reported in Tanzania (77.1%)[107] compared with Nigeria (46%),[43] Guinea (33%)[108] and Kenya (12.4%).[109] With regard to cancer, the available literature reports a high use of TCAM among patients with cancer in Sub-Saharan Africa (Nigeria: 65%[34]; Ethiopia: 79%[110]; Ghana: 73.5%[56]), although one Nigerian study did report a lower rate of use specifically for TCAM services.[111] A Prospective Urban and Rural Epidemiological (PURE) study in South Africa reported a higher (61%) TCAM product use among general adult population with non-communicable diseases.[12] With regard to TCAM use among patients with asthma, the reviewed literature was drawn from smaller sample size studies conducted in Nigeria, and they suggested that slightly over half of adult (50.5%)[29] and a quarter of paediatric (25%)[47] patients were TCAM product users.

HIV/AIDS

Twenty-four papers reported TCAM product [112] and practitioner[113–115] usage among patients with HIV/AIDS. We observed a similar average prevalence of TCAM product (1.8%–96.8% (mean, 45.8%)) and practitioner use (17.6%–62% (mean, 45.0%)), respectively. Only one product-based[59] and one practitioner-based[113] studies were conducted using a large sample of patients with HIV/AIDS, and both reported utilisation rates of 1.8% and 62%, respectively.

Malaria and febrile illness

A total of eight papers reported TCAM use for malaria and febrile illness, with close to a quarter of children and at least half of adults reported using TCAM.[22 116–122] Two studies reporting large sample sizes in Sierra Leone reported 22%[121] and 24.7%[22] TCAM products use among children, while the rates were higher among adult populations in Sierra Leone (55%)[120] and Ghana (50.3%).[119] An increased rate of TCAM use for uncomplicated malaria was recorded in Mali[117] between 2003 (24%) and 2013 (58%). Another large population study in two rural districts in Mali documented 27% of individuals with uncomplicated malaria used TCAM alone for management of their health compared with 50% for complicated

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cases.[116] On the other hand, a lower proportion (18.2%) of TCAM products was reported among 33 children with complicated malaria[122] The only study reporting TCAM practitioner use for malaria was conducted in Nigeria and reported a prevalence of 49.7%.[118]

Mental and neurological disorders (epilepsy and mental health disorders)

A total of 11 articles reporting small sample sizes (<500) identified rates of TCAM use among patients with epilepsy[40 47 123] and mental health conditions.[23 124–131] Among children with epilepsy, Lagunju[40] reported a high use (56.6%) of TCAM products compared with 38% reported by Oshikoya *et al*.[47] On the other hand, Nwani *et al*[123] reported a high utilisation of TCAM practitioner service (65.5%) among adult patients with epilepsy. Seventy-six per cent of Nigerian patients with schizophrenia[129] and 11.5% of patients with psychosis in South Africa[131] used TCAM products. Among psychiatric patients in general, a higher proportion in Nigeria (73.5%)[125] and Ethiopia (50.3%)[23] used the service of a TCAM practitioner compared with their counterparts (in Ghana (23.3%)[127] and Malawi (22.7%)[128]). Greater than two-thirds (69%–76%) of patients with schizophrenia in Nigeria[124 129] seek care from a TCAM practitioner, whereas a lower proportion of patients with psychosis (11.5%–38.5%) in South Africa[126 131] visit a TCAM practitioner. On the other hand, a Ugandan study stated that more than 80% of patients with psychosis simultaneously access both orthodox and traditional medicine systems.[132] In Sudan, more than one-third (41%) of patients with mental disorders had sought the service of a TCAM practitioner prior to accessing conventional care.[130]

Musculoskeletal conditions

A total of seven (six Nigerian, one Ghanaian) studies drawn from small samples reported TCAM product and practitioner use for musculoskeletal conditions. Two studies reported 96.8% of peasant farmers[41] and 40.2% of occupational drivers[133] as using TCAM products for the management of musculoskeletal pain. Another study reported 47.2% of TCAM product use among patients with osteoarthritis.[42] On the other hand, 52.3%, 31.6% and 21% of patients with bone fracture from north central[134 135] and middle belt[136] regions of Nigeria patronises traditional bonesetters (TBS), respectively. In the Ghanaian study, 29 of the 46 patients interviewed had received treatment from a TBS.[137]

Diarrhoea

Four studies were identified that reported TCAM product and practitioner use among individuals experiencing diarrhoea.[96 121 138 139] A general population study from Kenya[139] and a paediatric-based survey in Sierra Leone[121] reported 97.45% and 31% of TCAM product use to manage diarrhoea, respectively. In addition to the Kenyan study, similar studies from Mali (57%)[138] and Nigeria (11.3%)[96] reported rates of TCAM use for diarrhoea management.

Eye diseases

Seven studies,[38 140–144] five of which were conducted in Nigeria, reported that the TCAM use for ophthalmic conditions ranged from 1.6% to 83.2% (average, 28.2%). No study presented TCAM practitioner use for the management of ophthalmic conditions.

Surgical care

Two studies from Nigeria and South Africa reported studies on TCAM product use among surgical patients. In the Nigerian study, 40% of 60 patients surveyed used herbal medicine during their preoperative period,[145] while in the South African study 7% of 495 surgical patients had used TCAM in the preceding 6 weeks.[146]

Others (infantile colic, tuberculosis, oral health and mycetoma)

A study in Nigeria reported that 32.8% and 3.1% use TCAM product and visited a traditional birth attendant to manage infantile colic, respectively.[147] Also, studies conducted in Nigeria reported that 10% and 19.8% of patients suffering from tuberculosis[148] and toothache[149] had consulted with a traditional medicine practitioner, respectively. In addition, another Nigerian study reported that 31.9% of mothers with sick children visiting a private primary healthcare clinic used crude oil as traditional medication.[150] In Sudan, 42.4% of patients with mycetoma reported using herbal medicines,[151] while 57% of deceased patients who were terminally ill in Ethiopia visited a traditional and spiritual healer.[152]

General inpatients and outpatients

Five studies (three Nigerian, one South African and one Ugandan) assessed TCAM use among inpatients and outpatients. The current review indicates a higher TCAM utilisation rate among outpatients compared with inpatients. For instance, a Nigerian study among inpatient and outpatients reported that 72% of the 200 outpatients are currently using TCAM products, whereas 18.5% of the 65 inpatients are reportedly using TCAM products.[153] Similar findings among outpatients were reported in similar studies in Nigeria (89.9%)[30] and South Africa (60.9%)[154] and among inpatients in Nigeria (14.2%)[155] and Uganda(18.3%).[156]

Student population, healthcare professionals and academic staff

The reviewed literature indicates that 38.4% of high school students in Nigeria used a TCAM product[157] compared with 81.8% and 75.1% TCAM product utilisation rates that were reported among Nigerian university students[31] and university students and staff,[158] respectively. A similar high utilisation rate was reported among university students in Ghana (89.1%).[35] This rate was lower among medical students in both countries (Nigeria: 28%[159]; Ghana: 56.7%[160]) and among paramedical students in Nigeria (53.9%).[161] In Sierra Leone, 59.1%

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and 55.6% of graduating medical and nursing students[37] as well as all pharmacy students[36] used TCAM products.

Among healthcare professionals, TCAM use was reported among medical doctors in Nigeria (20.7%)[162] and professionals providing HIV/AIDS care in Durban, South Africa (23.5%).[163] One study drawn from a large sample reported that 50.3% of the academic and administrative staff in a South African university[54] used TCAM.

Prevalence of concurrent use of TCAM and allopathic medicines

Twenty-six papers were identified that reported on the concurrent use of TCAM products and conventional medicines within the general population[44 64 164] and subhealth population.[21 35 53 55 66 89 91 105 106 109 112 117 153 165–174] The prevalence of concomitant use ranged from 4.3% to 69.4% (mean, 30.5%). There is high prevalence of concurrent use with conventional medicine in the general population (mean, 54.9% (40%–63.7%)). The prevalence of co-use of TCAM and allopathic medicines among patients with HIV/AIDS had a mean of 20.3% (4.3%–47.9%).[21 53 55 112 166–170 173 174] With regard to patients with hypertension, the utilisation rate was higher in a study conducted in Nigeria (47.5%)[106] than in Uganda (14.3%),[105] but a relatively lower utilisation rate (7%) was reported among patients with diabetes in Kenya.[109] Among pregnant women, the prevalence of concurrent use was lower in Kenya (20%)[89] than Uganda (64.1%)[91] and Ghana (45%).[172] Among the general outpatients, two studies in Nigeria reported a varied prevalence of 21%[153] and 69.4%.[165]

Sociodemographic profile of TCAM users in the general population

The sociodemographic characteristics of users of TCAM were identified in a number of articles. TCAM users were reported in many studies to be more common in individuals with a lower socioeconomic status[20 44 45 62 65 66 71 79 175 176] and who are unemployed and unskilled[20 69 74] when compared with non-users. With regard to the link between age and TCAM use, the relevant papers reported variability based on where the study was conducted. Generally, studies conducted in urban or semiurban settings reported TCAM users to be younger (20–50 years),[20 58 61 71 74] whereas those conducted in a rural setting reported TCAM users to more likely be older (>55 years).[62 177] An inconsistent pattern was observed from the available literature with respect to educational status of TCAM users. While four included studies reported TCAM users to have little or no formal education,[20 62 71 177] two other studies provided a contrasting view.[61 74] Generally, TCAM users compared with non-TCAM users in the general population were more commonly reported to be married[44 45 57] than not married.[20] Two studies reported on the link between TCAM use and spatial location of respondents. A national household survey in South Africa identified rural residents as more likely to visit a TCAM practitioner than their urban counterparts,[20] while a study among 324 residents of the Ashanti Region of Ghana did not find any significant difference between TCAM users residing in both locations.[50] The available literature reports an equivocal relationship between TCAM use and gender. On one hand, two studies from Ethiopia and Nigeria identified women more than men as likely TCAM users,[44 65] while another Nigerian study reported men as likely users of TCAM.[45] With respect to religion, a community-based study in Enugu, Nigeria reported TCAM users were likely to be Christians than other religions,[74] whereas another Nigerian study conducted in Imo State did not observe any significant difference.[68] Meanwhile, two Nigerian studies reported no significant correlation between the sociodemographic characteristics of the respondents and TCAM use.[60 72]

In summary, TCAM users compared with non-TCAM users in the general population across Sub-Saharan Africa are more likely to be of low socioeconomic status, while there were inconsistencies in age, sex, educational status, spatial location and religious affiliation among TCAM users

Sociodemographic profile of TCAM users in health subpopulations

TCAM users in pregnancy, childbirth and abortion

The reviewed literature shows pregnant women who use TCAM were more likely to be of low socioeconomic status[84 88 92 93 98] and less educated[84 86 88 89 92 98] compared with non-users, although one study reported higher education completion as a predictor of TCAM use.[84] TCAM users were also found to be younger (<30 years)[84 98] and married[84 98] compared with non-TCAM users.[24] Meanwhile, three studies from Zambia,[82] Mali[90] and Ethiopia[83] reported no sociodemographic difference between TCAM users and non-users. With regard to TCAM use during childbirth, two studies drawn from a large sample of Nigerian women show TCAM users are likely to be women who are less educated, from low socioeconomic background, Muslim and primiparous.[95 96] With respect to pregnancy termination, a Tanzanian study indicates that women with primary education from both rural and urban settings were more likely to use herbs to induce abortion compared with those with at least a high school education.[97]

TCAM users among patients with HIV/AIDS

Patients with HIV/AIDS who identified as a TCAM user in a number of studies across Sub-Saharan Africa were more likely to be female,[21 168 178–180] not married,[180 181] of low socioeconomic status,[21 180] younger (<39 years),[25 179 180] unemployed,[180 181] educated,[21 25] from a rural area[21 53] and of Christian religious denomination.[180]

TCAM users among patients with hypertension and diabetes

A review of the literature indicates that patients with hypertension who are male,[33 39 46] of low income level,[33 39] less educated,[33] older[106] and reside in rural area[33] are more likely to be TCAM users. A Ugandan study did not

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find any significant association between the sociodemographic profile of patients with hypertension and TCAM use.[105] A study undertaken in South Africa in 2010 found that TCAM users with hypertension compared with non-hypertensive TCAM users were more likely to be older, without a partner and unemployed.[104] With regard to patients with diabetes, two studies from Kenya[109] and Nigeria[43] show that patients with diabetes who are older and have had at least a formal education were more likely to be TCAM users.

TCAM users among patients with cancer

A Ghanaian study reported that patients with cancer who were female were more likely users of TCAM,[56] whereas a similar study in Ethiopia reported that patients who have attained at least secondary education, had monthly income of more than US$125, presented with comorbidity and at the advanced stage of their disease were likely users of TCAM.[110] However, there were no statistically significant differences between TCAM users and non-users with regard to the type of cancer. Meanwhile, a Nigerian study did not find any significant difference between users and non-users of TCAM.[34]

TCAM users among patients with eye diseases

Patients with eye problems who are older (≥50 years),[140 142] from a rural settlement,[141 143] married[141] and uneducated[142] are likely to be TCAM users in Sub-Saharan Africa. However, another study from Nigeria identified younger age (<50 years) as a determinant of TCAM use for eye diseases.[141] Also, a similar study from Zimbabwe reported traditional medicine users for eye conditions are likely to belong to the Apostolic sect, reside in a periurban area and unemployed.[38]

TCAM users among surgical patients

The two identified studies from Nigeria and South Africa conducted among presurgical patients found no statistically significant differences exist between TCAM users and non-users.[145 146]

TCAM users among patients with malaria and febrile illness

Two Sierra Leonean studies reported that TCAM use was associated with being male,[120] Muslim[121] and living in a rural area.[120] In a study conducted among female residents in Nigeria, TCAM users were more likely to be older (≥50 years), and less educated, unemployed or had a blue-collar job.[118]

TCAM users presenting with sexual health conditions

A Ugandan study among patients with sexually transmitted infection reported that TCAM use was common among those who were married and educated.[103] Ghanaian patients visiting gynaecological units and using TCAM were reported to be less educated and unskilled compared with non-users.[94] A Zambian study examining the use of TCAM to achieve vaginal dryness prior to sexual intercourse revealed that the practice was common among married women and those who grew up in rural areas.[102]

TCAM users seeking infertility care

The two identified studies from Nigeria and Uganda indicated that TCAM users were likely to have attained at least secondary education,[99 100] of low socioeconomic class,[100] married, never conceived and older than 30 years.[99] The Ugandan study also reported herbal medicine use was higher among women with less than 3 years of infertility.[99]

TCAM users with musculoskeletal diseases

With regard to musculoskeletal diseases, only one Nigerian study among patients with osteoarthritis was identified, and it reported no significant difference in respondent demographics between TCAM users and non-users.[42] On the other hand, another Nigerian study that assessed the utilisation of services rendered by TBS reported that being young, male, married, having a skilled occupation and of low economic status were associated with visiting a TBS.[134]

TCAM users with mental illness and neurological disorders

Two Nigerian studies[40 129] reported the characteristics of TCAM users with mental health disorders. Caregivers of children with epilepsy who came from low socioeconomic background and had lower levels of education were more likely to use TCAM.[40] Patients with schizophrenia who are older (>40 years), less educated, reside in a rural setting and practise African traditional religion were more likely to use the services of a traditional healer.[129] This same study further reported that patients with schizophrenia who are Christians were likely to visit a psychiatric hospital and faith healer compared with their counterparts practising African traditional religion.[129] Another study from Sudan reported that mental health patients who visit traditional healers were men, with an average age of 31 years, illiterate or with only a primary education, and unemployed.[130]

TCAM users among students, healthcare professionals, academic staff and general outpatient population

A Ghanaian study observed that TCAM users were more likely to be Christians enrolled in non-science-related programmes at the university.[35] In Sierra Leone, healthcare students' gender, age and year of study were not associated with TCAM use,[36 37] although being a Christian was associated with the use of spirituality/prayer among pharmacy students.[36] With regard to the general outpatient population, a study in Nigeria reported that women who were older, less educated and whose occupation was fishing were more likely to use crude oil as traditional medication.[150]

Drivers of TCAM use

A handful of papers included in our review identified a number of pull and push factors promoting TCAM use. Key pull factors reported in the literature include

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relative low cost and flexibility of payment of TCAM products and services,[29–31 42 45 49 60 68 72–76 78 86 88 91 98 106 108 110 118 134 139 150 161 181–190] accessibility,[22 30 31 49 57 60 72 73 76 88 98 108 118 134 175 183 184 186 187 190 191] and the perception of TCAM being natural and therefore safe as well as effective compared with conventional healthcare.[20 29–32 42 45 48 49 57 73 74 76 78 85 86 88 91 106 108 118 134 139 141 150 157 175 183 187 188 192]

Patients participating in the identified studies were also positively attracted to TCAM for other reasons such as alignment with a patient's sociocultural, religious and spiritual values with regard to health and disease[12 32 33 42 68 72 73 81 91 106 110 118 149 181 183 187 188 190 192 193] and the sense of patient autonomy of their health.[183] Other pull factors of TCAM use identified from the literature are patients' trust and confidence in their traditional medicine practitioner to share their personal secrets and the perceived privacy they enjoyed with their traditional medicine practitioner.[187 194] Perceived psychosocial care and support provided by TCAM providers compared with orthodox healthcare providers have also been reported as a pull factor.[98 110 183] In addition, recommendation by respected and trusted peers such as TCAM providers, elders, relatives and friends has also been reported as a factor that drives patients into using TCAM.[12 54 111 134 135 161 186] Aggressive advertisement of TCAM products and services is another pull factor.[54 73 76 186]

The push factors mainly centred on dissatisfaction with conventional healthcare, and this includes long distance to health facilities,[187] unavailability of drugs,[22 91 186 187] difficulty and inequity in accessing care,[22 91 106 186] negative attitude of healthcare providers,[106 134 187] long waiting time, lengthy procedures and fear of being diagnosed of a serious disease.[134 192]

Barriers to TCAM use

A number of population and subpopulation studies reported factors limiting the use of TCAM in Sub-Saharan Africa. Studies conducted among Nigerian[31] and Sierra Leonean[36] undergraduate students and Nigerian medical doctors[162] cited an absence of conclusive scientific evidence that supports TCAM practice as a common barrier to the use of TCAM. A similar finding was reported in a population-based study in Ethiopia.[49] Also, lack of patient belief in the safety and efficacy of TCAM was identified as a barrier to TCAM use in studies conducted among patients with hypertension,[33] pregnant women[88] and patients with various health conditions,[192] as well as in the general population.[49] In addition, two population-based studies[48 189] and a subhealth study[192] reported that respondents were reluctant to use traditional medical care due to the perceived demonic nature of TCAM. Further, four population-based studies from Ghana[183 184 189] and Tanzania[73] and subpopulation studies from Nigeria[31] and Ghana[192] cited perceived lack of an appropriate dose for TCAM products and unhygienic practice in product preparation,[31 73 183 184 189] as well as the unregulated TCAM practitioner practice,[183 192] as deterrent to using TCAM. Other barriers to TCAM use were an absence of health financing for traditional health care[183] and a perceived lack of education and training among TCAM practitioners.[36 183 189]

Non-disclosure of TCAM use to healthcare providers

Twenty-five subhealth population studies reported on patients' non-disclosure of TCAM use to their conventional healthcare providers.[21 26 33 34 39 40 43 51 52 56 66 82 88 89 91 106 110–112 145 153 169 194–196] The non-disclosure rate of TCAM use to healthcare providers ranged from 55.8% to 100%, with an average of 83.0%. With regard to reasons for non-disclosure, four studies conducted among pregnant women in Uganda[91] and Zambia,[82] patients with hypertension in Ghana[39] and patients with HIV/AIDS in South Africa[195] cited fear of receiving improper care as a reason for not disclosing their TCAM use status to their healthcare provider. Another reason for non-disclosure of TCAM use was the conventional medicine provider's negative attitude with perceived lack of support and understanding that lead to mistrust and stigma from conventional providers. Such reasons were put forward by patients with HIV/AIDS in South Africa,[194] Uganda[196] and Ghana,[51] as well as patients with cancer in Nigeria[111] and pregnant women in Uganda.[91] The perception among Ethiopian patients with cancer[110] and Ugandan patients with HIV/AIDS[196] that their conventional healthcare providers lack knowledge about TCAM was another reason for not divulging their TCAM use status. Healthcare providers' lack of enquiry about TCAM use was also cited among patients with cancer,[34] epilepsy[40] and diabetes[43] in Nigeria. A study in Uganda reported that two-thirds of patients were open for discussion on TCAM use if initiated by their healthcare provider, and majority of them were also willing to adhere to their advice on TCAM use.[196]

Cost of TCAM use

We identified 15 papers that reported on the cost of TCAM use.[20 21 25 27 47 55 71 111 112 117 130 146 167 197 198] The current literature shows a conflicting picture among studies that compared cost incurred between TCAM and conventional care. Some studies suggest that there is relatively low cost involved in using TCAM therapy compared with conventional care, although there is variation on how cost was measured in the two groups. For example, a Ghanaian national survey revealed that the average total household cost in the last 12 months for conventional care was slightly higher (US$33.43) than costs incurred in seeking TCAM treatment (US$30.33).[27] Also, a study conducted among patients with cancer in Nigeria indicates cost of TCAM ranged from no cost to US$31.25, compared with the minimum cost of US$250 for conventional care.[111] In Mali, half of conventional malaria treatment costs ranged from no cost to US$116, whereas TCAM treatment ranged from no cost for three-quarters of patients to US$100.[117] In other studies, the cost of TCAM was higher than conventional care. For example, a Cameroonian study reported that the cost of TCAM

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treatment per day (US$1.5) was higher than conventional treatment (US$0.77).[197] Although cost was not stated, Sorketti and colleagues[130] in Sudan reported that more than three-quarters of psychiatric patients reported that the cost of treatment in traditional health centres was not less than conventional psychiatric service. Although no comparison was made with regard to conventional care, cost for TCAM services was relatively high in certain cases. For instance, in Tanzania, the maximum cost of TCAM treatment for epilepsy was US$100.[119] A relatively high cost of TCAM practitioner services was also reported among the general population in South Africa, where the median cost for the last visit to a traditional healer was calculated at US$21. TCAM costs can take up a significant part of the household healthcare budget. Sixty-four per cent of households in a South African study spent more than 10% of their monthly spending,[20] whereas majority (92.2%) of patients with HIV/AIDS who are TCAM users in Nigeria spent less than 20% of their monthly income on herbal treatment.[112] Among surgical patients in South Africa, close to one-third (30%) paid less than US$60 for TCAM services.[146]

Findings from studies that assessed the cost per month of TCAM use alone reported an average of US$47.5 (US$12.60–US$96.88).[21 25 47 55 167] In comparison between self-treatment and TCAM practitioner use, the average financial cost in Burkina Faso for TCAM self-care (US$2.85) was almost half of that for practitioner use (US$4.77).[71]

Safety of TCAM (self-reported or observed adverse effects)

Twenty-four papers reported on the perceived adverse effects due to TCAM or in combination with allopathic medicines.[33–35 44 47 52 55 59 66 69 76 84–86 88 106 110 145 146 153 156 199 200] Fifteen of the studies[33 34 44 47 69 76 84–86 88 110 145 146 153 199 200] reported on the prevalence of respondents' perceived side effects due to TCAM products use (4%–53.3% (mean, 19.1%)), whereas four[35 66 106 153] reported on respondents' perceived side effects due to concomitant use of TCAM products and conventional medicines (2%–56.5% (mean, 23.5%)). One Nigerian study[153] among outpatients reported a relatively high prevalence of TCAM adverse effects when used alone (9%) than when used in combination with conventional medicine (2%). Gastrointestinal disturbances (nausea, vomiting, diarrhoea and abdominal pain) followed by dizziness, headache and malaise were the most common types of adverse effects reported in 11[34 44 52 55 76 84–86 145 146 153 201] of the 12[34 44 52 55 59 76 84–86 145 146 153 201] studies that reported on the types of respondents' perceived side effects. A Ugandan study among patients with HIV/AIDS and non-HIV/AIDS individuals reported that TCAM use was independently associated with the occurrence of liver fibrosis,[59] while another among general inpatients indicated that 10 adverse effects were associated with the use of herbal products prior to admission.[156]

DISCUSSION

This paper reports the first ever systematic review of the available research evidence on the contemporary use of TCAM in Sub-Saharan Africa. While there are assumptions about high use of TCAM (eg, 80%) across the continent that circulate in the literature, there has been no systematic review to date to substantiate that claim. Our review attempts to provide an estimate of TCAM (product and practitioners) prevalence both in the general population and health subpopulations based on the review of the current literature. The reviewed studies report varied TCAM (product and practitioners) use prevalence rates within and across countries in line with previous reviews.[202 203] Such variability is possibly attributed to differences in TCAM definition and sample size in different studies and the high tendency for recall bias due to variations in timeframes over which TCAM use was evaluated. For instance, two large Nigerian studies report different prevalence rates of TCAM use during childbirth due to differences in study location, method of sampling and the way TCAM use was assessed.[95 96] Despite an apparent conflict between variability in reported TCAM utilisation rates across studies, and the high sample size and response rate of many of these studies, our review highlights a relatively high use of TCAM both in the general population and health subpopulations, which resonate with findings of previous studies conducted in developed nations[204 205] and estimates by the WHO.[1] The push and pull factors of TCAM use identified in our review also resonate with the drivers of TCAM use reported outside of Africa,[206] and appear to be important drivers underpinning the high use of TCAM across the continent. As in countries outside of Africa, the high use of TCAM also underscores the substantial role of TCAM as a source of basic healthcare to populations across Africa. It is imperative for health departments and governments across Sub-Saharan Africa to at least consider and inform themselves regarding TCAM, its current role and future possibilities in wider healthcare systems. This can be in the form of TCAM policy design and implementation, promoting TCAM training, research and development, as well as encouraging consideration of the integration of TCAM into mainstream healthcare system.[1] It is worth noting that as a means of advancing TCAM use, some institutions have integrated TCAM into medical education curriculum within and outside of Africa.[6 207]

Our review also identified a variation in patient non-disclosure rates across studies which resonates with findings from research outside Africa.[208 209] The lowest estimate identified in our review is sufficiently large to warrant concern over communication between patients who are TCAM users and their healthcare providers. Insufficient disclosure of TCAM use also highlights the need to have a clear insight into the barriers to disclosure. The available literature outside of Africa indicates that individual and/or contextual factors may influence patients' decision not to disclose his/her TCAM use status.[208 210] However, the reasons for non-disclosure identified in our review

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are informed by differences in beliefs and attitudes regarding conventional medicine and TCAM between patients and healthcare providers. In order to improve patient–provider communication about TCAM at the health service delivery level, it is important for healthcare professionals to be aware that their patients are likely users of TCAM and to encourage and facilitate an open dialogue about TCAM use as routine in their interaction with patients. Such communication regarding TCAM should imbibe the culture of shared decision making[211] about therapeutic options for patients since it promotes patient satisfaction and active patient involvement in their care.[212] Also, TCAM policy and practice guidelines should incorporate culturally sensitive patient education about the usefulness of patient disclosure of TCAM use to their conventional healthcare providers. In addition, to leverage communication about TCAM use with patients, conventional healthcare providers are required to be knowledgeable about commonly used TCAM products and practices to better advise their patients and the public on their risks and benefits. The current literature, although scanty, indicates a deficiency in knowledge about TCAM products and practices among healthcare providers in Sub-Saharan Africa[213 214] and outside of Africa.[215 216] As it has been suggested in studies outside of Africa,[217 218] there is a need for the inclusion of common TCAM modalities into the existing curricula of healthcare training institutions and continuous professional education programme of the various healthcare cadres, as well as making reputable TCAM pharmacopoeias available in health facilities across Africa.

The reasons for the high TCAM patronage across the continent were also examined in our review, and they appear to resonate with the push and pull factors reported in studies conducted outside of Africa.[219 220] Possible underlying structural factors that help explain the drivers of TCAM use include the fact that Sub-Saharan Africa is host to the largest population of people who are economically disadvantaged,[221] and access to conventional care is limited due to cost and distance.[222] Therefore, TCAM offers an affordable and easily accessible healthcare option. Also, because TCAM is publicly available and allows active patient involvement in health decision making, it offers users greater freedom and ownership in terms of their healthcare choices compared with conventional care in which health decisions are generally controlled by the healthcare professional.[223]

Our review also indicates that TCAM was used concurrently with conventional medicine, indicating that TCAM is mostly used as a complementary therapy rather than an alternative to conventional care. This may be linked to a growing paradigm shift among patients towards a holistic attitude in health that aligns with the philosophy of TCAM and acknowledges the insufficiencies of biomedical care.[224] Given the complex interplay of factors influencing the pluralistic nature of health service utilisation in Sub-Saharan Africa,[225] further research exploring the factors influencing the decision to use TCAM is required.

The concurrent use of TCAM and allopathic medicines is known to also potentially undermine patient safety and health outcome due to herb–drug interactions leading to serious adverse effect and therapeutic failure of conventional medications.[226–228] It is imperative that clinical studies be conducted to provide evidence of clinical interactions between conventional medicine and commonly used TCAM modalities in Sub-Saharan Africa. Such information is of value to healthcare providers when interacting with their patients as it will help provide an opportunity for well-informed therapeutic choices to be made that will contribute to maximising patient health outcomes.

Our review indicates a relatively low prevalence of self-reported TCAM adverse effects when used alone or in combination with allopathic medicines compared with what has been reported outside of Africa. Although not verified, it shows that TCAM like any conventional medicine is not free of adverse effects.[229] The relatively low prevalence may be due to the fact that patient non-disclosure rate across the Sub-Saharan Africa is high and the fact that TCAM is often considered natural and therefore safe. TCAM adverse effects can be due to inherent toxicity or due to quality issues such as poor quality of TCAM products, incorrect or misidentified, or adulterated or contaminated TCAM products. Despite the majority of side effects being reported were gastrointestinal disturbances in our review, serious adverse effects such as liver and kidney toxicities have been cited in the literature.[230 231] This has led the WHO to develop guidelines for the safety monitoring of herbal medicine product within the existing WHO pharmacovigilance framework.[232] However, TCAM product safety regulation across Africa is still a challenge as many countries across Africa lack adequate regulatory framework to ensure the safety and quality of TCAM.[233] Such challenge is compounded by the fact that there are few preclinical and postmarket TCAM safety and quality data as in addition to confusing nomenclature over plant species, varied cultural differences and traditional practices across Africa.[234] Despite its limitations, the use of pharmacovigilance principles as part of the overall regulatory framework for TCAM in Africa is urgently needed. The incorporation of pharmacovigilance questions into ethnobotanical or ethnopharmacological studies is worth experimenting.[235] Thus, the systematic collection and analysis of TCAM safety data is crucial in order to protect patients and the public at large.

Our review also identifies, among the general population and some health subpopulations, a relatively high level of self-directed TCAM use compared with the levels of practitioner-directed TCAM use. This may be explained by the significant amount of studies that focused on TCAM product use compared with TCAM practitioner use, or that the decision to use TCAM is more often influenced by family, friends and neighbours than traditional medicine practitioners.[12 111] National representative studies that specifically look at TCAM

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practitioner utilisation both in general populations and among health subpopulations will provide further insight into the extent of TCAM practitioners' contribution to the health delivery system.

In the general population in particular, the available literature indicates that TCAM users are likely to be of low socioeconomic class who are unemployed and unskilled. This suggests that low socioeconomic status in the society influences the decision to use TCAM given the fact that TCAM is a low-cost healthcare option compared with biomedicine. With particular reference to educational status, the result of the majority of the relevant studies reviewed contrasted with studies from high-income countries that show that TCAM users are more likely to have attained a high level of education than non-users,[206 236 237] but in line with current scholarship in other low and middle-income nations.[238] The low levels of health literacy[239] and low access to evidence-based health information across most populations in Sub-Saharan Africa[240] may explain such correlation. Our review reports conflicting findings on the relationship between TCAM utilisation and age, gender, religion and spatial location. This is in contrast with reviews that focused on studies outside of Africa, particularly with respect to gender in which women were more likely TCAM users compared with men.[206 236 241] Variations in study design, sample size and data analysis may also explain the differences in TCAM user profile across studies, principally where statistical methods employed did not allow for the impact of confounders to be measured,[242] thereby affecting the validity of the findings. Well-designed nationwide, or multinational, studies in which data are appropriately analysed are required to understand how sociodemographic factors affect TCAM use in and across Sub-Saharan Africa.

Our review highlights that there has been a disproportionate research focus on TCAM use among HIV/AIDS and obstetric patients in Sub-Saharan Africa. This pattern suggests the current TCAM research priorities in Sub-Saharan Africa and underscores the historic public health policy and research attention dedicated to infectious diseases and maternal child health in Sub-Saharan Africa.[243] Areas that have received less attention in the TCAM research agenda in Sub-Saharan Africa include cancer, diabetes, musculoskeletal conditions and surgery. Given the steady rise in non-communicable diseases in the region[10] and the high rate of TCAM use by individuals with these conditions,[11 12] greater policy attention and research focus are needed to understand TCAM role in non-communicable diseases prevention and treatment in Sub-Saharan Africa. Specifically, well-designed, large-scale studies that look at how TCAM interfaces or interacts with conventional care for non-communicable disease conditions are urgently needed. Also, for both communicable and non-communicable health conditions, the interprofessional dynamics and provider–patient communication with regard to TCAM use need to be further explored.

Review limitations and future research directions

Our review highlights key research gaps that need to be addressed that currently challenge attempts to provide a comprehensive overview of TCAM use across Sub-Saharan Africa. First, most of the studies in our review were from Nigeria, South Africa and Ghana. Additional data are required from other Sub-Saharan Africa countries where little research has been conducted to know whether findings from less researched countries are in line or in contrast to the current evidence synthesised in our review. Second, of those articles appraised for quality, the majority had critical methodological flaws, such as employing a non-representative sample strategy, reporting a small sample size, incorporating a substantial risk of recall bias and failing to provide a definition of TCAM in their studies, all of which undermine the integrity of research findings and challenge the ability to draw definitive conclusions and conduct proper comparisons across different studies. Similar methodological limitations have been reported elsewhere.[236 238] It is of utmost importance that the quality of empirical research into TCAM use in Sub-Saharan Africa is improved by using standardised methodology that follows good research design and practice.[244] Third, our review identified the low cost of TCAM as a key driver of TCAM use, and low socioeconomic status was identified as a possible predictor of TCAM use in our review. However, only few studies in our review compared patient-reported cost of TCAM care and conventional healthcare and it shows a conflicting picture. Thus, there is a dearth of research evidence on the actual cost incurred by patients when seeking TCAM care. An economic analysis of TCAM use relative to conventional healthcare in general and subhealth populations is a worthy focus within the future TCAM research agenda in Sub-Saharan Africa. Fourth, the majority of the papers reviewed in our study employed quantitative survey design and analysis, providing a useful snapshot of TCAM utilisation patterns. Such research design, although useful, provides limited information regarding the decision-making process around TCAM use and patient–provider communication about TCAM use. Quantitative survey design also failed to provide an indepth insight with regard to the interface between the lived experience of TCAM use and the user's religion and culture. As such, it is important that qualitative studies that focused on TCAM use and practice are conducted to help provide cultural and social insights that are useful to healthcare providers, policy makers and patients. Fifth, only studies published in English were considered in our review. We decided to include only English papers because none of us are proficient in French and other languages. Given that the full text of each included article is thoroughly read and understood before data are extracted, it will be unwise to rely on the English abstract of papers written in other languages given our limitation in other languages other than English. It is possible that an inclusion of studies published in other languages would have influenced our results. Finally, there are new publications

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beyond our search duration which if included may have influenced our findings. It is good for readers to take this and other aforementioned limitations when interpreting our findings.

CONCLUSION

TCAM use appears widespread across many countries in Sub-Saharan Africa, although most studies emerge from just a few countries including Nigeria, South Africa, Ghana and Uganda. Stakeholders involved in the healthcare sector in these countries should be mindful of this critical role of TCAM in healthcare service delivery across these countries. Further research in Sub-Saharan Africa should address a number of gaps identified in the current scholarship in order to help inform policy design and practice, as well as contribute to providing safe, efficient and harmonised healthcare for all in Sub-Saharan Africa.

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