



## Current Status and Future of Traditional, Complementary and Integrative Medicine in Nigeria

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## ABSTRACT

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Globally a large proportion of people use some form of Complementary and Alternative Medicine (CAM). In Africa and especially in Nigeria herbal and traditional medicine is very popular probably because of its holistic nature blending it with the cultural milieu. Despite the remarkable efforts made by the Nigerian government in promoting traditional therapies it has still not moved to a comfortable position. In primary healthcare of the marginalized people CAM can play an important role in developing countries such as Nigeria. However, many CAM practices do not have sufficient scientific data to prove its efficacy, hence still considered as quackery. Moreover, to produce good CAM practitioners it is essential for the students to get adequate training and education. Very few Nigerian universities offer course on CAM or traditional African medicine. Recently, National Universities Commission has revamped the undergraduate curriculum for Nigerian universities i.e., Core Curriculum and Minimum Academic Standards (CCMAS) for the Nigerian University System. Complementary and Alternative Medicine studies is now included under the Allied Health Sciences as an independent degree program. This may encourage many universities to start CAM studies in Nigeria. Various established CAM practices like Ayurveda, homeopathy, naturopathy, herbal medicine, traditional Chinese medicine, etc., has now been successfully integrated with conventional medical care in countries like India, China and Ghana. Efforts should be made so that useful CAM practices can be integrated into the standard medical care in Nigeria in the future.

**Keywords:** CAM, traditional Medicine, Africa, Nigeria, Alternative Medicine

### Introduction

A large population in Africa is dependent on Complementary and Alternative Medicine (CAM). “Complementary Medicine” or “Alternative Medicine” refer to a broad set of health care practices that are not taught in conventional medical school. These practices and therapies are not completely integrated into the conventional health-care system.<sup>1</sup> Whereas, Traditional Medicine (TM) is knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures. The popularity of CAM and TM in Africa is due the high cost of conventional medicine, lack of infrastructure and above all belief in traditional culture. The general perception about CAM or TM is poor among the conventional medical practitioners. For decades, confusion existed with the terms like CAM, TM, Alternative Medicine (AM), and many such practices and therapies that are not taught in conventional medical school.<sup>2</sup> With many emerging research studies, it is now clear that not all CAM is bad, some are potentially good and now being integrated in main stream medicine.<sup>3,4</sup>

Global scientific interest in CAM started when some complementary therapies got acceptance in medical schools of USA over two decades ago.<sup>5</sup> The Integrative Medicine (IM) is defined as healing philosophy which takes into account the whole person i.e., body, mind and spirit.

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It also takes into account the lifestyle modification and dietary changes required to cure specific problems. However, these therapies are applied along with the conventional medicine, and most often inside the premises of a conventional hospitals, hence they are called as IM. The integrated CAM can be properly monitored by medical experts to ascertain that patients are not harmed by them. Certain complementary medicine which have gained tremendous popularity in the recent times are hypnosis, acupuncture, massage therapy, meditation, yoga, and qigong.<sup>6</sup>

Another form of medicine which is termed as Alternative Medicine (AM), have their own philosophy and no connection with the conventional medicine. Many of them have not undergone rigorous clinical testing and some simply cannot be explained with scientific theories. Many of such therapies are often referred as pseudo and quackery. Though, Homeopathy principles violate the fundamental laws of nature and there is little evidence to suggest that homeopathic remedies are better than placebo, but the public opinion about homeopathy remains strong and its popularity has not declined over the years.<sup>7</sup> It is still very difficult to comprehend how homeopathic medicines can work without any active ingredients in them. On the other hand, ‘Ayurveda’ an ancient traditional Indian medicine system which is recognized as one of the world's oldest medical systems and date back to over 5000 years. It is officially recognized by the World Health Organization (WHO) and enjoying great popularity in the US, Germany, Italy and the Netherlands apart from India.<sup>8</sup> Same is the case with Traditional Chinese Medicine (TCM), it recently got recognition from WHO.<sup>9, 10</sup> An indigenous healing practices popular all over Africa is better known as Traditional African Medicine (TAM).<sup>11</sup> The medicines of TAM are derived from mineral, plants, and animal origin. It also employs spiritual technique, and exercises to treat, prevent and diagnose illness. TAM is now official recognized in

some countries.<sup>12, 13</sup> A list of various CAM, and traditional practices is give in Table 1.<sup>14</sup>

#### Why CAM is so popular?

Despite tremendous advancement in orthodox medical sciences the popularity of CAM throughout the world is growing. In the first 70 years the 20th century the communicable disease dominated the global scenario; the next 30 years the 50% health burden was shifted to non-communicable diseases like cardiovascular diseases, hypertension, diabetes, drug addiction, tobacco and depression.<sup>15</sup> The tremendous progress in science and technology had a drastic effect on our lifestyle that changed our eating, sleeping, drinking habits. Due to the changed in food habit coupled with lack of exercise made many people obese and unhealthy. Moreover, despite all scientific efforts still we are not able to get an affordable and reliable medicine for most cancers and HIV. In the 1990s a survey conducted in the USA indicated that 47% increase in total visits to alternative medicine practitioner.<sup>16</sup> One of the reasons for CAM popularity seemed to be holistic nature and is compatible with the patients' values, world-view, spiritual/religious philosophy or beliefs.

In the developing world CAM is the lifeline for many who cannot assess or afford the expensive conventional medicine,<sup>14</sup> however, it is interesting to note that in the western societies CAM has become very popular.<sup>17</sup> The use of homeopathic remedies, vitamins, minerals, over-the counter (OTC), non-prescription medicines, and herbal supplements (CAM) has grown significantly.<sup>18</sup> CAM plays a significant role in long-term chronic conditions<sup>19</sup> such as arthritis,<sup>20</sup> skin problems,<sup>21</sup> anemia,<sup>22</sup> migraine,<sup>23</sup> where patients are not completely satisfied with conventional therapy and want to try something new. In case of life threatening illness, patients will try all types of therapies as success rate even with conventional therapy is poor. High use of CAM and TM has been reported in patients with cancer,<sup>24,25</sup> HIV,<sup>26</sup> and COVID-19.<sup>27</sup> Use of herbal medicine combined with contemporary treatment was shown to provide better containment of COVID-19 infection.<sup>28</sup>

#### CAM use in Nigeria

CAM is not very uncommon to the people of Africa; it is rather a household sources of therapy.<sup>29</sup> To some it is for health promotion and maintenance.<sup>30</sup> For many living in marginalized situations it is the first and the last source of medical care as conventional medical care is just out of their reach. Moreover, poor infrastructure; lack of health care professionals; lack of awareness; no health insurance and government sponsored schemes compels many to adopt some form of AM or TM.<sup>31</sup> High prevalence of herbal therapy along with conventional medicine was recorded in patients with diabetes.<sup>32</sup> The herbs that were used by patients were garlic (*Allium sativum*), *Aloe vera*, ginger (*Zingiber officinale*), local herbs, bitter leaf (*Vernonia amygdalina*), and *Moringa oleifera*.<sup>33</sup> CAM is also popular in the patients with hypertension, especially living in urban communities,<sup>34</sup> in an investigation it was reported that 2.5% hypertensive patients also used spiritual therapy for managing their condition.<sup>35</sup> Sickle cell anemia is another condition were patients are found to try some CAM or TM therapy.<sup>36</sup> It is not uncommon for parents to try CAM and TM for their

children suffering from epilepsy, asthma and sickle cell disease.<sup>37</sup> In urban, and rural areas of Nigeria the use of CAM and TR is very common with HIV infected patients.<sup>38, 39</sup> In Nigerian rural communities' farmers commonly use CAM like herbal medicines and massage as remedy to musculoskeletal pain.<sup>40</sup> A common practice among Nigerian pregnant women is the use of various herbs to enhance the fetal development and safe delivery.<sup>41</sup> Many patients suffering from chronic degenerative disease like osteoarthritis regularly use CAM and TM for relieving joint pain and stiffness.<sup>42</sup> CAM use in cancer treatment is a global phenomenon and Nigeria is not different for elsewhere, a large number of Nigerian cancer patients use CAM;<sup>43</sup> however, many individuals do not disclose about the use of CAM to their treating physicians. As a result, the physicians are completely unaware of such traditional self-medication practices.<sup>31</sup> This portend a lot of harm to patients and may result in dangerous drug interactions and adverse reactions. In an investigation of CAM use in pregnant women it was found that the user had low haemoglobin concentration, high caesarean section rate, maternal complications, low birth weight as compared with none users.<sup>44</sup>

#### Global Status of CAM

Before scientific medicine got established medical practice was a relatively undifferentiated field. Herbal remedies were prescribed regularly, and the traditional healers or bonesetters had a good reputation. The rise of scientific medicine (conventional medicine) started during the late 19th century and it spread across the globe by the British Raj. As the scientific medicine gradually became dominant the traditional medicine and approaches was relegated as quackery.<sup>15</sup> The scientific medicine was governed by code of ethics, strict rules, scientific principles for the treatment offered and uniform criteria for diagnosis and treatment. Moreover, the professional association of scientific medicine ensured that all the persons who wanted to practice scientific medicine is properly trained and only after one successfully completed the training got a license to practice. Whereas the TM had less scientific backing, no professional organization and practically no regulation. In many cases the knowledge about tradition medicine is passed from one generation to another orally there is no written documents. And even if there were some written documents available, there was no proper school to teach them and with little support from the governmental agencies these alternative medical practices such as TAM, homeopathy, naturopathy, traditional oriental medicine, acupuncture, herbal medicine etc., went into obscurity. After the passage of medical licensing laws that broadly defined the 'practice of medicine' the practitioners of alternative medicine were prosecution as they did not have proper license mandated by the government.<sup>45</sup> As the scientific medicine became stronger and dominant during the 1950s with the understanding of human disease many alternative medicine providers migrated to the fringes. They kept their practice hidden from the eyes of the governmental agencies in fear of getting prosecuted. During the 1950s and 1960s many countries in Asia, Africa and other places got independence from the western colonial power. With the change of power, the dynamics also changed and many traditional practices and CAM therapies was not looked down as it used to be before independence.

**Table 1:** A list of few important CAM, AM, IM and other traditional therapies.<sup>14</sup>

Complementary Medicine	Alternative Medicine	Integrative Medicine	Traditional Medicine
Acupressure	Ayurveda	Acupuncture	Traditional Chinese Medicine
Transcendental Meditation	Herbal therapy	Hypnotherapy	Traditional African Medicine
Bach Flower Remedy	Chiropractic	Massage therapy	Tai Chi
Music therapy	Naturopathy	Meditation	Oriental Medicine
Reki	Homeopathy	Yoga	Kanpō medicine
Prayers	Siddha Medicine	Qi gong	Unani-Tibb
Aromatherapy	Biofeedback	Dietary therapy	Traditional Zulu Medicines
	Magnet Therapy	Reflexology	Traditional Maori medicine

Some TM and CAM started gradually flourishing with government support. An Indian AM system Ayurveda which had little significance before independence is now thriving well along with conventional medicine. There are over 393 Ayurveda colleges in India now and these colleges produce thousands of graduates every year.<sup>46</sup> Ayurveda have also become quite popular in the United States of America and other parts of the globe.<sup>47</sup> Not only Ayurveda, in India other AM like Homeopathy, Unani, Siddha, Naturopathy and Yoga are government recognized. A ministry of the Government of India 'AYUSH', is responsible for research & education, and propagation of indigenous and traditional medicine systems in India.<sup>48</sup>

This unprecedented interest among American public regarding CAM culminated in the creation of National Center for Complementary and Complementary Medicine (NCCAM) in the 1990s, which later became National Center for Complementary and Integrative Health (NCCIH), at National Institute of Health, Bethesda, USA.<sup>16, 49</sup> The mission of NCCIH is to promote evidence based CAM and AM and to disseminate authoritative information to the public and professionals. The useful and helpful CAM are established after rigorous clinical trials. CAM is very popular across Europe,<sup>17</sup> Canada,<sup>50</sup> China,<sup>51</sup> in India CAM is the backbone of the primary health care,<sup>52</sup> whereas, in Malaysia it has been integrated into the public healthcare.<sup>53, 54</sup> CAM is also very popular in Mexico<sup>55</sup> Japan,<sup>56</sup> South Korea,<sup>57</sup> New Zealand,<sup>58</sup> Brazil,<sup>59</sup> Lebanon,<sup>60</sup> Cambodia, Thailand and Vietnam.<sup>61</sup> CAM is extremely popular in many other developing and under developed nations of the world.

#### *Future of CAM in Nigeria*

**Governmental Activity:** The future of CAM in Nigeria is bright as numerous actions have been taken by the Federal Government, through the Ministry of Health, to encourage the use of traditional medicine in the nation. The Nigeria Natural Medicine Development Agency (NNMDA) was founded in 1997 by the Federal Ministry of Health.<sup>62</sup> Nigeria adopted its National Policy on Traditional Medicine, Laws and Regulations in 2004. In August 2006, the Nigerian Traditional Medicine Policy was created by the Federal Executive Council. Lagos saw the establishment of the Center for Research in Traditional Complementary and Alternative Medicine (CRTCAM) in 2017.<sup>63</sup> The idea of CRTCAM is to support WHO sponsored program to integrate traditional medical practice into public healthcare in Nigeria. The Federal Ministry of Health established the department of Traditional, Complementary and Alternative Medicines (TCAM) in 2018.<sup>64</sup> TCAM departments are now been established in all 36 states of Nigeria. A council for the practice of complementary, alternative, and traditional medicine in Nigeria was authorized by the Ministry of Health in 2020. The goal is to institutionalize complementary and alternative medicine, as is the case in nations like China and India.<sup>65</sup>

**Licensing & Practice of CAM:** It is currently difficult to say that any one regulatory authority or agency in Nigeria is primarily in charge of overseeing the traditional means of delivering healthcare. The Federal government of Nigeria has not established a specific legislative framework to oversee or regulate the practice of traditional medicine. The traditional methods of delivering healthcare are not adequately covered by the law, and the application of the relevant laws or regulation is ambiguous.<sup>63</sup> It is possible to represent oneself as a traditional medicine practitioner or to practice for profit without being registered. Regulation of conventional medicine is solely the province of the federal government; legislation pertaining to traditional and alternative medicine is concurrently the domain of the federal and state governments. At the federal level, there are two different kinds of registration: practitioner registration for practice and product registration through labeling and advertising.<sup>66</sup> The applicant must identify the area(s) in which he practices traditional medicine in order to be registered as a practitioner. There are various areas where a traditional practitioner can register, such as: Herbalist, Diviner, Dentist, Oculist, Homeopath, Osteopathy, Traditional birth attendant, Traditional surgeon, Psychotherapist, Speech therapy etc.<sup>67</sup> The Medical Rehabilitation Therapist Act, the Community Health Practitioners Board of Nigeria Act, the Pharmacists Council of Nigeria Act, and the Nursing and Midwifery Act are other pieces of legislation pertaining to alternative medical practices.

**Regulation of Herbal Medicine:** Batch to batch variation is not very uncommon in herbal preparation, hence, quality control is crucial. Sometime herbal medicine can also contain harmful substances because Good Manufacturing Practices (GMP) was not followed. In Nigeria the National Agency for Food and Drug Administration and Control (NAFDAC) plays an important role for the regulation of the herbal medicine<sup>68</sup>. NAFDAC made it mandatory that all the herbal products indigenous or imported should be first registered with them under the Herbal Medicines and Related Products Registration Regulations of 2019. Before a product of herbal medicine/ traditional/ alternative medicine is advertised, it is required that it must be registered with NAFDAC. The herbal medicine should also indicate the various raw ingredients that are used and no claim suggestive of any therapeutic claim should be there on the bottle.

**CAM Curriculum in Nigerian Colleges:** The course curriculum for the study of African Traditional Medicine or other CAM subjects are not well defined in Nigeria. Though the need for this was stressed in the 1980s.<sup>69</sup> Recently, after the Minister of State for Health requested the universities to offer degree program in herbal medicine utilizing the Tertiary Education Trust Fund,<sup>70</sup> three Nigerian universities are now in a process to introduce degree and certificate courses in 'Herbal Medicine'. These university are Adegboyega University, Ogwa; Edo State, University of Medical Sciences, Ondo; and the University of Ibadan. The University of Ibadan had already approved and commenced postgraduate degree and PhD programs in African Traditional Medicine at its Institute of African studies.<sup>71</sup> National Universities Commission has recently revamped the undergraduate curriculum for Nigerian universities i.e., Core Curriculum and Minimum Academic Standards (CCMAS) for the Nigerian university system. Complementary and Alternative Medicine studies is included under the Allied Health Sciences as a degree program.<sup>72</sup>

Experience from India and China suggest that in order to make CAM teaching more appealing and competitive alongside with convention medicine the students should be exposed to various subjects apart from the core CAM topics and field training. In India all the CAM practices such as Ayurveda, Homeopathy, Unani, Siddha, Naturopathy and Yoga have developed their own medical schools where traditional medicine is taught, researched, and practiced to a high level.<sup>69</sup> A similar approach should also be adopted in Nigeria. In order to get quality CAM practitioners, it is essential the students should have a basic knowledge of some sciences subjects such as biology, physics, biochemistry, microbiology, immunology, and genetics. A good knowledge of human anatomy, physiology, radiology, pharmacology, pharmacognosy and medical jurisprudence. And a sound knowledge of various CAM disciplines like African Traditional Medicine, Herbal medicine, Ayurveda, Traditional Chinese Medicine, Homeopathy, Naturopathy and Yoga. A brief about all these CAM practices mentioned here is given below.

**Traditional African Medicine (TAM):** This AM system encompasses the use of indigenous herbal medicine, psychic healing and African spirituality, midwives, and herbalists.<sup>73, 74</sup> Prior to the arrival of the Europeans TAM was dominant medical system in Africa, millions of people depended on it. However, recent studies indicated the popularity of TAM has not declined over the years as it supported the spiritual, cultural, psychological, emotional and social needs of the patients.<sup>75</sup> The African people are more comfortable with the TAM than the scientific medicine. The practitioner of TAM claimed to have cured many chronic conditions like cancer, hypertension, psychiatric problems, infertility, eczema, asthma, epilepsy, depression, burn wound healing, gout etc., however, proper scientific research and clinical studies are lacking. Moreover, the TAM is poorly regulated and detailed documentation of the traditional knowledge, which is generally transferred orally.

**Herbal Medicine:** Based on the traditional knowledge a substantial number of people globally use various botanical extracts made from various parts of the plant to treat disease. Some plant extract is used alone or in combination with other herbs for synergistic effects. Many modern conventional drugs have been derived from medicinal herbs. However, traditional herbal medicine or supplements, unlike conventional medicine do not undergo strict standardized to ensure batch-to-batch consistency.<sup>76</sup> Many herbal medicine that got

tremendous popularity are Ginseng used for reducing inflammation and boost immunity. Popular herbal medication St. John's wort (*Hypericum perforatum*) is said to help alleviate depression. Many conditions, such as heart disease, dementia, mental health issues, and sexual dysfunction, are reported to be helped by *Ginkgo biloba*. Turmeric is known to have potential anti-inflammatory properties.

**Ayurveda:** This holistic form of AM system is believed to have been originated in India and is over 3000 years old. Despite all the adversities this system of medicine has not only survived but is flourishing now in India and many other countries.<sup>77</sup> The Sanskrit words ayur (life) and veda (science or knowledge) are the root of the name Ayurveda. Hence, Ayurveda can be translated as knowledge of life. Ayurveda principles is based on five elements — space (aakash), water (jala), earth (prithvi), fire (teja), and air (vayu). A combination of these elements results in three doshas (life forces), known as *Vata* (air and space), *Kapha* (earth), and *Pitta* (fire and water). It is thought that these doshas are in charge of an individual's physical, mental, and emotional well-being. The primary basis of Ayurvedic medicine is based on the *Prakriti* (the body's constitution) and the doshas. The goal of Ayurveda treatment is internal purification process by eliminating body impurities and restoring the balance of all the doshas. Ayurveda also employs modified diet, herbal and natural remedies, yoga, meditation and massage therapy.<sup>78</sup>

**Traditional Chinese Medicine (TCM):** This AM having roots in China and in use for thousands of years. TCM have a holistic approach and look at the entire well-being of the patients. The four main diagnostic approach that are adopted: i.) Inspection, ii.) Auscultation and olfaction, iii.) Inquiry, and iv.) Palpation. Traditional Chinese medicine (TCM) has evolved over thousands of years.<sup>79</sup> For treatment purpose the practitioners of TCM use various psychological and/or physical approaches like Acupuncture (stimulating particular body points, typically by passing tiny needles through the skin); Moxibustion (the burning of herbal plants on or near the body); Cupping (using heated glass jars to apply suction to specific body parts); Massage; Herbal medicines and activities involving movement and concentration (like Tai Chi). TCM is effective in reducing chronic back pain, osteoarthritis/knee pain, and carpal tunnel syndrome.

**Homeopathy:** This is a very popular AM in many countries of the world. Over 300 million people in 70 countries now use homeopathy. Established in the late 1700s by German physician Dr. Samuel Hahnemann the doctrine of this alternative medicine is *similia similibus curentur*, or "like cures like." It is thought that a substance that produces disease symptoms in healthy individuals can treat those same symptoms in sick individuals. The principles of "memory of water" and "immunological memory," as well as the parallels between the pharmacological properties of the medication and the ailment, form the foundation of homeopathy. Many consider it is a pseudoscience as the medicine used are diluted thousand to million folds that may not have active molecules in them.<sup>80</sup> However, the popularity of homeopathy has not declined even after 225 years. Homeopathy is officially recognized in many countries of Europe and in India.<sup>81</sup>

**Yoga:** The origin of yoga can be traced back to India and it is almost 5000 years old practice. The diagnosis of various ailments is based on pulse reading and analysis *Tridosha* state of an individual. Yoga emphasizes 3 things to obtain tranquility and improve health conditions, they are: *Asanas* (physical postures), *Pranayama* (breathing techniques), and *Dhyana* (meditation). Some lifestyle modification is suggested along with dietary modifications. Some refer to yoga and two Chinese practices, Tai chi and Qigong, as "meditative movement" activities. Research has demonstrated that yoga can enhance overall well-being by reducing stress, promoting healthy lifestyle choices, enhancing mental and emotional stability, promoting sound sleep, and alleviating neck and low back discomfort.<sup>82</sup>

**Naturopathy:** this is a form of alternative medicine started in 19<sup>th</sup> century Europe from the 'Nature Cure Movement,' and now have become quite popular in many countries across the globe. As the name suggests this form of AM is based on the use of natural substances such as water, herbs, fruits, sunlight, mud bath, homeopathy, etc. It also used exercise and complete avoidance of tea, coffee, tobacco and overwork. The naturopathic system believed the power of the nature in

restoration of good health. It also ensures proper sleep and rest is taken and circadian rhythms is not disturbed. Stress reduction, psychotherapy and counseling is also a key component of this AM.<sup>83</sup>

## Conclusion

The main purpose of medicine be it conventional or CAM is to relieve the emotional distress and elevate physical healing. The main doctrine of CAM is to exploit the natural resources locally available and come up with a product that suits the religious belief and the social structure of the indigenous peoples. Recently, using scientific methods validation of the therapeutic efficacy of some these products are achieved. Despite the tremendous power and promise a large section of the population still cannot access the benefit of conventional medicine.<sup>84</sup> Some chose to avoid it, but for many they just cannot afford it. In many developing nations of Africa almost 80% of the populations heavily depend on some form of CAM and traditional therapy for treatment of various ailments. Many CAM therapies are hard to explain with scientific principles for example homeopathy; however, public opinion about it is very strong and growing. There are many CAM therapies like acupuncture, hypnotherapy, massage, meditation, yoga that is now integrated with the mainstream conventional care because of their proven efficacy in clinical trials. If properly exploited CAM can be a great asset in the primary health care of any country. Countries such as Nigeria can be immensely benefited if CAM therapies like African Traditional Medicine, Ayurveda, Herbal medicine, Naturopathy, Traditional Chinese Medicine etc., is properly institutionalizing and promoted. Proper assimilation of these CAM therapies along with conventional care can do wonders in health care sector. It appears that CAM in Nigeria has a promising future, the announcement by NUC regarding CAM curriculum for Nigerian universities can be considered as a positive step in this direction. Before CAM practices can be integrated in the mainstream medicine a lot of obstacles need to be cleared. The belief that all CAM approaches are harmful must first be addressed. Next, CAM practitioners must have adequate training. Finally, the rules and regulations regarding CAM practices must be made more transparent, streamlined and easily accessible.

## Conflict of Interest

The authors declare no conflict of interest.

## Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

## References

1. World Health Organization. Traditional, complementary and integrative medicine. <https://tinyurl.com/4c9c65ks>
2. Powell SK. Integrative Medicine and Case Management. *Prof Case Manag.* 2016; 21(3): 111 - 113.
3. Rayner JA, Willis K, Pirotta M. What's in a name: integrative medicine or simply good medical practice? *Fam Pract.* 2011; 28: 655-660.
4. Pirotta M, Kotsirilos V, Brown J, Adams J, Morgan T, Williamson M. Complementary medicine in general practice: a national survey of GP attitudes and knowledge. *Aust Fam Physician.* 2010; 39 (12): 946-950.
5. Academic Consortium for Integrative Medicine & Health. <https://imconsortium.org/about/history/>
6. Deng G. Integrative medicine therapies for pain management in cancer patients. *Cancer J.* 2019; 25(5): 343-348.
7. Cukaci C, Freissmuth M, Mann C, Marti J, Sperl V. Against all odds-the persistent popularity of homeopathy. *Wien Klin Wochenschr.* 2020; 132(9): 232-242.

8. Ragozin BV. The history of the development of Ayurvedic medicine in Russia. *Anc Sci Life*. 2016; 35(3): 143 - 149.
9. Anon. The World Health Organization gives the nod to traditional Chinese medicine. *Bad idea*. *Sci American* 320, 4, 6 (April 2019). doi:10.1038/scientificamerican0419-6
10. Fu M, Meng X, Li Z. Analysis the characteristics of traditional Chinese medicine in English literature development in modern history. *Ann Palliat Med*. 2021; 10(8): 9251-9258.
11. Okpako DT. Traditional African medicine: theory and pharmacology explored. *Trends Pharmacol Sci*. 1999; 20(12): 482-485. doi: 10.1016/s0165-6147(99)01406-6.
12. Fokunang CN, Ndikum V, Tabi OY, Jiofack RB, Ngameni B, Guedje NM, Tembe-Fokunang EA, Tomkins P, Barkwan S, Kechia F, Asongalem E, Ngoupayou J, Torimiro NJ, Gonsu KH, Sielinou V, Ngadjui BT, Angwafor III, F, Nkongmeneck A, Abena OM, J Ngogang J, Asonganyi T, Colizzi V, Lohoue J, Kamsu-Kom. Traditional medicine: past, present and future research and development prospects and integration in the National Health System of Cameroon. *Afr J Tradit Complement Altern Med*. 2011; 8(3): 284-295.
13. James PB, Wardle J, Steel A, Adams J. Traditional, Complementary and Alternative Medicine use in Sub-Saharan Africa: a systematic review. *BMJ Glob Health*. 2018; 3(5):e000895. doi:10.1136/bmjgh-2018-000895
14. Pal SK. Complementary and alternative medicine: an overview. *Cur Sci*. 2002; 82(5): 518 - 524.
15. Cohen MH. Complementary and integrative medical therapies, the FDA, and the NIH: definitions and regulation. *Dermat Ther*. 2003; 16: 77 - 84.
16. Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, Kessler RC. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. *JAMA*. 1998; 280: 1569 -1575.
17. Fjær EL, Landet ER, McNamara CL, Eikemo TA. The use of complementary and alternative medicine (CAM) in Europe. *BMC Complement Med Ther*. 2020; 20(1): 108. doi: 10.1186/s12906-020-02903-w.
18. Warriner S, Bryan K, Brown AM. Women's attitude towards the use of complementary and alternative medicines (CAM) in pregnancy. *Midwifery*. 2014; 30(1): 138-143.
19. Corp N, Jordan J L, Croft PR. Justifications for using complementary and alternative medicine reported by persons with musculoskeletal conditions: A narrative literature synthesis. *PLoS One* 2018. eCollection <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6053199/>
20. Baig S, DiRenzo DD. Complementary and alternative medicine use in rheumatoid arthritis. *Curr Rheumatol Rep*. 2020; 22(10): 61. doi: 10.1007/s11926-020-00938-z.
21. Jones VA, Patel PM, Wilson C, Wang H, Ashack KA. Complementary and alternative medicine treatments for common skin diseases: A systematic review and meta-analysis. *JAAD Int*. 2020; 26(2): 76-93.
22. Busari AA, Mufutau MA. High prevalence of complementary and alternative medicine use among patients with sickle cell disease in a tertiary hospital in Lagos, South West, Nigeria. *BMC Complement Altern Med*. 2017; 17(1): 299. doi: 10.1186/s12906-017-1812-2.
23. Wells RE, Beuthin J, Granetzke L. Complementary and Integrative Medicine for episodic migraine: an update of evidence from the last 3 years. *Curr Pain Headache Rep*. 2019; 23(2): 10. doi: 10.1007/s11916-019-0750-8.
24. Knecht K, Kinder D, Stockert A. Biologically-based complementary and alternative medicine (CAM) use in cancer patients: the good, the bad, the misunderstood. *Front Nut*. 2020; 6: (196) doi: 10.3389/fnut.2019.00196.
25. Alhazmi LSS, Bawadood MAA, Aljohani AMS, Alzharani AAR, Moshref L, Trabulsi N, Moshref R. Pain Management in Breast Cancer Patients: A Multidisciplinary Approach. *Cureus*. 2021; 13(6): e15994. doi: 10.7759/cureus.15994.
26. Littlewood RA, Venable PA. A global perspective on complementary and alternative medicine use among people living with HIV/AIDS in the era of antiretroviral treatment. *Curr HIV/AIDS Rep*. 2011; 8(4): 257-268.
27. Ilori T, Akintayo AD, Adewale BA, Oyetola EO. Knowledge, attitude and practice of Nigerian medical students towards complementary and alternative medicine in covid-19 management. *Ann Ibd Pg Med*. 2021; 19 (Suppl 1): S22 - S30.
28. Laksemi DAAS, Sukrama DM, Sudarmaja M, Damayanti PAA, Swastika K, Diarthini NLPE, Astawa NM, Tunas K. Medicinal plants as recent complementary and alternative therapy for COVID-19: A review. *Trop J Nat Prod Res*. 2020; 4(12):1025-1032.
29. Akinola OB. Should complementary and alternative medicine familiarization modules be taught in African medical schools? *Zhong Xi Yi Jie He Xue Bao*. 2011; 9(11): 1165-1169.
30. Onyiaapat JLE, Okoronkwo IL, Ogbonnaya NP. Complementary and alternative medicine use among adults in Enugu, Nigeria. *BMC Complement Altern Med*. 2011; 11 (19): doi: 10.1186/1472-6882-11-19.
31. Aliyu UM, Awosan KJ, Oche MO, Taiwo AO, Jimoh AO, Okufo EC. Prevalence and correlates of complementary and alternative medicine use among cancer patients in Usmanu Danfodiyo university teaching hospital, Sokoto, Nigeria. *Niger J Clin Pract*. 2017; 20(12): 1576-1583.
32. Ala AO, Ojo OA, Enikuomehin CA, Ajani GO, Olamoyegun MA, Akinlade AT, Olabode OR. Prevalence and determinants of complementary and alternative medicine (CAM) use among diabetes patients in Southwestern Nigeria. *West Afr J Med*. 2020; 37(5): 528-536.
33. Ogbera AO, Dada O, Adeyeye F, Jewo PI. Complementary and alternative medicine use in diabetes mellitus. *West Afr J Med*. 2010; 29(3): 158-162.
34. Osamor PE, Owumi BE. Complementary and alternative medicine in the management of hypertension in an urban Nigerian community. *BMC Complement Altern Med*. 2010; 10 (36): doi: 10.1186/1472-6882-10-36.
35. Amira OC, Okubadejo NU. Frequency of complementary and alternative medicine utilization in hypertensive patients attending an urban tertiary care centre in Nigeria. *BMC Complement Altern Med*. 2007; 7(30): doi: 10.1186/1472-6882-7-30.
36. Busari AA, Mufutau MA. High prevalence of complementary and alternative medicine use among patients with sickle cell disease in a tertiary hospital in Lagos, South West, Nigeria. *BMC Complement Altern Med*. 2017; 17(1): 299.
37. Oshikoya KA, Senbanjo IO, Njokanma OF, Soipe A. Use of complementary and alternative medicines for children with chronic health conditions in Lagos, Nigeria. *BMC Complement Altern Med*. 2008; 8(66): doi: 10.1186/1472-6882-8-66.
38. Ahwinahwi US, Odili VU, Ogbere J. Benefits and extent of CAM use among persons living with HIV attending an antiretroviral therapy clinic in Warri, Nigeria. *Int J Pharm Pract*. 2018; 26(4): 351-355.
39. Ekwunife OI, Oreh C, Ubaka CM. Concurrent use of complementary and alternative medicine with antiretroviral therapy reduces adherence to HIV medications. *Int J Pharm Pract*. 2012; 20(5): 340-343.
40. Mbada CE, Adeyemi TL, Adedoyin RA, Badmus HD, Awotidebe TO, Arije OO, Omotosho OS. Prevalence and modes of complementary and alternative medicine use among peasant farmers with musculoskeletal pain in a rural community in South-Western Nigeria. *BMC Complement*

- Altern Med. 2015; 15(164): doi: 10.1186/s12906-015-0695-3.
41. Adebisi IM, Bakare, UA, Umaru, ML. Medicinal plants used in the treatment of pregnancy related problems in Sokoto State, Nigeria. *Trop J Nat Prod Res.* 2018; 2(11): 466–470.
  42. Obalum DC, Ogo CN. Usage of Complementary and Alternative Medicine (CAM) among osteoarthritis patients attending an urban multi-specialist hospital in Lagos, Nigeria. *Niger Postgrad Med J.* 2011; 18(1): 44-47.
  43. Ezeome ER, Anarado AN. Use of complementary and alternative medicine by cancer patients at the university of Nigeria teaching hospital, Enugu, Nigeria. *BMC Complement Altern Med.* 2007; 7(28): doi: 10.1186/1472-6882-7-28.
  44. Ajah LO, Ezegwui HU, Ajah MI, Iyoke CA, Dim CC, Nwankwo TO, Umeh AU, Iketuonye A. The outcome of complementary and alternative medicine use among pregnant women in South-East Nigeria: a multi-centre prospective study. *J Obstet Gynaecol.* 2021; 42(4): 557-562.
  45. Cohen MH. Complementary and alternative medicine: legal boundaries and regulatory perspectives. Baltimore: Johns Hopkins University Press, 1998.
  46. Shriram S. The untold story of plight of Ayurveda in pre and post-independent India. *J Health Adm Ethics.* 2020; 6(1): 26-34.
  47. Halpern M. A review of the evolution of Ayurveda in the United States. *Altern Ther Health Med.* 2018; 24(1): 12-14.
  48. Samal J. Role of AYUSH workforce, therapeutics, and principles in health care delivery with special reference to National Rural Health Mission. *Ayu.* 2015; 36(1): 5-8.
  49. National Center for Complementary and Integrative Health (NCCIH). <https://tinyurl.com/2p89y5ew>
  50. Ng JY. The regulation of complementary and alternative medicine professions in Ontario, Canada. *Integr Med Res.* 2020; 9(1): 12-16.
  51. Wang S, Long S, Wu W. Application of Traditional Chinese Medicines as personalized therapy in human Cancers. *Am J Chin Med* 2018; 6(5): 953-970.
  52. Nambiar D, Narayan VV, Josyula LK, Porter JD, Sathyanarayana TN, Sheikh K. Experiences and meanings of integration of TCAM (Traditional, Complementary and Alternative Medical) providers in three Indian states: results from a cross-sectional, qualitative implementation research study. *BMJ Open.* 2014; 4:11 e005203. doi: 10.1136/bmjopen-2014-005203.
  53. Kaur J, Hamajima N, Yamamoto E, Saw YM, Kariya T, Soon GC, Amin A, Halim AN, Aziz FA, Sharon SH. Patient satisfaction on the utilization of traditional and complementary medicine services at public hospitals in Malaysia. *Complement Ther Med.* 2019; (42): 422-428.
  54. Ong SC, Yeong SW, Azman N, Tan BY, Shafie AA, Ooi GS, Harun SN. Factors predicting traditional and complementary medicine use among the general public in Malaysia. *Trop J Nat Prod Res.* 2022; 6(7): 1165-1173.
  55. Caballero-Hernández CI, González-Chávez SA, Urenda-Quezada A, Reyes-Cordero GC, Peláez-Ballestas I, Álvarez-Hernández E, Pacheco-Tena C. Prevalence of complementary and alternative medicine despite limited perceived efficacy in patients with rheumatic diseases in Mexico: Cross-sectional study. *PLoS One.* 2021; 16(9): e0257319. doi: 10.1371/journal.pone.0257319.
  56. Hori S, Mihaylov I, Vasconcelos JC, McCoubrie M. Patterns of complementary and alternative medicine use amongst outpatients in Tokyo, Japan. *BMC Complement Altern Med* 2008; 8:14. doi: 10.1186/1472-6882-8-14.
  57. Seo HJ, Baek SM, Kim SG, Kim TH, Choi SM. Prevalence of complementary and alternative medicine use in a community-based population in South Korea: a systematic review. *Complement Ther Med.* 2013; 21: 260-271.
  58. Duke K. A century of CAM in New Zealand: a struggle for recognition. *Complement Ther Clin Pract.* 2005; 11: 11–16.
  59. Boccolini PDMM, Boclin KDLS, Sousa IMCD, Boccolini CS. Prevalence of complementary and alternative medicine use in Brazil: results of the National Health Survey, 2019. *BMC Complement Med Ther.* 2022; Aug 2; 22(1):205. doi: 10.1186/s12906-022-03687-x.
  60. Naja F, Alameddine M, Itani L, Shoaib H, Hariri D, Talhouk S. The use of complementary and alternative medicine among Lebanese adults: results from a national survey. *Evid Based Complement Alternat Med.* 2015; 682397. doi: 10.1155/2015/682397.
  61. Peltzer K, Pengpid S, Puckpinyo A, Yi S, Anh LV. The utilization of traditional, complementary and alternative medicine for non-communicable diseases and mental disorders in health care patients in Cambodia, Thailand and Vietnam. *BMC Complement Altern Med.* 2016; 16(92): doi: 10.1186/s12906-016-1078-0.
  62. Awodele O, Amagon KI, Wannang NW, Aguiyi JC. Traditional medicine policy and regulation in Nigeria: an index of herbal medicine safety. *Curr Drug Saf.* 2014; 9(1): 16-22.
  63. Adebayo AK, Taiwo A, Toyosi AT. An appraisal of laws and regulatory mechanisms on traditional methods of healing in Nigeria. *Crescent Univ Law J.* 2021; 6: 84-96.
  64. Federal Ministry of Health. Traditional, Complementary & Alternative Medicine. <https://tinyurl.com/2p8axcxt>.
  65. Ailemen A. FG approves bill for establishment of council for traditional, alternative and complementary medicine practice in Nigeria. 2020; Business Day, Oct 21. <https://tinyurl.com/5dpd5tus>
  66. Ojonugwa AF, Gwom GS. The role and challenges of the National Agency for Food and Drug Administration and regulation of alternative medicine in Nigeria. *Wolverhampton Law J.* 2021; 52. <https://www.wlv.ac.uk/research/institutes-and-centres/law-research-centre/wolverhampton-law-journal/>
  67. Azeez YA, Isholab AS. Alternative medicine in Nigeria: the legal framework. In the proceedings of International Conference on Language literature, culture and education, held in Malaysia on 25-26 April 2015; ICLLCE (2015-90): 62 – 71.
  68. Osuide GE. Chapter 21 - Regulation of herbal medicines in Nigeria: the role of the National Agency for Food and Drug Administration and Control (NAFDAC). *Adv Phytomedicine.* 2002; 1: 249 - 258.
  69. Tahzib F, Daniel SO. Traditional medicine and the modern medical curriculum. *The Lancet.* 1986; 328: 203-204.
  70. Anon. Give degrees in Traditional medicine, Minister urges Universities. 2019; Vanguard August 31. <https://tinyurl.com/mutrsx2y>
  71. Ojerinde D. Three varsities to begin degree programs in herbal medicine. 2018 Punch, 29 May. <https://punchng.com/three-varsities-to-begin-degree-programmes-in-herbal-medicine/>
  72. CCMAS: Allied Health Sciences (New). 2022; <https://nucmmas.ng/download/ccmas-allied-health-sciences/>
  73. Mahomoodally MF. Traditional medicines in Africa: an appraisal of ten potent African medicinal plants. *Evid Based Complement Altern Med.* 2013; Article ID 617459,
  74. Anon. African traditional medicine struggles to find its place within health care. *CMAJ.* 2012; 184(16): E831 – E832.
  75. Oguntibeju OO. African traditional medicine: relevance, regulation, potential challenges and possible remedies. *Asian J Agric & Biol.* 2019; 7(1): 166-175.
  76. Pal SK, Shukla Y. Herbal medicine: past present and the future. *Asian Pac J Cancer Prev.* 2003; 4: 281 – 288.
  77. Jaiswal YS, Williams LL. A glimpse of Ayurveda: The forgotten history and principles of Indian. *J Tradit Complement Med.* 2017; 7(1): 50–53.

78. Ayurvedic medicine: In depth. National Centre for Complementary and Integrative Health. <https://www.nccih.nih.gov/health/ayurvedic-medicine-in-depth>
79. Zhang Q, Zhou J, Zhang B. Computational traditional Chinese medicine diagnosis: a literature survey. *Computers in Biology and Medicine*. 2021; 133: <https://doi.org/10.1016/j.combiomed.2021.104358>
80. Smith K. "Homeopathy is unscientific and unethical". *Bioethics*. 2012; 26(9): 508–512. doi:10.1111/j.1467-8519.2011.01956.x
81. The European Committee for Homeopathy. <https://homeopathyeurope.org/regulatory-status/>
82. Yoga: What you need to know. National Centre for Complementary and Integrative Health. <https://www.nccih.nih.gov/health/yoga-what-you-need-to-know>
83. Naturopathy. National Centre for Complementary and Integrative Health. <https://www.nccih.nih.gov/health/naturopathy>
84. Debas HT, Laxminarayan R, Straus SE. Complementary and Alternative Medicine. In Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, Jha P, Mills A, Musgrove P, (Eds.) *Disease Control Priorities in Developing Countries*. 2nd edition. Washington, DC: World Bank and Oxford University Press. © World Bank. 2006. Chapter 69. Pp 1289 – 1291.