

African Traditional Medicine: South African Perspective

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Abstract

African traditional medicine (ATM) has been used by African populations for the treatment of diseases long before the advent of orthodox medicine and continues to carry a part of the burden of health for the majority of the population. South Africa, as a member state of the World Health Organisation, has been set on the path of institutionalising African traditional medicine. This chapter outlines the processes and progress pertaining to the acceptance and acknowledgement of the role of ATM in health care. It sets out to describe the strides made with regard to the traditional health practitioners' Act and other laws, research in ATM, education of both health care and traditional health practitioners, including the role of collaboration. An overview of the practice of African traditional medicine is provided.

Keywords: African traditional medicine, research, indigenous knowledge

1. Background

The World Health Organisation (WHO) defines traditional medicine (TM) as 'the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, that are used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illnesses' [1]. Therefore, African traditional medicine (ATM) would be the TM indigenous to the different African cultures. Traditional medicine has been used by humankind for the treatment of various diseases since long before the advent of orthodox medicine, and to this day, serve the health care needs of the majority of the world population. According to the WHO, trends in the use of TM and complementary medicines have been increasing [2]. Complementary medicine or alternative medicine (CAM) refers to a broad set of health care practices that are not part of a country's own tradition or conventional medicine and are not fully integrated into the dominant health care system of that country. The terms are used interchangeably with TM in some countries. Other terms sometimes used to describe these health care practices include 'natural medicine', 'non-conventional medicine' and 'holistic medicine' [3]. Traditional medicines (TMs) include herbal medicines, which may be herbs, herbal materials, herbal preparations and finished herbal products [4].

In South Africa (SA), as in countries where the dominant health care system is based on allopathic medicine or where TM has not been incorporated into the national health care system, all other TM not indigenous to SA are termed 'complementary', 'alternative' or 'non-conventional' medicine [5].

African traditional medicine (ATM) is said to be one of the oldest and most diverse of all medicine systems, even though the medicine systems are poorly recorded [6]. African traditional healing is interwoven with cultural practices and religious beliefs and is therefore regarded as being holistic, involving both the body and the mind [6–8]. The WHO has been at the forefront of TM matters, collating information about TM practices worldwide and providing guidelines in advancing the recognition, acceptance and integration of TM into the health systems of member countries.

2. The role of WHO in traditional medicine

The role of the WHO in the recognition, promotion and acceptance of TM dates as far back as 1976; when the World Health Assembly (WHA), which is the governing body of WHO, drew attention to the reserve constituted by those practising traditional medicine. The organisation urged its member states to utilise their traditional systems of medicine. In 1978, at the International Conference on Primary Health Care at Alma Ata, the WHA recommended that governments prioritise the incorporation of traditional health practitioners (THPs) and birth attendants into the health care team and proven traditional remedies into national drug policies and regulation [9].

In 2000, the WHO Regional Committee for Africa adopted a strategy for the African countries, the aim of which was to contribute to the achievement of health for all in the African Region by optimising the use of TM. The strategy urged member states to develop national policies and legislation on traditional medicine and to improve regional and sub-regional collaboration. It also encouraged the member states to take steps to promote and protect traditional medicine nationally. Consequently, the WHO Regional Office for Africa in collaboration with the Department of Essential Drugs and Medicines Policy organised a series of workshops on the regulation of traditional medicines to assist member states to establish mechanisms for evaluating traditional medicines for registration purposes [10].

The WHO African Regional Strategy on TM was adopted in 2001 by the Organisation of African Unity (OAU), now called the African Union. The period 2001–2010 was declared as the Decade for African Traditional Medicine. An annual African Traditional Medicine Day was declared as the 31st of August and is celebrated every year. All stakeholders were requested to prepare a Plan of Action for implementation to meet the objectives of the strategy [11].

The WHO Traditional Medicines Strategy 2002–2005 provided a framework for action to promote the use of TM and Complementary Alternative medicine (TM/CAM) in reducing mortality and morbidity in impoverished nations. The strategy had four objectives, which were

- to integrate TM/CAM into national health care systems, where appropriate, by developing and implementing national TM/CAM policies and programmes,
- to promote the safety, efficacy and quality of TM/CAM by expanding the knowledge base of these remedies and by providing guidance on regulatory and quality assurance standards,
- to increase the availability and affordability of TM/CAM where appropriate, focusing on poorer populations and
- to promote therapeutically sound use of appropriate TM/CAM by providers and consumers [11].

In 2003, the first WHO regional workshop was held in SA where a set of guidelines for the registration of traditional medicines was developed. The minimum regulatory requirements for the registration of TMs were determined [12]. In the same year, resolution WHA56.31 on TM was adopted at the 56th World Health Assembly (WHA). It urged Member States to establish or expand and reinforce existing national drug safety monitoring systems to monitor herbal medicines and other traditional practices [13].

In 2004, 'Guidelines for registration of traditional medicines in the WHO Africa region' were issued. The overall objective of the guidelines was to facilitate the registration, marketing and distribution of traditional medicines of consistent quality in the African Region [12]. The 'Guidelines on the safety monitoring of herbal medicines in pharmacovigilance system' were issued, with the objectives which included promoting the safe and proper use of herbal medicines [4].

By 2004, it had become important for the WHO to obtain detailed qualitative and quantitative information about the prevalence of TM/CAM utilisation. A set of indicators had been proposed by a special consultative meeting of experts in 2001 to measure these aspects. The core indicators were expected to provide answers for who uses TM/CAM, what is used, why is it used and what it costs. The indicators were classified into three main groups. Background indicators included amongst others, aspects such as the total number of prescribers and the total number of TM/CAM providers within and outside of the conventional medicine system. Structural indicators addressed issues such as whether there was official national policy and legislation on TM/CAM. Process indicators provided answers for estimated prevalence of national TM/CAM and estimated prevalence of the five most popular therapies used [14].

The first WHO Congress on Traditional medicine was held in Beijing, China in 2008, to further assess the role of TM/CAM, to review the progress of member states as well as to help these countries integrate TM into their health systems. Part of the Beijing Declaration adopted by Congress stated, amongst others, that

- governments had a responsibility for the health of their people and should formulate national policies, regulations and standards to ensure safe, appropriate and effective use of TM and
- TM should be further developed based on research and innovation.

It also encouraged improved education, clinical inquiry into traditional medicine and improved communication between health care providers [1]. The 62nd WHA held in 2009 endorsed the resolutions of the Beijing declaration and urged member states to adopt and implement the declaration in accordance with national capacities, priorities, relevant legislation and circumstances [15].

The progress report on the Decade of African traditional medicine indicated that many countries popularised TM. They established and strengthened their institutional capacity and developed national policies and regulatory frameworks for TM. There was progress in establishing national programmes and setting up expert committees for the development of TM in their health ministries. By 2010, 22 countries including SA were using WHO guidelines in conducting research on TM for diabetes, hypertension, HIV/AIDs, malaria and sickle cell anaemia. SA and 11 other countries issued market authorisations for TM, ranging from one in Cameroon to more than 1000 in Ghana and Nigeria. Six countries including SA had tools for the protection of Intellectual Property Rights and the TM knowledge [16]. A total of five countries had included TM in their National Essential Drugs list, which was an increase from only one in 1999/2000 to four in 2010.

The WHO Traditional Medicine Strategy for 2014–2023, was released in 2012. It was intended to support member states in, amongst others,

- harnessing the potential contribution of TM to health, wellness and people-centred care,
- promoting the safe and effective use of TM by regulating, researching and integrating TM products, practitioners and practice into health systems where appropriate and
- education and training of TM and CAM practitioners.

This strategy also provided a review of the progress made since the strategy 2002–2005 and it sought to build upon that strategy [5].

The WHO report of 2013 acknowledged that there was growing interest in the world about the use of traditional and complementary medicine (T&CM). The report stated that there had been significant progress in implementing, regulating and managing T&CM in most regions. Member states that had established or developed national policies for T&CM had increased from 39 in 2003 to 69 in 2012 and those who were regulating herbal medicines had increased from 82 in 2003 to 119. Member states had developed regulations on the quality, quantity, accreditation and education structures for T&CM practitioners and conventional medicine practitioners who used T&CM. Member states that provided education on T&CM up to university doctoral degrees had increased from none to 39. Some institutions in the African region, including SA, had included TM in the curricula of health professions students. Some countries across the world had set up national research institutes in the field of T&CM, and those had increased from 56 in 2003 to 73 in 2012 [5].

3. Progress emanating from WHO strategies: legislation and regulation of ATM

Under apartheid and colonial South Africa, the practise of TM was deemed unscientific and illegal. It was considered to be uncivilised, suspect, scientifically unfounded, backward and superstitious [17]. The Witchcraft Suppression Act of 1957 and the Witchcraft Suppression Amendment Act of 1970 declared TM unconstitutional and prohibited practitioners of TM from doing their business [18]. Cooperation between conventional health practitioners (CHPs) and THPs was outlawed by the Medical Association of South Africa in 1953. The prohibition of TM was somewhat based on the conviction that the concept of disease and illness in Africa was generally rooted in witchcraft [19].

An attempt to regulate the practise of THPs was made in 1982 through the promulgation of the Associated Health Service Professions Act of 1982, as amended [20]. This Act set up a registration and licencing scheme for herbalists, chiropractors, homoeopaths, osteopaths and naturopaths, but prohibited their use of the title ‘Medical Practitioner’. The province of KwaZulu-Natal was the exception and had a different law on the licencing and control of THPs, which was covered by the KwaZulu Act on the Code of Zulu Law (CZL) of 1981. The CZL allowed for the practise of THPs who were licenced and allowed for them to claim a fee for services rendered [21].

Before the first democratic government in South Africa in 1994, the African National Congress (ANC) submitted in its health plan that THPs would become an integral and recognised part of the health care system in South Africa. It claimed

that patients would be granted the right to choose their preferred health care practitioner. At the same time, the ANC realised the need to regulate the practise of THPs in order to protect patients from harmful practices. The ANC health plan further stated the need to promote cooperation and liaison between THPs and allopathic health practitioners [22].

South Africa is a member state of the WHO, the AU and the Southern African Development Community (SADC). All three bodies have accepted resolutions, which urge member states to develop and implement national policies on ATM. The SA government has therefore taken steps towards the official recognition, acceptance and institutionalisation of ATM. Institutionalisation means formalisation and official incorporation of TM into the national health system [23].

The National Drug Policy (NDP) for South Africa of 1996 [24] is amongst one of the first documents to recognise the potential role and benefits of traditional medicine for the national health system. It was aimed at investigating 'the use of effective and safe traditional medicines at primary level' and specified the following, with regard to traditional medicine:

- Traditional medicine would be investigated for its 'efficacy, safety and quality with a view to incorporate their use in the health care system'.
- Marketed traditional medicine will be registered and controlled.
- A National Reference Centre for African Traditional Medicine for African Traditional Medicines (the NRCATM) would be established [25]. The NRCATM, a virtual reference centre, was established in 2003 by the Medicines Control Council (MCC) of the National Department of Health (NDoH) in collaboration with the Council for Science and Industrial Research (CSIR) and the Medical Research Council (MRC). The purpose of the centre was to gather, harness and synthesise information to promote, regulate and register ATMs derived from plants. Some of its functions included the development of a national database of indigenous plants that have been screened for efficacy and toxicity and to test the effectiveness and safety of traditional medicines, so as to protect the public from unproven claims within the traditional medicines sector [25].

A presidential task team was appointed in 2006 to advice on national policy and appropriate regulatory and legal framework regarding TM institutionalisation. This task team drafted the national policy of ATM in SA after consultation with various stakeholders. The Draft National Policy on ATM in SA was gazetted in 2008 [26] and was finally passed as the Traditional Health Practitioners Act (THPA) No. 22 of 2007 [27].

A new directorate, the Directorate: Traditional medicine, (DTM) was established to manage the work related to TM within the NDoH. The vision of the DTM was to advance the contribution of TM to the health and well-being of the population with the mission to facilitate the institutionalisation of TM in the National Healthcare System (NHS) through validation and production of safe and effective TMs and the promotion of TM practice based on a sound legislative and policy framework. The DTM served to coordinate all activities relating to ATM in liaison with units of TM at provincial level and other government departments and statutory research councils such as the CSIR, the MRC and the Agricultural Research Council (ARC) [26].

The THPA (Act 22 of 2007) has now been enacted. This act was purposed to establish an interim Traditional Health Practitioners Council, which was eventually inaugurated in 2013. The council is tasked to provide

- a regulatory framework to ensure the efficacy, safety and quality of traditional health care services and
- the management and control over the registration, training and conduct of practitioners, students and specified categories of the THPs.

The Act makes provisions for a register of all traditional healers and categorises them as sangomas, herbalists, traditional midwives and surgeons. The THPA promotes the training and practice of THPs and proposes the establishment of certified institutions for their training [28]. It further affords THPs the ability to be reimbursed by medical aid schemes for services rendered to patients as well as the authority to issue medical certificates [29].

In accordance with the THPA the regulations for Traditional Health Practitioners were published in the Government Gazette No. 39358, Notice No. 1052 of 3 November 2015 [30]. Although the regulations are in place, there has been a reluctance to take up the registration by THs. One of the challenges is that there is no code of conduct in place; hence, there is no way of determining genuine practitioners from bogus ones for purposes of registration [29, 31]. The non-registration is also as a result of lack of knowledge and understanding of the working of the Act and the registration process. There is also a level of mistrust and suspicion about government's true intention and commitment to ATM and the fear the TM practice being Westernised by conventional health practitioners [17]. Only registered healers have the authority to issue valid sick certificates. Without being registered, the healer cannot provide the service [29]. Although there are still no clear guidelines about this, some employers recognise and accommodate African cultural beliefs and do accept THP-issued sick notes [32].

4. Utilisation and prevalence of traditional medicine in South Africa

The use of TM in developing countries has increased since the 1990s [1]. South Africa is classified as a mixture of both a developing and a developed country [33]. Like other African countries, SA has a pluralistic system of healthcare, in which modern medicine practice coexists with other non-conventional health systems. These include a variety of indigenous systems based on traditional practices and beliefs [34].

African traditional medicine is described in the Draft Policy on African Traditional Medicine for SA as a body of knowledge that has been developed and accumulated over tens of thousands of years, which is associated with the examination, diagnosis, therapy, treatment, prevention of, or promotion and rehabilitation of the physical, mental, spiritual or social well-being of humans and animals [26].

It has been estimated that 80% of Africans use TM, compared to 60% of the world's population in general [1, 7]. The use of ATM by the general public has been reported since years back [35], and ATM is used for many ailments and conditions including for HIV, diabetes mellitus, hypertension, pain, gynaecological disorders, mental disorders and asthma [36–39].

It was reported that in seeking health, people consult traditional healers first before a conventional health provider (CHP) [34, 40–42]. These people may choose to withhold this information when consulting a CHP and not tell that they use ATM [36–38, 40, 43, 44]. A large proportion of the Black population makes use of the dual health care system, in which both the conventional and traditional medicines are demanded depending on the ailment [44]. It was estimated that 72% of the Black African population use ATM, and the average frequency of use per consumer

was 4.8 times per year. The number of THPs in SA was estimated to be 350,000 in the early 1990s [45], and in 2009, it was estimated that there is 500 THs for every 100,000 people as opposed to 77 medical doctors for the same population [28].

Recent cases that demonstrated the dualism in health seeking patterns are those involving the therapy of HIV infection. The majority of people living with HIV and AIDS consulted THPs first before visiting conventional medicine practitioners [21, 46]. Many individuals on antiretroviral treatment (ART) also reported the use of TM concomitantly [47–50]. The THs refer their suspected HIV patients to relevant CHPs, yet continue to treat the patients with higher CD4 counts, who are on ARTs [51]. Consumers of ATMs come from all classes and categories of society, including different ages, education levels, religious practices and occupation [38, 44, 52, 53]. The use of TM is a common practice across most sectors of the Black African population and is not merely confined to the poor, rural or uneducated users [44].

There are many reasons cited for the use of TM. Cultural practice is the common reason for use of ATM; others include affordability, availability, accessibility, spiritual and emotional reasons and a general desire for wellness [8, 38, 54]. Affordability means the monetary cost associated with the utilisation of TM treatment, consultation or products thereof. Availability refers to the extent to which TM treatment, provider or products are geographically available to the user [14]. The decision to use a particular medical remedy was dependant on socio-economic variables such as the type of illness; its seriousness, the time it occurs, past experiences of the illness, access to health service, the perceived quality of the service and distrust in clinics [55].

While TM may not always be affordable, it is physically, socially and culturally more available than allopathic treatment. Also, the practice of TM is client centred and personalised, paying due regard to social and spiritual matters that are fundamental to African cultures [56]. In addition to healing of the mind, body and spirit, THPs serve many roles in the community, including counselling, social mediation, cultural education and being custodians of African traditions and customs [41].

5. Research in African traditional medicine

African traditional medicine plays a large role in the management of health, holistically, and in either a preventative, curative and/or palliative nature. Many qualitative studies where THPs are interviewed indicate the diverse range of illnesses and diseases that are managed, from those presenting with physical symptoms to those manifesting psychosocially. There are also claims of cures of conditions without tangible supporting evidence of efficacy, at times, which is one of the reasons why government seeks to protect the interests of members of the public who use the services of traditional health practitioners.

Research on ATM is driven by the desire for new drug discovery as well as the need to validate the use of the ATMs for the specific claims made. There is a dire need to bring the ATM into the scientific understanding of the conventional medicine and CHPs. Most of the TMs have not been well researched scientifically. For CHPs and the scientific community to accept them, there has to be clear understanding of the pharmacology and toxicology of the medicines, which can be explained by the mechanisms of action, the biochemical or physiological pathways the medicines affect and the possible toxicological effects they have. The WHO encourages further research in TM to ascertain the efficacy and safety, as inappropriate use can have negative or harmful effects [13]. A long history of use and simply being natural does not necessarily imply safety. The use of ATMs may cause adverse effects, increase the risk of harmful drug-herb interactions and delay access to effective conventional medicines [13, 57].

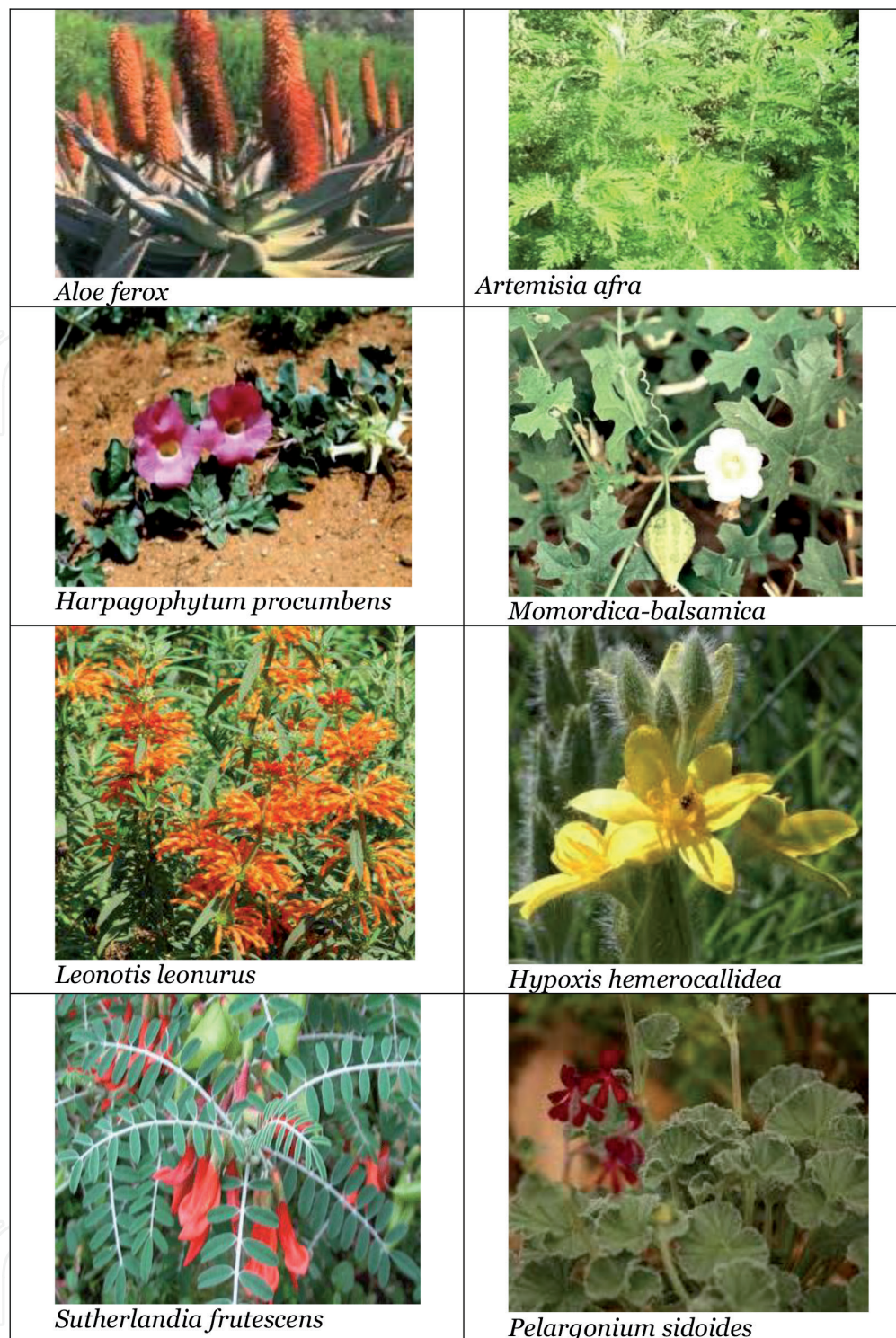


Figure 1.
Commonly used and mentioned medicinal plants used as African traditional medicines.

Most of the research in TM is directed at medicinal plants used. The general approach in medicinal plant research is initiated by ethnobotanical studies, followed by experimental laboratory-based processes which include solvent extraction of medicinal plant material with solvents of different polarities, qualitative and quantitative phytochemical screening, bioassay-guided fractionation, isolation of active and/or inactive compounds and structural elucidation of the compounds. The extracts and compounds of interest are then investigated further using various tests for pharmacological and toxicological activities, usually guided by the ethnobotanical use of the plant [58].

The SA government provides a platform across various sectors for research into ATM. The government has formed collaboration with institutions including

the Centre for Scientific and Industrial Research (CSIR), Agricultural Research Council (ARC), the Medicines Research Council (MRC), Department of Agriculture (DoA) as well as Department of Science and Technology (DST). Traditional medicine research is conducted at several institutions, facilitated by funding from government through the National Research Foundation (NRF), or other parastatal organisations as part of indigenous knowledge systems (IKSs). Each institution conducts research mainly independently, with a few national and international collaborations present. Hence, the research into ATM is largely uncoordinated. Few flagship programmes are presently running in key institutions with a focus on medicinal plants for the development of immunomodulators, microbicides, anti-diabetic medicines, anti-tuberculosis medicines, antimalarial agents and anti-cancer medicines. Across other institutions, there is a focus on the research in ATM for antihypertensive, anti-diabetic, antimalarial, antimicrobial and anti-HIV medicines.

Over the past few years, ethnobotanical studies in SA have revealed several plants for different conditions. The list (**Figure 1**) includes medicinal plants that have been listed and been investigated for biological, pharmacological and other activities. These plants are used as ATM by communities for conditions, mainly diabetes mellitus, hypertension, HIV infection and others. They also form part of the list of potent medicinal plants and those with potential to be developed into commercial products [59–64].

The toxicology studies of these medicinal plant extracts have been performed. Some of the tests performed include those for anti-inflammatory, antioxidant, antimicrobial, cytotoxic, mutagenic and genotoxic effects [65, 66]. These tests were generally performed after the extraction and concentration of what the researchers believed to be the active compounds within the herbal medicines. Most studies have investigated the toxicity of individual herbs or plant extracts but not mixtures. These are in contrast to how the herbal medicines would normally be used or handled in the traditional medicine practice. However, as recommended by WHO general guidelines for methodologies on research and evaluation of TM, the safety data obtained from *in vitro* tests might not be absolute markers of safety but should be seen as indicators of potential toxicity [67].

6. Collaboration between African traditional medicine practice and conventional research

There is evidence for the need to have collaboration between CHPs and THPs in managing health care. In acknowledging the dualism that exists in seeking health, one of the objectives of the strategic health plan of the NDoH is to form links with THPs and complementary healers.

However, notwithstanding the knowledge that users of ATM do not disclose to their CHPs, there is still a reluctance within the conventional health practice to collaborate with THPs. Several factors hinder collaboration between health practitioners as reported in a few studies. In the biomedical approach, all authority and responsibility are given to the medical practitioner, whereas traditional healing is all-inclusive, taking into account the whole person, as well as the social environment [68]. THPs have indicated their willingness to learn and refer patients to clinics and hospitals; however, CHPs do not share the sentiment this [41, 69]. In one study, CHPs' views were that the two health systems were not compatible with respect to the science involved and the source of knowledge, and that the quality of health care will be compromised if traditional health practitioners are

allowed to work in public health facilities. Lack of knowledge about ATM and exposure to it seems to be a major hindrance to opportunities in collaboration with traditional healers [70].

A respectful attitude of open exchange and information is essential for successful collaboration which will impact the health care service positively. The incorporation of traditional healers in modern health care may improve the health care of many South Africans who consult them first before seeking conventional medicine. The collaboration could also help advance the study and research of the medicinal plants that they use [71]. It is recommended that government should develop policy on collaboration, detailing how it should be structured, implemented and monitored. If there were clear guidelines of the implementation thereof, it would facilitate the process and enhance involvement and interaction of all relevant stakeholders [70].

One of the concerns raised particularly by THPs in collaboration with research is the protection of intellectual property and indigenous knowledge. The WHO traditional medicine strategy 2002–2005 advocated for, amongst others, measures to protect knowledge of traditional medicine and plant resources, as well as the intellectual property rights of traditional practitioners [11]. South Africa and other African countries reviewed their legislation to conform to the Trade Related Aspects of Intellectual Property Rights (TRIPS) and the African Union's legislation on protection of traditional medical knowledge of indigenous people [72]. A national indigenous knowledge system (IKS) policy was adopted in 2004, and a national office of IKS was established in 2006. The policy was developed as an overall framework to guide and coordinate the work of different government departments with regard to indigenous knowledge [73]. The Biodiversity Act 10 of 2004, known as 'the Biodiversity Act', provides for the management and conservation of South Africa's biodiversity. This includes the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, and importantly, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources [74].

There are several research groups/centres that show evidence of success in collaboration. At a clinical level, in the province of KZN, THPs treat patients first if they deem appropriate and refer them to the CHPs in the clinics. The patients report back to the THPS after undergoing medical treatment [75, 76]. A collaboration project was initiated on HIV and AIDS, which included researchers, THPs, traditional leadership and national and provincial government officials. The project involved THPs to spread HIV prevention and treatment messages to their patients and the researchers collected data for monitoring and evaluation purposes. The success of the project was the birth of a referral system in which the THPs refer their patients to the clinics, and clinics being able to refer patients to THPs who have special knowledge in certain diseases. This relationship has resulted in clinics appointing a THP to their board of directors [77].

Collaboration in research is showing great progress in terms of bringing ATM into understanding of science fraternity. The Department of Science and Technology (DST) primarily ensures effective coordination and responsiveness to industry and academia. The DST works closely with communities in flagship projects that have resulted in patenting and commercialisation of novel products. Through its Bio-economy Strategy the department has led to the development, formulation, patenting and commercialisation of products that are nutraceuticals (Moringa iced tea and Moringa vitamin water) and cosmeceuticals (skin tone evener) [78].

The MRC in collaboration with the University of Cape Town (UCT), developed the TM database, TRAMED III which was aimed at gathering research on the TM

and making the information available to the public. A practical guidebook for traditional healers in Primary Health Care Principles was compiled and published, in collaboration with THP groups [47, 79]. CSIR is collaborating with THPs to investigate the efficacy and toxicity of the TMs based on how THPs use them. This collaboration has led to the identification of a number of traditional herbal remedies. One success venture is that CSIR has partnered with Afriplex, in research, development, and patenting of a product from *Elephantorrhiza elephantina* for the treatment of male pattern baldness [80]. Both the CSIR and the MRC have benefit-sharing policies that guarantee compensation for THPs and communities for commercialising medicinal plant products [18].

Within its Indigenous Knowledge Systems unit, the University of the Free State is involved in research in medicinal plants used for the treatment of malaria, HIV, cancer and diabetes. The collaboration with THPs has produced indigenous teas, which are at the level of commercialisation [81]. When the university hosted the South African Society for Basic and Clinical Pharmacology Conference in 2017, it was noteworthy to have the participation of staff members from the Traditional Healers' Organisation, who form part of their IKS unit collaboration. The conference therefore marked a new beginning for closer association of researchers and THPs, by allowing engagement on the same platform.

7. Education

There are no formal institutions in SA for the training in TM as a practice. The training of a THP is a formal and painstaking process, which is initiated in a unique manner for each prospective trainee. The training period may be months to one or more years depending on how fast the trainee learns the trade, and on the calling. The calling to become a healer may manifest as a form of illness, which would then be verified by a qualified diviner [82, 83].

The THPA 22 of 2007 stipulates the initiation and setting up for an institution of training. All healer practice training is performed by trainees under the guidance of a practising and experienced healer. The minimum standards of training are clearly outlined, indicating the expected minimum duration of training, competencies, and age for entry [27].

In line with the call for indigenisation/decolonisation/Africanisation of the curricula, there is an acceptance and recognition of the importance of teaching medical or health science students in higher institutions of learning about ATM. This need was critically driven and accelerated by the students' protest action which started in 2017. Part of the call for the movement was that the curriculum in universities was still shaped and influenced and geared towards a Western and conventional education system and model. The training of health sciences and medical students is intended to prepare the students as health professionals who would largely operate within a health system in which the recipients of the services are within a population that practice traditional medicine in addition to the orthodox medicine. Therefore, there is a dire need to prepare the students adequately and optimally for the real situation that they will be released into. Prior to 2017, only one of the eight medical schools in the country had incorporated TCAM in to the curriculum, despite calls by government to introduce concepts of TM in the teaching [84].

Exposure and training at undergraduate level regarding the traditional health system are recommended as it would facilitate collaboration with THPs [70]. ATM is indigenous knowledge in medicine. More institutions have now incorporated ATM and CAM into their curricula. The challenge will occur with content development and delivery modes. Current academics may be inadequately equipped in

terms of knowledge on ATM, while there also may be negative perceptions and prejudices. Hence, the teaching on ATM in the early stages will require academics to be objective and creative in providing the information. The student populations may have diverse perceptions, opinions and attitudes about ATM. The knowledge base of the students would also be variable, ranging from those who have no knowledge at all, to those who have experience on ATM. It would require the lecturer to have the confidence and competence of teaching sensitive topics such as ATM.

8. Overview of African traditional medicine practice

According to the THPA, traditional medicine is the sum total of skills and practices based on beliefs and experiences indigenous to African cultures, that are used to prevent, diagnose, improve or treat physical and mental illnesses.

Traditional medicine is an object or substance used in traditional health practice for the diagnosis, treatment or prevention of physical or mental illness; or well-being in human beings; and traditional health practice means the performance of a function, activity, process or service based on traditional philosophy, that includes the utilisation of TM. Traditional healing is associated with herbs, remedies and advice from a traditional healer, with a strong spiritual component. For this reason, it is impossible to separate African traditional healing from African spirituality [47, 83]. African spirituality encompasses belief and worship to God, and reverence and acknowledgement of ancestors. Ancestors are compassionate spirits of the departed blood-relatives of an individual, and may involve a whole lineage spanning generations [83, 85, 86]. They are revered but not worshiped as one would pray to God and serve to mediate between the living and God [87]. They are regarded as custodians of the lives of future generations and therefore occupy a position of dignity and respect within their descendants [86]. Anecdotal evidence has been noted, where a client or a trainee healer inadvertently discovers their true identity in terms of family name and origin, something that would cause consternation in families, particularly where this had been kept secret from the individual. This is equivalent to how DNA tests confirm blood relations in orthodox medicine. African traditional healing or African indigenous healing in SA is closely associated with African indigenous churches, most of which practice Christianity. This is largely as a result of early influence by Western missionaries and colonisation. Nonetheless, African traditional healing embraces God as the Supreme Being and Creator, the main pillar of the universe and is the same God that Christianity and other religious practices believe in [83, 86].

Communication with ancestors is facilitated by a THP who would also guide on how to specifically communicate depending on the purpose and the ritual that may be required. The consultation occurs at different time periods and differ from group to group [83, 86]. The ritual usually involves the slaughtering of an animal, either chicken, goat, sheep or cow, depending on the purpose, the significance or simply the instruction from ancestors. The slaughtering is important as the blood signifies the connection between the individual and the ancestors. It represents the eternal bond between the ancestors and their descendants. For that reason, the slaughtering has to be done properly, according to specific instructions and at the right place which often is the homestead and can never be at an abattoir [83]. This spiritual healing provides a sense of security, anchoring and validates their identity of the descendants and a sense of belonging and purpose in life [86].

Ancestors may extend beyond the individual or personal level, as in when dealing with community issues [83]. In such cases, reverence will be directed at the ancestors of the village, the tribe or the country. In SA, the government has erected

a memorial, the Freedom Park in Pretoria in recognition of the role of ancestors to the living. Within the park there are several sacred sites that are assigned the meaning and importance of the park. The Wall of Names is inscribed with the names of those who lost their lives in the various conflicts that took place in South Africa, from pre-colonial wars to the South African War (Anglo Boer War), World War I, World War II and the liberation struggle. The Garden of Remembrance, *Isivivane*, is the spiritual resting place of those who played a role in the freedom and liberation of South Africa. It is a tranquil space that invites reflection and prayer and visitors entering are required to take off their shoes as a sign of respect. Ancestral rituals are occasionally performed in this garden, including when the remains of those who perished in foreign countries during the struggle are repatriated. The Sanctuary has been created to provide meditative space which permits introspection and quiet contemplation. Guests are allowed to light a candle to honour their ancestors and remember the many South Africans who sacrificed their lives to ensure freedom for all [88].

According to the THPA, THPs are classified as diviners, herbalists, traditional surgeons and traditional birth attendants [18, 27, 83]. A traditional healer is 'a person who is recognised by the community where he or she lives as someone competent to provide health care by using plant, animal and mineral substances and other methods based on social, cultural and religious practices' [9]. There are estimated to be between 200,000 and 300,000 traditional healers in South Africa [89]; with the healer-patient ratio of 1:500–1200, as compared to the medical doctor-patient ratio of 1:40000. Faith healers and prophets are no longer classified under the THPA as they are more church-oriented practice and are therefore legislated separately [41]. The diviners use divination to communicate with their ancestral spirits (and their patient's) to diagnose their patients' misfortunes or ailment, which may be done using different physiological, psychiatric and spiritual conditions [83, 85]. Diviners are said to be spirituality experts as they diagnose and define illness, its origin and the reason in terms of African belief systems [85, 90]. The herbalist practices the art of healing by administration of relevant herbs and plant material. The herbalist has extensive knowledge of plants, herbs, insects, animals, birds and snakes [34]. Diviners and herbalists are called *iSangoma* and *iNyanga* in *isiZulu*, respectively, and both are African shaman [87]. The terms are commonly used although other SA indigenous languages have their own names. Traditional surgeons are generally males qualified, accredited, trusted, experienced and recognised to perform circumcision on boys [34, 83]. Traditional birth attendants are older women who have years of experience as midwives, also provide care and advice during pregnancy, and may provide maternal and child care [34].

The trigger for consultation of a traditional healer may be illness, manifesting physically and or psychosocially. Actual experience of symptoms of illness (e.g., headaches, acute or chronic body pain), an injury (trauma) or heightened senses of anxiety and restlessness, unhappiness, depression or uncertainty are some of the factors that may spur consultation. Some of the reasons for consulting a traditional healer include accessibility, affordability, trust in the healer, culture and beliefs, spiritual and emotional reasons, time devoted to patient by the healer, emphasis on cure rather than prevention in conventional treatments, limitations of conventional treatments in dealing with chronic health problems and a general desire for wellness [54].

For diagnosis, a healer may use an appropriate medium, depending on the practice of the diviner. The diviner may silently observe the patient, or use a particular object as a symbol of the connection to the patient such as a lit candle, a glass of water or an item of clothing, etc. The patient can also do self-diagnosis by informing the healer what the patient or others have observed. Common diagnostic methods

of the diviner include spirit possession, the use of divination bones and dreams. Spirit possession is when the ancestral spirit occupies the healer, and therefore, the healer serves as a conduit for messages. Divination bones are a set of various small objects ranging from shells, dice, tiny animal bones to plant kernels, which represent various elements in the spiritual context. The bones, when thrown by either the diviner or the patient, fall in a particular pattern intended by the ancestors and specific to the patient. The diviner then interprets this pattern as applicable to the patient or the situation. Diviners are also adept at interpreting dreams as ancestors may send messages in dreams [87]. Treatment in traditional healing may be in various forms. ATMs (products) are derived from various plant parts such as leaves, stem, bark, roots; herbs, animal sources and other materials such as water and ash [83]. Generally, a healer issues the ATM with instructions of use or may direct a patient where to collect the medicines. The practice of using plants and animal products is widespread in Africa and trading in plants and animal parts for ATM is common in many African towns and cities [91]. ATM may be a single item or combination of either plant or animal products or other materials.

Medicinal plants used as ATM by THPs and communities for the treatment of various conditions including diabetes mellitus [92], cancer [93], asthma [39, 94]), tuberculosis [95], for use by HIV infected persons [96] and mental disorders [39] have been compiled and listed through many ethnobotanical studies. As an example, some of the plants used for diabetes mellitus, such as *Aloe ferox*, have also been investigated scientifically for anti-diabetic properties. The leaf, as well as the sap from the leaf, of *Aloe ferox* is commonly used in ATM, and *in vitro* and *in vivo* studies have shown that it has insulin-increasing activity which may be the mechanism by which it reverses hyperglycaemia [59, 62, 97, 98]. *Ubulawu*, a traditional medicine prepared from roots of *Silene bellidioides* and stem of *Helinus integrifolius*, is used to cleanse the body and the mind. This medicine is therefore said to provide both physical and psycho-spiritual healing. THPs use it to open their intuition and enhance their dreaming, to increase their learning ability and bring forth their gifts of healing; while ordinary people use it for dreaming and to increase general health and energy [85].

A diverse range of animal products is used as ATM [99] as evidenced by the notable trade in TM markets in SA [100], and other countries such as Mozambique that provide cross border trading thereof [101]. The animal species traded include various species of birds, reptiles, mammals and amphibians. This trading has raised concern as some of the animals are listed for conservation, and the trading is extensive but not well understood and not controlled [100]. Animal parts used may include one or combination of parts such as the skin, tail, meat, hair, bones, teeth, fat, glands and faecal pellets. The conditions managed include physical and mental illnesses as well as antenatal care [91]. The highest reported sales in the ATM market in Faraday, Johannesburg were of crocodiles, pythons and baboons [100]. In traditional healing, crocodile fat is mixed with ground bark of *Cryptocarya latifolia* for the treatment of chest pain, and with ashes of burnt powdered bark of *Euclea natalensis* for treatment of abnormal growths [102].

ATM may be administered through various routes depending on ailment. The oral route includes drinking (concoction, decoction, infusion), eating (powdered plant material mixed with food and chewing (parts of plant—leaf, bark, root and spitting out the chaff)). Decoctions, which are concentrated extracts, are prepared by adding cold water to the amount of plant material required and allowing it to boil. Infusions are prepared like tea, by steeping the herbs in boiling water and taking it either warm or cold. Enemas and emesis (purging) are ways of detoxing to get rid of toxic substances that are unsuitable to stay long in the gastrointestinal tract. *Ubulawo*, mentioned earlier, is used as an emetic and purgative [85, 86]. Inhalational route involves smoking dried, burnt plant material or steaming (vapour). Topical

administration includes bathing in water in which the ATM is suspended or applying a paste on the skin, in the same way that a lotion would be applied. A poultice is a paste from the crushed fresh plant material, usually mixed in water and then applied on the required part of the body [6]. Subcutaneous administration involves making tiny incisions in the skin and applying the medicine as a paste by rubbing it into the cut [87]. This ensures entry of the medicine into the system. Other modalities of administration of treatment include prayer to God and/or devotion to ancestors, drumming, chants and dances; and reassurance and rest [82, 86]. The ATM may also be worn as a charm, amulet or bracelet [34].

9. Commercialisation of African traditional medicine

ATM was generally associated with herbs, remedies and advice from diviners or healers with strong spiritual and cultural components [8]. Usually, ATM would be obtained from traditional healers or by self-collection on advice from a healer or someone knowledgeable about the medicine. Commercialisation of indigenous medicinal plants is a process that has been growing gradually since the early 1990s, with the aim of developing the known medicinal plants into various health products [90]. Commercialisation is the process of introducing a new product into the commerce, i.e., making the product available on the market. Due to commercialisation, some ATMs are available ready for use from various retail outlets. These include grocery stores, *muthi* markets, health shops, street side vendors, supermarkets and over-the-counter (OTC) in pharmacies. *Muthi* is the Zulu word for medicine. The producers of commercially available TM are the retail *muthi* shops, health shops that specialise in herbal medicines, pharmaceutical manufacturers and Laissez faire manufacturers [44, 52]. Some medicinal plants used for common ailments have been developed into medicinal products and commercialised by large manufacturing pharmaceutical companies such as Phyto Nova Pty (Ltd) and Aspen Pharmacare. These medicines are available as formal processed and standardised preparations in modern packaging and in dosage forms such as capsules, ointments, tablets, teas or tinctures. Some of the medicines are derived from plants that are common household traditional remedies such as *Aloe ferox*, *Artemisia afra*, *Harpagophytum procumbens*, *Hypoxis hemerocallidea*, *Lippia javanica*, *Sutherlandia frutescens* and *Pelargonium sidoides* [103, 104].

There is a growing informal or semi-formal trade sector, in which a large number of medicinal plants are sold as crude, unprocessed plant material. The traditional medicines trade is huge and growing, generating billions of rands per annum in South Africa in various sectors [44]. There are no clear statistics providing an indication of how many ATM (*muthi*) shops are available currently, but these shops form part of the commercial landscapes of many metropolitan centres of South Africa. With commercialisation, many of the ATMs are being prepared and processed as herbal mixtures or concoctions readily available for sale to the public. Most of them are developed, packaged and branded similar to over-the-counter (OTC) medicines and known herbal supplements [103]. Some of them may be in the form of coloured solids, brightly coloured and scented liquids, capsules and incense sticks [105]. Street vendors, owners of *muthi* shops, THPs and TM users were interviewed and agreed that the use and trade of plants for medicinal use are no longer confined to traditional healers, but had entered both the formal and informal entrepreneurial sectors of the SA economy [106].

These commercial HMs are popularised by advertisements and promotions in both print and electronic media. Social networks, the internet, radio, television and newspapers have provided a new platform for marketing of ATM by THPs [107]. The market for CHMs will continue growing as it facilitates the use of ATMs through

self-medication. It may be that it is convenient in that both time and money are saved in bypassing the need for consultation of a THP. They are generally sold in retail outlets, muthi shops, by streetside hawkers as well in pharmacies. However, even with modern packaging and marketing practices, the CHMs have not been tested for efficacy and safety, and their labels do not provide adequate information about medicines [105, 108]. An observation made was that there were inconsistencies and deceptive tendencies regarding the labelling and the actual contents; hence, the labels cannot be trusted about the contents of the containers. Nevertheless, the lack or incompleteness of information or about these medicines does not dissuade their use by the public or their sale by the various available retailers/vendors, including pharmacies. It was noted that the market for CHMs may be driven by the desire for urbanised populations to use TM, but having neither the time nor the resources to produce the medicines [105]. The use of the CHMs may therefore be solely based on manufacturer claims and marketing. There might also be the indirect connotation that since the HMs are sold in pharmacies; then, they are guaranteed for safety and efficacy. There may also be the perception that as natural products they signify purity and safety [108]. Nonetheless, of course 'natural' does not necessarily imply safety [23].

The increasing availability of the concoctions or the commercial herbal mixtures used as ATMs have raised the interest of researchers, as they are produced for the public and sold as ready-made mixtures; and their market seems to be growing. Researchers have evaluated some of these for various activities and effects; including toxicology studies. Four concoctions tested displayed antimicrobial activity, variably against *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella pneumoniae*, and *Candida albicans* [109], and had anti-cyclooxygenase activity (anti-inflammatory). Other CHMS were found to have inhibitory and stimulatory effects on isolated and non-isolated human neutrophils and platelets; effects which were also observed variably at low and high concentrations of the herbal mixtures. These effects were observed in neutrophils and platelets from healthy diabetes mellitus, hypertension and asthma patients. The effects may signify beneficial roles in the conditions, yet they also imply possible complications, which may be harmful [110, 111]. A batch of concoctions were confirmed to have different levels of cytotoxicity and mutagenicity [39, 112]. Other concoctions had moderate antibacterial activity against *Enterobacter cloacae*, *Enterobacter aerogenes*, *Escherichia coli*, *Klebsiella pneumonia* and *Citrobacter braakii* [113].

A great concern has been raised with regard to their purity or possible contamination either during production, storage or dispensing, which can be through adulteration by chemicals and biological contamination [114, 115]. Biological contamination refers to impurities in medicinal herbs and their preparations and products and may involve living microbes such as bacteria and their spores, yeasts and moulds, viruses, protozoa, insects (their eggs and larvae) and other organisms [116]. Microbial contamination was found in herbal medicines sold in the Nelson Mandela Metropole (Port Elizabeth) and in Johannesburg, which may pose a major health risk to patients. Thus, there is a need for introduction of guidelines for the quality control in preparation and storage of ATMs and community awareness about the potential health risks [114, 115]. Herbal concoctions bought directly from private traders and streetside sellers were evaluated and found to have been contaminated by *Enterobacter cloacae*, *Enterobacter aerogenes*, *Escherichia coli*, *Leclercia adecarboxylata* and *Citrobacter braakii*, which are motile bacteria and hence are more damaging to cells [113]; and *K. pneumoniae* and *P. fluorescens*, which may negatively affect the health of those using them [117]. The concoctions were also contaminated by commonly occurring yeasts—*Stephanoascus ciferrii* and *Cryptococcus laurentii*. These findings suggest an urgent need for regulation



Figure 2.
Plant material in various stages of the production: from collection to point of use as a ready-to-use mixture.

measures of the handling of the herbal mixtures during production, storage and dispensing. The South African Health Products Authority (SAHPRA), through its working group, is working on the draft framework for the regulation of ATMs produced for bulk sale [118], and these studies should serve as a guide for fast-tracking the processes (Figure 2).

10. Current African traditional medicine issues: the status of *Cannabis sativa*

In September 2018, the Constitutional Court of SA announced that the prohibition of for private use and consumption of cannabis, as well as cultivation for personal use is against the constitutional rights of citizens to privacy, thereby legalising the use of cannabis privately [119]. The ruling, however, made it clear that public consumption, distribution or selling and use by minors is illegal. This pronouncement has changed the whole landscape of cannabis use, including the use for medicinal purposes. Beforehand, in 2016, cannabis had been legalised for medicinal use, and a team of experts had identified priority areas for research which would advance its use and benefit healthcare [120]. In 2017, the SAHPRA (which was still MCC) had issued guidelines on growing of cannabis for medicinal use and for manufacture of related pharmaceutical products. For cultivation, production, manufacture and use of medicinal cannabis products, a licence has to be applied for and be obtained from SAHPRA, as well as a permit from the Department of Health [121]. Only one institution, the Department of Pharmacology, University of the Free State, has been granted licence to perform systematic research on medicinal cannabis thus far [82].

Cannabis has been reported for use as TM for various conditions including diabetes mellitus [92], cancer [93], asthma [39, 94], tuberculosis [95], for use by



Figure 3.
Cannabis sativa.

HIV-infected persons [96] and other conditions [39]. It is used as a decoction or infusion, alone or mixed with other herbs and taken daily as a preventative medicine, and it would be obtained from THPs [39, 94]. The legalisation certainly provides an environment for continued use of the plant as ATM and obligates that more research should be done to explore further benefits of medicinal cannabis. Hence, the regulations around granting licence for research may need to be reviewed in light of the ruling (**Figure 3**).

11. Conclusion

The use of African traditional medicine by the public will persist and keep growing. ATM plays a role that cannot be completely substituted by conventional medicine; hence, it will remain as a part of the healthcare option available to the population as long as it is accessible. Legislation and policies are in place to facilitate institutionalisation of the TM, although there is slow progress of applications of the various laws. It is pertinent that SAHPRA has to accelerate the framework of regulation of the production of ATMs for bulk sale as the market is growing rapidly, increasing the potential risks to the public. While there is notable progress and benefit in institutional research and collaboration, there is a great need to provide guidelines and regulation for collaboration at primary health care and clinical level. Proper education of conventional health providers about African traditional medicine and the role of traditional health practitioners will facilitate understanding and trust between the two practices and benefit the health care service. The complexities that are delaying the enactment of the Traditional Health Practitioners Act should be addressed, so that the registration, training and acceptance of THPs will be realised.

Conflict of interest

None.

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