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Preservation of traditional medicinal knowledge: Initiatives and techniques in rural communities in KwaZulu-Natal

by

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Abstract

The aim of this study is to evaluate and assess the initiatives and techniques of preserving traditional medicinal knowledge. The dependence on indigenous knowledge in communities is continuous as it was years back. Thus indigenous knowledge remains the primary foundation for local decision making in developing countries and it signifies an imperative component of worldwide knowledge on development issues. Research in indigenous knowledge has shown enormous growth over the years while most of the indigenous knowledge is still found in its tacit form. It is necessary to evaluate these initiatives and techniques of preserving traditional medicinal knowledge because of the nature of indigenous knowledge which is normally communicated verbally from generation to generation. This chapter examined the various initiatives in different parts of the world established with the aim to preserve indigenous knowledge, techniques of preserving traditional medicinal knowledge and challenges of preserving this knowledge. This paper concluded that there are no specific techniques that are used to preserve traditional medicinal knowledge and various attempts made by different nations around the world towards preserving this knowledge have been successful and others not so successful. The challenges can be overcome if government, users and owners of this knowledge share similar goals for the preservation of this knowledge which is preserving this knowledge for use by future generations.

Key words: Indigenous knowledge; traditional medicinal knowledge; techniques; preservation; challenges; initiatives

Introduction

The World Health Organisation (WHO) (2013) defines traditional medicinal knowledge as the total sum of knowledge, skills and practices that are based on the theories, beliefs and

experiences of indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses. For over forty (40) years, traditional medicine has played a significant role in the lives of South Africans. According to Abdullah (2011), about seventy percent (70%) of the population in South Africa primarily relies on traditional medicinal knowledge for their health care needs. Notably, South African is estimated to have about 200,000 traditional medicinal knowledge owners, also known as traditional medicine practitioners (TMPs) that serve the health needs of thirty (30) million South Africans (Coleman, 2013). Traditional medicinal knowledge can be used to treat and heal a number of illnesses such as cancer, high blood pressure, cholera, venereal diseases, eczema, fever, anxiety, depression, healing of wounds and burns, gout and sexually transmitted disease. Das and Sarkhel (2016) argue that traditional medicinal knowledge is not only essential to health care but it is an essential source of revenue and an essential component to the identity of a society.

Traditional medicinal knowledge is normally practiced in secret, therefore it resides and is stored within the owner's head. According to Khumalo, Khumalo, and Nsindane (2018), traditional medicinal knowledge owners obtain their knowledge from various source such as parents and relatives who were once owners of this knowledge. Therefore, this knowledge is only shared with a chosen individual and it is tacitly held by owners as it remains in their heads. This means that in South Africa, a great amount of valuable knowledge may get lost when the owners of this knowledge die or perish. This will have a negative impact in the health system and lives of those who depend on this knowledge. However, the implementation of preservation measures will facilitate the capturing, storing, and dissemination of traditional medicinal knowledge and will assist in keeping this knowledge alive for the use of upcoming generations. Therefore, this study establishes initiatives and techniques used by traditional medicinal knowledge owners in preserving their knowledge.

The objectives are as follows:

- To determine the techniques used by traditional medicinal knowledge owners in preserving their traditional medicinal knowledge;
- To establish the effectiveness of the techniques used by traditional medicinal knowledge owners in preserving their traditional medicinal knowledge;

- To determine the perceptions of traditional medicinal knowledge owners regarding preserving their knowledge; and
- To identify challenges associated with the preservation of traditional medicinal knowledge.

Initiatives of preserving indigenous knowledge in other parts of the world

There have been various initiatives that have been formulated in different parts of the world in an attempt to preserve different forms of indigenous knowledge. The present study is therefore of the view that what is successfully in operation in other countries in terms of preserving traditional medicinal knowledge may be learned by other countries. These initiatives are discussed below:

Traditional Knowledge Digital Library (TKDL)

Preserving traditional medicinal knowledge includes creating technologies that will guarantee the knowledge's ongoing existence and viability and passing them on to future generations (Anyaoku, Nwafor-Orizu, & Eneh, 2015). India and other countries have used technology advancement to their advantage through a digital library system and database as efforts of preserving traditional knowledge of medicine. The traditional knowledge digital library (TKDL) is set to be the biggest traditional knowledge preserver in the universe. Sen and Chakraborty (2017) argue that the database provides information about the medicinal plant, formulation of Ayurveda, Siddha, Unani, Yoga, etc. The authors further proffer that TKDL has information of 500 Ayurvedic, 500 Unani and 200 Siddha formulations. TKDL is a collaborative project of the Council of Scientific and Industrial Research (CSIR) and AYUSH, and documents are accessible in both national and international languages (Ansari, 2016). Ansari (2016) further points out that the TKDL project digitises the documents of various Indian traditional medicine systems that are available in the public domain. Such knowledge is protected from being misused through patents on innovations that are not original. In the past, there were challenges that emerged regarding the patenting of India's traditional knowledge which resulted in India deciding to establish their digital library. Ansari (2016) argues that the establishment of the Traditional Knowledge Digital Library was due to India's efforts to terminate a patent granted by the United States Patents. However, TKDL has made an impact in the world where numerous countries have recognised and appreciated India's efforts to come up with a reliable solution in safeguarding and preserving traditional knowledge. For example, interests to replicate the TKDL has been shown by organisations and countries such as the African Regional Intellectual Property Organisation, Magnolia, South Africa, Nigeria, Malaysia and Thailand (Chakravart & Mahajan, 2010).

The Honey Bee Network (HBN)

The Honey Bee Network(HBN) is another project of India that was established in 1986. Information is collected by members of the communities known as fieldworkers and the project has collected over 10 000 of India's traditional knowledge systems. This project facilitates the sharing of knowledge from different people such as academics, students, farmers etc. and is then translated into various languages which are registered in the database and published in the form of a newsletter. The aim of HBN is to provide support to non-formal innovators who possess rich knowledge and also to alleviate the lives of the poor in India by granting an opportunity for innovations and inventions to be sold throughout the world. This project also plays a role in providing knowledge owners a platform to share their knowledge if they desire to and in return they are recognised for their contribution to preserve knowledge. The knowledge shared is connected with the name of the owners of knowledge or location or their physical address (Honey Bee Network, 2013; Khalala, Makitla, Botha, & Alberts, 2014).

The Biozulua

The Biozulua is a database that captures information on medicinal plants. This is a project of Venezuela in the Northern coast of South America which focuses on capturing information possessed by various ethnic groups about plants and animals that are viewed as useful in food and medicinal uses. The database consists of different information such as indigenous traditional medicine, indigenous agriculture technologies and preservation practices. Field researchers are responsible for the collection of information which is then stored in a researchable database managed by the Foundation for Development of Mathematics and Physical and Natural Sciences. The Biozulua database provides depth information about plants including the generic profile of plants and the coordination positions of location of plants. It allows entries that are expressed together with their geographical reference, bibliographies and digital pictures. The Biozulua database cannot be accessed by the public and the sui generis system is expected to be used as the legal protection in the years to come. All the information stored in the database remains the intellectual property of indigenous groups. However, this project was discontinued after representative of communities from which the indigenous knowledge was collected felt like the system didn't address their rights (Poorna, Mymoon, & Hariharan, 2014; Khalala et al., 2014).

Traditional Chinese Medicinal Patent Database

The Traditional Chinese Medicine Patents Database (TCMPD) is a database published by the China's state Intellectual Property Office to meet the needs of the examiner and it was established in 1985 (Finetti, 2011). The database contains information of medicines with over 22, 000 patent records and 1,100,000 items with documents that are presented in Chinese with a few in English languages. The TCMPC has various ways of searching for documents. They can be retrieved using the easy search which has a text search for all documents within a database and through using the advanced search which allows the use of Boolean operators. TMC Formula search is another way of searching which is a tool that consists of similarity and quality.

The Korean Traditional Knowledge Portal library

The Korean Tradition Knowledge Portal (KTKP) library was established by the Korean Intellectual Office in 2004. The role of the KTKP is to prevent unauthorized patent and to protect Korea's traditional knowledge. According to Poorna et al. (2014), the database is estimated to contain about 350,000 entries on Korean medicine and Korean cultural heritage that can be accessed in both Korean and English languages. The KTKP contains Korean and Chinese medicine, patent document and literary articles, and it enables different searches such as basic and advanced searches that can be used to attain information within the different databases (Poorna et al., 2014). A link that is appearing on the database is able to transfer users to a related item or documents and this can be done using key words or synonyms. The compound database allows searches to be made using compound names, CAS numbers and chemical formulas as presented.

Ara Irititja Project

Ara Irititja project was officially implemented in the year 2001 and the word Irititja means "stories from ancient times" in the Pitjantjatjara language. Lowish (2013) argues that the project is a community based digital project aimed at restoring materials of cultural, historical and contemporary value to the traditional community known as the Anangu that is located in the Western and central parts of Australia. The Irititja project gathers different kinds of valuable historical and cultural materials such as photographs, films, videos, sound recordings, documents and artefacts, etc. and these are kept in public and private collections (Poorna et al.,

2014). The Ara Irititja project is guided by the Executive Council of the Pitjantjatjara. Attention has been mainly focused on the recording, transcribing and translating stories that are possessed by the older generation. The project has painstakingly followed its guidelines from the Anangu on the accession and preservation of their cultural knowledge and to ensure that knowledge remains controlled by the Anangu. Materials are provided on an online system than in a tangible form.

Lowish (2013) further argues that the Ara Irititja locates existing materials of cultural heritage and arranges them for retrieval of significance materials, physically archives them, makes digital copies of materials and sends back all archived materials to the community of the Anangu so that they can have full control of their archive whereby they are able to create, manage and control the archive. Poorna et al. (2014) note that the software of the Irititja operates as a metadata collector that permits members of the community to cover information about each item including names of places, diaries, photographed places, the stories that accompany it, etc. between materials of both males and females. The living archive is open for providing solutions to concerns of members within the Anangu community. The project presently contains 1,30,000 digital records that are guided by protocols and policies to ensure intellectual rights and moral rights of materials of the Anangu. The materials within the archive are subject to the copyright laws along with the intellectual and moral rights lying with the Anangu society (Lowish, 2013; Poorna et al., 2014).

Preservation initiatives in Africa and South Africa

It was evident from the literature review that Africa is said to have made very little progress with regards to putting in place techniques and initiatives in the preservation of traditional medicinal knowledge as compared with other countries in the world. A few projects have been initiated to address the issues of traditional medicinal knowledge in Africa and South Africa.

The Woreda Knowledge Centre (WKC) of Ethiopia

The Woreda Knowledge Centre (WKC) is an Ethiopian project which was established by the Improving Productivity and Market Success (IPMS) in 2005 which is operated by the International Livestock Research Institute (Sehai, 2009). It has created a set of information centre in various parts of Ethiopia. According to Jain (2014), these information centres use information and communication technology tools to document, preserve and limit the cost of distribution and better knowledge of agricultural related content. The centre consists of five (5) computers, a television, DVD players and a library with books, manuals and training guides

in print and electronic form (Sehai, 2009). There are about twenty-eight (28) information centres scattered around communities of Ethiopia. Furthermore, the centres serve the role of encouraging the act of sharing knowledge, and collaboration between farmers and extension workers (Jain, 2014). The main goal of these centres is to improve links between farmers and traders and thereby alleviate poverty. Information and communication tools such as television and DVD players play a role of being a training tool to farmers where training videos and recordings of farmers are demonstrating crop management techniques.

The Centre of Indigenous Knowledge Systems (CEFKIS)

The Centre of Indigenous Knowledge System (CEFKIS) is a non-profit and non-government organisation of Accra, Ghana. The CEFKIS has an affiliate branch in the United State and is devoted to the inclusion of indigenous knowledge systems in Africa (Jain, 2014). CEFIKS (2010) argues that the centre is committed to the mushrooming of information technology in Ghana by empowering disadvantaged people in rural and urban areas for them to have access to and to use both indigenous and surfacing information and communication technology. The CEFKIS is dedicated to using indigenous knowledge systems and other types of information for capacity building as a way to accelerate socio-economic growth in the rural and urban regions of Ghana and the entire western African region (CEFIKS, 2010).

The Durban Ulwazi Programme

The Ulwazi programme collects, disseminates and compiles indigenous knowledge in an online digital library in the format of a web site which is made available to communities through the web and mobile technologies. The website allows for modification and allows use by many users. The programme is the first online indigenous knowledge database to exist in South Africa. The intended goal of the database is to collect and circulate indigenous knowledge in Durban communities, which in turn preserves and enables future use of indigenous knowledge. The programme consists of various kinds of indigenous knowledge such as traditional celebrations, clothing, Zulu proverbs, folk tales, spiritual herbs and agricultural methods which are found in isiZulu and English languages. The Ulwazi programme functions as an integral part of the local public library network that provides a framework for a digital library of indigenous knowledge in which content is created and owned by the communities themselves with libraries serving in the role of moderators and custodians of knowledge. The employed community fieldworkers are responsible for the collection of information (Greyling & McNully, 2012).

The Department of Science and Technology - National Research Foundation (DST-NRF) Centre in Indigenous Knowledge Systems (CIKS)

The Department of Science and Technology - National Research Foundation (DST-NRF) Centre in Indigenous Knowledge Systems (IKS) is also known as the Centre in Indigenous Knowledge Systems (CIKS). UKZN (2019) notes that the centre is based on a Hub and spoke/space model. The CIKS is a collaboration of five (5) universities i.e., the University of KwaZulu Natal (UKZN), North-West University (NWU), University of Limpopo (UL), University of South Africa (UNISA) and University of Venda (UNIVEN). The university of KwaZulu-Natal is the provider of the Hub. UKZN (2019) further notes that the centre is primarily responsible for facilitating institutional collaboration in indigenous knowledge systems research and postgraduate training including sharing existing knowledge production and capacity building through networks and partnerships. The Hub is multi and trans disciplinary in terms of research, teaching, learning, knowledge brokerage networking and community engagement. The focus area is indigenous knowledge systems curriculum studies and development with an emphasis on the emerging quest for non-Eurocentric paradigms, food security, traditional medicine, biodiversity and environmental management (UKZN, 2019).

Techniques used to preserve traditional medicinal knowledge

This study sought to evaluate the techniques used by traditional medicinal knowledge owners in preserving their knowledge. Lodhi and Mikulecky (2010) elaborated on the important steps for preserving indigenous knowledge, i.e. identifying and capturing, validating, recording and documenting, storing, transforming and dissemination. The techniques used must be able to identify, capture, store and disseminate this knowledge as a means of preserving it. Research indicates that a great deal of recognition and attempts have been given towards preserving indigenous knowledge over the years and progress has been indicated. The WHO (World Health Organisation) (2013) has created awareness and the importance of traditional medicinal knowledge. African communities preserve and share their knowledge using techniques such as oral storytelling and experiential instructions (Anyira et al., 2010). Research shows that modern techniques have been suggested such as the use of ICTs, libraries and others.

Oral tradition

According to Kargbo (2008), oral traditions are the recollections and living memories of the past that have been transmitted, recounted and shared throughout culture. Oral tradition includes a variety of cultural heritage methods and resources transferred over generations to qualify as oral traditions through observation and word of mouth (Zimu-Biyela, 2016). Oral traditions consist of dances, role plays and acting, songs, proverbs, myths, folklore, riddles etc. as techniques that are used to express and pass knowledge about a community's culture, custom and behaviour. According to Reitsma (2013), acting is used to convey messages through the use of vocal emotions, facial expressions, bodily movements and vocal expressions. Acting enables, the performer to discover a narration style as a means of making the performance memorable. It has been noted that in African societies storytelling is used to teach children about their historical background and culture. Linde (1993) observes that African women perform traditional educational methods during ceremonies and rituals in the form of dance, folktales, proverbs, poetry and songs as means of passing down cultural values with their children and community members. Therefore, the skills and knowledge are taught to children from early childhood to improve communication amongst males, females and the community at large. Kargbo (2008) suggests that oral tradition should not only be used as a teaching tool but should be used as the means to develop local history programmes that will train students in doing local research by investigating local communities with regards to family, history, tribal customs, religious beliefs, song, drama, dance and agricultural practices.

Community of Practice (CoP)

Ngulube and Mngadi (2009) define a community of practice as a group of people who work together in a responsible way to share ideas. Communities form communal meetings to share tacit (traditional medicinal) knowledge with each other. Zimu-Biyela (2016) stated that knowledge sharing through community practice is a technique that has existed and used for a long period of time. Traditional medicinal knowledge can be preserved through communal meetings where socialisation occurs in the form of sharing ideas, knowledge and experiences. According to Wanger (2011), a community of practice is created by people who engage in a process of collective learning in a shared domain of human endeavour such as a tribe learning to survive, a band of musicians trying to find new forms of expression, a group of defining their identity in school, etc. A community of practice enables the sharing of knowledge through apprenticeship. Zimu-Biyela (2016) states that the sharing of knowledge through communal meetings has been practised by communities for a long period of time but this practice was disappearing due to reasons associated with modernisation. According to Zimu-Biyela (2016),

a community of practice is made up of three proportions namely: the area of expertise of a group member, the member who possesses a trusting relationship and commitment to the goals of community of practice.

Zimu-Biyela (2016) states that apprenticeship (learning by doing) is still regarded as a common tool in preserving indigenous knowledge in communities. The findings of Coleman (2013) provide evidence that the manner in which traditional medicinal knowledge owners preserve their knowledge is through apprenticeship which occurs under the guidance of a recognised traditional medicinal knowledge owner who imparts this knowledge for many years and is paid for training others. This means that individuals who are experts are the only ones that can share this knowledge with others of which it cannot be regarded as an effective way to preserve this knowledge because what will happen to this knowledge when the expert vanishes or dies. Coleman (2013) further argues that tacit knowledge that is possessed by traditional medicinal knowledge owners needs to be transformed from tacit knowledge to explicit knowledge in order to provide for mechanisms of collecting knowledge from owners.

The role of Information and Communication Technology (ICTs) tools in preserving traditional indigenous knowledge

Information and Communication Technology (ICTs) tools play major roles in improving the availability of indigenous knowledge systems and enhancing its blending with the modern scientific and technical knowledge (Ukwueze, 2012). Information and Communication technology (ICTs) includes telecommunications technologies such as telephone, cable, satellite and radio, as well as digital technologies, such as computers, information networks and software. The use of information and communication technology tools in preserving indigenous knowledge has been recommended by many scholars. Dlamini (2016) states that ICTs have the ability of handling information and facilitating different forms of communication between sectors, between human beings and electronic system. Adams (2007) notes that the use of ICTs are as follows:

- To capture, store and disseminate indigenous knowledge so that traditional knowledge is preserved for the future generation
- Promote cost-effective dissemination of indigenous knowledge
- To create easily accessible indigenous knowledge information systems
- To promote integration of indigenous knowledge into formal and non-formal

- Training and education
- To provide a platform for advocating for improved benefit from IK systems of the poor.

According to Ocholla and Dlamini (2017), information and communication technology tools have the capacity to support knowledge preservation through various technologies which combine microelectronics, computer hardware and software and optoelectronics which enable processing and can store large amounts of information. The appropriate applications of information and communication technology tools is important for stimulating the flow of indigenous knowledge and incorporations of modern scientific and technological understandings to traditional knowledge (Lishana, 2013). However, in as much as using information and communication technology tools is viewed as the appropriate technique to preserve indigenous knowledge, however there are challenges associated with its use. Yunnus (2017) adds that not all aspects of indigenous knowledge can be captured as artefacts using digital technology and the collection of knowledge from indigenous knowledge owners takes time and is expensive. Adams (2007) voices concern on the use of information and communication technology as the collection of information from holders of indigenous knowledge is time consuming and requires costs.

Information and Communication Technology (ICTs) tools for storing indigenous knowledge

Adams (2013) argues that information and communication technology tools play a role in improving the availability of indigenous knowledge through the use of various technological tools. These tools consist of USBs, DCROMs, DVDs, VCDs, magnetic tapes, video-tapes, etc. They are viewed as suitable because of their ability to store large volumes of still moving images. Ilo (2012) observes that the strength of documented knowledge can as well occur in mp4 devices, mobile phones and computers. In this regard, computers and mobile phones are the commonly used gadgets for storage purposes. For example, computers and mobile phones consist of internet facilities which enable the stored information to be sent as attachments to the mail boxes (Ilo, 2012). The author further states that information can as well be transformed to 'You Tube' files and subsequently placed on 'You Tube' for public access to it while video and audio-tapes serve as relevant storage devices. The author concludes that music, folktales, and riddles can also be stored and preserved in audio tapes while pictures are preserved in video CDs.

The role of public libraries in preserving indigenous knowledge

According to the International Federation of Library Association (IFLA,1994), the public library is the local centre of information, creating every kind of information that is available and without delay on the provision of services to its users. The IFLA (1994) further states that its services are provided on the idea of equality of access for all, in spite of age, gender, language, religion, or social rank. Public libraries have the ability to assist local communities in preserving indigenous knowledge through resources, skills in collection, capturing, storing and retrieving (Anyira et al., 2010). Therefore, it is important that public libraries play a role in preserving traditional medicinal knowledge. Plockey (2014) notes that public libraries' inclusiveness allows them to construct bridges between people at the local level and therefore world levels of knowledge.

According to IFLA (1994), libraries can assist in the following ways:

- In the collection, preservation and dissemination of indigenous knowledge;
- By publicizing the value, contribution, and importance of IK to both non-indigenous and indigenous people;
- Raise awareness on the protection of indigenous knowledge against exploitation;
- Involving elders and communities in the production of IK; and
- Encouraging the recognition of intellectual property laws to ensure the proper protection.

The role of medicinal libraries in preserving traditional medicinal knowledge

The main responsibility of medicinal libraries is to preserve and disseminate traditional medicinal knowledge and information in print and electronic form. Medicinal libraries can play a significant role in preserving traditional medicinal knowledge through their information management abilities. Anyaoku et al. (2015) argue that this role depends on its mandate for the collection, preservation and dissemination of medicinal knowledge and information agencies. In this regard, librarians have a role to play in ensuring that the preservation of traditional medicinal knowledge becomes a success. The IFLA (1994) further notes the role of the librarian as being “an active intermediary between users and resources.” Librarians should engage in developing the collection of traditional medicinal knowledge within the library which can be accessed both in print and written material.

Librarians must also engage with the community by making means that will enable them to engage with owners of traditional medicinal knowledge for the identification of this knowledge. The findings of Anyaoku et al. (2015) indicate that the medical library in Nigeria was more focused on preserving western medicine than traditional medicine. Therefore, it was recommended to the Nigeria medical library that it creates collection development policies that will support traditional medicinal knowledge. In doing so, this helps to preserve traditional medicinal knowledge in Nigeria and to facilitate its safe use.

Challenges of preserving traditional medicinal knowledge

As stated above, indigenous knowledge is stored within the minds of its owners and transmitted verbally, therefore this makes it difficult to preserve it. It can be said that the challenges of indigenous knowledge are presented by the nature of indigenous knowledge of being tacitly held by its owners. The challenges of indigenous knowledge are highlighted below:

Intellectual property rights

According to Ngulube (2002), intellectual property is the legal right that can attach to information emanating from the mind of a person if it can be applied to making a product that is made distinctive and useful by that information. Lwoga, Ngulube, and Stilwell (2010) argue that African countries use indigenous knowledge for decision making, health care, education, natural resources management, food security and agriculture. Msomi (2015) notes that one of the challenges of preserving indigenous knowledge is the protection of intellectual property rights. Intellectual Property Rights (IPR) laws grant innovators and inventors of intangible assets exclusive rights and these rights include copyrights, patents, trademarks, etc. (Msomi, 2015). This implies that every artefact of intellectual expression can be viewed as intellectual property, therefore the suggestion that indigenous knowledge can be protected through intellectual property, however there are challenges that are presented by intellectual property laws. Preserving traditional medicinal knowledge also means protecting the property that is used to perform healing and treatment procedures.

Abbott (2014) notes that existing intellectual property regimes have not been intended to accommodate traditional knowledge and it has been argued that the standard of patent laws is insufficient to safeguard traditional knowledge. Abbott (2014) further indicates the challenges with regards to patents. Patents are known to be constricted in duration, therefore traditional medicinal knowledge owners may find it challenging to consider that or indefinitely protection should be provided (Abbott, 2014). It is believed that African countries are greatly reliant on

indigenous knowledge as the assistance in their daily functioning whether it is in the form of agriculture, food and security, health, sustainable development, decision making, etc. Dlamini (2016) states that not all nations are for the idea of protecting indigenous knowledge especially developing nations because they are huge poachers of indigenous knowledge while internationally, it is not believed that indigenous knowledge should be protected through intellectual property.

Reduction in medicinal plants

According to Chiwanza, Musingafi, and Mupa (2013), there are difficulties inherent in formulating appropriate legislation on public resources where crops of business importance are concerned. The increase of population in African countries is causing a high demand of traditional medicine but mostly because it is used in conjunction with western medicine. The treatment and healing practices of traditional medicinal knowledge is embedded in plants and animals. Chiwanza et al. (2013) argue that plants and animals are collected from the wild to produce traditional medicine. This recreates a reduction in the plants that are used in the traditional medicinal knowledge process mostly because the Western medicine and drug producing companies exploit these plants for financial benefits. Therefore, there becomes limited access of plants that are used to heal various types of diseases.

Mode of transference

Anyira et al. (2010) provide the main challenge of preserving traditional medicinal knowledge to be the mode of transference, therefore a large portion of this knowledge remains uncaptured and unrecorded in written or electronic media. This mode of transference is known to be in verbal form, from one generation to the next. Coleman (2013) emphasises that these unique skills are passed down from a close family member and others obtain them through observing while being treated. Large amounts of traditional medicinal knowledge are not preserved in digital or written form in South Africa. Several proponents have argued that if indigenous knowledge is not digitized, it will become unavailable for generations to come (Biyela, Oyelude & Haumba, 2016). However, the advancement of technology enables information to be easily and freely available to the general public. This facilitates easy copying and transmission of information which is problematic as ownership of this knowledge is at risk. The United Nations Declaration (2007) on the rights of indigenous people states that indigenous people have the right to recognize full ownership, control and protection of their culture and intellectual property.

Secrecy

The other major challenge of preserving traditional medicinal knowledge is that it is practiced in secrecy. Khumalo et al. (2018) mention that this knowledge is only shared by the senior traditional medicinal knowledge owners with many years of experience where they stay with trainees until the duration of their training. The owners of this knowledge are generally reluctant to have their knowledge and skills documented and to share their drug sources, materials, methods and implementation procedures with the general public. Therefore, this makes close family members to be the ones who imbibe this knowledge from its owners before they perish or die (Anyaoku et al., 2015). A study by Wanakwakwa, Munabi, Lwanga, Muhumuza and Gateese (2013) on traditional medicinal knowledge indicates that participants who were interviewed on traditional medicine preferred keeping secrecy of their knowledge and any attempts made towards invasion of secrecy was fined to prevent efforts to stealing this knowledge. Traditional medicinal knowledge is mainly in the form of intangible knowledge so it should be captured, stored, documented and preserved for future use but these challenges pose a threat in the preservation of this knowledge.

Conclusion and recommendation

This study confirms that the technique used by traditional medicinal knowledge does not facilitate the capturing, storing, retrieval and dissemination of traditional medicinal knowledge. This study also confirms that the technique that is used to preserve traditional medicinal knowledge is not effective as it can easily get lost, stolen and damaged in the hands of the owner. It also has been noted that owners of this knowledge are for the idea of preserving their knowledge, therefore they see the need for this act. The findings provide evidence that the challenges are a result of the technique that is used to preserve traditional medicinal knowledge which is writing down knowledge in a note book, and the restriction of medicinal plants makes it hard to preserve this knowledge.

This study revealed that there is an emergency for the need of preserving traditional medicinal knowledge before it gets extinct, therefore, this study recommends the following:

- The advancement of technology should be applied by traditional medicinal knowledge owners as a means to preserve indigenous knowledge such as Information and Communication Technology tools because of its ability to capture, store, retrieve and disseminate indigenous knowledge for the use of future generations.

- Libraries should provide workshops where they educate traditional medicinal knowledge owners on how to use technology to preserve their knowledge.
- The government should review its law on the restriction on medicinal plants as it has a negative effect on traditional medicinal knowledge preservation.

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