

Issues to consider when applying indigenous medical knowledge to provide healthcare by county governments in Kenya

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Abstract

Rationale of Study – This study explores issues that should be considered in implementing IMK in providing quality healthcare by county governments in Kenya. The study's specific objectives were to determine different categories of IMK systems, to analyse categories of IMK practitioners and to propose issues that need to be considered in the application of IMK in the provision of quality health care by county governments in Kenya.

Methodology – The study used a qualitative research approach. Data was collected from literature sources identified purposively through different search engines based on their relevance to the research topic.

Findings – The study found that there are different systems of IMK, including pharmacology, physiotherapy, spiritual therapy and surgical therapy. In terms of practitioners, the study found that IMK practitioners can be categorised as herbalists, generalists, bone setters, dentists, traditional birth attendants and spiritual healers. Further, the issues that the county government should consider the application of IMK in the provision of health care include governance issues, intellectual property rights, application of IMK to health care provision, and proper management of IMK covering creation, codification, transfer, utilisation, validation and preservation.

Implications – The study recommended that county governments in Kenya should: involve IMK practitioners in their healthcare delivery, address IMK management issues, and put in place appropriate legal and policy instruments to guide their efforts in integrating IMK systems in healthcare delivery. Implementing these recommendations will ensure that county governments can pull back their healthcare challenges by appropriately investing in their IMK resources.

Originality – The study was original and explores a unique issue within the context of traditional knowledge in Kenya.

Keywords

Knowledge, indigenous medical knowledge, county government, biomedicine, healthcare

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1 Introduction

Indigenous Medical Knowledge (IMK) refers to knowledge and practices used by indigenous communities in diagnosing, preventing, and eliminating diseases. It is based entirely on practical experience and observations handed down from generation to generation. It covers varying knowledge systems, including pharmacology, physiotherapy, behaviour therapy, spiritual therapy and surgical therapy. These knowledge systems sustained humanity before modern medicine's emergence and have survived.

According to the World Health Organization (WHO), 80% of the people living in developing countries rely on IMK for their health care needs, utilising it as a complementary medical system to the current services provided in health facilities. Sirama (2014) further predicts that the number of people living on IMK systems will rise due to epidemiological shifts and an increase in life expectancy, leading to an increased burden of lifestyle diseases such as diabetes, cancer and pressure, among others. Again, there is the re-emergence of IMK in healthcare provision due to IMK quality control and validation grounded on modern scientific research, giving way to many efforts in manufacturing herbal drugs.

According to WHO (2006), the need to embrace IMK systems in healthcare provision has been acknowledged for so many years. These systems of knowledge hold the key to extending healthcare services to vulnerable groups who find them more accessible, affordable and culturally acceptable as compared to modern medicine systems. To this end, the IMK systems help governments respond to the need to provide low-cost but practical and sustainable healthcare services. As a result, there have been different global efforts in leveraging IMK systems in healthcare delivery.

On the global stage, many declarations and initiatives have been put in place supporting IMK systems and their application in healthcare delivery. The 30th World Health Assembly resolved that countries forming WHO should support the use of IMK systems in their healthcare delivery by, among other things seeking to validate them and educating people about them (WHO, 1977). Furthermore, the International Conference on Primary Healthcare held in Alma-Ata, USSR, organised under the sponsorship of WHO and the United Nations Children's Fund (UNICEF), came up with different resolutions supporting the utilisation of IMK within the formal healthcare systems. Later came the Chiang Mai Declaration, arrived at by WHO, the World Conservation Union

(WCU) and the World-Wide Fund for Nature (WWFN), emphasising the need to strengthen the preservation of medicinal plants as a source of IMK systems. The World Bank (WB) has been another critical player in promoting the application of IMK systems in healthcare delivery to people worldwide. Through its Indigenous Knowledge for Development Programme, the Bank supports research on the use of medicinal plants in managing diseases.

In tandem with the global momentum in support of IMK systems, different countries have sought to mainstream its application in delivering their health care. Guite (2010) reports that in India, the government formally support the use of IKK systems in their healthcare delivery, alongside allopathy in their healthcare systems. This is the same in North American and Asian countries such as China, Japan and Korea. In countries like Germany and France, medical doctors are provided training on traditional medicine systems at professional levels. Hinged on this acknowledgement, these countries have moved to come up with legislation governing the practice of IMK systems (Sirama, 2014). It is generally acknowledged that there is greater dependence on IMK systems in Africa than in any part of the world. As a result, many African countries have legislated issues of IMK systems and their application in healthcare delivery. These countries include South Africa, the Republic of Benin, Guinea, Mali, Mauritius, Swaziland, Kenya, Nigeria and Ghana.

In the Kenya National Household Survey 2019, 57% of the population reported seeking treatment from traditional healers and herbalists. The prevalence of IMK systems in Kenya has led to a plural health care system defined by IMK practitioners and biomedical practitioners. The Constitution of Kenya 2010 supports this position, the Kenya Health Act 2017 and the Traditional Practices and Cultural Heritage Act 2016.

Adopting the Kenya Constitution 2010 brought a paradigm shift in healthcare provision in Kenya. Notable among the changes was the almost total devolution of healthcare services to the 47 counties. In this arrangement, while working with national governments, county governments are expected to take complete control of healthcare services at their levels (MOH, 2014).

In striving to realise their constitutional mandates for healthcare provision, county governments face teething challenges that undermine their healthcare programmes and dilute the country's gains in the healthcare sector. These challenges generally touch on

the inconsistency of services due to strikes and other factors, poor system staffing, management challenges and lack of coordination between the national and county governments (GOK, 2013). In the face of these challenges, the Health Act 2017 recognises and recommends applying IMK to supplement hospital services.

2 Research Problem Statement

The role of IMK in providing quality health care is globally acknowledged. This reality is drawn from the different declarations and initiatives to this end. Notable in this regard is the Alama-Ata declaration and the Chiang Mai declaration. In Kenya, both the Constitution of Kenya 2010, the Health Act 2017 and the Traditional Practices and Cultural Heritage Act 2016 support the need to leverage IMK in providing quality health care alongside biomedical practices. Indeed, the Traditional Practices and Cultural Heritage Act 2016 calls on county governments to harness the opportunities provided by IMK practitioners to strengthen their healthcare provision services. It is, however, noted that after ten years of devolution into county governments, the need to embrace IMK in health care provision at county levels has yet to be taken up. A review of health policy documents indicates a total lack of appreciation of the need to include IMK in providing quality health care. This reality calls for the need to study issues that affect the inclusion of IMK in the provision of quality health care by county governments in Kenya.

The purpose of the study was to propose issues that should be considered in the application of IMK towards providing quality health care in Kenya. The specific objectives were to determine different categories of IMK systems; analyse the different categories of IMK practitioners; and determine issues that should be considered in implementing IMK in providing quality health care by county governments in Kenya.

3 Theoretical Framework

According to Adon and Hussein (2018), research theories are formulated to explain, predict and understand a phenomenon. Ultimately, it acts as the conceptual basis for understanding, analysing and designing ways to investigate phenomena. Based on the two constructs that anchor the topic, the study was guided by two theoretical frameworks:

Unified Model of Dynamic Knowledge Creation

According to Njagi and Namande (2018), the broader field of Knowledge Management (KM) is defined by several theories, including the Knowledge Maps, SECI Model, Activity Based Knowledge Management Systems, Ontology-Based KMSs and

Knowledge Transfer Model. Further, a study by Corall (2004) identified more frameworks, including the intellectual capital model, Leavitt's diamond organisational model, the knowledge worldview model and the unified model of dynamic knowledge creation. Based on all these frameworks, this study identified the unified model of dynamic knowledge creation to provide a framework for analysing IMK issues. The use of this model in the study is due to the reality that it has the broadest coverage of KM issues. Indeed, it covers all the partial aspects addressed by other models.

According to Nonaka and Toyama (2015), the Unified Model of Dynamic Knowledge Creation is an improved model that seeks to address the weaknesses associated with both SECI and knowledge capital models. The model has three forms: the process of knowledge creation and conversion (SECI), resource development and use and the context that allows and supports knowledge creation and conversion (ba). This model is superior to the widely used SECI model since it introduces the knowledge asset/resource and contextual issues in the debate of knowledge creation.

Donabedian Model of Quality Healthcare

Simon (2007) argued that different significant models guide to research and practice in healthcare delivery and utilisation. These models include the Health Services Model, Health Behavioral Model, Empowerment Theory, Health Belief Model, Equity of Access Model and Donabedian Model. Considering the strengths and weaknesses of all these models, this study adopted the Donabedian model of healthcare quality as its second source of theoretical framework. It is noted that globally, the Donabedian model is the most widely used framework for quality healthcare research. Avedi Donabedian, a physician by profession, proposed the model in the 1960s (Broaden et al., 2008). The model presents a multi-purpose perspective on quality healthcare improvement based on the three dimensions structure-process-outcome (SPO) model.

As can be seen from the diagram, the three dimensions are interrelated and feed into each other. Again, all the dimensions are interpreted within distinct factors which have been improving over the years. As elaborated by the Institute of Medicine (IOM, 2006), the structure or organisational dimension is defined by physical environments, provider skill sets/practice, distractions, and handoffs inherent in-patient care. These structural factors may compromise patient observation, comfort, diagnosis, and therapy. Then combined effect of structural factors and process weaknesses may lead to poor

outcomes, including staff liability, patient dissatisfaction, inefficiency and inaccessibility from the patient and hospital administrator perspectives.

4 Methodology

This study was based on a qualitative research approach and guided by an exploratory research design. This allowed the researcher to explore issues that need to be considered in applying IMK in providing quality health care by county governments in Kenya. Data was collected from different documents and databases selected purposively from the internet. The essential criteria of selection were relevance to the research topic and up-to-datedness. The data from the sources were analysed qualitatively through reduction and rewriting to develop a research report.

4 Presentation and Discussion of Results

The findings of the study are presented and discussed in this section according to the key themes of the study.

4.1 Determination of IMK systems

Indigenous Medicine knowledge (IMK) systems refer to a branch of indigenous knowledge that applies to healthcare delivery. This knowledge has attracted different phraseologies, such as traditional medicine, folk medicine, indigenous medicine, alternative medicine, and ethnomedicine. According to the WHO (2008), this knowledge is applied in the diagnosis, prevention and elimination of physical, mental or social imbalance and survived across generations in the history of humankind. In the context of IMK systems, Onu (1996) argued that the cause of the disease is intimately related to magic, science and religion. To this extent, diseases are explained in terms of cultural symbols, experiences and expectations used in sickness labelling, explaining disease experiences and making decisions on disease treatment.

Effective deployment of IMK systems in healthcare delivery should start with identifying IMK systems existing in different jurisdictions and counties. These systems have been classified variously. The most overarching categorisation puts the IMK systems into the knowledge of *flora* (plants), *fauna* (animals) and animals and their application treatment of diseases (Varma & Goldey, 2011). In a precise way, Mbwai et al. (2013) puts IMK systems into four main categories - pharmacology, physiotherapy and behaviour therapy, spiritual therapy and surgical therapy.

Pharmacology, more popularly known as herbalism, refers to plants' use in treating diseases. Plants that have been used in the treatment of disease have been widely documented in the pharmacopoeia of traditional medicinal plants. This is seen in Argentina, Russia, South Africa and Mali. In Kenya, it is noted that this trend is yet to take off. This is a window of opportunity for county governments. Another important domain of IMK systems has been called Psychotherapy and behavioural therapy in literature. According to Mbwayo et al. (2013), this domain is associated with practitioners performing different disease management rituals. The administration of treatment, in this case, is associated with psychotherapy and behavioural therapy approaches, just like it is seen in the work of psychiatrists today. Closely related to this is spiritual therapy, which seeks to bring peace and harmony between the living and the spiritual world and is based on the belief that the dead spirits or ancestors still influence the life, indeed, the health of the living. Treatment, in this case, involves striking harmony with the ancestral world. This is usually performed through the works of priests or priestesses found in almost all indigenous communities and consulted on different health issues.

Among the IMK practitioners, some specialise in *surgical operations*. A case in point is those who perform craniology (traditional surgical interventions) to treat psychosis-related diseases. In other cases, minor cuts are made on the body to relieve pain or insert medicines. At the same time, surgical operations are also seen among those communities that perform circumcision and Female Genital Mutilation (FGM). Quave and Pieroni (2013) identified zootherapy as another binding domain of IMK systems. In this domain, animals and their products are used as a source of medicine. In this case, examples include using raw eggs to treat poisoning, human faeces to treat snake bites; donkey milk to treat coughs and pertussis; goat fat for treating asthma; dog's lick for treatment of wounds and woman's milk for eye inflammation. The World Bank (2004) also identified *indigenous dietary systems* as critical to healthcare provision. In this category are traditional vegetables, fruits and animal products, which provide essential vitamins, calcium, iron, zinc, protein, carbohydrates and beta-carotene with profound health potential. IMK systems have been identified in other jurisdictions, including acupuncture and yoga.

4.2 Identification of IMK practitioners

Indigenous Medical Knowledge Systems usually operate under clear specialists and institutions. In particular, traditional health practitioners hold the knowledge and are the providers of alternative or complementary healthcare. They use their knowledge to provide holistic care covering prevention, protection and cure of diseases (UNAIDS,

2000. The practitioners have been classified into various categories, chiefly herbalists and spiritualists. Other notable practitioners include diviners (practice divination), priests, faith healers, mid-wives, bonesetters and home wives. At the global level, other forms of healing have also been recognised as necessary in healthcare provision. They include acupuncture, Ayurveda, Chiropractic, Herbalism, Homeopathy, Massage and other body therapy techniques such as Osteopathy and Psychotherapy. All these forms of IMK systems use natural substances, manipulation techniques and nutritional/supplements and advice to support health. Within the framework of the county healthcare programme, they should all be acknowledged and put into use.

According to Leonard Keneth, Lemiere Christophe, and Herbst Christopher (2011), IMK practitioners have different specialisations that define their identities. These specialisations are herbalists, generalists, dentists, traditional birth attendants, bone setters, and spiritual/faith healers. The author describes these practitioners as follows:

- i) Herbalists: they prepare medicines that contain parts of a plant and other materials as active ingredients and are known to treat different diseases, including respiratory, digestive, sexually transmitted diseases, and urinary and intestinal parasites, among others.
- ii) Generalists use plant materials to treat various diseases, none in particular.
- iii) Bone setters: people visit them to fix broken bones and dislocations.
- iv) Dentists: Usually, they deal with toothaches and extract decayed or broken teeth.
- v) Traditional Birth Attendants: They assist women in times of delivery and deal with birth-related complications.
- vi) Spiritual faith healers are relied on to deal with diseases like stress, depression or mental problems by using spiritual powers.

4.3 Issues to be considered in applying IMK to the provision of health care

Governance Issues

Governance issues related to policies and institutional arrangements to implement such policies. It also has to do with how decisions and goals are arrived at and achieved, thus providing a mechanism that helps to regulate practices in any sector. In Kenya, the regulatory governance frameworks for IMK systems and practices are very robust and comprise several regulations, as seen below (Chebii, Muthee & Kiemo, 2020; Chepchirchir et al., 2018).

S/No.	Regulations	Provisions
1.	Witchcraft Act 1925	Outlawed any form of witchcraft practices at a time when colonialists referred to IMK practitioners as witch doctors.
2.	Alma Ata Declaration 1978	Recognised the role midwives, community health workers, and other IMK practitioners played in healthcare provision.
3.	Kenya development Plan 1989 - 1993	Recognised IMK systems and called for promoting the welfare of IMK practitioners and further tasked the provincial administration to register them.
4.	United Nations Convention on Biological Diversity, 1992	Advocates for using indigenous knowledge in biodiversity conservation and emphasises the importance of identifying and preserving medicinal plants.
5.	Kenya National Drug Policy, 1994	Recognised IMK systems as crucial components of Kenya's cultures, which should be mainstreamed in the healthcare delivery systems.
6.	National Policy on traditional medicines and regulation of herbal medicines, 2005	Set up KEMRI, which partly deals with the regulation of IMK systems.
7.	Sessional paper on traditional medicine in Kenya, 2009	Pushed to promote IMKS through regulations, setting up institutions, safety validation and conservation of medicinal plants.
8.	Pharmacy and Poisons Board 2010	Provides guidelines for submission of traditional herbal and complementary production and licensing.
9.	Traditional medicines and medicinal plants bill, 2010.	Proposed the creation of traditional medicines management council (TMMC) to oversee the practice of traditional medicines in Kenya.
10.	The Health Bill, 2012	Recognised the role of traditional and complementary remedies in the healthcare sector and proposed a framework of Kenya Health Services Authority (KNHSA) composed of traditional and complementary medicines experts.
11.	Traditional health practitioners bill, 2014.	Provided for training, registration and licensing of traditional health practitioners and proposed the creation of the Traditional Health Practitioners Council of Kenya

		(THPCK).
12.	The health bill, 2015	Recognised traditional medicines and recommended sound policies to regulate the practice of traditional medicines through the department of health, preferred a referral system to health facilities and proposed a National Research for Health Committee (NRHC) comprising traditional health experts.
13.	Protection of traditional knowledge and cultural expression Act 2016	Provides for the protection of traditional medicine knowledge, genetic resources and biodiversity.
14.	Health Act 2017	Gave power to the health department to develop policies and regulatory frameworks to guide the practice of traditional and alternative medicines and provide a mechanism for IMK practitioners to refer patients to modern health facilities.
15.	Health Law Amendment Bill, 2018	Recognised traditional and alternative medicine as a health product.
16.	Traditional and alternative medicines policy, 2018 (draft)	Proposes the mainstreaming of IMK systems in the national healthcare system to boost access to healthcare for all.

The regulatory frameworks identified above point to the critical issues that need to be taken into consideration by county governments when they are developing their policy frameworks for mainstreaming IMK systems in their healthcare provision programmes. Critical among these issues is recognition of IMK systems as health resources, regulating IMK practices, setting up a regulatory body for IMK practitioners, continued research in IMK systems and manufacture of IMK products and most importantly, training, licensing and registration of IMK practitioners.

Application of IMK in health care provision

According to Agrawal (2001), IMK systems have become more attractive in healthcare delivery globally, surviving the hitherto negative stereotypes. The world has accepted that the IMK systems hold immense value in providing sustainable and cost-effective healthcare services. In many parts of Africa, health facilities are many kilometres away from the people, transport is scarce, and community health workers rarely reach out to the people.

According to WHO (2006), IMK systems use a holistic approach in diagnosing and treating diseases as they consider health's physiological, psychological, spiritual, economic, environmental and social aspects. This is in line with the comprehensive definition of health as complete physical, mental and social well-being and not merely the absence of disease or infirmity. UNAIDS (2000) justified the support of IMK systems as a complementary pathway to the provision of healthcare services by arguing that the number of traditional healers outnumbers that of doctors by 100 to 1 making their services more accessible and available. Further, the organisation averred that traditional healers provide more effective treatment at a more affordable cost; are client-centred and personalised in their service delivery. They are culturally close to the clients and generally respected healthcare providers in their communities. It is on these accounts that they have survived over the years – they are more accessible, affordable, effective and efficient and acceptable to the people.

It is based on the advantages of IMK systems that different countries have recognised in their healthcare providers. In countries like Tanzania and Kenya, some IMK practitioners, such as midwives and bonesetters, are allowed access to health facilities (Nlooto & Kaya, 2017). Beyond this, the role of IMK systems in managing different diseases is widely documented. Mbwanyo et al. (2013) argued that traditional healers manage most mental health cases in East Africa since modern health facilities scarcely recognise these diseases. In the area of HIV/AIDS, local solutions have assisted in the containment of the pandemic just as modern approaches, particularly in countries like Uganda and Senegal, where AIDS was seen more as a behavioural problem than being medical one. In Uganda, they adopted solutions based on a '*zero grazing*' approach, effectively containing the spread of the disease.

Green and Colucci (2020) asserted that traditional healers have been able to treat different diseases, which they ascribe their causes to the transgression of taboos related to birth, pregnancy, marriage, and death. At the same time, the diseases are interpreted within the framework of contagions which could include invasion of the body by dangerous microorganisms, pollution or environmental dangers. These diseases are commonly considered African, and their prevention approaches involve wearing protective charms and tattoos or having traditional vaccination, which involves installing herbs in skin incisions.

Traditional healers also play a critical role in the provision of maternal healthcare. In Africa, many deliveries still take place at home, in the hands of traditional birth attendants who have skills in dealing with birth issues, including the ability to calculate dates on which births are due based on menstrual periods and to induce birth where there is need. The traditional birth attendants also have roles such as supporting first milk practices and the child's proper growth. Silwal (2011) reports that traditional birth attendants can deal with birth complications such as diarrhoea and milk fever (inability to produce milk) which can easily be handled by traditional herbs given alongside nutritious food or even spiritual healing.

Hughes et al. (2015) report that people living with None Communicable Diseases (NCD) in many parts of Africa rely primarily on herbal medicine or combined with conventional drugs. These diseases include cardiovascular disease, type 2 diabetes, chronic respiratory disease and certain cancers. Hughes et al. (2015) identified some of the critical medicinal plants and the ailments which they treat. This is as per the table below:

S/No.	Botanical Name	Common Name	Disease treated
1.	<i>Aspalathus linearis</i>	Rooibos	Stomach cramps
2.	<i>Sutherlandia frutescent</i>	as cancer bush	Cancer, HIV/AIDS (Immune booster)
3.	<i>Harpogophytun procumbens</i>	Devils Claw	Arthritic pain
4.	<i>Hoodia Gordonii</i>	Hoodonia	appetite suppressant
5.	<i>Tulbaghia alliacea</i>	wild garlic	fever, cold, asthma and TB
6.	<i>Cyclopia maculata</i>	honeybush	Anti-obesity

Stanifer et al. (2015) also reported on traditional medicines used to treat kidney problems, including *Aloe vera*, *Commiphora africana*, *Cymbopogon citrullus*, *Persea americana* and *Zanthoxylum chalybeum*. The authors also noted the use of traditional medicines in treating different ailments, including malaria/febrile illnesses, reproductive illnesses, neurologic illnesses, urogenital conditions, worms/parasite treatment, spiritual/traditional diseases, cancers and disease prevention. Lunyera et al. (2016) catalogued plant-based IMK systems used for diabetes care, including *Moringa oleifera*, *Cymbopogon citrullus*, *Hagenia abyssinica*, *Aloe vera*, *Clausena anisata*, *Cajanus cajan*, *Artemisia afra*, and *Persea americana*.

According to Quave and Pieroni (2013), since early times, animals have been used as a source of human the authors identified animals such as swine, cattle, poultry, goats, and dogs, as well as many marine and terrestrial animals that have been included in folk pharmacopoeia to treat deal with many healthcare challenges stomach problems, coughs, eye and ear pains, snakebites, wound and mumps.

It is, therefore, evident that IMK systems are essential to address different health challenges. They help solve problems associated with modern healthcare, which are known to be inaccessible (due to distance), unaffordable (due to poverty and cost of services), unapproachable (due to social/power relations), incomprehensible (due to language barriers) and cultural insensitivity and ineffectiveness (due to the poor quality of services). In addition, IMK systems can treat many ailments that bedevil humankind in modern times. As such, county governments need to consider them in developing their healthcare programmes.

4.4 Intellectual property concerns

According to Guite (2010), Intellectual Property Rights refer to mechanisms for allocating ownership and distributing benefits to actual property owners. In IMK systems, intellectual property rights aim to address three primary concerns - ethical, managerial and preservationist issues. Regarding ethics, the rapid loss of IMK systems presents a moral obligation to protect them. The loss has been attributed to a lack of capacity by indigenous people to protect their knowledge. Again, advances in technology have made it easy to exploit IMK systems in creating new products without caring about the interest of indigenous people.

Additionally, many indigenous people have lost interest in matters like the preservation of biodiversity. From a managerial point of view, there is a need to give ownership of IMK systems to indigenous communities to ensure that they gain maximum rewards from this system of knowledge. When indigenous people are given formal ownership of their knowledge, they will control its access and use by negotiating fees and royalties with interested parties. From a preservationist point of view, the need for long-term preservation of IMK systems is advanced. This would ensure that the knowledge is made available to future generations.

Generally, IPRs provide mechanisms for defining ownership and patterns of benefit distribution in the IMK systems sector. It is noted that, unlike other properties, issues such as collective ownership of IMK systems differ from the requirement of most

intellectual property regimes that favour individual and corporate actors' ownership. On the other side, IMK systems survive on much secrecy, making it difficult to legally and scientifically defend their protection. This has given rise to calls to put in place arrangements that recognise political rights and give room to community ownership of IMK systems. The community ownership approach also poses further challenges. In many cases, IMK systems have only survived in a few areas since, in many cases, they have been subsumed in the global knowledge systems. The need for large-scale production of raw materials and immense-scale agricultural practices have destroyed diversity and its associated knowledge.

According to Guite (2010), two important international conventions have a bearing on intellectual property rights in indigenous knowledge systems: the World Trade Organization's Trade-Related Aspects of Intellectual Property Rights (TRIPs) and the Convention on Biological Diversity (CBD). TRIPs exist to promote national IPR regimes. It covers four intellectual property rights types: patents, geographical indications, undisclosed information (trade secrets) and trademarks. To the extent of protecting indigenous knowledge, it is noted that TRIPs do not acknowledge or distinguish between indigenous, community-based, and industry knowledge and do not refer to the protection of indigenous knowledge.

The CBD is the only major international convention that assigns ownership of biodiversity to indigenous communities and individuals and asserts their right to protect this knowledge. According to the convention, state Parties are required to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional ways of life that are relevant to the conservation and sustainable use of biological diversity and promote its development application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices. Secondly, the convention requires contracting Parties to "encourage and develop models of cooperation for the development and use of technologies, including traditional & indigenous technologies (UNEP, 1998).

Ngetich (2005) argued that IPRs provide a mechanism through which IMK can find their way into modern science and technology knowledge, but it also comes with other challenges. Firstly, insisting that the rights should be vested in legally recognised entities leads to the loss of collective orientation and communal ownership of the knowledge. It

takes the knowledge away from community representatives, and institutions respond to the community. Secondly, incorporating IHK in the system of IPR protection, such as patents and copyrights, emphasises material aspects of IK, which takes power away from indigenous people. Additionally, the move towards IPRs protection of IK has attracted capital-intensive medical and agricultural investment in IK towards large-scale production, which leads to the elimination of space available for indigenous people and condemns diversity to extinction.

Furthermore, it is noted that the commoditisation of IMK works against its survival and development since, instead of projecting IHK as a cultural artefact whose status is tied to the daily lives of a given community, it treats IHK as a commodity for exchange whose value is generally utilitarian. Experience has also shown that when IHK systems are patented, they become too expensive for the poor. A study in Italy concluded that the cost of medicines rises by 200% when they are patented, putting them out of reach for the indigenous people and working against the need to make healthcare accessible as a matter of quality healthcare provision. At this level, the knowledge now ceases to be of assistance to the indigenous people, who will lose control over it to large-scale investors without the benefit reaching them (Ngetich, 2005)

It is evident that unless properly designed, IPRs may not serve the interest of indigenous populations. Indeed, it might take away benefits from them. As presently constructed, IPR regimes contain elements detrimental to indigenous populations' interests. Many proposals have been raised on how to respond to this concern. The key is whether to confer the ownership to the state or the communities. However, another lingering question that must inform the decisions is how the indigenous communities will access royalties from their knowledge.

According to Nlooto and Kaya (2004), there has been a global concern in addressing the reality that the existing intellectual property laws do not adequately protect indigenous knowledge and innovation of indigenous practitioners, especially in Africa. It is noted that, whereas IMK systems are generally a community affair, its globalisation calls for protection so that the owners are not deprived of the benefits that arise from it. To this end, World Intellectual Property Rights (WIPO) has collaborated with different United Nations (UN) agencies to address the challenges of providing Intellectual Property Rights (IPR) to traditional knowledge holders. Sibisi (2004) reports that the Convention on Biodiversity (CBD) recognised the value of IK and established a framework for

providing access to their genetic resources and a means of equitable benefit sharing. Later, the World Trade Organization (WTO) under Trade Related Intellectual Property Rights (TRIPS) also created standards for minimum protection of IK. For many years, WIPO has been training stakeholders on understanding the role of IPRs in protecting IK.

To fast-track the above recommendations, it is asserted that proper documentation of IMK systems should be emphasised as a prerequisite for the proper protection of IMK systems. Based on appropriate documentation, IP offices can integrate the information into the existing procedures to enable those applying for patents to conduct searches related to IK inventions. In many parts, patenting IMK systems is possible because IMK is generally preserved through oral traditions rather than documentation. This has led to the loss of IK, especially given the rising disappearance of indigenous languages. To deal with this, local communities are encouraged to register traditional practices. Another option is to take advantage of opportunities provided by Material Transfer Agreements (MTAs), which involve the provision of materials in exchange for equitable monetary and non-monetary benefits between users and custodians of IK in different countries. It is also noted that in many communities, local procedures and protocols govern the procedures for acquiring and sharing knowledge and responsibilities attached to processing knowledge. The scientific community must understand these protocols and adapt them to their practices.

4.5 Proper management of IMK

At general levels, IMK management refers to processes and activities through which communities create knowledge, maintain existing knowledge and dispose of obsolete knowledge. These activities can be analysed as follows.

Knowledge creation

According to Agrawal (2004), knowledge creation is focused on acquiring and developing or replacing existing knowledge. Duffy (2001) has also described the knowledge creation process by other terminologies such as knowledge construction, seeking, generation, capture, collaboration, production, development and community learning. According to Davenport and Prusak (2004), organisations and communities should have conscious and intentional efforts to increase their stock of knowledge. According to the authors, there are four major strategies for knowledge creation: hiring knowledge owners, using dedicated resources like libraries, adapting existing knowledge through continuous

innovation and informal networks covering the IMK owners. AccKeneth, Lemiere Christophe and Herbst Christopher (2011), many practitioners acquired knowledge from parents, grandparents and relatives through apprenticeship. Other practitioners also acquired their knowledge from spirits and others from dreams.

Knowledge codification

Knowledge codification is the process of putting knowledge (primarily tacit) into a form that makes it accessible to those who need it. When coded, knowledge becomes organised, explicit, portable, and easy to understand; that is, it transforms tacit knowledge into explicit knowledge. The process of knowledge codification strives to give permanence to knowledge that exists only in people's minds by representing or embedding it in a form in which it can be shared, stored, combined and manipulated in various ways. Agrawal (2004) identified different strategies of knowledge codification, such as knowledge categorisation, description, mapping and modelling, simulation and embedding into rules and procedures.

According to Ngetich (2005) and Murumba et al. (2020), tacit IMK codification helps to ensure that knowledge can easily be transferred. According to the author, there are different strategies for tacit IK codification, but majorly through the collection and publication of works by anthropologists, historians, botanists or other researchers and observers. The author further opined that compared to Asian Countries like India and China, African countries have not been very successful in disclosing their rich wealth of tacit IK through use and publication. Indeed, in Asian countries, codified traditional medical knowledge is made publicly available, making it unnecessary to have it protected. It is not even supposed to be appropriated by traditional holders or third parties. In countries where IMK generally remains un-codified, it has often been referred to as 'folk', 'rural', 'tribal' or 'indigenous' to mean that it has been handed over orally from generation to generation in communities, with much of it remaining very secret. Specialised traditional medicine knowledge in different areas such as bone-setting, midwifery (traditional birth attendants) and herbalism, including knowledge of healing techniques and properties of plants and animal substances, are highly kept secret as the people who own them only shared them with their close relatives thus hampering the transfer and development of innovations on this type of knowledge.

Knowledge transfer

Knowledge transfer generally refers to the movement of knowledge from the point of creation or codification to the point of use. In literature, the term has been used synonymously with terms such as knowledge socialisation, sharing, dissemination, distribution and flow. It is also noted that the process can occur between individuals, from individuals to groups and from groups to the organisation or society, through formal, informal, personal and impersonal channels. According to Sibisi (2001), like knowledge creation, the answer to the knowledge transfer question is about creating opportunities for people to come together and talk to each other. In the case of IMK, this is especially difficult to achieve since many practitioners are involved in hoarding their knowledge or need more time to talk to other people (Kwanya, 2019).

Consequently, many knowledge transfer strategies focus on ways to have people talk and listen to each other. Among IMK practitioners, it involves bringing together skills masters together with learners as a means of passing on the skills. Nlloto and Kaya (2017) identified knowledge transfer strategies, including face-to-face meetings, liaisons, assignees, workshops, training, technical reports and third-party licenses, among other techniques. Conversations among people create the opportunity to talk through problems and share ideas about how to solve them. Face-to-face meetings are essential in fostering knowledge exchange.

In contemporary societies, there has been considerable investment in technology infrastructure to enhance the transfer of tacit knowledge. This infrastructure includes networking technology, database-based knowledge maps and videoconferencing. In particular, YouTube has vast IMK resources in the form of video and audio recordings for stories from practitioners. In contrast, explicit knowledge is more successfully stored in repositories such as Lotus Notes or other highly structured databases.

However, it is agreed that IMK can be transmitted through indigenous means or exogenous channels such as mass media and the school system. However, essentially, the exchange of IMK typically takes place through personal communication and demonstration, that is, from master to apprentice, from parents to children, from neighbour to neighbour, and from priest to parish. According to Guite (2010), IMK is generally autonomous to a given culture or community with minimal overlap in practices in different regions. This is a significant transfer issue of this knowledge. Despite this, it is noted that IMK practitioners in the same community usually interact and share

knowledge among themselves and out of such interactions, knowledge transfer is facilitated.

Knowledge utilisation

Knowledge utilisation refers to integrating acquired knowledge into the organisation's products, processes, and services to benefit from its value in terms of sustainable competitive advantage, improved efficiency and cost reduction in different sectors. In the case of IMK, the critical utilisation question is to bridge the gaps in quality healthcare outcomes in areas such as ensuring efficiency, effectiveness, affordability, access and equity needs. Effective utilisation of knowledge depends on the users' absorptive capacity, that is, the ability to acquire, assimilate, and recognise the value of new knowledge and use it.

According to Saray (2001), knowledge utilisation has taken the framework of knowledge capitalisation in organisations that turn knowledge into value for the institution's success. The author further argued that the goal of knowledge management is to improve society's ability to do things and therefore increase its value; that is, knowledge received should be put to some use, lead to some change in behaviour or the development of new ideas. Again, what makes knowledge valuable in a society is the ability to make better decisions and actions based on knowledge. To this extent, different institutions have taken a decision-oriented approach to KM by seeking to determine how knowledge is reflected in specific decisions and quality healthcare delivery in the case of IMK. This is informed more by the fact that communities go through challenging times due to poor decisions due to a lack of relevant knowledge.

The commercial value of IMK can be appropriated directly by the holders or through the transmission to researchers and companies. Again, investments in IMK medicine can take different forms, including the cultivation of medicinal plants for sale or the production and distribution of herbal medicines. The sale of Ayurvedic products earned about US \$800 million. Unfortunately, the author notes that there needs to be more investment in IMK systems because herbalists depend on natural forests to provide the majority of plant material consumed by the herbal medicine industry. As such many African countries scarcely benefit from the world market value for medicines derived from medicinal plants, which stands at over US \$ 43 billion annually (Ngetich, 2014),

Knowledge validation

Many scholars aver that one of the critical weaknesses associated with IMK derives from the fact that this kind of knowledge is overwhelmingly based on word of mouth and lacks scientific proof to its claims. This reality also poses many other challenges to IMK claims, including difficulty administering quality standards and developing licensing and monitoring procedures. Out of these weaknesses, there has been a widespread feeling that traditional healers are engaged in harmful practices that are not scientifically tested compared to biomedicine. To deal with this, different initiatives seek to validate IMK claims. Some institutions have set up pharmaceutical laboratories that analyse medicinal plants to discover their active medicinal ingredients.

Sibisi (2004) argued that compared to the scientific approach, scientific validation of IMK claims is a significant roadblock to their acceptance and application in development. In the field of medicine, required standards that all treatments and processes must be subjected to critical analysis and proven based on replicable results before adoption. This needs to be adhered to in the case of IMK, which is generally based on oral traditions (not systematically documented) as it is held mainly by elders and practitioners who are rarely ready to share it with outsiders. To deal with these weaknesses, countries like India and China have been at the forefront in seeking scientific validation of their IMK and adequately documenting it for adequate capitalisation.

According to WHO (2006), the question of IMK validation presents a significant challenge to scientists on the need to bridge the gap between science and IMK by evolving standard methodologies in knowledge verification, validation and application. This can only be ensured when scientists and IMK practitioners are willing to work together. At the same time, IMK practitioners should systematically document their work to meet the requirement of scientific scrutiny.

Knowledge protection

Saray (2001) argued that knowledge protection refers to processes designed to secure and protect the IMK of communities from illegal or inappropriate use or theft. In modern institutions, it includes measures such as knowledge incentive alignment, employee conduct, and rules or the design of a security system that restricts access to vital knowledge. Concerning IMK, protection issues are fundamentally grounded on the issues of intellectual property rights (IPRs) relating to technologies and discoveries.

The ownership issues around IMK highlight the need to address the question of its protection. According to Ngetich (2005), ownership of IMK is classified into three categories: personal knowledge, distributed knowledge and collective knowledge. Based on these categories of IMK, communities usually have different attitudes that relate to how their IMK should be appropriated and shared. While in some communities, sharing ethos prohibits any form of individualistic appropriation, in other societies, the property concept of knowledge is deeply ingrained in a manner comparable to other intellectual properties. This creates an opportunity to sell or exchange knowledge as a commodity (Onu, 2001). At times IMK systems are held by individuals in trust for their communities, particularly in cases where the holders have unique roles in the community. Such people are usually obligated to transfer knowledge to others during history, making it community knowledge governed by cultural norms. A case in point is seen among the community, which has initiation rites where it is demanded that elders pass down this kind of knowledge to new initiates.

According to Sibisi (2004), the protection of IMK should consider three critical concerns. The erosion of cultural heritage has led to the loss of traditional knowledge. In terms of IMK systems, this is seen more in biodiversity, where the loss of many plant species has affected different medicinal plants (it is estimated that the world has over 7,000 medicinal plants). The matter is compounded by the green revolution, where large-scale farming and chemicals have become widespread to increase agricultural output. Secondly, IMK systems have been exposed to biopiracy and patenting within and beyond their countries of origin. This is mainly attributed to the rising global market value of IMK systems, particularly those derived from plants.

5 Conclusion

The purpose of this study was to analyse significant issues that should be considered in developing a framework for harnessing IMK systems in the provision of healthcare by county governments in Kenya. The topic was chosen against the backdrop of failure by county governments in Kenya to harness IMK systems in their healthcare delivery initiatives adequately. This reality persisted despite the many international and national policy instruments that called for integrating IMK systems in healthcare provision. As such, the study sought to explore issues that should be considered in applying IMK towards providing quality health care in Kenya. The study's objectives were to determine different categories of IMK systems, to analyse the different categories of IMK

practitioners and to determine issues that should be considered in the application of IMK in the provision of quality health care by county governments in Kenya. Based on these objectives, the study concluded that there are different areas of IMK, including pharmacology, physiotherapy, spiritual therapy and surgical therapy. In the same vein, there are also different categories of IMK practitioners, including herbalists, generalists, bene setters, dentists, traditional birth attendants and spiritual healers. Among the issues that the county governments should address in the application of IMK to health care providers are governance issues, intellectual property rights, application of IMK to health care provision, and proper management of IMK covering creation, codification, transfer, utilisation, validation and preservation.

6 Implications and Recommendations

- i) County governments should take steps to adequately involve IMK systems practitioners in their healthcare delivery initiatives as called for under different international declarations and local policies.
- ii) County governments in Kenya should survey to identify and document IMK systems and practitioners within their jurisdiction as the first step in integrating their IMK systems into their healthcare delivery initiatives.
- iii) County governments should implement appropriate legal and policy instruments to guide their efforts in integrating IMK systems in healthcare delivery. Already existing instruments in different quarters should guide the instruments.
- iv) County governments should put in place arrangements to ensure community ownership of their IMK systems to avoid their loss and theft by, among other things seeking to have them patented under the existing intellectual property rights regimes.
- v) County governments in Kenya should invest in IMK systems development by, among other things developing standards of their practice, seeking to validate them and setting up manufacturing arrangements for more significant benefit from the resources.
- vi) County governments should regulate IMK systems practitioners' work by, among other things, putting in place registration arrangements, licensing and capacity-building arrangements.

- vii) County governments should implement appropriate systems to promote the proper management of their IMK systems.

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