



Review Article

# Indigenous Healing in Sudan: Ethnomedical Practices, Beliefs, and Policy Perspectives

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## Abstract

**Background:** Traditional Sudanese medicine is a resilient, culturally grounded health system that remains central to healthcare across Sudan. Drawing on indigenous knowledge, spiritual traditions, and intercultural exchange, it encompasses diverse diagnostic and therapeutic practices. This review outlines the foundations, methods, practitioners, and policy aspects of traditional Sudanese medicine, emphasizing its current relevance and potential for integration into national health strategies.

**Methods:** The findings are based on more than fifty years of ethnographic research, archival study, and over 400 interviews with traditional health practitioners, patients, and community elders across Sudan and South Sudan, now known as the Republic of South Sudan. Fieldwork involved participant observation at healing centers, spirit possession ceremonies, mosques, markets, and therapeutic villages. Data were recorded through notes and audio, anonymized, and thematically analyzed using grounded theory. Archival sources include colonial reports, missionary writings, Wellcome Laboratory publications, and Arabic medical manuscripts. Ethnobotanical records were verified with herbaria, and voucher specimens were deposited at MAHRI (Medicinal and Aromatic Plants Research Institute) and the Sudan National Herbarium. Plans are in progress to make transcripts, metadata, and species-use matrices publicly accessible via Zenodo, supporting transparency and reproducibility.

**Results:** Traditional medicine in Sudan combines naturalistic and supernatural explanations of illness. Practices include divination, spirit mediation, and symbolic interpretation, with treatments ranging from herbal remedies to Quranic healing and possession rituals. Practitioners include herbalists, bonesetters, midwives, and religious healers. Despite widespread reliance, regulation and research remain limited, though policy efforts for integration are emerging.

**Conclusion:** Traditional medicine remains vital for health access and cultural identity in Sudan. Systematic documentation, regulation, and collaboration with biomedical systems are essential to ensure safety, preserve heritage, and strengthen sustainable healthcare.

**Keywords:** ethnomedicine, Sudan, traditional health practitioners, policy integration

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## 1. Introduction

Traditional Sudanese medicine is not just a historical artifact but a vibrant and evolving healing system that continues to influence healthcare practices today. Over the past 50 years, we visited communities across Sudan, observed healing practices first-hand, and conducted 400 interviews, supported by archival research). Additionally, a comprehensive review of the literature has been conducted to ensure the accuracy and depth of this research. While modernization and education have shaped these practices, many traditions remain, demonstrating remarkable resilience—even those that are still controversial [1].

The World Health Organization (WHO) defines traditional medicine as:

*The sum total of knowledge, skills, and practices based on the theories, beliefs, and experiences 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 illness. [2]*

Complementary and alternative medicine (CAM), as defined by the National Center for Complementary and Integrative Health (NCCIH), includes medical products and practices that are not part of standard Western biomedicine [3]. The term “CAM” encompasses various therapies, including acupuncture, herbal medicine, homeopathy, chiropractic care, and osteopathy. While some traditional healing systems—like Chinese medicine, Ayurveda, and Unani medicine—are recognized as traditional medicine in their countries of origin, they are classified as CAM in regions where they are not part of the main healthcare system. For

example, acupuncture is considered a traditional therapy in China but is labeled CAM in many European countries. Similarly, chiropractic and osteopathy, which originated in the US and Europe in the eighteenth century, are not categorized as traditional medicine but as CAM within Western healthcare systems.

This article serves as a resource for healthcare professionals, researchers, and anyone interested in Sudan’s medical heritage. By documenting Sudanese healing practices, researchers were encouraged to conduct further studies, engage in intellectual discourse, and develop a deeper appreciation of these traditions. While this work does not claim to cover every aspect of Sudan’s diverse healing systems, it provides a foundation for future research and highlights the need for comprehensive documentation.

The review discusses the benefits of traditional medicine while emphasizing the need for policies to guarantee its safety, quality, and effectiveness. It examines the close links between healing practices and supernatural beliefs, along with the variety of medical traditions among Sudan’s ethnic groups. Additionally, it differentiates Sudanese traditional medicine from CAM and Western biomedicine, pointing out both its unique features and areas of overlap.

Understanding traditional medicine is essential for recognizing the cultural influences on health, illness, and treatment methods. It offers insights into the social, psychological, and nutritional factors of healing, fostering cultural competence among healthcare providers. However, this field faces obstacles, including unverified claims, lack of regulation, and dangers such as herbal toxicity and complications from traditional surgical procedures.

To preserve Sudan’s rich healing traditions, more research and documentation are crucial. This

review provides a broad overview of Sudanese health beliefs and practices while encouraging a deeper exploration of their historical, cultural, and medical significance.

## 2. Health and Illness Beliefs

Sudanese health beliefs are deeply rooted in religious, magical, and cultural traditions, reflecting a complex interplay between naturalistic and personalistic explanations of illness [4]. These beliefs influence health behaviors, treatment choices, and the broader cultural response to disease and healing.

### 2.1. Naturalistic explanations of illness

For minor ailments, many Sudanese communities believe illnesses originate from natural causes, often based on empirical observations and historical medical theories. For instance, among the Nuba people, the connection between wading in contaminated water and Dracunculiasis (Guinea worm disease) led to the use of high-heeled protective footwear as a preventive measure. Furthermore, Greco-Roman and Islamic medical traditions influenced local practices through the introduction of the Four Humors Theory, which classifies bodily fluids into:

- Blood (hot & moist)
- Phlegm (cold & moist)
- Black bile (cold & dry)
- Yellow bile (hot & dry)

Health is seen as a balance of these humors, with treatments like dietary adjustments, purging, cupping, and bloodletting used to restore this balance.

### 2.2. Supernatural influences on health

Many Sudanese healing traditions include supernatural beliefs, viewing illness as a result of spiritual forces, divine intervention, or mystical disturbances.

- *Jinn*, recognized in Sudanese Islam, are believed to influence health, causing afflictions that require spiritual intervention.
- The Azande people attribute illness and misfortune to witchcraft, considering it a response to broken taboos.
- Dinka and Nuer communities in Southern Sudan connect sickness and events to the will of a Supreme Being, viewing illness as a form of divine punishment or fate.
- In the Mesakin (Nuba Mountains), witchcraft (*torogo*) is thought to operate within maternal kinship groups, leading to disputes and health-related consequences.

### 2.3. Cultural taboos and their impact on health

Taboos play a key role in Sudanese health beliefs, influencing behaviors that, if broken, might lead to illness.

- Spitting on urine is believed to lead to throat problems.
- Crossing bathwater is thought to put people at risk of harm.
- Ignoring a holy man's grave is said to cause ailments like Guinea worm disease.<sup>1</sup>

Social offenses can also show up as physical illnesses. For example, among the Nuba, leprosy is symbolically connected to unresolved clan disputes, emphasizing the link between social harmony and physical well-being.

## 2.4. The role of myth and symbolism in healing

Myths and symbolic narratives act as frameworks for understanding health and disease. Many Sudanese communities share stories of a mythical Elixir Tree, believed to have the power to cure all illnesses, symbolizing the enduring hope for an ultimate remedy within their healing traditions.

### 2.4.1. Death and health rituals

Beliefs surrounding death and burial practices vary significantly across Sudan's ethnic groups:

- In northern Sudan, where Muslims are the majority, Islamic burial customs are strictly observed.
- The Dinka and other southern tribes participate in detailed mourning ceremonies, strengthening community ties.

With 100 of tribes and over 100 languages, Sudan's diverse population exhibits a broad range of health beliefs that shape traditional healing methods and cultural reactions to illness. Understanding these perspectives provides valuable insights into how Sudanese communities approach health, blending naturalistic, supernatural, and symbolic frameworks.

## 3. Diagnosis of Illness

Sudanese laypeople distinguish between minor ailments, which can be managed on their own, and serious illnesses that require intervention from a healthcare provider, diviner, or traditional healer. When the cause of an illness is unclear, divination is used to uncover its underlying reason and decide on a course of action. These practices

also help resolve interpersonal conflicts and guide major life decisions. Diviners, whose credibility is boosted by dramatic rituals, specialized tools, and perceived effectiveness, draw on both natural and supernatural abilities, often working through human or animal agents.

Regional variations add further nuance. For example, among the Kababish Arabs, *ghazal al-sham* (غزال الشام) employs gazelle drawings for divination, while the Mandari practice rattle divination. Additionally, omens from animal behavior, like the cry of an owl or hyenas mating near a village, are considered bad signs

Among ethnic groups like the Azande, Dinka, and Acholi rely heavily on oracular methods for decision-making in legal, personal, and health issues. The Azande—whose practices are the most thoroughly documented—use several distinctive methods [5]:

- Poison oracle (*Benge*): Chickens are given a locally sourced plant poison, and their reactions reveal guilt, truth, or destiny.
- Rubbing-board oracle (*Euwa*): A wooden board and stick, often lubricated with plant juice, are rubbed together to reveal answers through their sliding or sticking movements.
- Termite oracle (*Dakpa*): Two tree branches are placed in a termite mound; the branch eaten overnight reveals the answer.
- Three-sticks oracle (*Mapingo*): Mostly used by women and children, three sticks placed overnight reveal hidden truths through their movements.

The Azande also view dreams (*Soroka*) as prophetic, sometimes enhanced by dream-boosting medicines. Other communities have their own unique oracular practices. For example, Arab tribes like the Rubatab have used trial-by-fire tests,

such as having an accused woman hold a red-hot axe, where unburned skin shows innocence and burns indicate guilt. In the Nuba Mountains, the Otoro people use magical *kidam* charms to force confessions by causing illness or death to wrongdoers. Additional divinatory practices further illustrate this rich tapestry (Table 1).

Collectively, these diverse methods form a complex tapestry of ritual practices in Sudan, blending natural phenomena, symbolic objects, and dramatic ordeals to provide guidance, resolve conflicts, and address the uncertainties of everyday life.

#### 4. Management of Illness

Sudanese traditional healing is a rich and complex system that combines cultural beliefs, religious influences, and practical methods. Treatments include amulets, talismans, Quranic verses, and ritual practices. Islamic elements play a key role, with Quranic recitations and incantations forming the basis of many healing rituals. Traditional healers, known as *fakis* (religious healers), use spiritual and physical techniques to treat mental illness, such as confinement, salt-free diets, whipping with date palm fronds inscribed with Quranic verses, *tas'it* (nasal douches – التسعيط), *mihaya* (holy erasures – المحاية), *azima* (exorcism – العزيمة), and *hijab* (protective amulet – الحجاب). These treatments rely heavily on psychological suggestions and belief in the healer's spiritual authority. A *faki* may recite Quranic verses while spitting on the patient or into water, transferring *baraka* (blessings – البركة). Sometimes, chewed herbs are used to induce sneezing, which is believed to help expel illness. *Ruqia* (protection – الرُقِيَّة) involves ritualistic recitations combined with herbal remedies, as

healing is seen as incomplete without these ritual elements.

Quranic verses are often written on wooden tablets, washed off, and the resulting liquid is consumed for healing and protection, especially during epidemics. Ritual incensing is another common practice, where papers with holy formulas are burned and the patient inhales the smoke under a cloth, or a mixture of herbs and minerals is burned to ward off the evil eye or break magic spells. *Huruz* (amulets) are used for protection, healing, and luck. They are crafted from wood, stone, and metal, often inscribed with Quranic verses or symbols. Their effectiveness depends on faith in the healer, proper usage, secrecy, and the materials used, such as chameleon skin for protection against weapons. Failures occur if the amulet is tampered with or misused.

Material amulets include the seven-knotted cloth ribbon called *Al-'Uqda* (العقدة), which is worn for protection and healing. Rare stones such as *Hajar al-Hirra* (Cat's Stone – حجر الهرة) are believed to prevent illegitimate offspring, while *Fass al-Damm* (Blood Stone – فص الدم) is thought to stop bleeding, sunstroke, and headaches. *Sibhat al-Yasur* (Jet Rosary – سبحة اليسر) is used in circumcision and marriage rituals. Rosaries and scarabs, like the prayer rosary *Al-Sibha* (السبحة), are used for recitation and protection, while the *Ju'rana* (الجعرانة), a scarab beetle charm, is connected to ancient Egyptian traditions against witchcraft. Other protective items include the Double Spiral Amulet, a fertility charm in Darfur, and kohl pins that are believed to shield new mothers from jinn.

Despite being a predominantly Muslim country, Sudanese healing practices incorporate Christian traditions. Black antimony crosses on newborns' foreheads are used to ward off the evil eye, and dung or blood crosses are used in ritual healing

Table 1: List of divinatory practices.

Sortilege ( <i>Khatt al-Wad'</i> – الودع)	Casting lots with cowry shells or coffee beans, often by women ( <i>wada'iya</i> – الوداعية) to forecast marriage outcomes, inheritance, and future events.
Sand divination ( <i>Raml</i> – الرمل)	Interpreting patterns drawn in the sand or counting beans, a method widely practiced in Muslim communities.
Tin divination ( <i>Fath al-'Ilba</i> – فتح العلبه)	In <i>Zar</i> spirit possession rituals, tin containers with incense are opened amid spirit-invoking music to reveal a patient's affliction.
Water gazing ( <i>Al-Mandal</i> – المندل)	A prepubescent child gazes into a bowl of water, oil, or ink to communicate with supernatural entities.
Astrology ( <i>Al-Tanjim</i> – التنجيم)	Celestial bodies are consulted to determine auspicious times for marriage, agriculture, and healing.
Numerology ( <i>'Ilm al-'Adad</i> – علم الأعداد)	The mystical power of numbers and magical squares is harnessed to create charms and amulets.
God invocation ( <i>Al-Istikhara</i> – الإستخارة and <i>Al-Khaira</i> – الخيرة)	A <i>faki</i> (religious scholar) employs prayer, Quranic verses, and personal details to seek divine guidance.
Revelations ( <i>Al-Ru'ya</i> – الرؤية – الروية الصادقة)	Divine insights obtained through dreams or prolonged prayer.
Gazelle and plant divination	Practices such as <i>ghazal al-Sham</i> (غزال الشام) [6] use symbolic drawings to ease childbirth, while <i>shajarat al-Khalas</i> – شجرة الخلاص (tree of salvation)—a plant ( <i>Kaff Maryam</i> – كف مريم) soaked in water—is used to aid labor. <sup>ii</sup>
Kujur Séances	Kujur shamans enter trances to diagnose illnesses, prescribe rituals, and forewarn misfortunes, often incorporating sacrifices or symbolic gestures.

among the Nuba and Sakkoat peoples. Colors also serve as amulets, with red playing a significant role in social and healing rituals, such as the tradition of brides wearing red silk dresses. Additionally, black is believed to repel spirits, as seen in the practice of placing black cumin under beds during pregnancy. Sacred phrases and names serve as verbal amulets, such as calling on Prophet Noah (يا النبي نوح) in times of distress.

Various talismans, mascots, and fetishes are used in Sudanese healing traditions. Date palm leaves are used in wedding rituals to bring good fortune. Animal-based charms such as lion claws, ostrich feathers, and elephant hair are believed to attract luck. Possession cults like *Zar* (music extravaganza – الزار) and *Tumbura* (الطمبورا) play key roles in healing practices. *Zar* ceremonies involve music, dance, and trance to create an environment for spiritual communication, often serving as a social and therapeutic outlet for women. Psychological analysis indicates that *Zar*

participation is frequently connected to marital issues, infertility, and trauma, with some theories suggesting that it offers a socially acceptable way for women to express grievances [7]. *Kujur* trances and rituals are used to diagnose illnesses, receive messages, and prescribe healing procedures.

## 5. Recipes

The Sudanese Materia Medica includes a wide range of *wasfat* (recipes – وصفات), or traditional recipes, that serve therapeutic, nutritional, preventive, and cosmetic purposes [8]. These remedies combine different substances, including plants, minerals, organic materials, and animal products such as meat, fat, milk, bile, urine, and rarer items like rhinoceros tusk powder and ostrich oil. Some *wasfas* are consumed as food, while others are specifically used to treat illnesses, prevent disease, or promote overall well-being. Toxic substances are also important, used for their effects as muscle

relaxants, stimulants, depressants, narcotics, or abortifacients.

A significant portion of traditional Sudanese remedies is derived from plants, accounting for most of the documented medicinal ingredients (Table 2). The remaining components include minerals, salts, soils, and animal-based substances. These remedies are available in various forms and are used through different methods, such as potions, decoctions, powders, ointments, poultices, gargles, chewing, inhalation, and eye drops, although injections are notably absent. Many of these remedies are closely guarded family secrets passed down through generations.

The Sudanese view of potency is closely linked to the strength of a medicine's physical effects. Remedies that cause strong physiological responses such as sweating, vomiting, diarrhea, or pain are often seen as particularly effective. Even side effects, like sneezing caused by inhaled medicine, are considered signs of success, believed to expel evil spirits or unwanted ailments from the body.

## 5.1. Symbolism

Symbolism is important in choosing ingredients, with many remedies selected for their resemblance to body parts, colors, or symbolic meanings. Pumpkins, for instance, are used to treat breast abscesses because of their similar shape, while porcine meat is believed to aid childbirth due to the animal's characteristic unfolding motion. Similarly, a wolf's eye socket is considered a cure for eye problems. Color symbolism is also common in Sudanese traditional medicine. Red remedies, like *karkade* (red sorrel), are used for blood-related issues, while bitterness is thought to counteract excessive sweetness, leading to the use of bitter plants like *turmus* (*Lupinus termis* – الترمس) and

*molaita* (*Reichardia tingitana* – الموليتة) for diabetes treatment.

## 5.2. Rituals

Rituals further shape traditional medicine practices. The use of remedies often follows specific rituals and times of day, such as sunrise or sunset, and may be prescribed in magical numbers. The number of sips or doses can be crucial for a remedy's effectiveness. Some unconventional ingredients are also used based on their perceived qualities; for example, *sananir* seeds (*Senecio vulgaris* – السنانير) are rubbed on a baby's gums, with their slimy texture symbolizing their ability to help teeth "draw through."

Blending practical knowledge with deep cultural beliefs, Sudanese traditional medicine combines both empirical and symbolic healing methods, demonstrating the complex interaction between ancestral wisdom and spiritual views of health and disease.

The accounts of Sudanese recipes are incomplete without referencing Andrews [9–14], Broun [15], and data from Wellcome Tropical Research Laboratories Reports cataloged by Abdel Hamid Ibrahim Sulaiman [16, 17], with inventory dates linked to Ahmed El Safi's influential pamphlet, *Native Medicine in Sudan*, which incorporates new findings and refines existing data. The pamphlet examines historical connections between Sudanese medicine and Medieval Arabic medical texts, highlighting shared practices across the Arab world and neighboring regions [18]. *Sudanese Materia Medica* is also a crucial source [9].

In this review and similar works, transcribing Arabic terms presents challenges due to dialectal variations. To ensure accurate plant identification and reproducibility, scientific names and synonyms are included, facilitating researchers' work [19].

Table 2: Frequently cited medicinal plants in Sudanese traditional medicine.

Local name	Scientific name	Use/Ailment treated
الضريسة ( <i>Dhiraïsa</i> )	<i>Tribulus terrestris</i>	Kidney stones, bladder issues, prostate health
كر كديه	<i>Hibiscus sabdariffa</i>	Hypertension, cooling agent
الترمس	<i>Lupinus termis</i>	Diabetes
الموليتة	<i>Reichardia tingitana</i>	Diabetes
كف مريم	<i>Anastatica hierochuntica</i>	Facilitating childbirth
حرجل	<i>Solenostemma argel</i>	Malaria, fevers
أبو جلاجل	<i>Aristolochia bracteolata</i>	Purgative, detoxification
عرق الحلاوة	<i>Gypsophila spp.</i>	Skin ailments, scabies
العشر	<i>Calotropis procera</i>	Joint pain, swelling
الحنظل	<i>Citrullus colocynthis</i>	Laxative, rheumatism
الشيح	<i>Artemisia herba-alba</i>	Colds, digestive issues
السواك	<i>Salvadora persica</i>	Oral hygiene, toothache
القرض	<i>Acacia nilotica</i>	Diarrhea, wound healing
المر	<i>Commiphora myrrha</i>	Antiseptic, mouthwash
الحلبة	<i>Trigonella foenum-graecum</i>	Postpartum tonic, digestive
الزنجبيل	<i>Zingiber officinale</i>	Warming agent, colds, nausea
الكمون	<i>Cuminum cyminum</i>	Indigestion, flatulence
القرفة	<i>Cinnamomum verum</i>	Circulation, cold symptoms

Sudanese plant names often include prefixes like “um” (mother of) and “abu” (father of), as seen in *Abu-Jalajil* (*Aristolochia bracteolata* – أبو جلاجل). Many plant names are descriptive or onomatopoeic; for example, *jalajil* (جلاجل) refers to seeds that sound like jingling bells. Some names originate from causative associations, such as *Irq al-Dabib* (*Heliotropium strigosum* – عرق الدييب), which is believed to repel snakes.

Since 1966, surveys across Sudan have gathered plant knowledge and medicinal recipes from traditional healers. Although the Wellcome Laboratories’ herbarium was lost, efforts continue at the Medicinal and Aromatic Plants Institute in Khartoum. Standardized cataloging remains a challenge; the list mentioned contributes to broader documentation efforts aimed at preserving indigenous knowledge.

Folk diagnoses often differ from modern medical concepts. For example, “liver pain” or “stomachache” may indicate broader health issues beyond their literal meanings. Traditional terminology reflects community perceptions rather than clinical definitions, underscoring the need for interdisciplinary research that bridges ethnomedicine and biomedicine.

Sudan’s botanical diversity remains under-documented, requiring coordinated research efforts. Institutions such as the Medicinal and Aromatic Plants Research Institute (MAHRI) and the Sudan Medical Heritage Foundation should incorporate Sudanese plant studies into global research networks to improve scientific validation and conservation efforts.

One notable medicinal plant is *Dhiraïsa* (*Tribulus terrestris* – الضريسة), found throughout Sudan. Its dried thorns are used in decoctions to treat kidney and bladder

stones as well as prostate enlargement, especially in the Kutrang region.

## 6. Traditional Health Practitioners

Traditional Health Practitioners (THPs) in Sudan play crucial roles that go beyond treating diseases, including spiritual, social, and medical functions. The term “traditional health practitioner” is now commonly used to broadly categorize healers, acknowledging their extensive expertise and various specializations. During the Anglo-Egyptian Condominium, British anthropologists classified Sudanese healers based on regional differences. In southern and western Sudan, healers were identified as medicine men, witch doctors, or shamans, while in northern Sudan, they included *fakis*, *basirs* (البصير – bonesetters)<sup>iii</sup>, and *habl* midwives (دايات الحبل). Researchers such as Evans-Pritchard (Azande, Ingassana, & Nuer) [19], Lienhardt (Dinka) [20], Nadel (Nuba) [21], Buxton (Mandari) [22], and Oyler (Shilluk) [23] documented these traditions, though classifications remain flexible and culture-dependent.

THPs vary in expertise, with some practicing full-time and others offering healing services part-time. Their roles can generally be grouped into general practitioners or specialists. General practitioners include religious healers, such as *fakis* (religious healers – فكي), who treat mental illness, perform exorcisms, and offer Quranic healing as protective charms. Specialists encompass *mu'raqi* (root specialists – مُعراقي), *ashshabin* or *attar* (herbalists – عشابين ✕ عطارين) who sell medicinal plants and sometimes diagnose and prescribe treatments. *Shaikhat al-zar* (شيخات الزار) lead spirit possession ceremonies and healing rituals. *Basirs* (bonesetters – البصراء) treat fractures, joint pain, and musculoskeletal injuries. *Dayat* (midwives –

الدايات) assist with childbirth, offer fertility advice, and perform circumcisions. *Shallaqin* (couching healers – شلاقة) perform basic cataract surgeries. Some practitioners overlap in their expertise; for instance, midwives and bonesetters often treat various ailments, while witch doctors are known for preparing poisons and antidotes (Table 3).

Sudanese patients often self-diagnose before seeking treatment, and many THPs are integrating modern medical tools into their practices. Bonesetters review X-rays before realigning fractures, religious healers combine *mihaya* with sedative medications, and urban THPs include laboratory tests and blood pressure checks in their diagnoses. Certain ailments are linked to specific healers and locations, such as epilepsy, which is associated with Hasan Wad Husuna's village, and rabies, which is treated by Musa Al-'Azab and Ahmad Wad Al-Turabi, all of whom are deceased holy men. Some THPs focus solely on diagnosis, referring patients to other specialists for treatment.

Many religious healers operate within *mesieds* (mosques – مسجد)<sup>iv</sup> that serve as community centers for healing. These centers typically include mosques, Quranic schools, and facilities for treating physical and mental illnesses. They also provide food, shelter, and long-term care, especially for psychiatric patients, and are supported by land donations and local financial aid. Healing authority is often passed down through *baraka* (blessing – البركة), which boosts a healer's standing. Traditional medicine in Sudan merges Islamic teachings, animist beliefs, and Arabian materia medica, creating a diverse and intricate healing system.

Spirit-based healing plays a central role in many Sudanese communities. *Kujurs* (Nuba shamans – الكجور) go into trances to heal illnesses, summon rain, and protect crops, a practice similar to

Table 3: Typology of Traditional Health Practitioners (THPs) in Sudan.

Type of practitioner	Local name (Arabic)	Main role/specialty
Religious healer	فكي ( <i>Faki</i> )	Quranic healing, exorcism, protective amulets
Herbalist	عشاب / عطار	Prescribe and sell medicinal plants
Bonesetter	بصير ( <i>Basir</i> )	Treat fractures and musculoskeletal injuries
Midwife	داية الحبل	Home births, circumcision, fertility advice
Couching healer	شلاق	Perform traditional cataract surgeries
Spirit medium	كجور / شيخة زار	Lead Zar, trances, spirit-based healing

those found in Central Asian and Native American traditions. Mandari jok doctors and healers, found among the Nuer, Dinka, and Azande, practice spirit-based medicine, while Zar-Bori practitioners, mostly women, lead possession rituals with drumming and sacrificial rites.

*Dayat El Habl* (rope midwives – دايات الحبل) assist with home births and offer fertility consultations. They also perform infibulation reversal before childbirth and re-infibulation afterward, often in unsanitary conditions. *Ashshabien* and *attarien* (العطارين ☒ العشابين) sell medicinal plants alongside everyday goods in markets, with Nigerian *mu'raqis* particularly known for promoting aphrodisiacs and protective charms. *Busara* (bonesetters – البصراء) treat fractures and joint pain with splints and herbal poultices, although complications like malunions and amputations are common. Witch doctors and medicine men, predominantly in southern and Southeast Sudan, practice divination, herbal medicine, and magical rituals, often inheriting supernatural abilities through family lineage and training. *Shallaqin* (eye healers – شلافة)<sup>v</sup> perform crude cataract surgeries (couching), which may temporarily restore vision but often lead to complications.

A new generation of educated traditional healers emerged, blending indigenous knowledge with modern medical advancements. Notable figures include the late Abd Al-Karim Mirghani<sup>vi</sup> and Hasan Al-Fatih Gharib Allah<sup>vii</sup>, who integrated Quranic

healing with modern medicine, and Osman Abd Al-Monem<sup>viii</sup>, who attempted to scientifically validate traditional remedies. Despite advancements in modern medicine, THPs remain deeply embedded in Sudanese society, continuously adapting to medical advancements while preserving cultural healing traditions.

## 7. The Profession of Traditional Medicine

Traditional medicine in Sudan is deeply rooted in cultural beliefs but has long faced neglect and opposition from the biomedical community. Despite its widespread use, there has been no official licensing, registration, or legal recognition of its practitioners. Traditional healers have tried to gain legitimacy by forming organizations, but these efforts have often been met with resistance or indifference from authorities. A notable example is *Zar* practitioner Wad Hulla, who attempted to modernize practices, establish a society, and work with cultural institutions in an effort to gain legal recognition.

Historically, religious and colonial oppositions have played significant roles in limiting traditional healing practices. The Mahdi and other Islamic reformers banned practices like using amulets and divination, calling them sacrilegious. Later, religious scholars continued to condemn these traditions, associating them with superstition and

ignorance. Some healing practices in Sudan were connected to secret societies, especially in southern regions, where groups like the Mani, Bili, and Bir performed magical and healing rituals. Certain groups, such as the *Yelde* women's group, utilized medicinal and magical knowledge to assert their independence from men. Colonial authorities and Christian missionaries saw these secret societies as disruptive and imposed laws to suppress them [24].

In the mid-twentieth century, psychiatrist Dr. El-Tigani El-Mahi advocated for integrating traditional and modern medicine, highlighting the cultural importance of indigenous healing practices. He proposed the "therapeutic village system" in Umdubban village, east of Khartoum. The model was successfully replicated in Aro village, Nigeria, where traditional healers played a key role in mental healthcare. Despite initial successes, official support for this initiative declined over time, and later generations of psychiatrists showed little interest in its continued integration [25].

While traditional medicine has never been explicitly banned, legislation has restricted its practice. The Sudan Medical Council and the Ministry of Health Acts prohibit unregistered medical practice, limiting healthcare services to certified professionals. The Public Health Act of 1975 and the Pharmacy and Poison Act of 1963 further exclude traditional healers from recognized medical practice. Although some exceptions, such as licensed midwifery training, have been made, traditional pharmacology remains legally unrecognized.

Despite these legal restrictions, traditional healers continue to deliver essential healthcare, especially in rural areas where access to modern medicine is limited. Many Sudanese prefer

traditional medicine because of cultural familiarity, affordability, and accessibility. However, complications from traditional surgical procedures, midwifery, and herbal treatments have occasionally led to injuries and fatalities. Still, traditional practitioners remain trusted figures within their communities.

Research on Sudanese traditional medicine has progressed, starting with colonial-era studies focused mainly on anthropology and poisoning cases. Later research examined Sudanese herbal remedies and indigenous treatments, with organizations like the WHO and the Organization of African Unity (OAU) encouraging the integration of traditional medicine into healthcare systems. Despite these efforts, Sudanese medical research institutions have largely overlooked traditional medicine, conducting only sporadic studies.

Institutional research in traditional medicine was initiated by the Medicinal and Aromatic Herbs Research Institute (MAHRI) and the Traditional Medicine Research Institute (TMRI). MAHRI, founded in 1970, conducted taxonomic, chemical, and pharmacological studies on Sudanese medicinal plants. In 1981, the TMRI was established [26].

TMRI received recognition from the WHO at its headquarters and regional office in Alexandria<sup>x</sup>, and was immediately acknowledged for its ability and readiness to contribute to the WHO's global traditional medicine program. As a result, TMRI was designated a WHO Collaborating Centre for Traditional Medicine in 1984. TMRI promoted studies on traditional medicine, collected data, and supported healthcare integration, but progress was hindered by implementation challenges and insufficient government support.

In 2005, the Sudan Medical Heritage Foundation was founded as a nongovernmental organization to support research on Sudanese

medical traditions, advocate for policy changes, train traditional healers, and promote evidence-based traditional medicine. A proposed initiative, the Sudan Museum of Health, aims to preserve and showcase Sudanese health history by collecting artifacts, documents, and specimens related to both traditional and modern medicine. The museum would also feature a medicinal herbarium and botanical garden for research and education. Traditional medicine in Sudan remains widely practiced despite official neglect, religious opposition, and legal barriers. While early integration efforts, such as the therapeutic village system, showed promise, they lacked sustained governmental and institutional support. Research into Sudanese traditional medicine has been inconsistent, with valuable findings often left unpublished. Strengthening collaboration between traditional healers and modern medical practitioners could help preserve Sudan's rich medical heritage while ensuring safe and effective healthcare for future generations.

## 8. Foreign Influences and Impressions

Sudanese health culture has been shaped by a continuous exchange of foreign ideas and external impressions over thousands of years. Its strategic location—bordering the Nile Valley, the Mediterranean, the Middle East, and several African countries, with access to the Red Sea—has facilitated continuous cultural and medical interactions. These exchanges brought new beliefs, practices, and techniques that blended with local knowledge, while also drawing the interest of travelers and colonial observers whose impressions, though sometimes inaccurate, are still important historical records.

### 8.1. Cultural and medical exchanges

Arab, African, and Mediterranean civilizations have all left indelible marks on Sudanese traditional medicine. Arab traders reached Sudan in pre-Islamic times, but Arabization and Islamization accelerated after the seventh century, especially through the work of Sufi missionaries who blended Islamic teachings with local healing traditions. The Hajj pilgrimage served as a channel for exchanging medical knowledge, bringing in Arabian, Babylonian, Greco-Roman, and Far Eastern medical theories and therapies.

One of the most lasting legacies of Arab influence is Islamic medicine, especially Prophetic Medicine (*Al-Tibb Al-Nabawi*), represented by scholars like Ibn al-Qayyim and Al-Zahabi. Techniques such as purgation, cautery, bloodletting, and cupping were incorporated into Sudanese healing practices, especially in the north. The controversial practice of female circumcision (*Al-Tahura Al-Far'auniyya* – الطهارة الفرعونية) also reflects a debated heritage, with pre-Islamic Arabian poetry suggesting Arabian origins rather than ancient Egyptian ones. Sudanese divination and spiritual healing—through amulets, incantations, and sand-reading—bear clear Arabian roots, while literate healers often consulted Arabic texts, including Avicenna's *Al-Qanun fi al-Tibb*.

Greco-Roman medical thought, especially the humoral theory developed by Hippocrates and Galen, was passed down through Arabic scholarship and influenced Sudanese ideas about disease classification and nutrition. Egyptian connections further reinforced these influences. Ancient Egyptian medicine reached Sudan during the Umayyad Caliphate through Arabic translations. Religious similarities, such as Nile worship and lunar rituals, strengthened these shared cultural paths. The Al-Taiman herbalists, who gained freedom after the

1884 Battle of Tawshki, opened the first herbal shop in Omdurman. Egyptian-trained Sudanese scholars from Al-Azhar introduced Arabic medical texts, and surgeons like Ahmad Yusuf Al-Hakim played a key role in blending Egyptian and Sudanese medical practices.<sup>xi</sup>

Babylonian traditions also persist in Sudanese healing culture, particularly in the areas of magic, numerology, and symbolism. Amulets often contain Babylonian motifs, and the use of numerical squares in talismans can be traced to Sumerian and Syriac origins. Facial scarification (*Shulukh* – الشلوخ) may reflect a numerological legacy linked to Babylonian and Islamic mystical systems.

From the south and west, Ethiopia, Eritrea, and West Africa added further layers. The Zar spirit possession cult, likely originating in Ethiopia, spread through Sudan and Egypt by the nineteenth century [27]. Kordofan and Darfur absorbed significant West African influences in herbal medicine and spiritual healing, especially through Hausa and Nigerian pilgrims whose trans-Saharan journeys helped transfer botanical and magical knowledge.

## 8.2. Foreign observers and their accounts

From the late eighteenth century onward, Sudan drew the interest of European, American, and Arab explorers, missionaries, historians, archaeologists, and colonial officials. These observers documented local health practices, hygiene, and diseases, but their accounts were often influenced by cultural biases and colonial perspectives.

Sudanese intellectuals, such as historian Abbas Ibrahim Muhammad Ali [28] and psychiatrist El-Tigani El-Mahi, later critiqued these impressions for their Eurocentric distortions. El-Mahi famously described pre-WWI literature on Sudanese medicine

as “half belief and half make-believe,” reflecting more about the observers’ prejudices than Sudanese realities. For instance, Samuel White Baker chronicled epidemics like smallpox and plague but frequently misdiagnosed diseases. Bayard Taylor [29] misinterpreted dental modification practices, describing them as “wolfish expressions.”

Despite these shortcomings, such writings remain valuable historical sources—provided they are critically examined. Travelers can be categorized into three groups: those documenting disease and epidemics, those recording indigenous medical practices, and those presenting ideologically biased perspectives.

## 8.3. Disease observers

William George Browne reported widespread cases of trachoma, syphilis, smallpox, leprosy, malaria-induced splenomegaly, and tapeworms in Darfur [30]. Johann Ludwig Burckhardt described fever outbreaks during Nile floods and the catastrophic 1812 smallpox epidemic in Berber and Shendi, which, coupled with famine, allegedly decimated two-thirds of the population. George August Schweinfurth noted cases of leprosy in southern Sudan but controversially alleged cannibalism among the Zande—a claim later contested [31]. In 1834, Ignatius Palmme documented fevers, dysentery, tuberculous adenitis, and syphilis in Kordofan, attributing the latter to Egyptian military occupation [32].

## 8.4. Documenters of indigenous medicine

Muhammad Ibn Umar Al-Tunisi’s writing in the eighteenth century provided detailed accounts of magical healing and surgery in Darfur [33]. Naom Shuqair chronicled dietary and medical

practices among Sudanese tribes [27]. Theodor Krump observed a wide array of ailments—smallpox, plague, ulcers, respiratory illnesses—and described cauterization for conditions such as sciatica and colic [34]. John Petherick witnessed treatments like oil massage (*dilka*) and ash-bed therapy for smallpox, as well as the use of onion juice for eye infections [35]. Palmme described lavage using syringes made from chicken bones and sheep intestines [32].

### 8.5. Colonial and biased observers

Some travelers imposed racist or religious interpretations on what they observed. The Tinne Expedition (1861–1864), led by three Dutch women in Bahr al-Ghazal, produced valuable botanical findings but was ultimately hindered by tropical fevers. British archaeologist George Alexander Hoskins highlighted the widespread Sudanese belief in destiny, epitomized by the phrase “*Maktub min Allah*” (“It is written”) [36]. Sir Samuel Baker questioned the humanity of Central Africans, while General Gordon asserted that Africans were unready for Christianity and required “maturity” [37].

### 8.6. Reassessing the record

While many foreign impressions misrepresented Sudanese medical systems, their documentation—when separated from myth and prejudice—offers valuable insights into Sudan’s historical health landscape. A systematic, decolonized reevaluation is crucial to distinguish factual observations from colonial fiction. Only then can these accounts be accurately placed within the broader history of Sudanese medical heritage.

## 9. Traditional Medicine Policy

### 9.1. Challenges

Traditional medicine is an important part of Sudan’s cultural heritage, based on knowledge and traditions passed down through generations. Despite advances in the national health system, traditional and herbal medicine remain key treatment methods, especially in rural and isolated areas. However, traditional medicine practices encounter several challenges, including weak regulation, limited scientific research, and a lack of quality and safety guarantees for products and services. Incorporating traditional medicine into the modern healthcare system can help improve public health and support sustainable development.

The Traditional Medicine Policy in Sudan aims to establish a regulatory framework that ensures the quality, effectiveness, and safety of traditional medicine while promoting its integration with modern medicine. It also seeks to develop the sector in alignment with international standards. Additionally, the policy supports research and development, encourages local production of herbal medicines, and protects biodiversity and associated traditional knowledge.

### 9.2. Policy objectives

The policy outlined specific steps, including:

- Establishing quality and safety standards for traditional medicine products and services
- Developing laws and regulations to protect intellectual property rights.
- Enhancing scientific research by creating specialized centers and documenting traditional knowledge.

- Promoting local manufacturing through incentives for domestic industries and fostering public–private partnerships.
- Training healthcare professionals to integrate traditional medicine into their practices.
- Protecting biodiversity and traditional knowledge with strategies and legal measures that safeguard intellectual property rights.
- Raising public awareness about the role of traditional medicine in improving health outcomes.

### 9.3. Implementation strategies

To implement this policy, a national regulatory body will be established to oversee its execution. Five-year action plans will be developed, with funding secured through local and international partnerships. Local communities will actively participate in the planning and implementation stages, while monitoring mechanisms will be put in place to evaluate progress, such as the number of registered traditional medicine products and the level of integration with the modern healthcare system.

This policy provides a comprehensive framework to improve the quality, safety, and effectiveness of traditional medicine while strengthening its role as a key part of the national healthcare system. In the end, it aims to support public health improvements and sustainable development.

## 10. Conclusion

Traditional medicine in Sudan is not just a legacy of the past—it is a living, adaptable, and deeply rooted cultural system that still meets the health needs of millions, especially in rural and underserved

areas. This review has shown the complexity and richness of Sudanese healing traditions, including naturalistic and supernatural beliefs, a wide range of medicinal materials, symbolic and ritualistic practices, and a diverse group of specialized practitioners. Despite its resilience and continued relevance, traditional medicine in Sudan remains marginalized by formal health policies and biomedical institutions, facing issues in regulation, research validation, and professional integration.

Yet the persistence of these practices, along with their ability for innovation and coexistence with modern medical tools, calls for a new era of recognition, regulation, and collaborative development. A culturally grounded and scientifically informed approach to integrating traditional medicine into national health strategies provides a vital path toward equitable and holistic healthcare. To accomplish this, continuous efforts in documentation, interdisciplinary research, practitioner training, public education, and legal reform are essential.

Sudan's indigenous healing heritage is not only a vital health resource but also a cornerstone of national identity and intangible cultural wealth. By combining traditional knowledge with the rigor of modern science and policy, Sudan can lead the way in creating a health system that is both inclusive and sustainable—leaving a lasting legacy for future generations.

It is noteworthy that this article was initially conceived during a period of cautious optimism following the Sudanese uprising of 2019, when the country was on the brink of reform and renewal. However, the brutal war that began on April 15, 2023, has since wrecked every aspect of national life. The institutions, legacies, and knowledge systems described in these pages—many painstakingly built over generations—have

been irreparably damaged, looted, or destroyed. Libraries, research centers, and cultural repositories have disappeared. What once stood as pillars of national identity and scholarly continuity are now in ruins.

In these tragic circumstances, efforts to incorporate recent developments—such as the WHO Regional Office for Africa policy updates from 2020 to 2022—take on a somber tone. These policy changes, although significant, now highlight a country whose capacity to implement or even engage with such frameworks has been severely diminished. Most scholars have been forced into involuntary exile, and the idea of participating in global conversations or catching up with knowledge has become a distant dream—an unaffordable luxury in a landscape marked by displacement, hunger, and survival.

Similarly, the inclusion of recent phytochemical and pharmacological studies on medicinal plants, once intended to strengthen the scientific basis of Sudanese traditional medicine, now reads like a memorial. These studies remain significant, but they reflect a heritage under attack. The physical environment that supported this knowledge—healers, forests, markets, laboratories—has been dismantled. Yet, documenting and preserving what remains, however fragmented, has become an act of defiance and remembrance: a way of protecting the soul of a wounded nation until recovery is possible.

## Declarations

## Acknowledgements

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## Ethical Considerations

Ethnographic fieldwork was carried out with informed consent from all participants. Identities were anonymized in records, and sensitive cultural practices were documented with respect and confidentiality.

## Competing Interests

None.

## Availability of Data and Materials

The author securely stores field notes, anonymized transcripts, and archival records at the Sudan Medical Heritage Foundation. Access is available upon reasonable request, subject to ethical considerations and confidentiality agreements.

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## Abbreviations and Symbols

WHO: World Health Organization

CAM: Complementary and alternative medicine

NCCIH: National Center for Complementary and Integrative Health

MAHRI: Medicinal and Aromatic Plants Research Institute

THPs: Traditional Health Practitioners

OAU: Organization of African Unity

TMRI: Traditional Medicine Research Institute

## AI Use Disclosure

Artificial intelligence (ChatGPT, OpenAI) was used to assist with language refinement and formatting of the abstract and supplementary statements. The author

retains full responsibility for the intellectual content, fieldwork, and analysis.

## Author Contributions

The author is solely accountable for all aspects of the work.

## End notes

<sup>i</sup>Dracunculiasis. A parasitic infestation caused by the guinea worm *Dracunculus medinensis* (al-'irq al-madīni – العرق المديني), or Medina worm. Avicenna mistakenly identified it as a protruding nerve (*Al-Qanun*, vol. 4, p. 138), while Razes accurately described the disease, its cause, and treatment.

<sup>ii</sup>*Shajarat al-Khalas*. Rose of Jericho (*Anastatica hierochuntica* L.) and its role in labor rituals.

<sup>iii</sup>*Basir* (plur. *busara*) is a person skilled in any craft, but it is mostly related to midwifery, bone-setting, animal healing, and boat-making. The word derives from *basara* (craftsmanship). Its Arabic etymological root “to see” indicates insight, wisdom, experience, and technical competence.

<sup>iv</sup>In modern jargon, the *mesied* (mosque-school – مسيد) provides occupational therapy, rehabilitation, and asylum for the mentally ill, handicapped, and those with chronic diseases. It also provides a haven for runaways and a shelter for those worn out by social pressure and competition. The *mesied* is, indeed, a comprehensive guest house for foreigners, passersby, and students of the Quran who come from different parts of the country or neighboring countries. However, in addition to its religious tasks of worship and prayer, the *mesied* provides religious education, elementary Arabic, and in-service training in basic crafts. While in the *mesied*, the students, usually very young, are initiated in an atmosphere of cooperation, self-denial, modesty, humility, and interaction between various colors, tribes, and nationalities.

<sup>v</sup>Also known as *shallanq* (شَلَانِق) / *shallanqi* (شَلَانِقِي) (pl. *shallanqin* or *shallanqa*). *Shallanq* is an eye healer in

the Fur tongue. In Arabic, *shalaq* (شَلَاق) is a longitudinal incision. It is uncertain whether there is any relation between the two meanings.

<sup>vi</sup>A notable Omdurmanian dignitary.

<sup>vii</sup>A notable head of a religious and Sufi sect in Omdurman.

<sup>viii</sup>A notable herbal expert from Dueim, who travelled widely in neighboring countries.

<sup>ix</sup>El-Tigani El-Muhammad (1911–1970), the first Sudanese psychiatrist, was a man of varied talents and interests. He was best known for his encyclopedic knowledge of history, especially that of Sudan, Arab, and Muslim science and medicine. He was also an Egyptologist and pioneered the studies of ethnopsychiatry and traditional medicine in Sudan.

<sup>x</sup>The office was consecutively filled by two eminent Sudanese psychiatrists: Dr. Tigani El Mahi (1959–1964) and Dr. Taha Baasher (1964–1970); both were interested in traditional medicine.

<sup>xi</sup>Born in Hihya (ههيا), Sharqiya, Egypt, Al-Hihyawiy (أحمد يوسف الصديق بن الحسين الههياوي) graduated in the second class of Abu Zaabal Medical School, specializing in surgery at the Sorbonne in Paris. He then joined the Egyptian army and entered Sudan in 1839 as a *Bikbashi* (major) in the Egyptian Turkish army. He served as *Hakimbashi* (chief physician) and later as Medical Director of Dongola and Berber, where he settled until his death in 1893. In 1840, he founded Berber Hospital in Al-Mukhayrif (Old Berber), performing various surgeries including bladder and ureter stone removal, amputations, tumor excisions, and dental extractions.

## References

- [1] El Safi, A. (2006). *Traditional Sudanese medicine: A primer for health care providers, researchers, and students* (1<sup>st</sup> ed.). AZZA House.
- [2] WHO. (1978). *The promotion and development of traditional medicine* (World Health Organization Technical Report Series 622). Geneva: World Health Organization.

- [3] Law, D. A. (1974). *Guide to alternative medicine*. Turnstone Press Limited.
- [4] Foster, G. M., & Anderson, B. C. (1978). *Medical anthropology*. John Wiley & Sons.
- [5] Evans-Pritchard, E. E. (1937). *Witchcraft, oracles, and magic among the Azande*. Oxford: Clarendon Press.
- [6] Allah Ali Ibrahim, A. (1969). Irth budai fi fann Al-Kababish Al-sha'bi. *Bulletin of Sudanese Studies*, 1(2), 89.
- [7] Lewis, I. M., El Safi, A., & Hurreiz S. H. (Eds.) (1991). *Women's medicine: The zar-bori cult in Africa and beyond* (International African Seminars). Edinburgh University Press.
- [8] El Safi, A. (2022). *A Sudanese materia medica: For medical and pharmacy researchers and entrepreneurs*. Independently published.
- [9] Andrews, F. W. (1947). *The flora of Erkowit. A. Trees and shrubs*. Sudan Government, Department of Agriculture and Forests, Research Division.
- [10] Andrews, F. W. (1948). *Vernacular names of plants as described in the flowering plants of the A/E Sudan* (vol. 1). T. Bundle (Arbroath, Angus) for the Sudan Government.
- [11] Andrews F. W. (1950). *The flowering plants of the A/E Sudan* (vol. 1) [Cycladaceae. Tiliaceae]. T. Bundle (Arbroath, Angus) for the Sudan Government.
- [12] Andrews, F. W. (1952). *The flowering plants of the A/E Sudan* (vol. 2) [Sterculiaceae-Dipsaceae]. T. Bundle (Arbroath, Angus) for the Sudan Government.
- [13] Andrews, F. W. (1953). *Vernacular names of plants*. McCorquodale & Co.
- [14] Andrews, F. W. (1957). *Vernacular names of plants* (vol. 3).
- [15] Broun, A., & Massey, R. (1929). *Flora of the Sudan*. Thomas Murley & Co.
- [16] Sulaiman, A. I. (n.d.). *Sudan folk medicine and materia medica, Catalogue of vegetable samples with notes on uses* (Appendix II, pp. 29–40). Annual Report of the Government Analyst, Wellcome Chemical Laboratories for the year 1958–1959, MOH, Republic of Sudan.
- [17] Sulaiman, A. I. (n.d.). *Sudan folk medicine and materia medica, Catalogue of mineral samples with notes on uses* (Appendix II, pp. 23–29). Annual Report of Government Analyst, Wellcome Chemical Laboratories for the year 1959–1960, Ministry of Health, Republic of Sudan.
- [18] El Safi, A. (1970). *Native medicine in the Sudan: Sources, concepts, and methods*. University of Khartoum.
- [19] Evans-Pritchard, E. E. (1927). A preliminary account of the Ingassana tribe in Fung province. *Sudan Notes and Records*, 10, 69–83.
- [20] Lienhardt, G. (1951). *The Dinka of the Nilotic Sudan* [D. Phil.]. London: Oxford.
- [21] Nadel, S. F. (1947). *The Nuba: An anthropological study of the Hill Tribes of Kordofan*. Oxford University Press.
- [22] Buxton, J. C. (1973). *Religion and healing in Mandari*. The Clarendon Press.
- [23] Oyler, D. S. (1920). The Shilluk's beliefs in the good medicine men. *Sudan Notes and Records*, 3, 110–116.
- [24] Sudan Notes and Records (Editorial). (1920). Secret societies of the Southern Sudan. *Sudan Notes and Records*, 3, 204–208.
- [25] El Safi, A., & Baasher, T. A. (Eds.). (1981). *Tigani Al-Mahi: Selected essays* (1<sup>st</sup> ed.). Khartoum: Khartoum University Press.
- [26] El Safi, A. (May 1980). *Organization of research in traditional medicine in the Sudan*. A proposal document presented to the Medical Research Council.
- [27] Shuqair, N. (1972). *Gughrafiyat wa Tariekh Al-Sudan (1903)* [Arabic]. Beirut: Dar Al-Thaqafa.
- [28] Ali, A. I. M. (May 1969). *Anglo-Saxon teutonic images of the peoples of the Sudan, 1772–1881* (African

- Studies Seminar Paper No. 6). Sudan Research Unit, University of Khartoum.
- [29] Taylor, B. (1856). A journey to central Africa.
- [30] Browne, W. G. (1799). *Travels in Africa, Egypt and Syria from the Year 1792 to 1798*. London.
- [31] Schweinfurth, G. (1874). *The heart of Africa* [English translation]. New York: Harper & Brothers.
- [32] Pallme, I. (1844). *Travels in Kordofan*. J. Madden and Co.
- [33] Al-Tunisi, M. I. O. (1965). *Tashhidh Al-Adhhan Bi-Sirat Bilad Al-'Arab Wa-l-Sudan*. Egyptian Genl. Organization. [Arabic]
- [34] Krump, T. (1710). *High and fruitful palm-tree of the Holy Gospel*. Augusburg. [German]
- [35] Petherick, J. (1861). *Egypt, the Soudan and Central Africa*. Buddenbrooks.
- [36] Hoskins, G. A. (1845). *Travels in Ethiopia*.
- [37] Gordon, N. A. (1888) *Letters of C.G. Gordon to his sister*. Mc Millan and Co.