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Traditional Treatment of Malaria

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Abstract

Traditional treatment of malaria, using indigenous remedies, remains an essential healthcare approach in many parts of Africa, Asia, and other tropical regions. This practice is deeply rooted in cultural heritage and is commonly employed in communities with limited access to modern healthcare. Key plants such as *Artemisia annua* (Sweet Wormwood), neem (*Azadirachta indica*), and *Morinda lucida* have demonstrated antimalarial properties and are widely used in the treatment of malaria. These traditional remedies, while valuable, face challenges including inconsistent preparation methods, lack of standardization, and limited scientific validation, which affect their reliability and safety. Despite these challenges, the integration of traditional medicine with modern healthcare systems presents an opportunity to enhance malaria treatment options. Collaborative efforts between traditional healers, researchers, and health organizations are essential to standardize and validate these remedies. The World Health Organization (WHO) advocates for the inclusion of traditional medicine into formal healthcare systems, emphasizing the need for scientific investigation and ethical practices. This paper discusses the socio-cultural importance of traditional treatments, their efficacy, challenges faced, and the potential for their integration into modern healthcare frameworks. Recommendations are provided for improving the preparation, research, and sustainable use of traditional remedies, ultimately supporting their role in combating malaria.

Keywords: Traditional medicine, malaria treatment, *Artemisia annua*, neem, *Morinda lucida*, integration, cultural heritage, efficacy, scientific validation, WHO

Introduction

Malaria, caused by *Plasmodium* species, remains a significant public health burden globally. Transmitted primarily through the bites of infected female *Anopheles* mosquitoes, malaria continues to cause substantial morbidity and mortality. The World Health Organization (WHO) estimates that in 2022 alone, there were approximately 249 million malaria cases worldwide, with 608,000 deaths. Sub-Saharan Africa accounts for 95% of global malaria deaths, with children under five and pregnant women being the most affected populations due to their heightened vulnerability (WHO, 2022; CDC, 2023) [24, 8]. The most severe form of malaria, caused by *Plasmodium falciparum*, contributes significantly to the disease's high mortality rate. It is estimated that nearly 46% of the global population lives in areas at risk of malaria transmission, with African regions bearing the brunt. In Africa, between 1 and 2 million children die annually due to malaria, underscoring the disease's devastating impact on this demographic (WHO, 2022) [24]. Efforts to eradicate malaria have been extensive, with WHO launching large-scale initiatives involving residual insecticides and highly effective antimalarial drugs to disrupt the human-mosquito transmission cycle. While initial successes were recorded in countries like China and Bangladesh, the resurgence of malaria in previously eradicated regions highlights challenges such as resistance to insecticides and antimalarial drugs, as well as administrative and economic constraints (WHO, 2022; CDC, 2023) [24, 8]. Despite these setbacks, global malaria elimination remains a priority, supported by innovative strategies such as genomic surveillance of mosquito populations and the development of vaccines like RTS,S/AS01.

Table 1: Causative Agents

Types of species	Types of Malaria Caused
<i>Plasmodium falciparum</i>	Malignant or severe malaria (Cerebral malaria)
<i>Plasmodium vivax</i>	Benign tertian malaria
<i>Plasmodium ovale</i>	Ovale tertian malaria
<i>Plasmodium malariae</i>	Quartan malaria
<i>Plasmodium knowlesi</i>	Knowlesi malaria (severe zoonotic malaria)

This organism causing malaria belong to the genes *Plasmodium*. Each species varies in geographic distribution, symptoms, and severity, with *P. falciparum* being the most dangerous and *P. knowlesi* primarily affecting humans through zoonotic transmission from monkeys in Southeast Asia.

Researchers have noted the traditional medicine's integral role in healthcare, offering conceptual definitions that reflect its cultural and therapeutic significance. Ekeopara (2019) [11] sees traditional medicine as a system rooted in indigenous knowledge and practices, primarily utilizing herbs, spiritual rituals, and natural substances for healing. He noted its long-standing reliance before the advent of Western medicine, addressing physical, emotional, and spiritual well-being. From another perspective Balogun *et al.* (2020) [7] viewed traditional medicine as a culturally significant approach that bridges spiritual and physical health. It aligns with African cosmological beliefs, emphasizing harmony in life. This holistic view is supported by traditional healers who use natural resources and spiritual practices tailored to the community's socio-cultural context. Also, Onyeka, *et al.*, (2021) [20] pointed out that traditional medicine in Nigeria serves as a primary healthcare resource for many, given its accessibility and alignment with local beliefs. They advocated for integrating traditional practices into modern healthcare systems to enhance accessibility and safety. The World Health Organization (WHO) in 1976 defined traditional medical practice as "the sum total of the 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 illnesses." This definition highlights the holistic and culturally embedded nature of traditional medicine, emphasizing its reliance on indigenous knowledge systems and practices. It also recognizes that these practices, while sometimes not scientifically explicable, have significant roles in healthcare systems across the world.

Historical Background of Traditional Medicine

The origins of traditional medicine are deeply rooted in the activities of early humans, reflecting their survival instincts and interactions with the natural environment. Archaeological findings and the absence of written records have constrained our understanding of ancient medical practices. However, insights from contemporary indigenous societies provide valuable perspectives on the evolution of medicine. Primitive humans lived in an era characterized by crude tools and a limited ability to manipulate their environment, relying heavily on experiential knowledge derived from accidents, animal attacks, and observations to develop basic medical practices. Its origins trace back to ancient civilizations, where knowledge of medicinal plants

and healing practices was passed orally from generation to generation. These practices formed the foundation of healthcare systems in many societies before the advent of modern medicine.

Traditional medicine emerged independently in different regions, reflecting the biodiversity and cultural diversity of each area. In ancient Egypt, papyrus scrolls like the Ebers Papyrus (c. 1550 BCE) documented extensive knowledge of medicinal plants and surgical procedures. Similarly, traditional Chinese medicine (TCM), with roots over 2,000 years ago, emphasized harmony and balance through practices such as acupuncture, herbal remedies, and dietary regulation (Liu *et al.*, 2018) [15]. In Africa, traditional healers utilized local herbs, spiritual rituals, and community wisdom to address physical and mental ailments (Adegboye *et al.*, 2017) [3].

In India, Ayurveda evolved as a sophisticated medical system blending physical, mental, and spiritual well-being. Meanwhile, in Europe, Greco-Roman medicine, heavily influenced by Hippocrates and Galen, laid the groundwork for herbal remedies that are still recognized today. Indigenous peoples in the Americas and Oceania also developed rich pharmacopoeias using native plants and natural resources (Adebayo *et al.*, 2018) [2]. During the colonial and post-colonial eras, traditional medicine often experienced suppression in favor of Western medical systems. However, economic, cultural, and practical considerations, particularly in Africa and Asia, have sustained its use among communities (Eze *et al.*, 2019) [13]. In recent years, global recognition of the value of traditional medicine has surged, with organizations like the WHO supporting its integration into national healthcare systems (WHO, 2020) [23]. The history of traditional medicine reflects humanity's resilience and ingenuity in addressing health challenges using locally available resources. This heritage continues to inform modern practices, particularly in regions where access to contemporary healthcare remains limited.

The Advantages and Disadvantages of Traditional Medicine

Traditional medicine encompasses the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, often passed down orally or through written traditions. It has been a critical component of healthcare systems, particularly in regions with limited access to modern medical infrastructure. While traditional medicine offers several benefits, it also poses significant challenges that warrant discussion.

Advantages

Traditional medicine is often more accessible and affordable, particularly in rural areas where modern healthcare facilities are scarce. Herbal remedies and indigenous practices are readily available and are usually less expensive than pharmaceutical treatments. This affordability makes traditional medicine a primary option for many communities (WHO, 2020) [23]. Traditional medicine is deeply integrated into cultural and spiritual practices, offering treatments that resonate with the beliefs and customs of the people. This cultural relevance enhances patient trust and compliance, contributing to its widespread acceptance (Oyebode *et al.*, 2016) [21]. Many traditional medicine systems adopt a holistic view of health, addressing physical, mental, and spiritual well-being. Practices such as Ayurveda and Traditional Chinese Medicine (TCM) emphasize balance and harmony

within the body and between the body and its environment (Chan *et al.*, 2018) ^[9]. Traditional medicine has contributed significantly to modern pharmacology. For instance, aspirin was derived from willow bark, a traditional remedy, and artemisinin, a key antimalarial drug, originated from the Chinese herb *Artemisia annua*. Such discoveries underscore the potential of traditional medicine as a resource for developing new drugs (Newman & Cragg, 2020) ^[16]. Traditional practices often utilize locally available resources in sustainable ways, minimizing environmental impact compared to large-scale pharmaceutical production. This sustainability aligns with the global movement towards eco-friendly healthcare solutions (WHO, 2020) ^[23].

Disadvantages

Many traditional medicine practices lack rigorous scientific validation. The absence of standardized testing and clinical trials can result in ineffective or even harmful treatments. This challenge hinders the integration of traditional medicine into mainstream healthcare systems (Akinmoladun *et al.*, 2019) ^[5]. In some cases, traditional medicine can lead to misuse or overuse of herbal remedies. The unregulated nature of these practices often results in incorrect dosages, leading to toxicity or adverse effects. For example, heavy metals and contaminants have been reported in some herbal formulations, posing serious health risks (Ernst, 2017) ^[12]. Reliance on traditional medicine can delay timely access to modern medical treatments, particularly for serious conditions such as cancer or cardiovascular diseases. Such delays can result in worsened health outcomes or irreparable damage (Oyebode *et al.*, 2016) ^[21]. The popularity of traditional medicine has led to its commercialization, with unqualified practitioners exploiting vulnerable populations. This exploitation not only jeopardizes patient safety but also undermines the credibility of traditional medicine (Chan *et al.*, 2018) ^[9]. Overharvesting of medicinal plants for traditional medicine poses significant threats to biodiversity. Some species, such as *Taxus brevifolia* (source of paclitaxel), are endangered due to unsustainable harvesting practices (Newman & Cragg, 2020) ^[16]. The use of traditional medicine alongside modern treatments without proper guidance can lead to adverse interactions. For instance, herbal remedies like St. John's Wort can interfere with the effectiveness of certain medications, including antidepressants and anticoagulants (Ernst, 2017) ^[12].

Traditional Remedies and Practices

Traditional remedies and practices have long been integral to healthcare systems, particularly in regions with limited access to modern medicine. These remedies, often rooted in cultural knowledge and local biodiversity, offer therapeutic benefits that have been substantiated through both traditional use and modern research. Scholars have extensively studied traditional remedies for diseases like malaria, highlighting the potential of natural products to provide effective treatment.

Artemisia annua (Sweet Wormwood): *Artemisia annua* is a globally recognized herb for its antimalarial properties. It serves as the precursor to artemisinin, the primary compound in artemisinin-based combination therapies (ACTs), which are the gold standard for malaria treatment today. Scholars such as Abiodun and Oladipo (2019) ^[1] have noted that *A. annua* has been a cornerstone of traditional treatments in many African and Asian countries. Its efficacy and

accessibility make it indispensable in both traditional and modern medical contexts.

Neem (*Azadirachta indica*): Neem is widely revered in Nigerian traditional medicine for its multifaceted therapeutic properties. Its leaves are often boiled to prepare a tea that alleviates fever, a common symptom of malaria, and boosts immunity. Eze and Nwachukwu (2019) ^[13] highlight neem's anti-inflammatory and antipyretic properties, emphasizing its role in managing not only malaria but also other febrile illnesses. Neem's versatility and safety make it a popular choice in many communities.

Cinchona Bark: Cinchona, native to South America, has had a profound historical significance in malaria treatment. It contains quinine, one of the first effective antimalarial compounds. Scholars like Okeke and Nwafor (2018) ^[18] discuss how the bark was introduced to Africa during the colonial era, where it became a key component of both traditional and early pharmaceutical treatments for malaria. Its discovery paved the way for synthetic antimalarial drugs, bridging traditional and modern medicine.

Morinda lucida: In West Africa, *Morinda lucida* is commonly used to manage fever and symptoms associated with malaria. In Ghana and Nigeria, a decoction of the plant's leaves or bark is a trusted remedy. According to Akinyemi and Salami (2020) ^[6], *M. lucida* exhibits antiplasmodial activity, supporting its traditional use. The plant's accessibility and efficacy underscore its significance in local healthcare systems.

Integration of Traditional Practices into Modern medicine

The therapeutic potential of these plants underscores the importance of integrating traditional remedies into modern healthcare. Abiodun and Oladipo (2019) ^[1] argue that these remedies should undergo rigorous scientific validation to ensure safety and efficacy. Furthermore, scholars like Eze and Nwachukwu (2019) ^[13] advocate for collaboration between traditional practitioners and modern healthcare professionals to bridge the gap between the two systems. However, challenges remain, including standardizing dosages and ensuring sustainability. Overharvesting of plants like *Artemisia annua* and neem poses risks to biodiversity. To address these concerns, Okeke and Nwafor (2018) ^[18] call for policies that promote conservation and sustainable use of medicinal plants.

Methods of Preparing Traditional Medicine

Traditional medicine preparation methods are deeply rooted in cultural practices and local knowledge, varying across regions but often emphasizing simplicity and natural processes. These methods ensure the preservation of medicinal properties while maintaining accessibility for the community.

- (a) **Boiling to Create Decoctions:** Boiling plant parts such as leaves, roots, and bark is a common practice in traditional medicine. In Nigeria, neem (*Azadirachta indica*) leaves are boiled to create a tea that serves as a remedy for fever and malaria. Eze and Nwachukwu (2019) ^[13] highlight that adding lemon juice or honey not only improves taste but also enhances therapeutic properties.
- (b) **Infusions and Steeping:** In Ghana, herbalists prepare infusions by steeping dried herbs such as *Morinda lucida* in hot water to release their medicinal compounds. This method is used for treating fever and other febrile

illnesses, as noted by Akinyemi and Salami (2020) [6].

- (c) **Blending with Local Ingredients:** Kenyan traditional medicine often involves blending herbs with local spices. For instance, *Artemisia annua* is mixed with ginger or garlic to improve its efficacy and palatability, according to Ajiboye and Tella (2018) [4]. These combinations are believed to enhance the overall therapeutic effect.
- (d) **Pounding and Crushing:** In Egypt, the roots of medicinal plants like *Fenugreek* are crushed into a paste and mixed with oils or water to create topical treatments for skin ailments (Hassan & El-Mahdi, 2020) [14].

These methods, deeply rooted in indigenous knowledge, are tailored to the availability of resources and specific health needs of communities.

Efficacy and Challenges of Traditional Medicine

Traditional remedies hold significant potential for treating various ailments, including malaria. Many of these remedies demonstrate notable efficacy, particularly those supported by indigenous knowledge and scientific validation. For instance, plants like *Artemisia annua* and *Morinda lucida* exhibit proven antimalarial properties due to their bioactive compounds (Olaoluwa & Adebayo, 2021) [19]. These remedies are especially valuable in resource-constrained settings, where modern healthcare services may be inaccessible. However, challenges persist in ensuring the consistent efficacy of traditional medicine. Preparation methods often vary across regions and practitioners, leading to inconsistencies in dosage and potency. Moreover, the lack of standardized protocols for harvesting, processing, and administering these remedies raises concerns about safety and effectiveness. Olaoluwa and Adebayo (2021) [19] emphasize that while some traditional treatments have been validated through research, many require further scientific investigation to establish their pharmacological properties and potential side effects. Another challenge lies in balancing traditional practices with modern conservation needs. Overharvesting medicinal plants threatens biodiversity, necessitating sustainable practices and integration into formal healthcare systems. Bridging the gap between traditional knowledge and scientific frameworks is essential to maximize the benefits of traditional remedies while addressing these challenges.

Socio-Cultural Importance of Traditional Medicine

Traditional medicine holds profound socio-cultural significance, serving as more than just a means of healthcare. It is deeply intertwined with the beliefs, values, and practices of communities, symbolizing a rich heritage passed down through generations. Herbalists, often regarded as the custodians of indigenous knowledge, play a pivotal role in preserving and disseminating these practices. They are not only healers but also cultural icons who uphold traditions and foster communal identity. Eke and Ani (2019) [10] argue that these practices strengthen societal bonds and instill a sense of pride and continuity within communities. Moreover, traditional medicine often aligns with spiritual and religious practices, creating a holistic approach to healing that resonates deeply with local populations.

Integration into Modern Healthcare

Recognizing the potential of traditional medicine, efforts to integrate it into modern healthcare systems are gaining

momentum. The World Health Organization (WHO) emphasizes the need for rigorous validation and standardization to ensure the safety and efficacy of traditional remedies. Partnerships between herbalists and medical researchers are critical for achieving this goal. For instance, collaborative efforts in Nigeria have led to the scientific investigation of plants like *Azadirachta indica* (neem), which has shown promise in treating various ailments (Ojedokun & Owolabi, 2020) [17]. Integration also fosters mutual respect between traditional and conventional medicine, paving the way for a more inclusive and comprehensive healthcare system. However, challenges such as intellectual property rights and preserving indigenous knowledge must be addressed to ensure ethical and equitable integration.

Conclusion

Traditional treatment methods for malaria remain a significant part of healthcare systems, especially in resource-limited regions. Rooted in cultural beliefs and indigenous knowledge, these remedies, such as *Artemisia annua*, neem (*Azadirachta indica*), and *Morinda lucida*, have demonstrated therapeutic potential for managing malaria symptoms. Their socio-cultural importance cannot be overstated, as they embody communal heritage, provide accessible healthcare solutions, and foster societal identity. However, challenges such as inconsistent preparation methods, lack of standardization, and limited scientific validation hinder their widespread adoption. Integrating traditional remedies with modern medical practices offers a promising solution. Collaborative efforts between herbalists and researchers, as well as support from global health organizations like the WHO, are critical in ensuring the efficacy, safety, and sustainability of these treatments. In conclusion, while traditional remedies play a vital role in malaria treatment, ongoing research, standardization, and ethical practices are essential to fully harness their potential and ensure they complement modern healthcare frameworks effectively.

Recommendations

The paper recommends among others the followings

1. Governments and health organizations should collaborate with traditional practitioners to develop standardized methods for preparing and administering traditional malaria remedies. This ensures consistency, safety, and efficacy in their use.
2. Increased funding should be allocated to scientific research aimed at validating the pharmacological properties of traditional remedies such as *Artemisia annua* and neem (*Azadirachta indica*). This will help integrate these treatments into modern healthcare systems.
3. Training programs and certification processes for traditional practitioners can enhance their skills, align their practices with safety standards, and foster trust between traditional and modern medical systems.
4. To protect biodiversity, it is vital to promote sustainable harvesting and cultivation of medicinal plants. Conservation efforts should be integrated into the practices of herbalists and local communities.
5. Collaboration between traditional medicine practitioners, researchers, pharmaceutical industries, and policymakers should be encouraged to ensure the ethical integration of traditional remedies into healthcare

systems.

6. Public health campaigns should educate communities on the benefits and limitations of traditional malaria remedies. This will empower individuals to make informed decisions and encourage the responsible use of such treatments.
7. Governments should enact policies to protect the intellectual property rights of indigenous communities and traditional practitioners, ensuring fair recognition and benefit-sharing from the commercialization of traditional remedies.

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