ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 16, Issue, 06, pp. 70452-70462, June, 2026
https://doi.org/10.37118/ijdr.30752.06.2026

RESEARCH ARTICLE OPEN ACCESS

INDIGENOUS MEDICAL KNOWLEDGE AND MANAGEMENT OF COVID-19-LIKE SYMPTOMS IN SOUTHERN NIGERIA

Solomon Oluwole Oyetade*[1] and Umefien Dakoru Epepe[2]

[1]Department of Linguistics, University of Ibadan, Ibadan, Oyo State, Nigeria
[2]Department of Mass Communication, National Institute for Nigerian Languages, Aba, Abia State, Nigeria

ARTICLE INFO

Article History:
Received 14th March, 2026
Received in revised form
14th April, 2026
Accepted 20th May, 2026
Published online 30th June, 2026

Key Words:

COVID-19, Indigenous medical knowledge Medical Pluralism, SARS-CoV-2, Symptommanagement, Southern Nigeria.

Corresponding author:
Solomon Oluwole Oyetade

ABSTRACT

The study explored ways indigenous medical knowledge aided in managing COVID-19-like symptoms among the Egene of Rivers State and the Yoruba in Oyo State, Southern Nigeria. The study anchored on the Development Communication Theory (DCT) and the Health Belief Model (HBM). Rapid ethnography was employed, involving observation, informal interviews and introspection. Data were collected from a purposive selection of traditional healers and family clusters. The result demonstrated that the Yoruba response to the menace of the pandemic was not so much for the treatment of the infected persons, but for the nutritional practices of the Yoruba, which ostensibly served as a preventive measure before and during the time the pandemic was holding sway in the country. Findings among the Egene cluster revealed an indigenous practice of diagnosis to determine the application of single or combined herbal remedies to manage COVID-19-like symptoms, such as cough, fever, sore throat, fatigue and other COVID-19-like symptoms. These findings highlighted the central role of indigenous medical knowledge in managing COVID-19-like symptoms like fever, cough, respiratory distress, and sore throat, amongst others, through the use of herbal remedies and practices. Results underscored the importance of medical pluralism by recognising and integrating traditional practices within broader public health communication strategies. It was recommended that given the attention accorded indigenous medicine in Southern Nigeria, particularly by the Yoruba of Oyo State and the Egene in Rivers State; public health messaging ought to have also reflected indigenous medical knowledge systems.

Citation: Solomon Oluwole Oyetade and Umefien Dakoru Epepe, 2026. "Indigenous medical Knowledge and Management of Covid-19-like Symptoms in Southern Nigeria". *International Journal of Development Research*, 16, (06), 70452-70462.

INTRODUCTION

In December 2019, Wuhan, China, saw the emergence of a novel strain of SARS-CoV-2 known as COVID-19. In less than two months, COVID-19 had spread to several nations across the world, including African countries. For example, the Nigeria Centre for Disease Control (NCDC) confirmed Nigeria's first COVID-19 case via its website on February 27, 2020. By March 11, 2020, the World Health Organization (WHO) had declared COVID-19, a global pandemic. As the WHO (2020) revealed, common signs of COVID-19 infection included respiratory symptoms, fever, cough, shortness of breath and breathing difficulties. In more severe cases, infections resulted in pneumonia, severe acute respiratory syndrome, kidney failure and even death. At the time, observations showed that the uncertainty that surrounded COVID-19 instilled fear and anxiety on the streets and in communities. As Mathpati *et al*. (2020) stated, despite the uncertainties and the limitations of biomedicine in treating COVID-19, the biomedical model, which focused more on outcomes and endpoints like vaccines, medications, amongst other safety measures, were the dominant viewpoints for the control of the pandemic in the international community. Mathpati and colleagues further noted that a scientific approach to control COVID-19 was insufficient considering the population's overall health during periods of an infectious disease pandemic. According to MacGregor *et al*. (2022), the epidemic's variability along with capacity and resource limitations led to increased ambiguity in "the science," as a lack of testing capacities continued to erode definitive data. MacGregor *et al*. also believed that by showcasing a greater comprehension of these procedures, legislators would embrace more distinctive approaches that account for the changing local interests and experiences. The argument that anthropological contributions were necessary to control and communicate intervention strategies for the "incurable" virus was therefore plausible.

Accordingly, Mathpati *et al*. (2020) argued that COVID-19 offered an opportunity to re-evaluate the tenets that underpinned our healthcare systems. As Abdullahi (2011, p. 115) posited, before cosmopolitan medicine was introduced, millions of individuals in both rural and urban populations in Africa accessed traditional medicine as their

main medical system. Therefore, indigenous knowledge was a fundamental healthcare system insight for COVID-19, as Indigenous peoples and communities have withstood historical and current problems through it (Power *et al*., 2020). Notwithstanding, Mathpati *et al*. (2020) pointed out that despite constant improvements; infectious disease management policies propagated across the health system are based on biomedical ideologies. It was perhaps, on this premise that MacGregor *et al*. (2022) ascribed the low COVID-19 numbers in Africa to the vertical, state-led strategy with lockdowns recommended by the WHO, while Moeti (2020) noted that the primary causes include under-testing and reporting, the hot weather, and other unproven socio-ecological factors.

Despite the apparent lack of biomedical expertise in managing the pandemic, the role of indigenous medical knowledge appeared to have been ignored in these assumptions. Granted under-testing and under-reporting might have been the likely issues for the low infection rates in several Nigerian areas, this assumption was inconclusive. As Büyüm *et al*. (2020) opined, the neglect of Africa's success in managing COVID-19 is yet another indication that the focus of global health discourse has to be decolonized. Regardless of the potential for under-reporting of COVID-19 infections, early reports indicated that the COVID-19 numbers in Southern Nigerian States such as Rivers State and Oyo State were concerning. According to NCDC reports (as cited in Ileyemi, 2021), Rivers State overtook Lagos State, which was the disease's epicentre, as the state with the most infections at some point in 2021 with 420 cases.

Research has shown that herbal remedies, traditional medical knowledge, and other traditional health practices have been helpful in managing COVID-19. For example, Gbadamosi (2020) investigated herbal remedies that were successful in treating COVID-19 infections. Olaopa (2020) looked into how people's perceptions of health, illness, and the management, treatment, and prevention of COVID-19 are influenced by traditions and practices. Also, the usefulness of African Indigenous Knowledge (AIK) as a long-term intervention coping strategy for the COVID-19 pandemic was examined by Shumba, Nyangari, and Mpofu (2022). Reuben *et al*. (2020) explored the importance of comprehending the epidemiological dynamics of COVID-19 by looking at the Knowledge, Attitudes, and Practices (KAP) of people living in North-Central Nigeria.

Though, as a homogeneous minority ethnic group, there was little particular documentation of COVID-19 cases in the Egene communities of Rivers State, outside of state-wide reports. The fact that most recorded cases originated from the urban areas of the state might have been a contributing factor. Nevertheless, observation showed that during the peak periods of the pandemic, there were manifestations of COVID-19-like symptoms among indigenes in Egene communities and also among some Egene's residing in Port Harcourt, Rivers State. On the other hand, according to Usman *et al*. (2020), the first reported case of COVID-19 in Oyo State was in March 2020 through a United Kingdom returnee.

Within that period, a total of 34 confirmed cases were identified in Ibadan, the state capital. To this end, Ilesanmi and Afolabi (2021) reported varying levels of awareness of the COVID-19 pandemic in Ibadan city, with radio and television as the major sources of information on the pandemic. Also, interpersonal communication on the management of the symptoms of the disease could not be glossed over. With the population of the city of Ibadan compared to other cities of the world, where the COVID-19 pandemic wreaked serious havoc, we conjectured that the low rate of infection and fatalities in Ibadan might be due to the indigenous methods adopted to curtail it, in the main, and the public enlightenment messages on the radio and television, while not ruling out the possibility of under-reporting.

To the researchers' knowledge, however, not much study was conducted to show how the Egene of Rivers State and Yoruba of Ibadan, Oyo State in Southern Nigeria employed Indigenous medical knowledge in managing COVID-19 in the first year of the pandemic. This study, therefore, aimed to fill some research gaps in this area of scholarship as it highlighted missing local contexts in the global approach to the management of COVID-19. Since this was not a comparative study of multiple medical systems, these interactions were glossed over but not emphasised.

Objectives

The objectives of the study were to:

- Ascertain whether Indigenous medical knowledge helped to manage COVID-19-like symptoms among the Egene of Rivers State and Yoruba of Oyo State;
- Find out the herbal remedies and Indigenous medical practices used in the management of COVID-19 among the Egene people in Rivers State, Nigeria;
- Ascertain the herbal remedies and Indigenous medical practices used in managing COVID-19 among the Yoruba in Ibadan, Oyo State, Nigeria.

Conceptualisation of key terms: Conceptualisation of key terms was necessary to offer deeper insights into this study. These included the Egene in Rivers State, the Yoruba in Oyo State, COVID-19, Indigenous Medical Knowledge (IMK) and Medical Anthropology.

The Egene in Rivers State: According to Ngulube (2011), colonial and administrative records refer to the Egene Language and areas as "Engenni". On November 20, 2009, the people decided to return to the name Egene, which served as the name of the area and language before the arrival of the colonists (Amachree 2021; Ngulube 2011). Early Christian missionaries and academics reported that oral traditions and linguistic evidence imply that the Egene came from the old Bini Empire in the 15th century (see Talbot, 1932, Newington, 1933, Newns, 1935 as cited in Amachree, 1982; Amachree, 2021; Ngulube, 2011). Drawing from the 2006 National Population Census and its 2016 projections, Amachree (2021) estimated that the Egene speakers in Rivers State and Bayelsa State are four hundred and thirty–thousand, eight hundred and forty-two (430,842). In this paper, Egene was used to refer to the people, language and location the Egene occupy in Rivers State, Nigeria. Although Christianity is widely accepted, the majority of people continue to believe in the efficacy of Indigenous medical knowledge in managing ailments and infectious diseases, including COVID-19.

The Yoruba in Oyo State: The Yoruba constitute the second largest ethno-linguistic group in Nigeria, with a population of about 50 million people. The name "Yoruba" is used for the people and their language. They are found mainly in six states of the Federation in the Southwest geo-political zone, namely: Oyo, Ogun, Lagos, Ondo, Osun and Ekiti States. The Yoruba are also found in Kwara and Kogi, and Edo and Delta States to a limited extent. The focus of this study is on the Yoruba in Ibadan. The city of Ibadan presents an ideal setting for a study of this nature, because of its population density, as well as the real mix of modern and traditional ways of life. It is believed that the virus spreads rapidly in places with high populations.

Despite the cosmopolitan nature of the city, traditional practices still hold sway. For example, in the indigenous areas of the city and adjoining villages, there are still cases of female circumcision. There are traditional healing centres, and hawkers selling herbal medicines are a common sight every day in the city. The first author, therefore, settled for Ibadan North Local Government and Akinyele Local Government Areas, representing roughly the newly developed and the rural areas.

Indigenous Medical Knowledge: An Overview: The phrase "Indigenous medical knowledge" (IMK) broadly refers to the traditional healing and health practices used by Indigenous peoples worldwide. This knowledge is firmly ingrained in the environment, spiritual beliefs, language, and culture of certain indigenous communities. Since physical, emotional, mental, and spiritual well-being are all interconnected, IMK incorporates a holistic approach to

health. As Bhasin (2007) puts it, thousands of years of observation and testing have aided in the formation of many empirical medical systems around the world, as well as their concepts and understanding of plants, animals, and minerals.

Thus, indigenous medical practices often included the use of herbal remedies, such as plants, herbs, and minerals, as well as therapeutic techniques like massage, acupuncture, and spiritual healing rituals (Bhasin, 2007). According to WHO (2002), traditional medicine included a variety of health practices, approaches, knowledge, and beliefs that incorporate medicines based on plants, animals, and/or minerals, spiritual therapies, manual techniques, and exercises applied either alone or in combination to maintain well-being, as well as to treat, diagnose, or prevent illness.

The WHO (2002) also noted, "In Africa, up to 80% of the population use TM to help meet their health care needs." Indigenous medicine is a manifestation of the role that indigenous knowledge plays in the provision of healthcare (Ilo, 2012). The utilization of medicinal plants as a source of medicine has been the panacea of primary health provision in African communities through the indigenous health care systems and is regarded to be the earliest form of the health care system (Mashego, Maditsi & Bhuda, 2021). Though the knowledge of medicinal plants in Indigenous communities is often passed on through oral traditions, every indigenous society has a distinct IMK that meets the medical and healthcare needs of the populace.

The application of Indigenous knowledge to address primary healthcare needs dates back to 1978 when the World Health Assembly called for member nations to employ traditional medical practices in basic healthcare and acknowledged the potential use of traditional medicine (Rankoana *et al*., 2015). According to Rankoana and colleagues, the World Bank recommended the use of traditional plant-derived medicines in primary health care in 2004, while the WHO launched the Traditional Medicine Strategy in 2000 to help countries develop national policies on the evaluation of traditional medical practice for the possibility of its integration into the National Health Plans. Thus, it is essential for indigenous peoples to employ indigenous healthcare practices to bridge the existing gaps in healthcare accessibility (Goma *et al*., 2016). Impliedly, indigenous medical knowledge was in place to manage and treat a wide range of illnesses, including fever, vomiting, respiratory issues, coughing, sneezing, and other infectious disorders, before biomedicine was introduced to African communities. We embrace the aforementioned conceptualizations. In this paper, IMK and Traditional Medical Knowledge (TMK) would be utilised interchangeably unless otherwise stated.

Indigenous Medical Knowledge Interventions in Infectious Diseases: Anecdotal and empirical data demonstrate how IMK is becoming more and more important in developing nations for the prevention and treatment of illnesses. Although there is a lack of sufficient scientific evidence regarding the safety, efficacy, and quality of the medications, the Medical Research Council (2008) noted that traditional herbal medicine continued to play a significant role in the prevention, treatment, and protection of life-threatening diseases like HIV and AIDS, malaria, and tuberculosis in developing nations. According to Wahlberg, Burke, and Manderson (2021), several scholars have argued that the public's reactions to the coronavirus were inspired by other viral outbreaks and diseases that occurred in the late 20th and early 21st centuries, such as HIV and AIDS, SARS-CoV-1, MERS, dengue, H1N1 (swine flu), Ebola, and Zika (e.g., MacPhail, 2015; Mason, 2016; Niehaus & Jonsson, 2005; Williamson, 2018).

Anthropologists Parker *et al.* (2019) and Sams *et al.* (2017) have shown that Ebola occurred in a deeply divided society where the effects of colonial domination were felt in the way that people were treated during the outbreak. A distinction was drawn by Manderson and Levine (2020), who noted that "Culture" was frequently brought up in Ebola-related media reporting and public discussions. COVID-19, on the other hand, appears to be culturally indifferent. Even so, the implementation of quarantine protocols, lockdowns, and border controls, alongside the demand for handwashing, highlights the significance of human behaviours and practices and portends a worldwide humanitarian calamity as community transmission expands throughout the Global South.

Studies on Ebola in West Africa have reported instances where widespread village-wide reactions grounded in local knowledge; social connections, trustworthy public officials, and cultural logic have contributed to the outbreak's containment (Abramowitz, 2017; Parker *et al*., 2019). Also, information on the Ebola virus disease is beneficial in modelling preventative attitudes and practices (Gidado *et al*., 2015). A study carried out in Ebola hotspots such as Uganda and Sierra Leone found that the majority of people were more terrified of a sickness that resembled COVID-19 than of one that resembled Ebola. Some explicitly claimed that this was due to their knowledge of Ebola prevention measures (Kamara, Mokuwa. & Richards, 2020). The importance of past Ebola experiences is evident in both countries, and people's opinions on COVID-19 are similar.

Throughout the continent, reactions to COVID-19 were observed to be influenced by past and present experiences with epidemics (Geissler & Prince, 2020b). In contrast, a man in a Ugandan community said that Ebola was "simple" and easy to handle, unlike COVID-19, which came with complicated instructions (MacGregor *et al*., 2022). Mirzaie *et al*. (2020) stated that traditional medicine, especially Chinese Traditional Medicine (CTM), showed notable and effective treatments for influenza A, H1N1, H7N9, Ebola, and SARS-CoV. In a Nigerian study, Tamuno (2011) discovered that HIV patients used both traditional medicine and antiretroviral medication (ART) to treat and manage their infection.

Research has also demonstrated that indigenous tribes employed traditional knowledge to fight the virus during the Ebola outbreak, including the use of particular herbs with antiviral qualities (Abramowitz, 2017; Baldé *et al*., 2016; Kleinman, 2016; Parker *et al*., 2019). During the 2014–2016 Ebola Virus Disease outbreaks, Baldé *et al*. (2016) published several herbal therapy recipes; however, none were investigated in conventional clinical studies. Similar patterns emerged in the community's reactions to COVID-19. Studies have also found that a range of traditional treatments is routinely used by members of the community to treat COVID-19-like symptoms (Adeleye *et al*., 2021; Chali *et al*., 2021). For instance, in an Ethiopian study, Chali *et al*. (2021) reported that the regular use of herbs such as garden cress, garlic, ginger, lemon, and "Damakase" prevented and cured COVID-19.

As Mirzaie *et al*. (2020) stated, there were claims that some fruit and herbal extracts helped in the cure of viral infections. According to them, one Sri Lankan herbal beverage, for example, reduced fever symptoms by preventing viral infections like SARS-CoV-2. Also, the WHO had recognised that medicinal herbs such as Artemisia annua have been researched as possible COVID-19 therapies, but the efficacy and adverse effects such claims must be evaluated (Koch & Pong, 2020). Another study found that after receiving treatment with traditional Chinese herbal medication, the first patient with symptoms of COVID-19 was released from the hospital on January 24, 2020 (Li *et al*., 2020). Furthermore, Leung *et al*. (as cited in Mirzaie *et al*. 2020) examined 90 peer-reviewed publications and concluded that using CTM in conjunction with conventional treatment had some benefits, such as a lower fever and a quicker recovery from chest infections and other symptoms.

However, either alone or in combination with Western medicine, like an antibiotic or antiviral drug regimen, CTM may help treat or prevent COVID-19 (Mirzaie *et al*., 2020). As Muhammad (2020) also mentioned, according to some media sources, COVID-19 patients are receiving a combination of contemporary medications and traditional therapies in different parts of the world. In Nigeria, herbs have long been used to cure and manage infections and illnesses. As Gbadamosi (2020) pointed out, this indigenous knowledge may be taught by traditional religious practices or family members. He claimed that to

prevent infectious diseases, traditional medicine makes use of plant haematinics, natural antioxidants, immune-boosting therapies, botanical detoxifiers, and spices. According to him, plants with antimalarial qualities, cough remedies, herbal analgesics, and medicinal plants with potential therapeutic benefits for respiratory tract infections could be useful in preventing COVID-19 infections such as fever, cough, body pain, flu, cold, and shortness of breath (Gbadamosi, 2020).

Due in part to public pressure, historical anecdotal evidence of efficacy, and the desperate search for COVID-19 cures, African traditional medicines have a high level of political and leadership acceptability, even though the clinical trials and beneficial effects of these traditional medicines were still unknown (Mirzaie *et al*., 2020; Muhammad, 2020; WHO, 2020). They also noted that the World Health Organisation, the Africa CDC, and the African Union Commission for Social Affairs all issued statements endorsing traditional medicines for COVID-19 in Africa, while simultaneously acknowledging the need for caution in spreading misleading information about their efficacy. Such caution might include the approval of a protocol for Phase III clinical trials of herbal medicines and the creation of committees to monitor data and safety in the clinical studies (Yimer *et al*., 2021).

As noted above, anthropological research on COVID-19, Ebola, and HIV/AIDS have emphasised the significance of IMK in the management of these infectious diseases. However, Abramowitz (2015) contended that the mechanisms for community-based response were still unknown, despite the surge in interest in local treatments that have been found to be effective in controlling Ebola. As Kutalek (2015) emphasised, the importance of local community involvement in the response was a critical lesson from the West African Ebola outbreak. Yet, Abramowitz (2015) noted that there were likely other reasons for the decline in transmission rates. Good public health principles and community involvement were essential in the fight against Ebola (Buseh *et al*., 2015).

Researchers who examined the role of community involvement in disease surveillance in Niger found that the quality of surveillance on guinea worm eradication campaigns improved when community leaders were included (Ndiaye *et al*., 2003). Nigerian observations indicate that the COVID-19 epidemic was similar to the Ebola and HIV/AIDS situations in that many community members respect traditional healers and indigenous medicines more than they do biomedical treatments. Understanding these cultural contexts was crucial to creating public health initiatives that promote health and uphold indigenous traditions.

Given the significant reliance on traditional healers in the context of HIV/AIDS, COVID-19, and Ebola, it became logical to argue that IMK should be included in public health campaigns during infectious diseases outbreaks. Tusasiirwe, Musinguzi, and Kukundakwe (2022) argued that the clear push for COVID-19 messages packaged and communicated in a biomedical and Western package, the opposition to these practices by a group of political actors, which aligned with aggressive Ministry of Health and WHO messages showed the strong influence of western hegemony. By combining biomedicine and IMK, community trust could have been increased and more effective medical treatments promoted. Comparing different infectious diseases helped with the understanding of the different strategies adopted in global health pandemics, which point in the direction of medical pluralism.

Managing COVID-19-like Symptoms: A move towards Indigenous Medical Knowledge: In their study, Yimer *et al*. (2021) critically examined the role of traditional medicine in the prevention, diagnosis, and treatment of COVID-19. They argued that in settings where formal healthcare could have been underfunded or mistrusted, integrating traditional medicine with conventional methods might have boosted community trust and promoted health-seeking behaviour. Yimer *et al*. (2021) also claimed that this dual approach was consistent with the concept of "complementary medicine" and showed a practical understanding of managing health throughout the impact of the pandemic.

According to WHO (2002), more national policies would have the added benefit of facilitating work on global issues such as the development and implementation of internationally accepted norms and standards for research into the safety and efficacy of TM/CAM, sustainable use of medicinal plants, and protection and equitable use of the knowledge of indigenous and traditional medicine. However, Africans used traditional medicine to strengthen their immune systems and fight COVID-19 in their bodies (Mashego *et al*. 2021). The use of traditional medicine in Africa grew when the government of Madagascar promoted Artemisia annua as a treatment for COVID-19. People thought that the only way to combat the deadly virus was to apply the medical wisdom of their ancestors (Kapepula *et al*., 2020).

Others, including Gumbo and Gaotlhobogwe (2021), showed how African knowledge and practices were used in ancestral, environmental, metaphysical, and generational modes to combat COVID-19 through restrictions, heat-related remedies, and plant-related remedies. As to be expected, the international medical and research community responded to these assertions with scepticism, thereby devaluing traditional indigenous knowledge systems (Shanker *et al*., 2020). Eze, Ezenkwu, and Etteh (2021) discussed the COVID-19 pandemic situation in Nigeria, focusing on the traditional health beliefs of the people, especially those living in rural areas, and argued that community informatics or grass-root computing should be the basis of Nigeria's pandemic control and management methods, taking into account the unique characteristics of each local community.

Orisakwe, Orish, and Nwanaforo (2020) looked at the variety of COVID-19 home remedies in Africa, including herbal medications used in Nigeria, and found that leaves (neem, paw, guava, etc.) and natural spices (garlic, ginger, turmeric, etc.) with potent anti-inflammatory and antioxidant properties were beneficial. They concluded that these home remedies were useful in preventing and curing COVID-19 infection. Orisakwe and colleagues argued that African home remedies, with their inherent antioxidant and anti-inflammatory properties, explain at least some of the widespread COVID-19 protection, symptom remission, sero-conversion, and cure in Africa, regardless of the aetiology. According to Orisakwe *et al*. (2020), the ability of most COVID-19 home treatments in Nigeria to recover both physiological and psychological functioning of patients was noteworthy.

Also, Olaopa (2020) posited that the COVID-19 threat could have been reduced with the use of indigenous initiatives and therapeutic methods that harness society's existing indigenous knowledge, and identify areas for improvement through authentic practices. Apparently, as in the past, indigenous peoples in many parts of the world practiced traditional medicine during the COVID-19 pandemic. As Madhubhashini (2021) noted, based on ethnic practices and beliefs, the Wahalkada, for example, used natural medicines, home remedies, and wholesome cuisine. To boost immunity, they cleansed their entire body with turmeric and cooked neem leaves, boiled lemon or neem leaves and steamed them, and drank coriander, ginger tea, false calumba, and other herbs (Madhubhashini, 2021).

Most of the patients who recovered from COVID-19 in some African isolation/treatment centres reported that local/herbal remedies, such as drinking and inhaling boiled water at 100°C containing ginger, turmeric, lemon, and garlic cloves, were effective (Mashego *et al*., 2021). In light of this, IMK and its methods arguably might have helped manage symptoms similar to COVID-19 among the Yoruba of Ibadan and the Egene in Rivers State both in Southern Nigeria.

Theoretical Anchors: The study anchored on the Development Communication Theory (DCT) and the Health Belief Model (HBM).

Development Communication Theory: Available evidence suggested that the field of Development Communication Theory (DCT) was

pioneered by Nora Cruz Quebral (1971, p. 1, 2006) who defined development communication as "the science of human communication linked to the transitioning of communities from poverty in all its forms to a dynamic, overall growth that fosters equity and the unfolding of the individual potential". Some other proponents, such as Servaes (2008), asserted that development communication theory focuses on how communication may promote social change and enhance development results, especially in underprivileged or marginalised areas. According to the theory, communication is participatory, with local people actively participating. It also highlighted the significance of addressing social challenges with culturally relevant and context-specific approaches.

As stated by Servaes (1999), DCT emphasised the role of communication in bringing about social change or transformation, particularly in community development, education, and health. Servaes (1999, 2008) and Servaes and Malikhao (2008) pointed out ways the significance of cultural contexts, participatory communication, local knowledge, and sensitivity support development initiatives. Gumucio Dagron (2001) suggested that DCT promote knowledge exchange so that communities can take charge of their health and well-being. The cultural beliefs and regional contexts that support indigenous medical practices are important, and DCT encourages their inclusion in health messaging and interventions.

Also, DCT offers medical anthropologists a better understanding of how cultural practices, attitudes, and communication styles affect community health treatments. By enhancing communication strategies with indigenous knowledge, DCT highlights the significance of culturally sensitive health intervention for successful health management. As Mashego *et al*. (2021) stated, the failure of efforts to intervene against infectious diseases, particularly COVID-19, was ascribed to the failure of global health communication policies to incorporate cultural context and beliefs. Particularly in light of public health emergencies such as the COVID-19 pandemic, this method was essential for comprehending how indigenous medical knowledge, practices, and beliefs could have been incorporated into official healthcare systems.

Through the lens of DCT, the relationship between indigenous knowledge systems and the broader public health response in Southern Nigeria was examined. In the context of COVID-19-like symptoms, DCT provided a useful framework for understanding the dissemination and integration of indigenous medical knowledge into larger health systems in Southern Nigeria. Focussing on the socio-cultural aspects of health and illness, the DCT supports medical anthropological theorisations, which highlighted how social, cultural, and environmental factors influence health practices. By bridging the gap between traditional and modern healthcare techniques, DCT facilitates a more inclusive, culturally aware approach to health communication that aids health outcomes and community resilience. The DCT also provides valuable insights for medical pluralsim and fosters a deeper understanding of the cultural factors influencing health behaviour through participatory and empowering communication techniques.

Health Belief Model: The Health Belief Model (HBM) was first developed by Hochbaum, Rosenstock, and Kegels in 1952. The HBM is a psychological model that focuses on people's attitudes and perceptions to explain and predict health behaviours. It explained why people participate in disease prevention and detection programs and how they behave after being diagnosed with a disease. The HBM postulates that several factors influence each person's unique health behaviours. These include perceptions of one's susceptibility to a health issue, the severity of the condition, potential outcomes, the advantages of taking specific actions to reduce the risk or severity of the issue, the costs or difficulties of following medical advice, perceptions of perceived barriers to action, perceptions of outside cues that motivate people to take action, and perceptions of one's effectiveness in implementing suggested medical actions.

The HBM offers a systematic way to understand how attitudes towards indigenous knowledge, symptoms similar to COVID-19, and alternative healthcare options affect behaviour. The severity and susceptibility of the disease, as well as the benefits and drawbacks of indigenous medicine, influenced whether people in Southern Nigeria opted for traditional treatments or seek out conventional healthcare. By examining these components, the researchers understood better how indigenous knowledge and medicine possibly promoted the management of COVID-19. Therefore, in the context of employing IMK to manage COVID-19-like symptoms, the HBM offered insights into how community beliefs influenced health behaviours. The HBM facilitated the identification of crucial elements that impacted treatment decisions, which could have been relevant to the construction of culturally-responsive health interventions that addressed community requirements.

MATERIALS AND METHODS

This study employed rapid ethnography due to its quick, immersive approach. Given the novelty of COVID-19 at the time of the investigation, the need for face-to-face interactions with participants and the limitations of time and resources, the study's design seemed suitable. This approach allowed the researchers to understand local practices, attitudes, and behaviours related to health and illness. The population included traditional healers and families of Egene extraction from Rivers State in South-South Nigeria, as well as the Yoruba from Ibadan in Oyo State in South-Western Nigeria. Traditional healers included herbalists, spiritual healers, and others who use traditional medicines to treat health issues, including symptoms similar to COVID-19. Members of the communities were groups of families who actively sought or used indigenous therapies for health issues, including symptoms resembling those of COVID-19. To provide a complete picture of community practices, the representation was diverse in age, gender, and socioeconomic status. Appreciating the IMK system required an understanding of traditional healers, who served as the primary caretakers and advisors in their communities. Family members shared their perspectives on the relative effectiveness of indigenous traditions compared to modern healthcare solutions, as well as background information on their use in day-to-day living. To choose participants who were familiar with indigenous medicine or who used traditional medicine during the COVID-19 epidemic, a purposive sampling technique was employed. The participants included adult males and females from urban and rural areas, regardless of their educational status, in order to examine the diverse dynamics in indigenous medical practices. Participants were either resident in the community or had lived their formative years in the communities. This allowed for the intentional selection of traditional healers and households, where at least one member manifested COVID-19-like symptoms during the peak periods of the pandemic, from March 2020 through September 2021.

In addition to interviewing three traditional healers, one of the researchers observed two family clusters in two Egene communities in the Ahoada West Local Government Area (LGA) and two family clusters who resided in Port Harcourt at the time. The other researcher interacted with two Yoruba family friends: one in Odande village, located along Arulogun Road in Akinyele LGA, and the other in Agbowo, which is located just outside the campus of University of Ibadan. One of the researchers frequently visited these two households as a preacher and friend. As a result, there was no hesitation while answering enquiries or offering clarification on any topic. Interviewees were from two local government areas in Ibadan: Ibadan North and Akinyele Local Governments, due to their proximity to the University of Ibadan and the fact that the researcher was well familiar with the terrain having lived in the areas for over 30 years. It is important to state at this point that whatever our discovery with the Yoruba group here was largely true of other Yoruba in other Yoruba-speaking states in the Southwest since this indigenous knowledge was universally applicable among the various Yoruba groups elsewhere in Nigeria and even beyond.

All participants were informed about the purpose of the research, their role in it, and their right to withdraw at any time without any repercussions. This approach was guided by the recommendation of Liamputtong (2007) who stated that the recruitment method should take into account regional traditions and practices to guarantee that participants felt appreciated and at ease during the study and those of Beauchamp and Childress (2013) who posited that researchers should be transparent about their intentions and the potential impact of their work. In line with the objectives of the study, the methods of data collection were participant observation, informal interviews and introspection. Each researcher observed COVID-19 management practices among the participants in their respective study areas. The researchers also took photographs (with oral consent) of plants and other relevant herbs used in managing COVID-19-like symptoms where necessary. The findings were cross-verified with the participants to enhance reliability.

RESULTS

Based on the observations and interview transcripts, the data set was qualitatively presented and analysed.

IMK and Management COVID-19-Like Symptoms: The study found that participants from the Egene of Rivers State and Yoruba of Oyo State significantly depended on IMK in managing COVID-19-like symptoms. For example, a participant from the Egene cluster reported using indigenous or herbal remedies to manage COVID-19-like symptoms, such as cough, fever, sore throat fatigue and other COVID-19-like symptoms. Another participant from the Yoruba cluster attested to his family's dependence on IMK in the management of COVID-19 symptoms. Though there were some variations in Indigenous remedies among the Egene and Yoruba, commonly used herbs included bitter kola, bitter leaf, alligator pepper, scent leaves, and African lettuce often prepared as teas or infusions. Common domesticated herbs were ginger and garlic.

Overall, though participants expressed varying levels of concern regarding COVID-19, they believed that IMK helped control COVID-19-like symptoms among persons we interacted with from the Egene and Yoruba axis based on our observations, introspection, and interviews with participants. While few acknowledged the seriousness of the virus, particularly in the context of its rapid spread, some believed it is similar to malaria and believed that traditional remedies could effectively mitigate its effects. For example, a male participant remarked, "*COVID-19 is nothing other than the malaria that our forefathers gave us herbs that protect us*." This reflected a complex relationship where community members recognized the threat posed by the virus but simultaneously maintained a strong belief in the efficacy of Indigenous treatments this aligned with the construct of perceived susceptibility and severity of the HBM.

It implied that if the participants from Egene perceived themselves to be at a higher risk of contracting COVID-19 due to limited access to healthcare, they might have been more likely to rely on IMK and remedies for the management of COVID-19-like symptoms Findings indicated that respondents perceived significant benefits in using IMK, including cultural familiarity and accessibility.

Herbal Remedies and Indigenous Medical Practices among the Egene: Many individuals reported a preference for herbal remedies due to their perceived effectiveness and fewer side effects compared to pharmaceutical treatments. A family member stated, "*I trust my mother's concoctions more than the hospital because she has been treating us for as long as I can remember.*" We also found that during the COVID-19 lockdown, herbal treatments and steam inhalation were actively employed to manage family members who had symptoms of fever, coughing, sneezing, intense headaches, and joint problems. This result was congruent with those of Mashego *et al*. (2021) and Eze *et al*. (2021), who found that traditional herbal remedies and steam inhalation were successful in the management of COVID-19.The difference between this study and Mashego and colleagues was that the subjects were not clinically proven to have COVID-19.

We argued that verifying COVID-19 cases solely by the PCR test reinforced biomedicine's hegemony narrative. These biomedical criteria were reflected in the way COVID-19 intervention strategies were presented in the legacy media. Cues to action, such as family and friends' recommendations of indigenous remedies, played a crucial role in influencing health behaviours. For example, our interview with a female participant in one of the family clusters, an Egene indigene who lived in Port Harcourt at the time, showed that she suspected she had COVID-19 in August 2021, when she developed fever, coughing, sore throat, sneezing, breathing trouble, dizziness, and severe headache. According to her, the symptoms were so bad that she could scarcely move. Although she did not go to be clinically tested for fear of stigmatization and isolation, she was certain that she had contracted COVID-19 due to information in the media about the virus. Rather than seek biomedical intervention apparently due to lack of trust and fear, she travelled to her village on the advice of a relative to seek the services of an herbalist, who provided her with some indigenous medicine derived from plant extracts which she took orally. In explaining the medication's efficacy, she stated, "*I was back on my feet and returned to Port Harcourt within three days of taking the herbal mixture".*

Consistent with the cues to action in the HBM, events such as local outbreaks of COVID-19, media campaigns, or witnessing the success of indigenous treatments in nearby communities could serve as cues to action. Traditional healers, family members, or community leaders could act as cues to motivate individuals to seek indigenous remedies for COVID-19-like symptoms. In this case, the advice from the participant's relative was the cue to action to try out herbal remedies, which appeared to have been more compelling than the biomedical messages in the media. In another household, a female participant shared, *"When I was down with fever, sore throat, congestion, cough and sweating, my uncle who comes from a generation of herbalists prepared a herbal infusion, which I took orally and inhaled via steam inhalation, and it brought relief."* As she noted, other members of her family also took the medication for prevention.

Again, there was a noticeable sense of self-efficacy among some family members who reiterated their capacity to use Indigenous knowledge to treat their COVID-19-like symptoms. A person's knowledge and experience with herbal medicine, along with guidance from local traditional healers, could contribute to greater self-efficacy in managing COVID-19-like symptoms using indigenous methods. Thus, as Servaes (1999, 2008) argued in their DCT, communication of intervention strategies should be participatory to enhance the effectiveness of the message.

Diagnosis Process: To address the issue of herbal remedies and methods used to manage COVID-19-like symptoms among the Egene, one of the researchers interrogated two elders (participants) knowledgeable in indigenous medicines. One of them, a woman in her late 60s from one of the communities, disclosed that her IMK was developed through informal mentorship from her grandfather. This was consistent with Gbadamosi's (2020) position that indigenous knowledge could be inherited or learnt in traditional religion (see also Ilo, 2012).

When questioned on how fever was treated in traditional Egene communities, the female participant referenced above revealed that in most cases, the starting point of treating any kind of fever was to ascertain the type of fever by topically applying leaves of a plant known as "ẹ̀bi ạkomu fọromu" to the patient. According to her, there are three main types of fever identified among the Egene. In no particular order, the first, ẹ̀bi ạkomu eḅili is described as the type of fever or malaria that came with fever, headache and weakness of the body. This type of fever or malaria could be identified when the liquid substance extracted from the "ẹ̀bi ạkomu fọromu" inside a calabash or basin and placed on certain body parts of the patient becomes thick, turned darkish brown and frothy.

The second type of fever is referred to as ạkomu ạgbura and is characterized by severe headache and fever. In this situation, the liquid component used in the diagnosing procedure became blackish and frothy, and its consistency thickens. The third type of fever is known as ọwinyi ạkọmu. This type of fever is characterised by symptoms of weakness, joint pain, and dizziness. In this instance, the liquid extract following the diagnosis process turned yellowish and frothy. If the person did not have any of these fevers, the extract did not alter in consistency or colour as it remained greenish and runny. Thus, ẹ̀bi ạkomu fọromu aided in the diagnosis of fever, thereby guided the herbalist on treatment options. This was an age-long tradition that many people have continued to employ, particularly those who resided in Egene communities, where there was easy access to medicinal plants.

Throughout our investigation, we discovered that it was thought that the ẹ̀bi ạkomu fọromu also had some healing properties, besides serving diagnosis purposes. This was because a person suffering from fever might have had some relief from symptoms following the diagnosis process. During the pandemic, the elderly female participant (herbalist) admitted she used this approach to manage COVID-19-like symptoms in her patients.

Treatment options: Observations and interactions with the Egene clusters revealed that while the term COVID-19 was alien to them, its classic symptoms such as fever, headaches, joint pain, coughing, nasal congestion and other respiratory difficulties had been effectively managed with IMK and herbal medicines and practices in the past. Findings from the interview validated our observation that there was a positive attitude towards herbal remedies in managing COVID-19-like symptoms. This echoed prior studies that demonstrated that in the context of COVID-19, plants with antimalarial effects, cough remedies, herbal analgesics and medicinal plants with plausible therapeutic effects in respiratory tract infections were useful in the prevention of COVID-19 infection (Gbadamosi, 2020; Mirzaie *et al*., 2020).

We also found that a common herb used for the treatment of fever or malaria among the Egene known as ẹ̀bi ạkomu ạgbura, which means the fever medicine of ghosts or the spirits was mostimes relied on. The ẹ̀bi ạkomu ạgbura is a utility herb used for the treatment of malaria, vomiting, feverish conditions, headache and other flu-like symptoms. We ascertained that the ẹ̀bi ạkomu ạgbura was used in two main ways: through an oral dose and/or steam inhalation. Ẹ̀bi ạkomu ạgbura was also combined with alligator pepper (ẹsani ọ̀ị ạbii) and salt (uḅoni) to decongest the chest. The efficacy of ẹ̀bi ạkomu ạgbura was possibly why it was likened to the spirits. This study further established that another important utility herb used during the period was etutwayi, which relieved coughs, while ẹ̀bi ọshiyemu was administered when the patient developed a sore throat. Thus, ẹ̀bi ạkomuạgbura, ẹtutwanyi and ẹ̀bi oshiyemu were used (not as combined therapy) to treat persons that presented any of the aforementioned COVID-19-like symptoms.

Combined Remedies: Findings from this present study demonstrated that in the instance of acute fever, herbs were combined to treat COVID-19-like symptoms. In one instance, we discovered a combination of three distinct herbs namely: (i) ẹ̀bi wiri-wiremu (a coinage of a type of plant with very tiny leaves) often referred to as the 21-disease cure leaves due to its wide utility; (ii) ẹ̀bi awulomu vura and (iii) olu-gbọto-ạzhi (wild or bush bitter leaves). The infusion from these combinations was either taken orally, used for steam inhalation or for bathing to treat high fevers. This result agreed with the WHO's (2002) position that stated "that there are diverse health practices and approaches that are applied including the incorporation of medicinal plants, animals, mineral-based medicine, spiritual therapies, manual techniques and exercises that are applied either singularly or in combination".

In another case involving an Egene family residing in Port Harcourt, one of the researchers observed that due to exposure to other cultures mostly via the mass media, particularly social media and interactions with people from other cultures, non-autochthonous herbal remedies also aided the management of COVID-19- like symptoms. Thus, herbs like ginger, garlic and turmeric that were not indigenous to Egene were also embraced to manage the symptoms. In one family cluster, we discovered that when a husband and wife both developed fever, headache, and other classic COVID-19 symptoms, their first reaction was to treat malaria with over-the-counter anti-malarial medicine, which did not bring any relief. With the symptoms persisting, they decided to experiment with some combined indigenous remedies including bush sugar cane known as "ekpuneyi", and mango leaves called "ẹ̀bi ogbenyi oyibo". This related in part to an extant Chinese study which found that CTM alone or in combination with Western medicine like antibiotic or antiviral drug regimens could be effective for the treatment or prevention of COVID-19 (Mirzaie *et al*., 2020).

The result in this present study implied a willingness of the participant to embrace medical pluralism by trying out orthodox and herbal remedies in managing COVID-19-like symptoms. This finding also agreed with Muhammad (2020), who noted that some media outlets claim that COVID-19 patients were treated in various parts of the world by combining biomedicine with traditional therapy. To further emphasise this point, the participants (couple above) also applied non-indigenous but domesticated herbs for combined remedies like ginger, lime, garlic, lemongrass and lemon fruit extracts, which they administered orally and used for steam inhalation, and bathing to manage the symptoms. The couple reported that they both recovered from their symptoms after using these combined herbal remedies and practices.

In addition, they revealed that their interaction with a neighbour (not from Egene) in Port Harcourt, introduced them to herbal blood-booster extracts (known as *hospital too far*), which they ingested to boost their blood levels for faster recovery from the COVID-19-like symptoms they had earlier presented. This was consistent with studies that have found ginger, garlic, and other herbal treatments to be effective in the management of COVID-19 (e.g. Mashego *et al*., 2021; Madhubhashini, 2021). From the findings in this present study, one can cautiously surmise that IMK was crucial in the management of COVID-19-like symptoms among participants from Egene.

Herbal Remedies and Indigenous Medical Practices among the Yoruba in Ibadan, Oyo State: The Yoruba response to the menace of the pandemic was not so much for the treatment of the infected persons but for the nutritional practices of the Yoruba, which ostensibly served as a preventive measure before and during the time the pandemic was holding sway in the country. This derived from the kind of fruits, vegetables and tubers eaten as food in Yorubaland. For example, the Yoruba eat orógbó- bitter kola (Garcinia kola) as a stimulant. It was equally used with honey to cure cough among the Yoruba. Part of its health benefits was that it boosted body immunity, helped internal decongestion, can deworm, prevents hypertension and helped to regulate sugar levels in the body among other benefits.

According to Gbadamosi (2020), based on the fact that COVID-19 is a viral infection, the use of anti-viral medicinal plants might have been useful in its prevention and management. Since its symptoms were fever, cough, body pain, flu, cold and shortness of breath, plants with anti-malarial effects, a cough remedy, herbal analgesic and medicinal plants with plausible therapeutic effects in respiratory tract infection proved useful in the prevention of COVID-19 infection. These were what the Yoruba utilized in various ways during the pandemic. For instance, it was widely observed that during the outbreak of COVID-19 among herb sellers in Ibadan markets, there was an increase in the demand for garlic, ginger, lime and lemon. This gave rise to the price increase of these medicinal products.

The reason for this was not far-fetched: through informal communication or interpersonal communication, the potency of these as anti-microbial agents prepared in various ways for safeguarding COVID-19 infection was all over the place. This agreed with Chali *et*

al. (2021) who reported using herbs such as garden cress, garlic, ginger, lemon, and "Damakase" to cure and prevent COVID-19 in an Ethiopian study. For instance, vegetables like amúnútutù- Indian spinach, àlùbósà onísu or àlùbósà eléwé- onion bulb or leaves (Allium cepa), atalẹ- ginger, ewúro- bitter leaf, efinrin- scent leaves, yánrin- African lettuce in combination with irú- locust beans prepared as a vegetable sauce or soup without magi cube to eat solid food like pounded yam, àmàlà, ẹ̀bà, etc were recommended for people manifesting different symptoms of COVID-19. As a result of the anti-microbial agents in them, they were potent immune boosters common in Yoruba recipes. Thus, the ravaging effects of COVID-19 were mitigated among the Yoruba.

Herbal remedies were also employed traditionally by the Yoruba for the treatment of cough and respiratory tract infection, which were symptoms of COVID-19. There was a new spate of awareness of the efficacy of the Yoruba ways of combating different kinds of cough. These were generally resorted to during the pandemic. Some tried to patronise pharmacy stores but for fear of being labelled as carriers of coronavirus, some steered clear of hospitals and any formal place for medical attention. For example, orógbó- bitter kola, àbámọdá- miracle leaves (Bryophyllum pinnatum) are ingredients used in the treatment of cough. One simple way of preparing cough syrup was to soak bitter kola in lemon juice in a bottle. One teaspoon of it was taken as a remedy against cough three times daily after food. An alternative cough remedy was made of àbámọdá- miracle leaf. The leaves were washed and put in hot water to make them tender and squeezed. Honey was added to the collected squeezed juice. Up to 100ml of the remedy was taken daily after food. For respiratory tract infection, an oral infusion of bitter kola and ginger (atalẹ) in clean water was taken by anyone affected.

For fever and body pains, which were notable symptoms of COVID-19, those who spoke to us said they were scared of going to the hospital to report, because they might have been subjected to a COVID-19 test, and if found positive, they would not have been allowed to go home. Therefore, rather than go to the hospitals, some of them tried self-medication, while others resorted to local remedies in the form of herbal mixtures. Some local herb sellers confirmed that some middle-class elites patronised them and requested them to prescribe herbs needed to combat feverish conditions and ways to prepare them. For instance, a middle-class woman told us that after using Camosunate, a popular malaria drug in Nigeria with no obvious improvement in her condition, she then grated raw ginger and mixed it with honey and lemon in hot water and drank it repeatedly. She said she was relieved afterwards. She also recommended a lot of rest after taking the recipe.

However, other concoctions for curing fever became prominent at this time. These were the various types of malaria fever mixtures which are prepared with barks of trees like dóńgóyárò (Azadirachta indica), òrúwọ (Morinda Lucida), ahùn (Alstonia Boonei), mango barks and leaves as well as cashew barks and leaves too were used together with other herbs to prepare concoctions to be drunk at regular intervals by anyone manifesting symptoms of fever. To prepare a common one, fresh barks of ahùn (Alstonia Boonei) were properly washed together with some quantity of lemongrass. They were boiled in palm wine or wastewater from sieved maize dough called omiíkan. It was drunk fairly hot three times daily after food. Another indigenous fever remedy by the Yoruba was àgúnmu ibà "fever powder". It was derived from the combination of à+gún 'pound/grind'+mu 'drink', that is, "that which is ground for drinking".

To prepare the powder, a large quantity of the roots of èsúrúgùn (Mondia whitei) are collected, and the hard inner part of the roots was removed leaving the barks alone, these are combined with ata wẹẹrẹ dúdú- unripe small-sized pepper together with irú wooro- unmashed locust beans. They were sun-dried in a safe place. After the combination was properly dried, it was ground but not necessarily into a powder form. A small quantity of it is added to hot pap (kókó/ àkàmù) every morning. The effect of it was that it made the person sweat, and, at the same time, cleared the throat of any blockade. The Yoruba also had an alternative sanitiser, not for the hand alone but for the whole body. It was rubbed on the body usually during the dry season to safeguard the body against airborne diseases like measles, chicken and smallpox. This was a cream made from òṣóṣòtu (Sida acuta) and ìjàn (Alchornea laxiflora) leaves. The two leaves were ground together when fresh and dried in the sun. When the mixture was completely dried without any moisture, they were still ground into fine powder. The powder form was then mixed with shea-butter. This helped to strengthen the immune system of the Yoruba and reduced the rate of infection of COVID-19 in the Yoruba communities both in the cities and mostly in the rural areas.

Finally, the common parlance among medical practitioners- take your food as your medicine/drug and your drug as your food- seemed to play out among the Yoruba in Oyo State, as many of the ingredients used in the preparation of their food before the outbreak of the pandemic had medicinal values that they were not conscious of. However as soon as they had the awareness through informal interactions they increased them in their food and drinks.

In addition, our preliminary investigation in Oyo State revealed that the general belief among the masses in Yorubaland is that the COVID-19 pandemic was not a disease for the commoners but for the rich, the aristocratic and people of means. Therefore, when the pandemic broke out, the market women were going about their business as if there was nothing to worry about. This echoes the tenets of perceived susceptibility (risk perception) in the HBM. If the community does not perceive themselves as susceptible to COVID-19 due to low infection rates in their area or their belief in the efficacy of traditional remedies, they might not have adopted formal preventive behaviours. In addition, if the severity of the illness was understood within the context of the community's existing medical system, people might have prioritized traditional remedies and spiritual practices over the formal healthcare system.

Secondly, people here leveraged the weather conditions by working under the sun, and those having some conditions symptomatic of COVID-19 bathed themselves in hot water. Some inhaled steam from boiling water. However, what seemed to be the most efficacious way of combating the pandemic was the use of traditional medicine. These were made of herbs, local fruits and vegetables. These include lime, lemon, ginger hot pepper, etc. These were prepared in various ways either in liquid or powder form for drinking or added as a supplement to food. This supported that "Africans had shown no conservatism in adopting useful food plants of Asian or American origin (Rodney, 2009 edition, p. 285)". Some of these adopted green plants popularised by herbal healers became the weapon the people used to prevent and combat COVID-19 in the area. This aligned with the DCT's emphasis on local communities' involvement in decision-making. In response to COVID-19, community elders or traditional healers might have used in-person interactions or community gatherings to teach members of the community how to recognise and treat symptoms with traditional remedies. This method of communication ensured that local knowledge was conveyed in ways that were consistent with the beliefs and traditions of the community.

Like the HBM posited, people were more inclined to adopt healthy behaviours if they believed they would benefit from them. If the Yoruba community believed that IMK could effectively manage symptoms similar to COVID-19, they would probably have kept using traditional medicines. However, they might have chosen a hybrid approach if they had found advantages in fusing old customs with contemporary medical treatments (such as vaccinations or good hygiene). Community leaders and traditional healers should have therefore highlighted the advantages of integrating indigenous knowledge with contemporary practices, like vaccination or hand washing, to increase acceptance of official health measures, while preserving the cultural significance of traditional knowledge. The findings emphasised the value of treating COVID-19-like symptoms in Southern Nigeria using IMK. A reflection of deeply rooted cultural practices and beliefs that have persisted for many generations was the widespread use of traditional remedies.

When considering healthcare from the perspective of cultural competency, this reliance on IMK made sense because familiarity and trust were factors that probably drove participants in this study to seek alternative medical interventions. Furthermore, the widespread scepticism of biomedical treatments emphasised how urgently communities and healthcare professionals needed to improve communication and trust-building. Addressing worries about the efficacy and safety of pharmaceuticals was essential to fostering acceptance of biomedical treatments. In addition to presenting evidence-based health information, public health initiatives should have accounted for regional cultures and beliefs. Additionally, they ought to promote dialogue that honours indigenous wisdom. By inference, development communication could have assisted in fusing traditional knowledge with contemporary medical procedures, guaranteeing that COVID-19 health messages (such as vaccines or hygiene) were conveyed in a manner consistent with indigenous health perspectives and experiences.

Furthermore, because participants had more faith in local healers or community leaders, they were more inclined to take vaccination campaigns or hygienic practices seriously. The importance of cultural competency in public health communications was highlighted by the persistence of cultural ideas and behaviours. By offering a thorough grasp of how IMK was disseminated and embraced in response to symptoms similar to COVID-19, both theories enhanced one another. Lastly, the enormous trust that people had in traditional healers demonstrated the relevance of integrating IMK into public health initiatives. Therefore, medical practitioners could have developed culturally-competent interventions that engaged community members and enhanced health outcomes during emergencies like COVID-19 through acknowledgment of the benefits of both systems.

DISCUSSION

The management of COVID-19-like symptoms in Southern Nigeria highlighted the significant role that indigenous medical knowledge plays in local health practices. For many years, communities in Southern Nigeria have used traditional methods to manage a range of health issues, such as herbal cures, spiritual healing, and regional food customs. The community's reaction to the COVID-19 pandemic relied heavily on these indigenous methods of healthcare, especially in places where access to official healthcare facilities was restricted. Consequently, this study uses a quick ethnographic method to comprehend IMK and the treatment of COVID-19-like symptoms in Southern Nigeria, with a particular emphasis on the Yoruba in Ibadan, Oyo State, and the Egene in Rivers State.

Given the uncertainties that surrounded the virus, as well as the gaps in biomedical interventions at the time, many people in Southern Nigeria depended on IMK and sought herbal remedies and practices to manage COVID-19-like symptoms. The DCT and the HBM together provided insights of how communities in Southern Nigeria responded to COVID-19-like symptoms using IMK. Granted, the integration of traditional medicine with contemporary medical practices, like vaccination and sanitation measures, proved to be crucial in the management of COVID-19.

However, IMK offered a culturally-appropriate and easily accessible way to manage COVID-19-related symptoms like fever, coughing, and respiratory distress. Thus, from a medical pluralism perspective, a cooperative strategy that honours and integrated traditional methods with evidence-based public health initiatives was required for effective management of the pandemic. Our findings showed that to manage symptoms similar to COVID-19, households from the clusters in Egene, Rivers State and Ibadan North, and Akinyele Local Government Areas in Oyo State, Nigeria, depended on knowledge from indigenous medicine.

We also found that although the Yoruba and Egene used different herbal remedies, both ethnic groups used steam inhalation as a method of COVID-19 control. The deliberate working under the sun reported among the Yoruba in Ibadan was one area where there was a notable divergence from the Egene. Since none of the patients in the family clusters in our investigation had a PCR test done before the indigenous medical interventions, we proceeded with caution in interpreting our findings, even though Mashego *et al*. (2021) showed the effectiveness of herbal therapies on verified COVID-19 patients. Effective communication strategies that encouraged health-seeking behaviours must be culturally appropriate and should account for local beliefs. Although the context of different infectious diseases may change, the underlying issues of indigenous knowledge, trust, and cultural significance as they affect health outcomes remained constant. Therefore, the focus of public health initiatives should have been on integrative approaches that empowered communities and leveraged IMK to improve health management and community resilience.

Family members might have lessened their exposure to medical facilities by using indigenous remedies to manage symptoms at home, which reduced the risk of virus transmission. Given the attention afforded to indigenous medicine, public health messaging ought to have reflected indigenous knowledge systems. By fusing the knowledge of contemporary public health with the wisdom of traditional practices, these integrated frameworks enabled communities to make well-informed health decisions. In conclusion, the response to COVID-19-like symptoms in the select communities in Southern Nigeria was a prime example of the importance of IMK during emergencies. By combining these practices with official health plans, communities could have established a more thorough and long-lasting health response, which would have ultimately improved public health in the areas studied.

This study acknowledged certain drawbacks, such as the researchers' potential biases that might have influenced their observations and analysis. Reflexivity and triangulation of data sources could be used in future research to overcome these limitations. The study provided useful information; however, the limited sample size might not have fully represented the range of health practices observed in all Southern Nigerian communities. This limitation affected how well the findings may be generalised to other populations. Regarding IMK and COVID-19 administration, many regions have distinct traditions and opinions. Future studies should consider several localities to accurately represent the diversity of medical pluralism in Southern Nigeria. Longitudinal studies could be carried out to reveal shifts in treatment options and the ways that local cultures were impacted by evolving health regulations.

Another significant limitation was that the herbs stated, especially in Egene, lacked botanical or English names, which made it hard for non-Egene speakers to identify with the plants. Thus, although we have pictures of some of these herbs in the appendix, future studies may focus on converting the names of these plants into English or developing scientific names for them. Again, this study did not aim to compare the effectiveness of indigenous treatments of COVID-19 against biomedicine or other infectious epidemics like Ebola, even though these were mentioned in passing. Therefore, a more thorough comparative ethnographic study is needed to ascertain the effectiveness of traditional remedies on different infectious pandemics, which we hoped, would be done in the future. The role of complementary and alternative medicine within the medical pluralist paradigm should also be the subject of future research. Despite these drawbacks, we have contributed modestly to the limited body of research on Egene's IMK and the growing body of knowledge on IMK among the Yoruba regarding COVID-19.

REFERENCES

Abramowitz, S. 2017. Epidemics (Especially Ebola). *Annual Review of Anthropology* 46(1), 421-45. https://www.annualreviews.org/doi/abs/10.1146/annurev-anthro-102116-041616

Abramowitz, S. A., McLean, K. E., McKune, S. L., Bardosh, K. L., Fallah, M., Monger, J.,Tehoungue, K., & Omidian, P. A. 2015.

Community-centered responses to Ebola in Urban Liberia: The view from below. *PLoS Neglected Tropical Diseases* 9(4), e0003706. doi:10.1371/journal.pntd.0003706

Abdullahi, A. A. 2011. Trends and challenges of traditional medicine in Africa. *African Journal of Traditional, Complement and Alternative Medicines,* 8(S), 115–123. doi: 10.4314/ajtcam. v8i5S.5.

Adeleye O.A., Femi-Oyewo, M. N., Bamiro, O. A., *et al*. 2021. Ethnomedicinal herbs in African traditional medicine with potential activity for the prevention, treatment, and management of coronavirus disease 2019. *Future Journal of Pharmaceutical Sciences,* 7(1), 72. doi: 10.1186/s43094-021-00223-5

Amachree, E. M. 2021. A contrastive analysis of the Egene and the English graphonemics. PhD dissertation, Department of English and Communication Arts, Ignatius Ajuru University of Education.

Amachree, M. R. 1982. Socio-cultural change: A case study of the marriage and family institution of the Engenni people of Rivers State of Nigeria. BSc Project, Department of Sociology, University of Ibadan.

Baldé A.M., Traoré, M.S., Baldé, M.A.,*et al*. 2016.Ethnomedical and ethnobotanical investigations on the response capacities of Guinean traditional health practioners in the management of outbreaks of infectious diseases: The case of the Ebola virus epidemic. *Journal of Ethnopharmacology,* 182, 137–149. https://doi.org/10.1016/j.jep.2016.02.021

Beauchamp, T. L., &. Childress, J. F. 2013. Principles of biomedical ethics (8th ed.). New York: Oxford University Press

Bhasin, V. 2007. Medical anthropology: A review. *Studies on Ethno-Medicine,* 1(1), 1–20. https://doi.org/10.1080/09735070.2007. 11886296

Buseh, A. G., Stevens, P. E., Bromberg, M. & Kelber, S. T.2015. The Ebola epidemic in West Africa: Challenges, opportunities, and policy priority areas. *Nursing Outlook,* 63(1), 30–40. http://dx.doi.org/10.1016/j.outlook.2014.12.013

Büyüm, A. M., Kenney, C., Koris, A., Mkumba, L., & Y. Raveendran . 2020. Decolonising global health: If not now, when? *BMJ Global Health,* 5(8), e003394. http://dx.doi.org/10.1136/bmjgh-2020-003394

Chali, B. U., Melaku, T., Berhanu, N., Mengistu, B., Milkessa, G., Mamo, G., Alemu, S. & Mulugeta, T. 2021. Traditional medicine practice in the context of COVID-19 pandemic: community claim in Jimma Zone, Oromia, Ethiopia. *Infection and Drug Resistance*, 14, 3773–3783. doi: 10.2147/IDR.S331434

Eze, P. U., Ezenkwu, C. P., & Etteh, C.C. 2021.Community informatics for sustainable management of pandemics in developing countries: A case study of COVID-19 in Nigeria.*Ethics, Medicine and Public Health,* 16. https://doi.org/10.1016/ j.jemep.2021.100632

Gbadamosi, I. T. 2020. Stay safe: Helpful herbal remedies in COVID-19 infection. *African Journal of Biomedical Research,* 23(2), 131-133.

Geissler, P. W. &Prince, R. J.2020b. Layers of epidemy: Present pasts during the first weeks of COVID-19 in western Kenya. *Centaurus,* 62(2), 248–56. doi:10.1111/1600-0498.12295

Gidado S., Oladimeji, A.M., Roberts, A. A., Nguku, P., Nwagwu, I.G., Waziri, N.E., *et al*. 2015. Public knowledge, perception and source of information on Ebola virus disease-Lagos, Nigeria. *PLoS Currents,* 8, 7.doi: 10.1371/currents.outbreaks. 0b805cac244d700a47d6a3713ef2d6db

Goma F., Prashar,l., Kalungia, C. A.,Bwalya, A.,Hamachila, A., Mutati,R. K.,Zingani,E., Mwila, C. &Musoke, P.2016. Indigenous knowledge systems for the treatment of hypertension in Lusaka, Zambia: Perceptions, knowledge and practice. *Medical Journal of Zambia*, 43 (3), 156 –166.

Gumbo, M. T. & Gaotlhobogwe, M. 2021. African indigenous knowledge and practices to combat COVID-19 pandemic.*Journal of Management, Spirituality & Religion,* 18(5), 462-481.

Gumucio Dagron, A. 2001. Making waves: Stories of participatory communication for socialchange. The Rockefeller Foundation.

Hochbaum, G., Rosenstock, I., &Kegels, S. 1952. Health belief model**.** Washington, DC: U.S. Public Health Service.

Ilesanmi, O. S. & Afolabi, A. A. 2021. Knowledge of community members on COVID-19 in Ibadan, Oyo State. *Pan African Medical Journal,* 39(17). doi: 10.11604/pamj.2021.39.17.24715

Ileyemi, M. 2021. COVID-19: Rivers leads as Nigeria records two deaths, 1,139 new cases Thursday. Premium Times, December 31, accessed February 13, 2023. https://www.premiumtimesng.com/news/top-news/503297-covid-19-rivers-leads-as-nigeria-records-two-deaths-1139-new-cases-thursday.html?tztc=1

Ilo, P. I. 2012. Acquisition, preservation and accessibility of indigenous knowledge in academic libraries in Nigeria: The place of ICT.*Ikenga International Journal of Institute of African Studies,* 14 (1), 468–487.

Kamara, F. M., Mokuwa, E. & Richards, P.2020. How villagers in central Sierra Leone understand infection risks under threat of Covid19. *PLoS ONE,* 15(6), e0235108. https://journals.plos.org/plosone/article?id=10.1371/journal.pone. 0235108

Kapepula, P. M., Kabengele, J. K., Kingombe, M., Van Bambeke, F., Tulkens, P. M., Kishabongo, A. S ... & Nachega, J. B.2020. Artemisia spp. derivatives for COVID-19 treatment: Anecdotal use, political hype, treatment potential, challenges, and road map to randomized clinical trials. *The American Journal of Tropical Medicine and Hygiene,* 103(3), 960-964.

Koch, S. & Pong, W. 2020. First up for COVID-19: Nearly 30 clinical readouts before end of April. [BioCentury, March 14],https://www.biocentury.com/article/304658/nearly-30-trials-for-covid-19-could-start-to-yield-data-in-the-next-couple-of-months

Kutalek R., Wang, S., Fallah, M., Wesseh,C. S. & Gilbert, J.2015. Ebola interventions: Listen to communities. *The Lancet Global Health* doi: 10.1016/S2214-109X(15)70010-0

Li, X., Zhang, X., Ding, J., Xu, Y., Wei, D., Tian, Y., Chen, W., Huang, J., Wen, T., & Li, S. 2014. Comparison between Chinese herbal medicines and conventional therapy in the treatment of severe hand, foot, and mouth disease: A randomized controlled trial.*Evidence-Based Complementary and Alternative Medicine,* 140764. http://dx.doi.org/10.1155/2014/140764.

Liamputtong, P. 2007. *Researching the vulnerable*. Sage PublicationsLtd. https://doi.org/10.4135/9781849209861

MacGregor, H., Leach, M., Akello, G., Babawo, L. S., Baluku, M., Desclaux, A., Grant, C., *et al*. 2022. Negotiating intersecting precarities: COVID-19, pandemic preparedness and response in Africa. *Medical Anthropology,* 41 (1), 19–33, doi: 10.1080/01459740.2021.2015591

Madhubhashini, G. T. 2021. The role of traditional forms of communication in the context of COVID-19 in rural Sri Lanka. *Asian Journal of Applied Communication,* 11(2), 61–72.

Manderson, L. & Levine, S. 2020. COVID-19, risk, fear, and fall-out. *Medical Anthropology,* 39, (5), 367–370 https://doi.org/10.1080/01459740.2020.1746301

Manderson, L. & Levine, S.2021 Militarising the pandemic: Lockdown in South Africa. In L. Manderson, N. J. Burke & A. Wahlberg (Eds), *Viral Loads: Anthropologies of urgency in the time of COVID-19* (pp. 47-66). London: UCL Press.

Mashego, S. L., Maditsi,M. E.,& Bhuda, M. T.2021. A response to COVID-19: perspectives from African indigenous knowledge systems. Gender & Behaviour 19(1), 17247-17260.

Mathpati, M. M., Payyappallimana, U., Shankar, D. & Porter, J. D. H. 2022. Population self-reliance in health' and COVID-19: The need for a 4th tier in the health system. *Journal of Ayurveda and Integrative Medicine,* 13(1), 100354.

Medical Research Council. 2008. National Reference Centre for African Traditional Medicine (NRCTM): A South African Model. Cape Town: Medical Research Council.

Mirzaie, A., Halaji, M., Dehkordi, F. S., Ranjbar, R. & Noorbazargan, H. 2020 A narrative literature review on traditional medicine options for treatment of corona virus disease 2019 (COVID-19). *Complementary Therapies in Clinical Practice*. 40, 101214

Moeti, M. 2020. Social, environmental factors seen behind Africa's low COVID-19 cases.WHO Africa, accessed November 16, 2020. https://www.afro.who.int/news/social-environmental-factors-seen-behind-africas-low-covid-19-cases

Muhammad, F. 2020. COVID-19 pandemic: The role of traditional medicine. *International Journal of Infection,* 7(3), e107090. doi: https://doi.org/10.5812/iji.107090

Nigeria Centre for Disease Control. 2020. COVID-19. https://ncdc.gov.ng/ncdc.gov.ng/diseases/factsheet/71

Ndiaye, S. M., Quick, L., Sanda, O. &Niandou, S. 2003. The value of community-participation in disease surveillance: A case study of Niger. *Health Promotion International,* 18(2), 89e98.

Ngulube, I. E. 2011. The Egene orthography. In O-M. Ndimele (Ed.), Orthographies of Nigerian languages. (Manual x. pp. 22-35). Nigerian Educational and Research Development Council.

Olaopa, O. R. 2020. Harnessing African indigenous knowledge for managing the COVID-19 pandemic in Africa. *International Journal of Technological Learning, Innovation and Development,* 12 (4), 267–290.

Orisakwe O. E., Orish, C.N. & Nwanaforo, E. O. 2020. Coronavirus disease (COVID-19) and Africa: Acclaimed home remedies. Scientific African 10: e00620

Parker, M., Hanson, T. M., Vandi, A., Babawo, L. S., & Allen, T. *et al*. 2019. Ebola and public authority: Saving loved ones in Sierra Leone. *Medical Anthropology*, 38(5), 440–454. https://doi.org/10.1080/01459740.2019.1609472

Power T., Wilson, D., Best, O., Brockie, T., Bearskin, L. B., Millender, E. & Lowe, J. 2020. COVID-19 and Indigenous peoples: An imperative for action. *Journal of Clinical Nursing*, 29(15–16), 2737–2741. https://doi.org/10.1111/jocn.15320

Quebral, N. C. 2006. Development communication in the agricultural context (1971, with a new foreword) 1. *Asian Journal of Communication,* 16(1), 100107. https://doi.org/10.1080/01292980500467657

Rankoana, S. A., Nel, K. A., Mothibi, K., Mothiba, T. M., Mamogobo, P. & Setwaba, M. 2015. The use of indigenous knowledge in primary health care: A case study of Makanye Community in Limpopo Province, South Africa. (Supplement 1, 2), 272–278.

Reuben, R. C., Danladi, M. M. A., Saleh, D. A., & Ejembi, P. E. 2020. Knowledge, attitudes and practices towards COVID-19: An epidemiological survey in North-Central Nigeria. *Journal of Community Health*, https://doi.org/10.1007/s10900-020-00881-1

Richards, P. 2016. Ebola: How a people's science helped end an epidemic. London: Zed Books.

Sams, K., Desclaux, A., Anoko, J., Akindès, F., Egrot, M., Sow, K., Taverne, B., Bila, B., Cros, M., Keïta-Diop, M., Fribault, M., & Wilkinson, A. 2017. 'From Ebola to plague and beyond: How can anthropologists best engage past experience to prepare for new epidemics?' *Society for Cultural Anthropology*, December 7. Retrieved from https://culanth.org/fieldsights/from-ebola-to-plague-and-beyond-how-can-anthropologists-best-engage-past-experience-to-prepare-for-new-epidemics

Sangaramoorthy, T., & Kroeger, K.,2020. Rapid ethnographic assessments: A practical approach and toolkit for collaborative community research. London: Routledge.

Servaes, J. 1999.Communication for development. One world, multiple cultures. Cresskill NJ: Hampton Press. doi:10.13140/RG.2.1.2113.7120

Servaes, J., & Malikhao, P., 2008. Development communication approaches in an international perspective. In J. Servaes (Ed.), Communication for development and social change (pp. 158–179). New Delhi, India: Sage.

Shankar, A., Dubey, A., Saini, D., & Prasad, C. P. 2020. Role of Complementary and alternative medicine in prevention and treatment of COVID-19: An overhyped hope. *Chinese Journal of Integrative Medicine,* 26(8), 565-567. doi: 10.1007/s11655-020-2851-y.

Shumba, S., Nyangari, E. & Mpofu, M.2022 African indigenous knowledge and the management of COVID-19 pandemic. In D. Masaka (Ed.), Knowledge production and the search for epistemic liberation in Africa, (pp. 179–199). Springer, Cham. https://doi.org/10.1007/978-3-031-07965-8_13

Tamuno I. 2011 Traditional medicine for HIV infected patients in antiretroviral therapy in a tertiary hospital in Kano, northwest Nigeria. *Asian Pacific Journal of Tropical Medicine,* 152-5.

Tusasiirwe, S., Musinguzi, L. K., & Kukundakwe, B. 2020. Re-imagining indigenous knowledge in Post-COVID-19 social work in Uganda. In R. Mehta, S. Thakur & D. Chakraborty (Eds.), Pandemic of perspectives: Creative re-imaginings (1st ed., pp. 166-177).U. K.: Routledge. 10.4324/9781003320524-26

Usman, A. B., Ayinde, O., Akinyode, A., Gbolahan, A., & Bello, B. 2020. Epidemiology of coronavirus disease 2019 (COVID-19) outbreak case in Oyo State, South West Nigeria, March-April 2020. *Pan African Medical Journal,* 35(Suppl 2), 88. doi: 10.11604/pamj.supp.2020.35.2.23832

Wahlberg, A., Burke, N. J., & Manderson, L. 2021. Introduction: Stratified livability and pandemic effects. In L. Manderson, N. J. Burke & A.

Wahlberg (Eds), Viral Loads: Anthropologies of urgency in the time of COVID-19, (pp.1–23). London: UCL Press.

World Health Organization. 2002. WHO traditional medicine strategy 2002–2005. https://iris.who.int/bitstream/handle/10665/67163/WHO_EDM_TRM_2002.1_eng.pdf?sequence=1

World Health Organization. 2020. About COVID-19. Accessed September 21, 2020. https://www.emro.who.int/health-topics/corona-virus/about-covid-19.html

Yimer, G., Ekuadzi, E., Fasinu, P., de Melo, A.C., & Pillai,G.C. 2021. Traditional medicines for COVID-19: Perspectives from clinical pharmacologists. *British Journal of Clinical Pharmacology,* 87(9), 3455-3458. https://doi.org/10.1111/bcp.14981

Zewdu, S. 2020. Africa: An unsung continent in the fight against COVID-19. Premium Times, July 16, accessed September 21, 2020. https://opinion.premiumtimesng.com/2020/06/24/africa-an-unsung-%E2%80%AFcontinent-in-the-fight-against-%E2%80%AFcovid-19-by-solomon-zewdu/

****