

ROLE OF SOCIAL MEDIA AND ARTIFICIAL INTELLIGENCE IN ENHANCING HEALTHCARE ACCESS IN BENUE STATE, NIGERIA

By

Elizabeth Titilayo Aduloju

Department of Pastoral/Communication Studies,
Catholic Institute of West Africa,
Port Harcourt, River State, Nigeria.
Email: t.aduloju@ciwa.edu.ng

and

Budzee Appolonia Dzelabvem

Department of Pastoral/Communication Studies,
Catholic Institute of West Africa,
Port Harcourt, River State, Nigeria.
Email: appobudze@gmail.com

Abstract

Communication media has long played a crucial role in the facilitation of various dimensions of community development. The emergence of social media and artificial intelligence (AI) has significantly enhanced these functions by introducing instantaneity and interactivity. Recognising healthcare delivery as a fundamental component of sustainable development, the United Nations ranks it fifth among the 17 Sustainable Development Goals. Thus, this study explores the potential of social media and AI in improving healthcare accessibility for the population of

Benue State, where insecurity severely disrupts socio-economic activities and limits access to medical services. The persistent threat to safety, particularly in rural areas, instils fear and disrupts movements, preventing individuals from seeking medical care or obtaining reliable health information. The absence of timely intervention exacerbates health risks and loss. Grounded in the diffusion of innovation theory, this paper seeks to identify existing communication channels between healthcare providers and communities and assess the utilisation of digital media tools among them. The study employs a survey designed with a questionnaire and observation as instruments for data collection. The quantitative and qualitative data analyses methods are employed. Findings reveal that the use of digital medical devices by health facilities is quite minimal due to media knowledge deficiency by healthcare personnel and shortage of resources. The few available tools are not necessarily leveraged for healthcare communication to improve access. It therefore recommends, among others, strategies for optimising digital communication technologies to enhance healthcare access, such as the provision of accessible emergency phone numbers and media literacy.

Keywords: Artificial Intelligence in Healthcare Conflict, New Media, Social Media in health, geopolitical conflicts and health.

Introduction

As new media continues to take centre stage in the 21st century, every profession feels compelled to explore ways of maximising the outburst of information and communication technologies for effective performance, yet without compromising the professional ethics and standards. In Sub-Saharan Africa, many communities have passed the stage of resistance to the new communication

technologies and are fast engaging with them as their usefulness becomes evident, their growth unstoppable and their influence on the human culture uncontrollable. The healthcare stakeholders should either key into it or face the exclusion. In the urban areas of Nigeria, sporadic innovations in digital communication in healthcare are ongoing, such as “cloud computing, artificial intelligence (AI), machine learning (ML), blockchain, digitally mediated diagnostics and treatment, telehealth, mobile health (mHealth), eHealth, algorithmic medicine, and consumer-facing mHealth applications that are now commonly employed in self-management healthcare, and biomedical science”¹. Artificial intelligence is enabling diagnosis by sensors and robotic interventions such as surgery. While Bill Gates predicts healthcare professionals as one of those to be replaced by AI, most of rural Sub-Saharan Africa lacks healthcare access due to challenges of finance, distance, shortages in medication, infrastructures and health personnel². However, Governor Hyacinth Alia of Benue State, Nigeria, launched a health management information system for the State, involving 30 health facilities at the pilot face, aiming to scale up health information management as the starting point for integrating technology into healthcare³. The Benue State in northeastern Nigeria is home to approximately 6.62 million inhabitants, with a growth rate of 2.5 percent⁴. Most of the area (81.9%) is rural, with Makurdi being the capital. It is referred to as the breadbasket of the nation, as most people are involved in agriculture on their fertile lands. Yet, farming has become riskier due to the Fulani intrusion and raids. Their cattle, driven into farms, cause enormous destruction and starvation upon the people⁵. Additionally, the Nigerian National Human Right Commission records 6900 deaths and over 400,000

displacements from 2024 to 2025⁶. Government intervention is neither decisive nor assured⁷ and the local youth who mobilise for the protection of their villages are comparatively fragile. In this context of unrest, nothing is stable. Mobile health teams that used to penetrate into the villages with health campaigns have become too risky for the health professionals, as they have been victims of harassment, kidnapping and killing⁸. On the other hand, the population cannot travel freely and at will to access health services, especially in emergency cases. If thousands of Nigerians die monthly from treatable diseases⁹, insecurity is part of the causes of the rise in mortality rate. Provision of medication to remote health facilities faces the same challenges to the extent that remote health facilities lack basic medication and vaccines. The healthcare of large populations is left in the hands of chemists who are more commercial agents than professionals. Our research aims to explore the extent to which social media and AI, which are insensitive to distance, have been and can be leveraged by healthcare professionals to step up healthcare access in Benue State.

Statement of Problem

Healthcare access constitutes one of the basic human rights¹⁰, reinforced by the third Sustainable Development Goal in January 2016. Without reliable health care, human life, which is susceptible to diseases, cannot be guaranteed. Insecurity in Benue State that shows itself in the frequent raids of villages, displacement of persons, destruction of property, kidnapping for ransom, killing of people and destabilisation of socio-economic activities especially in the remote areas. This scenario ignites fear and makes travelling extremely risky for both the population and the health teams. However, not everyone has evacuated the villages despite the threats. This state of affairs destabilises

the entire social and economic fabric of the Benue community. It mitigates entrepreneurial motivation to invest in healthcare or in any other business. Renown for its engagement in agricultural activities, the population does not go farming in extensive villages fear of being kidnapped or killed. Children in such remote village do not have access to education as qualified teachers decline from serving there.

Healthcare facilities like St. Monica Hospital, Adikpo and St. John Hospital, Gboko that regularly visited remote health facilities to reinforce the capacity of the staff and offer specialized services like gynaecology, eye care, urology, etc. to the village population can no longer undertake such missions, to the detriment of the population. The village populations, on their part, cannot travel freely for timely medical attention as the attackers usually invade by ambush passengers. The transportation of medication, vaccines to the village health posts faces the same hassles. The villagers also lack mobile network coverage and electricity. Such a scenario prevents the achievement of the third Sustainable Development Goal of universal health coverage among the marginalized Benue State population. If the social media and AI have been helpful in other conflict-laden and limited-resource regions, it could equally increase healthcare access to the disenfranchised populations of the Benue.

Research Objectives

The research objectives were:

1. To examine the communication strategies employed in interactions between health facilities and local populations.
2. To assess the role of social media in enhancing access to healthcare services.

3. To explore the challenges associated with deploying social media and artificial intelligence (AI) for healthcare delivery in contexts of insecurity.
4. To develop collaborative communication strategies that the health professionals and communities can adopt to improve healthcare accessibility in remote and insecure regions.

Research Questions

1. What communication strategies are currently utilized by health facilities in engaging with citizens?
2. How does social media influence healthcare access in remote and underserved communities?
3. What are the challenges that hinder effective health communication in insecure and geographically isolated areas?
4. What are the collaborative communication strategies can be developed by health institutions and communities to expand healthcare coverage in remote and insecure regions?

Definition of terms

Social Media

Kaplan and Haenlein¹¹ describe social media as a collection of internet and web 2.0 technologies used for communication. Interactivity, instantaneity, user-generated content and digitality are the characteristics of social media. They are interactive technologies that enhance the creation, sharing and aggregation of digital content among virtual networks and virtual communities¹². Within the past ten years, social media has surged in Nigeria, enhancing human interactions and professional effectiveness in all fields. The commonest

social media platforms in Nigeria are Facebook, YouTube, WhatsApp, Instagram, TikTok, etc. This paper is interested in the use of this category of media as well as AI in improving healthcare access to the digitally disadvantaged villages in Benue State ¹³.

Artificial Intelligence

In 1956, John McCarthy organised a summer workshop at Dartmouth University to explore the problem of “Artificial Intelligence”, which he defined as “that of making a machine behave in ways that would be called intelligent if a human were so behaving”¹⁴. Artificial intelligence is the construction of technology to imitate or automate the logic of the human mind and creativity. Fernandez et al.¹⁵ highlight that AI's influence is widespread, affecting diverse aspects of human life, including “interpersonal relationships, education, work, art, healthcare, law, warfare, and international relations” (Art. 4). Artificial intelligence is built into the social media application but also stand alone in applications such as chatbots, digital assistants, facial recognition technology, automation, identification of geographical locations, and translation, which serve critical roles in sectors like office management, finance, healthcare, translation, statistics, marketing, and even religious communication. Machine-generated information refers to the “automated function wherein machines consult datasets to generate insights autonomously”¹⁶ This process relies on complex information processes:

Machine Learning – where programmers train computer programs using sample data to recognise patterns based on algorithms. Unlike logical deduction, machine learning primarily relies on statistical inference. An example is a temperature-sensitive alarm system that activates when a predefined threshold is reached.

Neural Networks – These computational models are designed to emulate the structure and function of neurones in the human brain, enabling advanced pattern recognition and decision-making capabilities.

Natural Language Processing (NLP) – This technology equips machines with the ability to comprehend spoken language, analyse textual content, and generate human-like responses.

These AI methods and processes have simulated healthcare processes and produced facilities such as:

Telemedicine for remote consultations, reducing the need for physical visits; mobile health applications empower users to track health behaviours and access medical information, promoting preventive care and self-management. Wearable devices provide real-time health monitoring, fostering proactive patient engagement; digital health technologies (DHTs) facilitate health worker training, improve supervision, and enhance communication among healthcare teams; automation in medical documentation and information exchange further streamlines processes, reducing administrative burdens and improving institutional efficiency¹⁷.

These devices, already operation in Nigeria and elsewhere, can be utilised in the remote areas in Benue State to make healthcare more accessible to the population, compelled to vagabondage.

Healthcare Access

Healthcare access refers to the level at which the population is able to reach and use health services. Health access considers matrixes like distance, perception,

affordability and functionality. It is one of the indicators for measuring the strength of a healthcare system. The guarantee of health care access is incumbent both on the service provider and on the population. Health facilities are unevenly distributed in Nigeria, with the best ones converging in the urban areas. If 81% of Benue State is rural¹⁸, then the majority of the population lacks basic health services, falling below the expectation of the UN's sustainable development goal 3, which aims at enabling everyone, irrespective of their location, economic or social status, to enjoy basic health services¹⁹.

Literature review

Insecurity as a great challenge to universal health coverage

Moemeka's assertion that peace is the bedrock for integral and sustainable development implies that insecurity is the primary antagonist and antithesis for development.²⁰ Dawn affirms that without a peaceful environment, sustainable development cannot be envisaged.²¹ Insecurity makes investment triply risky because, apart from the market forces that can mitigate the growth of a business, insecurity negatively affects the purchasing power of the people and can destroy the business physically. If healthcare is considered a business from the managerial point of view, it faces the same risk in an insecure environment²². Universal health coverage is the ability to make healthcare accessible to everyone irrespective of their socio-economic situation or geographical location²³. Discussions regarding the challenges facing universal health coverage, which constitutes the third sustainable development goal, are multiple. They border around health financing, shortage of health personnel, shortage of health facilities and medications and insecurity. When the

population is unable to access the health facility at any point in time for fear of harassment by armed robbers or raiders; when health personnel decline from working in certain environments because they fear being harassed and when medical supplies or construction of health facilities cannot take place in certain areas for security concerns, then insecurity is mitigating the attainment of the enviable dream of universal health coverage. This prevailing situation in Benue State could be mitigated by digital communication tools.

Polemics of Healthcare ethics and the use of modern technologies

Technological advancement stimulates debate in every circle or profession regarding the rightness or wrongness of its applicability as well as methods to mitigate the challenges²⁴. While some are quick in the integration of the AI tools, others have been sceptical. Korkmaz and Oke are unanimous about the benefits of digital health technologies; such as, accuracy in health diagnoses and analyses of datasets to forecast disease trends and for assistance in treatment operations; however, the concerns of its ability to discriminate on socio-economic status, information leakages, erosion of personnel skills are causes for concern²⁵. Healthcare ethics has hardly reached a level of establishing and upholding universally acceptable norms, as there is still polarisation about issues such as euthanasia, abortion, war, capital punishment, stem cells and a whole lot of aspects of reproductive health. The Catholic Church, with its influential moral voice in the world, has been engaged in discussions regarding ethical considerations of technology and healthcare. Antiqua et Novo²⁶, for example, acknowledges that AI technologies were seriously impactful and epoch-breaking on all aspects

of human life, including health, whereby health professionals had to respect their divine roles.

As participants in God's healing work, healthcare professionals have the vocation and responsibility to be 'guardians and servants of human life'. Because of this, the healthcare profession carries an 'intrinsic and undeniable ethical dimension', recognized by the Hippocratic Oath, which obliges physicians and healthcare professionals to commit themselves to having 'absolute respect for human life and its sacredness'... and 'who reject the creation of a society of exclusion and act instead as neighbours, lifting up and rehabilitating the fallen for the sake of the common good'".

This document hails AI for its potential contribution to the “loving closeness” that healthcare professionals by “assisting the diagnostic work of healthcare providers, facilitating relationships between patients and medical staff, offering new treatment options, and expanding access to quality care also for those who are isolated or marginalised” (p. 12). The same authority, however, raises concerns if AI will replace the relationship between patients and healthcare professions, mitigate solidarity with the sick or intensify loneliness that often accompanies the sick. According to the Vatican, decisions regarding patients must remain the responsibility of the human person and not be delegated to AI. Again, using AI to determine the destination of treatment on an economic basis is an expression of the “technocratic paradigm” that must be rejected. The use of new technologies, including artificial intelligence in healthcare, with its benefits and shortcomings, should therefore be applied with care based on the fundamental human rights and the moral law. The

developers and programmers of digital health technologies require the voice of ethics and of healthcare professionals to design technologies that are appropriate and respect the socio-cultural beliefs and practices of the people in Benue.²⁷

Empirical Considerations

Health access for the population entails a whole range of elements, such as qualified health personnel to deliver the services, medical supplies and equipment, infrastructure and information, quality of service and affordability. Shaker & Otto²⁸ compile a report for the World Bank's programme eTransform Africa, which portrays ICTs as a game changer in healthcare in the areas of e-learning and telemedicine, data exchange and analysis, supply chain management, public health promotion and health financing in low-resourced Africa South of the Sahara.

Oke and Sibomana²⁹ conducted analytical studies of 230 articles that have focused on various facets of digital health technologies, published from 2010 to 2024. The study confirmed the increasing engagement of the technologies in healthcare, such as telehealth, mHealth, eHealth, algorithmic medicine, mobile applications, cloud computing, AI, ML, blockchain, medical devices, and digitally mediated diagnostics and treatment. The comprehensive study found out that “the widespread adoption of mHealth, telemedicine, and digital health devices has the potential to address critical gaps in healthcare access, particularly in underserved rural areas... while digital health tools such as portable diagnostic devices could transform healthcare delivery in resource-limited settings”³⁰.

Egwudo et al ³¹ discovered through scoping review of 31 studies that “digital health technologies enhanced

treatment adherence, healthcare utilization, community engagement,... better health outcomes, and improved healthcare delivery in underserved and remote areas...". The digital tools in question included mobile health applications and electronic health records. Jeilani & Hussein³² conducted a similar study in 2025 in Mogadishu, Somalia, which discovered that digital health technologies improved health personnel performance and reduced workload. The concern about the erosion of skills and performance of health personnel due to over-dependence on AI is further echoed by Korkmaz³³.

Ndayishimiye, Lopes and Middleton³⁴ confirm the impactful role played by digital health technologies in addressing geographical barriers, ensuring healthcare access for individuals in remote and underserved areas. According to the study, during the COVID-19 pandemic, teleconsultations, e-diagnosis, and surveillance systems demonstrated the transformative potential of DHTs in primary healthcare.

Theoretical Framework

The Diffusion of Innovation Theory, created by the social scientist, Everett M. Rogers³⁵, explains how new ideas or inventions become popular in a society. The theory holds that people accept innovations based on their perception, education, economic viability and its usability. Katz et al in Ginikanwa et al³⁶, argue that for innovation to diffuse into common usage, they are psychologically processed through awareness, interest, evaluation, and trial before adaptation. Following on the same line of thought, Moemeka³⁷ upholds that sustainable development that involves social change undergoes the stages of judgement of its relative advantage, compatibility, triability, simplification, and communicability. The benefits of digital health technologies and AI have fast penetrated into

healthcare operations due to their accuracy of analyses, efficiency in diagnoses, assistance in treatment, and speed in big data management to enhanced informed decision-making. Researchers focus on the challenges of digital communication usage from the perspective of finding solutions and buying into the offers. The major reason for the low adoption of AI and digital communication in Africa is media illiteracy and limited resources for the acquisition of the technologies.

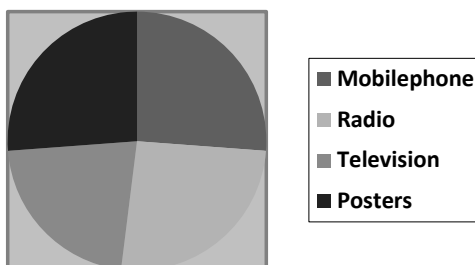
Methodology

The study employed the use of survey research design with questionnaire as instrument of data collection. The questionnaire was distributed to 110 personnel in three health facilities in the Benue State; namely, St. Monica Hospital, Adikpo; St. John Hospital, Gboko and Comprehensive Primary Healthcare, Gboko East. The selection of the health facilities was based on the nonprobabilist purposive sampling, as the health facilities in Adikpo and Gboko were available for data collection and have extensive experiences with outreach facilities in the remote areas. The selection of respondents was based on stratified random sampling ensuring a representation from the professional departments of nursing, laboratory, pharmacy, and medical doctors. These also assume the role of healthcare sensitisers during community outreach to the remote villages. The instruments were tested by content validity. The quantitative and qualitative approaches was used in analysing the responses.

Data Presentation and Analysis

A total of 110 healthcare professionals from three health facilities in the Benue State were selected through stratified random sampling to respond to the survey.

1. Communication strategies employed between the health facilities and the population

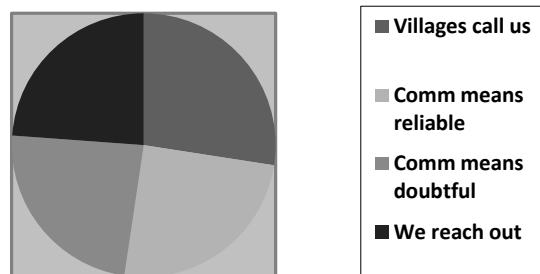


The essence of this question was to examine personnel's consciousness of the means of communication employed by facility in reaching out to their health area and also to

find out if the population initiates media contacts with the health facility. In fact, 76% agreed that persons from remote villages reached out to them for their health needs. While 69% considered their means of communication with the villagers as reliable, 66% wasn't sure if this method was reliable. In naming some specific means of communication between the health facility and the population, 66% agreed they communicate with the population by mobile telephone, 65.5% identified radio, 55.45% by television and 66% by posters. However, a significantly big number disagree with the use of mobile phones (30%), radio (30.90%), television (39%) and posters (25.45%).

Figure 1. Survey on communication means between the health facility and the villagers

2. Usage of social media and AI communication in increasing rural community's access to healthcare



Accessing the role played by social media in improving healthcare access revealed a very low utilization. More than half of the responded

62.7% disagreed the usage of social media by the population to reach them while 55.5% agree they are contacted. Up to 53.6% disagreed to using the social media for the barest health communication activity like sensitization. With regards to online consultation, 50% denied using it while the other half said they use it.

Figure 2: Media tools used by facilities for outreach communication

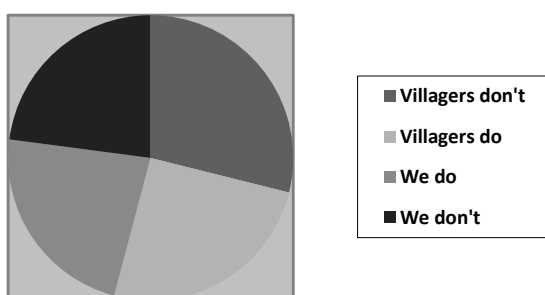


Figure 3: Usage of social media between villagers and facilities

3. How insecurity and other factors challenge health communication and access

This question was intended to verify if insecurity, poor road network and other factors pose a challenge to healthcare access, proposed to be resolved by social media and AI. In fact, 52% acknowledge they sustain the struggle for outreach to the remote villages physically despite these obstacles while 43% find the difficulty unsurmountable. Similarly, 55% of the health personnel are concerned about the poor healthcare access in the remote villages. A whopping 63.6% have difficulties procuring data for digital healthcare communication with the villagers. Significantly, 80.9% of the health personnel indicated they didn't know how to use the social media for health communication. Basically, the villagers who are able, travel physically to the accessible health facilities while a good number remains in the village.

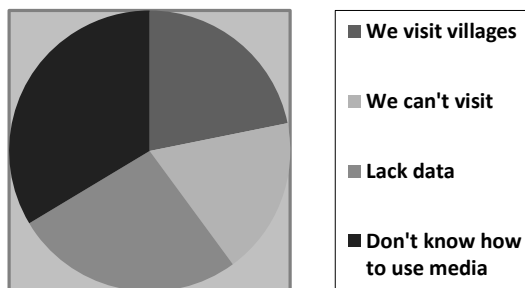


Figure 4: Insecurity and other challenges to social media communication in healthcare

RQ4: Suggestions for a joint communication strategy by health facilities and communities to improve health access in the remote, insecure villages

An open-ended question requesting for suggestion of a joint communication strategy to be undertaken by health personnel and the communities. The responses have been grouped into categories as shown below:

Category	Suggestion on Media or Channels or action	Number	Percentage
Mass Media Channels	Social media applications like WhatsApp and Tiktok, establish an emergency hotline in each facility	19	17.3
	Tele medicines	3	2.7
	AI for data collection, feedback: mobile health applications, preservation of health	9	8.2

	records, seek health advice, map out disease outbreak, translation, etc		
	Radio	14	12.7
	Posters, billboards and flyers	20	18.2
Education and information management	Digital health literacy for health personnel and the population, create a central data bank to be accessed by health personnel	10	9.1
Social communication	Campaigns in groups, rallies, physical visits	14	12.7
	Community-based networks (empowerme	16	14.5

	nt of traditional rulers, community health workers, etc)		
Infrastructural solutions	Engage with solar-powered tools, advocacy for improved network coverage,	4	3.6
	Ensure good road network	10	9.1
Security related solutions	Dialogue with armed groups, train staff on security measures, use peacebuilding to solve the unrest, engage security official to escort health personnel on field trips	8	7.3

Discussion of Findings

Even though the researchers consulted^{38 39 40} observe that Nigeria has leveraged numerous forms of digital communication and AI to extend healthcare to underserved populations, this reality is not evident in Benue from our findings. The launching of the pioneer healthcare information system in 2024 by the Governor of Benue State would have been a step in the right direction that should set the ball rolling⁴¹. However, the usage of digital communication tools by the healthcare professionals and the villages is mainly for telephone calls. If the health personnel have challenges in the procurement of data and do not know exactly how to apply the social media to improve healthcare access, then a great part of the Benue State are on the victim side of the digital divide⁴². Each facility and health governing structures need to set up a systematic and sustainable development plan on the integration of digital media and AI in healthcare management.

The awareness of the possibilities of social media and AI among the health personnel is quite low as only 17.2% suggested the use of social media, 2.7% mentioned telemedicines and 8.2% mentioned the use of AI. However, their awareness (14.5%) of the need to engage with community-based approach to improve health access is laudable since Oopen⁴³ upholds that sustainable development must be participatory, engaging local stakeholders and tailored to socio-cultural reality⁴⁴. The relatability is one of the favourable conditions for the diffusion of innovation⁴⁵. Digital media and AI tools can simulate other tools already in use (18.2%). Lack of funding remains a grave barrier to the usage of digital media to improve healthcare access for the remote populations. In fact, if the data to broadcast health

campaigns is a challenge, the mobilisation of funds for investment in digital communication and IA tools in the rural areas may sound unattainable. Staff inaptitude (80.9%) in the use of these tools is equally highlighted as a concern by Egwundo et al⁴⁶ whose study equally suggested gender-and-cultural sensitive applications, not reflected by our respondents.

Conclusion

The possibility of using digital communication technologies to enhance healthcare access for the population logged in remote and conflict-ridden areas is relieving as attested by the researchers reviewed. However, the multi-faceted development challenges in the Benue State that is 81% rural need to be handled strategically by healthcare stakeholders with their various competencies. The building of synergy to streamline best practice, study possibilities, carry out advocacy for general issues like stable power supply⁴⁷, increased network coverage as well as the provision of basic digital communication and AI devices and infrastructures for surveillance, diagnoses and treatment. Healthcare stakeholders would need to utilize the development models that start from small and attainable steps in sustainable growth, leveraging AI and digital communication technologies to upscale healthcare access in remote areas.

Recommendations

Healthcare professionals to take initiatives in capacity building and media literacy to exploit social media applications and the basic use of electronic medical devices.

Healthcare providers to form synergies to advocate for infrastructural development such as connectivity and power supply on which digitalization is hinged.

Health facilities to form networks to brainstorm for creative ways of leveraging the basic digital devices to improve health access for the population within their circumference.

Policy makers, software developers and AI constructors to engage with health care professionals in designing innovative, relevant and culturally sensitive applications to improve healthcare access in resource-limited areas⁴⁸.

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