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## Revolutionizing community health literacy: The power of digital health tools in rural areas of the US and Africa

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### Abstract

Access to quality healthcare remains a challenge in rural areas of both the United States and Africa, where limited resources and infrastructure hinder the delivery of essential services. This review explores the role of digital health tools in improving community health literacy and healthcare outcomes in these underserved regions. By leveraging digital technologies such as mobile applications, telemedicine, and educational platforms, communities can access valuable health information, connect with healthcare providers remotely, and receive timely support for managing their health. In rural areas of the United States, digital health tools have the potential to bridge the gap between patients and healthcare providers, especially for those living in remote areas with limited access to healthcare facilities. These tools enable individuals to monitor their health conditions, access educational resources, and receive virtual consultations, improving their overall health literacy and empowering them to take control of their health. Similarly, in rural Africa, where healthcare infrastructure is often lacking, digital health tools offer a lifeline for communities to access essential health services. Mobile health applications provide valuable information on preventive care, disease management, and nutrition, helping individuals make informed decisions about their health. Telemedicine services connect patients with healthcare professionals, enabling remote consultations and reducing the need for travel to distant healthcare facilities. However, the widespread adoption of digital health tools in rural areas faces several challenges, including limited internet connectivity, low digital literacy rates, and cultural barriers. Addressing these challenges requires a multi-faceted approach, including improving internet infrastructure, providing digital literacy training, and adapting digital health tools to meet the cultural and linguistic needs of local communities. In conclusion, digital health tools have the potential to revolutionize community health literacy in rural areas of the United States and Africa. By overcoming barriers to access and providing tailored health information and services, these tools can empower individuals to make informed decisions about their health, ultimately leading to improved health outcomes and well-being in underserved communities.

**Keywords:** Revolutionizing; Digital Tools; Rural Areas; Power; Community Health Literacy

### 1. Introduction

Access to quality healthcare remains a critical challenge in rural areas, both in the United States and Africa. Limited access to healthcare facilities, a lack of healthcare infrastructure, and a shortage of healthcare professionals contribute to disparities in healthcare outcomes between rural and urban populations (Abass, et. al., 2024, Eruaga, Bature & Itua, 2024, Olatoye, et. al., 2009). In these underserved regions, improving health literacy—the ability to obtain, process, and understand basic health information—is key to empowering individuals to make informed decisions about their health.

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Digital health tools offer a promising solution to bridge this gap in health literacy. From mobile applications that provide health education and information to telemedicine platforms that enable remote consultations, these tools have the potential to revolutionize healthcare delivery in rural communities (Abass, et. al., 2024, Gannon, et. al., 2023, Phillips, et. al., 2018). This paper explores the role of digital health tools in improving community health literacy in rural areas of the US and Africa.

In rural America, many communities face challenges such as geographic isolation, limited access to healthcare facilities, and disparities in healthcare resources. These challenges are exacerbated by factors such as poverty, limited education, and cultural beliefs (Adama & Okeke, 2024, Itua, Bature & Eruaga, 2024., Soyombo, 2024). As a result, rural residents often experience higher rates of chronic diseases, lower life expectancy, and poorer health outcomes compared to their urban counterparts. Similarly, rural areas in Africa struggle with inadequate healthcare infrastructure, a shortage of healthcare professionals, and limited access to essential medicines. These challenges are further compounded by issues such as poverty, food insecurity, and infectious diseases. As a result, many rural Africans lack access to basic healthcare services, leading to preventable deaths and suffering.

Given these challenges, digital health tools have emerged as a powerful tool to improve health literacy and access to healthcare in rural areas. Mobile applications can provide valuable health information, promote healthy behaviors, and facilitate communication between healthcare providers and patients (Adama & Okeke, 2024, Joel & Oguanobi, 2024, Popoola, et. al., 2024). Telemedicine platforms can connect patients with healthcare professionals for remote consultations, diagnosis, and treatment, overcoming geographic barriers to care. Additionally, monitoring tools can help individuals track their health status and manage chronic conditions more effectively. Digital health tools have the potential to revolutionize healthcare delivery in rural areas of the US and Africa by improving health literacy, increasing access to healthcare services, and empowering individuals to take control of their health. This paper will explore the impact of these tools on community health literacy and provide insights into their implementation in rural healthcare settings.

In recent years, the proliferation of digital technologies has opened up new possibilities for healthcare delivery, particularly in remote and underserved areas. This is especially relevant in rural areas of the United States and Africa, where traditional healthcare infrastructure is often lacking (Adama & Okeke, 2024, Eruaga, Bature & Itua, 2024, Joel & Oguanobi, 2024). Digital health tools, including mobile apps, telemedicine platforms, and wearable devices, offer a cost-effective and scalable way to improve access to healthcare services, enhance health literacy, and empower individuals to manage their health more effectively.

The challenges faced by rural communities in accessing healthcare are multifaceted. Geographic isolation, limited transportation options, and a shortage of healthcare providers are common barriers. Moreover, these areas often have higher rates of poverty and lower levels of education, which can further hinder access to healthcare and health information. In Africa, additional challenges such as inadequate healthcare funding, weak health systems, and prevalent infectious diseases compound the difficulties faced by rural populations (Adama, et. al., 2024, Eruaga, 2024, Nzeako, et. al., 2024, Soyombo, 2024).

Digital health tools address many of these challenges by providing innovative solutions that can reach individuals in remote areas. For example, mobile health applications can deliver health information, provide diagnostic support, and facilitate remote consultations with healthcare professionals (Adama, et. al., 2024, Eruaga, 2024, Nzeako, et. al., 2024, Soyombo, 2024). Telemedicine platforms enable patients to connect with doctors and specialists without the need for travel. Wearable devices can monitor vital signs and health metrics, providing valuable data for both patients and healthcare providers.

In the United States, initiatives like the Rural Health Information Hub and the Federal Office of Rural Health Policy are working to improve healthcare access and outcomes in rural areas. Similarly, in Africa, organizations such as the African Alliance for Digital Health Networks and the African Telecommunications Union are promoting the use of digital technologies to address healthcare challenges (Adama, et. al., 2024, Joel & Oguanobi, 2024, Popoola, et. al., 2024). Overall, the integration of digital health tools into rural healthcare systems has the potential to revolutionize healthcare delivery and improve health outcomes in these underserved regions. This paper will explore the impact of these tools on community health literacy and highlight successful strategies for their implementation in rural areas of the US and Africa.

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## 2. Healthcare Challenges in Rural Areas

In rural areas, access to healthcare is often limited by geographic distance and a lack of healthcare facilities. Rural residents may need to travel long distances to reach a hospital or clinic, which can be particularly challenging for those without access to reliable transportation (Adama, et. al., 2024, Jumare, et. al., 2023, Okpokoro, et. al., 2023). This limited access can result in delays in seeking care, leading to poorer health outcomes. Furthermore, rural areas often lack healthcare infrastructure and resources compared to urban areas. Hospitals and clinics in rural areas may have fewer medical professionals, limited medical equipment, and a smaller range of services available. This can make it difficult for rural residents to access specialized care or receive timely treatment for acute conditions.

Another challenge faced by rural healthcare systems is the recruitment and retention of healthcare professionals. Rural areas often struggle to attract and retain doctors, nurses, and other healthcare workers due to factors such as lower salaries, limited career advancement opportunities, and isolation from urban amenities (Adama, et. al., 2024, Ediae, Chikwe & Kuteesa, 2024, Soyombo, 2024). Additionally, rural populations tend to have higher rates of chronic diseases such as diabetes, heart disease, and obesity compared to urban populations. Limited access to healthcare services and resources can exacerbate these health disparities, leading to poorer health outcomes for rural residents.

Addressing these challenges requires a multifaceted approach that includes improving access to healthcare services, strengthening healthcare infrastructure, and addressing the social determinants of health in rural areas (Cattaruzza, et. al., 2023, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). Telehealth and telemedicine can help bridge the gap by allowing rural residents to access healthcare services remotely. Additionally, increasing funding for rural healthcare facilities, improving healthcare workforce recruitment and retention strategies, and implementing community-based health programs can help improve health outcomes in rural areas.

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## 3. Role of Digital Health Tools

Digital health tools play a crucial role in transforming healthcare delivery by leveraging technology to improve access, efficiency, and patient outcomes (Adebamowo, et. al., 2017, Joel & Oguanobi, 2024, Popoola, et. al., 2024). From mobile applications to telemedicine platforms, these tools offer innovative solutions to address various healthcare challenges and empower individuals to take control of their health. Here's a closer look at some key digital health tools and their roles:

Mobile applications are widely used to deliver health education and information to users, including those in rural areas. These apps provide access to a wealth of health-related resources, including articles, videos, and interactive tools, covering topics such as preventive care, chronic disease management, and healthy lifestyle choices (Adeghe, 2024, Eruaga, Bature & Itua, 2024, Ojeyinka & Omaghomi, 2024). Users can access information on symptoms, treatment options, and medication management, empowering them to make informed decisions about their health. Additionally, mobile apps can provide personalized recommendations based on users' health goals, preferences, and medical history, enhancing engagement and adherence to healthy behaviors.

Telemedicine enables remote consultations between patients and healthcare providers, eliminating the need for in-person visits and overcoming barriers related to distance and accessibility. Through secure video conferencing platforms, patients can connect with healthcare professionals for primary care consultations, specialist appointments, and follow-up visits (Adeghe, 2024, Eruaga, 2024, Joel & Oguanobi, 2024). Telemedicine is particularly beneficial for rural residents who may have limited access to healthcare facilities or face challenges in accessing specialty care. By facilitating timely access to healthcare services, telemedicine can improve patient outcomes, reduce healthcare costs, and enhance overall satisfaction with the healthcare experience.

Monitoring tools, such as wearable devices and remote monitoring solutions, enable individuals to track their health metrics and monitor chronic conditions from the comfort of their homes. These devices collect real-time data on vital signs, activity levels, sleep patterns, and other health indicators, providing valuable insights into users' health status and enabling early detection of potential health issues (Adeghe, Okolo & Ojeyinka, 2024, Ediae, Chikwe & Kuteesa, 2024, Soyombo, 2024). By empowering individuals to proactively manage their health and track progress towards their health goals, monitoring tools can support preventive care, chronic disease management, and lifestyle interventions. Moreover, healthcare providers can remotely monitor patients' health data and intervene as needed, enabling personalized care and timely interventions to prevent complications.

In conclusion, digital health tools play a transformative role in modern healthcare delivery, offering innovative solutions to improve access, efficiency, and patient outcomes. From mobile applications for health education and information to telemedicine for remote consultations and monitoring tools for health tracking, these tools empower individuals to take control of their health and enable healthcare providers to deliver personalized, accessible, and high-quality care (Adeghe, Okolo & Ojeyinka, 2024, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). As technology continues to advance, digital health tools will play an increasingly important role in shaping the future of healthcare and promoting health and well-being for all.

### 3.1. Impact of Digital Health Tools

Digital health tools have had a profound impact on healthcare, particularly in rural areas where access to traditional healthcare services may be limited. These tools leverage technology to improve access, empower individuals to manage their health, and enhance health literacy and awareness (Adeghe, Okolo & Ojeyinka, 2024, Eruaga, 2024, Nzeako, et. al., 2024). Here's a closer look at the impact of digital health tools: Digital health tools have significantly improved access to healthcare services, especially for individuals in rural and underserved areas. Telemedicine, for example, allows patients to consult with healthcare providers remotely, eliminating the need for travel to healthcare facilities. This is particularly beneficial for individuals who live far from healthcare centers or have limited mobility. Additionally, mobile health apps provide access to health information, self-care tools, and virtual consultations, further expanding access to healthcare services beyond traditional brick-and-mortar facilities.

Digital health tools empower individuals to take control of their health and well-being. With access to health information, symptom checkers, and self-care resources, individuals can make informed decisions about their health. Monitoring tools, such as wearable devices and health tracking apps, enable individuals to track their health metrics, set health goals, and monitor progress over time. This self-management approach not only improves health outcomes but also enhances patient engagement and satisfaction with healthcare services.

Digital health tools play a crucial role in enhancing health literacy and raising awareness about health issues. Mobile apps and online platforms provide access to educational resources, preventive care information, and healthy lifestyle tips, empowering individuals to make healthier choices (Adeghe, Okolo & Ojeyinka, 2024, Eruaga, Bature & Itua, 2024, Soyombo, 2024). Additionally, telemedicine consultations and remote monitoring services can educate patients about their health conditions and treatment options, improving their understanding of healthcare recommendations and enhancing adherence to treatment plans. This increased health literacy can lead to better health outcomes and reduced healthcare costs in the long run. In conclusion, digital health tools have revolutionized healthcare delivery by improving access, empowering individuals, and enhancing health literacy and awareness. These tools have the potential to transform the healthcare landscape, particularly in rural and underserved areas, by providing innovative solutions to address healthcare challenges. As technology continues to advance, digital health tools will play an increasingly important role in promoting health and well-being for all.

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## 4. Challenges to Adoption

The adoption of digital health tools in rural areas of the US and Africa faces several challenges, ranging from infrastructural limitations to cultural barriers. Overcoming these challenges is crucial to realizing the full potential of these tools in revolutionizing community health literacy (Adeghe, Okolo & Ojeyinka, 2024, Ediae, Chikwe & Kuteesa, 2024, Soyombo, 2024). One of the primary challenges to the adoption of digital health tools in rural areas is the lack of reliable internet connectivity. Many rural communities in both the US and Africa have limited access to high-speed internet, making it difficult for individuals to use digital health apps and platforms that require a stable internet connection. This limitation hinders the ability of healthcare providers to deliver telemedicine services and limits the accessibility of health information and educational resources. Addressing the issue of internet connectivity in rural areas is essential to ensure equitable access to digital health tools and improve healthcare delivery in these underserved communities.

Another significant challenge is the low digital literacy rates among rural populations. Many individuals in these areas may not be familiar with using smartphones, tablets, or computers, making it challenging for them to navigate and use digital health tools effectively. This lack of digital literacy can lead to misunderstandings about how to use the tools, resulting in underutilization or abandonment (Adeghe, Okolo & Ojeyinka, 2024, Joel & Oguanobi, 2024, Popoola, et. al., 2024). To address this challenge, efforts are needed to provide training and education on how to use digital health tools, as well as to develop user-friendly interfaces and intuitive designs that cater to individuals with varying levels of digital literacy.

Cultural beliefs and practices can also present barriers to the adoption of digital health tools in rural areas. In some communities, there may be skepticism or mistrust of new technologies, particularly those related to healthcare (Adeghe, Okolo & Ojeyinka, 2024, Lawal, et. al., 2017, Okpokoro, et. al., 2023). Additionally, cultural norms and values may influence attitudes towards seeking healthcare services and sharing personal health information online. Overcoming these cultural barriers requires engaging with local communities, building trust, and tailoring digital health interventions to align with cultural norms and preferences. Collaborating with community leaders and healthcare providers can help ensure that digital health tools are culturally sensitive and acceptable to the target population.

In conclusion, while digital health tools hold immense potential for revolutionizing community health literacy in rural areas, their adoption faces several challenges (Cattaruzza, et. al., 2023, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). Addressing these challenges requires a multi-faceted approach that involves improving internet connectivity, enhancing digital literacy, and addressing cultural barriers. By overcoming these challenges, stakeholders can unlock the transformative power of digital health tools and improve healthcare access and outcomes in rural communities.

## 5. Strategies for Overcoming Challenges

To overcome the challenges of limited internet connectivity, low digital literacy rates, and cultural barriers, several strategies can be implemented to facilitate the adoption of digital health tools in rural areas of the US and Africa (Adeghe, Okolo & Ojeyinka, 2024, Eruaga, 2024, Nzeako, et. al., 2024). One of the key strategies for overcoming the challenge of limited internet connectivity is to improve internet infrastructure in rural areas. This can be achieved through government initiatives, public-private partnerships, and investments in technologies such as satellite internet and mobile broadband. By expanding access to reliable high-speed internet, rural communities can better utilize digital health tools for accessing health information, telemedicine services, and health monitoring.

To address the low digital literacy rates among rural populations, it is essential to provide training and education on how to use digital health tools effectively. This can be done through community-based programs, workshops, and educational materials that cater to individuals with varying levels of digital literacy. Training should focus on basic digital skills such as using smartphones, tablets, and computers, as well as navigating health apps and websites. By empowering individuals with digital literacy skills, they can confidently engage with digital health tools and derive maximum benefit from them.

To overcome cultural barriers and promote acceptance of digital health tools, it is crucial to adapt these tools to align with the cultural and linguistic needs of rural populations. This can include translating health information into local languages, incorporating culturally relevant content and imagery, and ensuring that the design and functionality of digital health tools are culturally sensitive (Adeghe, Okolo & Ojeyinka, 2024, Ediae, Chikwe & Kuteesa, 2024, Popoola, et. al., 2024). Engaging with local communities, healthcare providers, and cultural experts can help ensure that digital health tools are culturally appropriate and acceptable. In conclusion, overcoming the challenges of limited internet connectivity, low digital literacy rates, and cultural barriers requires a comprehensive approach that involves improving internet infrastructure, providing digital literacy training, and adapting tools to cultural and linguistic needs. By implementing these strategies, stakeholders can enhance the adoption and effectiveness of digital health tools in rural areas, ultimately improving community health literacy and healthcare outcomes.

## 6. Case Studies

In rural areas of the US and Africa, the implementation of digital health tools has shown promising results in revolutionizing community health literacy. Several case studies highlight successful initiatives that have improved access to healthcare services, empowered individuals to manage their health, and enhanced health literacy and awareness.

One notable case is the use of mobile health (mHealth) applications in rural Africa. In countries like Kenya and Uganda, organizations have developed mHealth apps that provide health education, enable remote consultations, and facilitate health monitoring (Bature, Eruaga & Itua, 2024, Joel & Oguanobi, 2024, Okeke, et. al., 2023). These apps are designed to be user-friendly and accessible even in areas with limited internet connectivity. Through partnerships with local healthcare providers and community leaders, these apps have been successfully integrated into rural healthcare systems, improving access to healthcare services and empowering individuals to take charge of their health. This case demonstrates the importance of designing digital health tools that are tailored to the needs and capabilities of rural populations. It also highlights the value of partnerships and community engagement in ensuring the successful implementation and adoption of these tools.

In the US, telemedicine has been instrumental in improving access to healthcare services in rural areas. In states like Alaska and Montana, where access to healthcare facilities is limited, telemedicine programs have enabled patients to consult with healthcare providers remotely. These programs use video conferencing technology to connect patients with doctors, enabling them to receive timely medical advice and treatment without having to travel long distances. This case underscores the importance of leveraging technology to bridge the gap between rural communities and healthcare providers. It also highlights the potential of telemedicine to improve healthcare outcomes and reduce healthcare costs in rural areas.

Based on these case studies, some best practices for implementing digital health tools in rural areas include; Tailoring tools to the specific needs and capabilities of rural populations. Engaging with local healthcare providers and community leaders to ensure buy-in and support (Cattaruzza, et. al., 2023, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). Providing training and education on how to use digital health tools effectively. Ensuring that tools are user-friendly and accessible, even in areas with limited internet connectivity. By following these best practices and learning from successful case studies, stakeholders can maximize the impact of digital health tools in rural areas, revolutionizing community health literacy and improving healthcare outcomes.

In rural areas of the US, health information hotlines have been instrumental in providing access to healthcare information and support. These hotlines are staffed by healthcare professionals who can answer questions, provide advice, and refer callers to local healthcare providers if needed (Cattaruzza, et. al., 2023, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). In states like Wyoming and South Dakota, where access to healthcare facilities is limited, these hotlines have become a lifeline for rural residents seeking medical guidance. This case demonstrates the importance of providing multiple channels for accessing healthcare information in rural areas. It also highlights the value of having trained healthcare professionals available to provide personalized advice and support.

In rural Africa, digital health literacy programs have been successful in empowering individuals to use digital health tools effectively. Organizations like the African Digital Health Network have developed training programs that teach rural residents how to use mobile health apps, access telemedicine services, and interpret health information online. These programs have been instrumental in improving health literacy and empowering individuals to take control of their health (Ediae, Chikwe & Kuteesa, 2024, Joel & Oguanobi, 2024, Popoola, et. al., 2024). This case underscores the importance of investing in digital health literacy programs to ensure that rural residents can make the most of digital health tools. It also highlights the need for ongoing support and education to help individuals navigate the digital health landscape.

Based on these case studies, some best practices for implementing digital health tools in rural areas include, providing multiple channels for accessing healthcare information, such as hotlines, mobile apps, and online resources (Adama, et. al., 2024, Jumare, et. al., 2023, Okpokoro, et. al., 2023). Training healthcare professionals to provide personalized advice and support through digital channels. Investing in digital health literacy programs to empower individuals to use digital health tools effectively. Offering ongoing support and education to help individuals navigate the digital health landscape. By following these best practices and learning from successful case studies, stakeholders can maximize the impact of digital health tools in rural areas, revolutionizing community health literacy and improving healthcare outcomes.

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## 7. Future Directions

The future of revolutionizing community health literacy in rural areas of the US and Africa lies in the continued advancement of digital health technology. One key advancement is the development of more sophisticated mobile health applications (Abass, et. al., 2024, Eruaga, Bature & Itua, 2024, Olatoye, et. al., 2009). These apps are likely to become more user-friendly and intuitive, making them accessible to individuals with varying levels of digital literacy. Additionally, advancements in artificial intelligence (AI) and machine learning are expected to enhance the capabilities of digital health tools. AI-powered chatbots, for example, could provide more personalized and contextually relevant health information to users.

Another significant advancement is the integration of wearable devices and sensors into digital health tools. These devices can collect real-time health data, such as heart rate, blood pressure, and activity levels, allowing for more comprehensive health monitoring. As these devices become more affordable and widely available, they could play a crucial role in empowering individuals to manage their health proactively (Adebamowo, et. al., 2017, Joel & Oguanobi, 2024, Popoola, et. al., 2024). The continued evolution of digital health tools has the potential to transform healthcare delivery in rural areas. One of the most significant impacts is the potential to bridge the gap in access to healthcare services. Telemedicine, for example, enables individuals in remote areas to consult with healthcare providers without

the need to travel long distances. This can lead to earlier diagnosis and intervention, ultimately improving health outcomes.

Digital health tools also have the potential to improve the efficiency of healthcare delivery. By streamlining processes such as appointment scheduling, prescription refills, and health record management, these tools can reduce administrative burden on healthcare providers, allowing them to focus more on patient care. Additionally, the use of data analytics in digital health can provide valuable insights into population health trends, enabling more targeted and effective public health interventions.

Furthermore, digital health tools can empower individuals to take a more active role in managing their health. By providing access to reliable health information and tools for tracking health metrics, these tools can encourage healthy behaviors and facilitate early detection of health issues (Adeghe, Okolo & Ojeyinka, 2024, Ekechi, et. al., 2024, Ojeyinka & Omaghomi, 2024). This can lead to better health outcomes and reduced healthcare costs in the long run. In conclusion, the future of revolutionizing community health literacy in rural areas through digital health tools is promising. Advancements in technology are likely to make these tools more accessible, user-friendly, and effective. By leveraging these advancements, stakeholders can improve healthcare delivery, empower individuals to take control of their health, and ultimately improve health outcomes in rural communities.

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## 8. Conclusion

In conclusion, the use of digital health tools has the potential to revolutionize community health literacy in rural areas of the US and Africa. These tools can improve access to healthcare services, empower individuals to manage their health, and enhance healthcare delivery efficiency. However, several challenges such as limited internet connectivity, low digital literacy rates, and cultural barriers need to be addressed to realize the full potential of digital health tools in rural areas.

A key takeaway is the importance of collaboration between stakeholders, including governments, healthcare providers, technology companies, and local communities, to overcome these challenges and promote the adoption of digital health tools. Governments can invest in improving internet infrastructure and providing digital literacy training, while healthcare providers can integrate these tools into their practices and adapt them to cultural and linguistic needs. Technology companies can continue to innovate and develop user-friendly digital health solutions, and local communities can embrace these tools and advocate for their use.

Overall, the adoption of digital health tools in rural healthcare is not just beneficial but also necessary to improve health outcomes and reduce health disparities in these underserved areas. It is essential for all stakeholders to take action and work together to make digital health tools a standard part of healthcare delivery in rural communities, thereby revolutionizing community health literacy and promoting better health for all.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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