PERSPECTIVES ON THE PROPER USE OF MOBILE HEALTH (MHEALTH) TOOLS FOR LIFELONG WELLNESS AMONG WOMEN IN ZAMFARA STATE HOSPITALS

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Abstract

Mobile health (mHealth) technologies offer promising solutions to address persistent health disparities and improve lifelong wellness among women in Zamfara State, Nigeria. This paper explores perspectives on the proper use of mHealth tools within hospital settings, drawing on a conceptual framework that highlights the role of technology in expanding access, enhancing health education, and strengthening care continuity. It examines the Nigerian mHealth context, including the adoption of SMS reminders, teleconsultation platforms, and mobile education services within the broader policy and regulatory landscape. The paper analyses women's health needs in Zamfara State, with particular attention to maternal and reproductive health challenges, chronic disease management, health literacy barriers, and socio-cultural considerations that shape care-seeking behaviours. It reviews practical applications of mHealth tools in local hospitals, such as patient education campaigns, appointment scheduling, remote consultations, and monitoring of maternal health indicators. The analysis highlights the benefits of proper mHealth use in improving access to services, promoting knowledge and behaviour change, reducing maternal and child mortality, and supporting continuity of care. Despite these benefits, significant challenges and barriers persist, including infrastructural limitations, low digital literacy among women and health workers, privacy and data protection concerns, and socio-cultural resistance. The paper concludes by underscoring the need for targeted strategies such as training and capacity building, community engagement, infrastructure strengthening, and policy development to ensure effective implementation. Recommendations emphasise collaborative efforts among government agencies, hospitals, telecommunications providers, and local communities to build an enabling environment for sustainable mHealth integration that advances women's health and wellness in Zamfara State.

Keywords: mHealth, hospital, lifelong wellness, women, maternal health, reproductive health.

Introduction

Women's health remains a critical component of public health development, particularly in low-resource settings where access to quality healthcare services is limited. In Northern Nigeria, including Zamfara State, maternal and reproductive health outcomes continue to face challenges due to socioeconomic disparities, cultural barriers, and under-resourced healthcare systems (Akorede et al., 2022). Hospitals in Zamfara State, often serving as referral centres in a weak primary healthcare system, play a central role in addressing these gaps. However, the burden on these facilities is high, and innovative approaches are needed to strengthen service delivery and promote lifelong wellness among women.

Mobile health (mHealth) has emerged globally as a promising strategy to enhance healthcare access, patient education, and service quality, especially in underserved regions. mHealth tools ranging from SMS-based education programs to sophisticated smartphone applications and teleconsultation platforms have been deployed to improve maternal health, chronic disease management, and health literacy (World Health Organization [WHO], 2011; Free et al., 2013). In the Nigerian context, mHealth interventions have shown potential to reduce barriers related to distance, cost, and limited workforce capacity (Oyeyemi & Wynn, 2015). Yet, the effective and sustainable use of these tools depends on appropriate design, cultural adaptation, and integration into existing hospital systems.

This paper explores perspectives on the proper use of mHealth tools as a means to achieve lifelong wellness among women in hospitals in Zamfara State. By examining health needs specific to women in the region, reviewing potential applications of mHealth in hospital settings, and analysing barriers and enabling strategies, the discussion seeks to inform healthcare managers, policymakers, and development partners about best practices for leveraging technology to improve women's health outcomes in Zamfara State. Such a focus aligns with Nigeria's commitment to achieving Universal Health Coverage (UHC) and Sustainable Development Goal 3, which emphasises healthy lives and well-being for all at all ages (Federal Ministry of Health, 2016; United Nations, 2015).

Conceptual Framework

This paper is grounded in the intersection of lifelong wellness, women's health, and digital health technologies, particularly mobile health (mHealth). Lifelong wellness, in this context, refers to a continuous state of physical, mental, and social well-being experienced by women across all stages of life, not merely the absence of disease (WHO, 1948). Achieving such wellness requires sustained access to health services, health literacy, and proactive health behaviours, all of which can be supported through digital innovations like mHealth. mHealth operates within the broader scope of eHealth, which encompasses the use of information and communication technologies (ICT) for health. The Technology Acceptance Model (TAM) by Davis (1989) helps explain how users, such as patients and healthcare workers, perceive and adopt mHealth tools. According to TAM, perceived usefulness and ease of use are critical in determining whether technology will be accepted and effectively utilised. In a healthcare setting such as Zamfara State hospitals, both patients' and providers' perceptions of mobile tools play a major role in their adoption and success.

This framework also draws on Andersen's Behavioural Model of Health Service Use, which explains access and utilisation of health services based on three key factors: predisposing characteristics (such as age, gender, education), enabling resources (e.g., technology, income, mobile access), and need factors (such as pregnancy, chronic illness). In Zamfara State, mHealth can serve as an enabling resource that bridges the gap between need and service delivery, especially for women facing geographic, financial, or cultural barriers to care. Furthermore, this paper adopts a gender-sensitive health systems approach, recognising that women's unique biological, social, and economic realities shape how they access and benefit from healthcare innovations. mHealth tools must therefore be tailored not only to clinical needs but also to the social contexts of women's lives, particularly in rural or underserved regions of Nigeria.

By combining these theoretical perspectives, the conceptual framework emphasises that the effective and proper use of mHealth tools is not merely a technological intervention but a social and systemic strategy to empower women, improve hospital-based service delivery, and support lifelong wellness.

mHealth Tools in the Nigerian Context

Nigeria has experienced a rapid increase in mobile phone penetration, with over 200 million active mobile subscriptions as of 2022 (Nigerian Communications Commission [NCC], 2022). This widespread access has created a fertile ground for the adoption of mobile health (mHealth) initiatives aimed at improving healthcare delivery, especially in underserved regions. The Nigerian government and various non-governmental organisations have begun integrating mHealth solutions to address challenges such as maternal health, infectious disease management, and health education (Adepoju et al., 2019). Despite these advancements, the adoption of mHealth remains uneven, hindered by infrastructural deficits, digital literacy barriers, and limited policy frameworks (Akinbo et al., 2021).

Types of mHealth Tools Used in Hospitals

In Nigerian hospitals, several mHealth tools are employed to enhance health services:

SMS reminders and health education messages: Widely used to improve appointment adherence and disseminate health information, especially for maternal and child health (Oluwole et al., 2018).

Mobile apps and platforms: Some hospitals utilise specialised applications for disease tracking, clinical decision support, and patient management (Adepoju et al., 2019).

Telemedicine and remote consultations: Increasingly adopted in urban centres to provide specialist services and reduce patient travel (Akinbo et al., 2021).

Electronic health records (EHRs) accessed via mobile devices: Used for data management and patient monitoring, although their implementation is still evolving.

Policy and Regulatory Environment for mHealth

The Nigerian government has recognised the importance of digital health, with policies like the National Digital Health Strategy (2019–2024) aiming to foster the integration of mHealth into mainstream healthcare (Federal Ministry of Health, Nigeria, 2019). However, regulatory challenges persist, including concerns over data privacy, security, and standardisation. The absence of comprehensive legal frameworks has sometimes slowed widespread adoption and trust among users (Oluwole et al., 2018). Efforts are ongoing to develop guidelines that ensure patient confidentiality, interoperability, and quality assurance for mHealth initiatives in Nigeria.

Women's Health Needs in Zamfara State

Women in Zamfara State face significant and interrelated health challenges that underscore the need for innovative approaches such as mHealth tools in hospital settings. Maternal and reproductive health indicators remain poor, with high rates of maternal mortality attributed to limited access to skilled birth attendants, delays in seeking care, and inadequate emergency obstetric services (National Population Commission & ICF, 2019). Hospitals often serve as critical referral centres for complicated pregnancies but face overwhelming demand and resource constraints, making timely communication and patient tracking essential.

Chronic disease management is an emerging concern for women in Zamfara State. Conditions such as hypertension, diabetes, and anaemia affect women across their life course, yet routine screening and long-term follow-up are limited. Hospitals struggle with fragmented records and patient loss to follow-up, complicating continuity of care. mHealth tools offer opportunities for appointment reminders, home-based monitoring, and structured follow-up protocols that can improve outcomes for chronic disease patients.

Health education and literacy barriers further complicate women's health outcomes. Many women in rural areas have limited formal education, which affects their understanding of health information, adherence to treatment plans, and ability to navigate hospital systems. Language differences and low literacy levels also reduce the effectiveness of traditional health education approaches. mHealth solutions, particularly those using voice, local languages, or pictorial messaging, can help overcome these barriers by delivering accessible, culturally tailored health education directly to women's mobile phones.

Cultural and social considerations are central to women's health in Zamfara State. Gender norms may limit women's autonomy in seeking healthcare, particularly for reproductive services, while concerns about privacy and confidentiality can discourage open communication with providers. Additionally, family decision-making dynamics and religious beliefs may influence care-seeking behaviour. Any use of mHealth tools must be sensitive to these realities, ensuring respect for cultural values while empowering women to take an active role in their own lifelong wellness.

Applications of mHealth Tools in Zamfara State Hospitals

mHealth tools hold significant promise for strengthening hospital-based health services for women in Zamfara State by addressing persistent gaps in access, communication, and continuity of care. Some of the important applications include;

1. Patient education and awareness campaigns.

Hospitals can leverage SMS, voice messages, or mobile apps to deliver culturally appropriate health education on topics such as antenatal care, postpartum nutrition, family planning, and chronic disease management (Akorede et al., 2022; WHO, 2011). Such targeted campaigns can improve health literacy among women with limited formal education, fostering informed decision-making and healthier behaviours (Federal Ministry of Health, 2015).

2. Appointment Scheduling and Reminders

Hospitals utilise mobile-based appointment systems to streamline scheduling, reduce missed visits, and improve clinic efficiency. Automated SMS reminders alert women about upcoming antenatal or postnatal appointments, which is crucial in reducing maternal mortality and ensuring continuity of care (Ojo et al., 2019).

3. Teleconsultation and Remote Support

Telemedicine platforms enable healthcare providers in Zamfara to offer remote consultations, especially in areas lacking specialists. Women can receive guidance on pregnancy complications, reproductive health concerns, or chronic disease management without travelling long distances, thereby improving access to quality care (Akinbo et al., 2021).

4. Monitoring and Follow-up of Maternal Health Indicators

mHealth tools facilitate real-time monitoring of maternal health indicators such as blood pressure, fetal heartbeat, and postpartum recovery. Community health workers can record and transmit data remotely, enabling timely interventions and better tracking of maternal health outcomes (Adepoju et al., 2019).

Benefits of Proper Use of mHealth Tools for Women's Wellness

The proper use of mHealth tools in Zamfara State hospitals offers significant opportunities to advance women's lifelong wellness by addressing systemic barriers to healthcare access and quality.

1. Improving Access to Healthcare Services

Properly implemented mHealth tools can bridge gaps in healthcare access, especially in remote and underserved areas like Zamfara State. They enable women to reach healthcare providers via teleconsultations, access health information, and receive reminders for appointments, reducing the need for long-distance travel and overcoming mobility barriers (Fagbamigbe et al., 2020).

2. Enhancing Health Knowledge and Behaviour Change

mHealth platforms facilitate targeted health education, increasing women's awareness about reproductive health, nutrition, and disease prevention. This increased knowledge encourages positive health behaviours, such as timely antenatal visits, family planning use, and proper hygiene practices (Akorede & Toyin, 2020; Harande et al., 2025).

3. Reducing Maternal and Child Mortality

By promoting early detection of pregnancy complications, ensuring adherence to antenatal and postnatal care, and supporting timely interventions, mHealth tools contribute to lowering maternal and neonatal mortality rates. Consistent follow-up and monitoring enable healthcare providers to respond promptly to health risks (Akorede et al., 2020; Akinbo et al., 2021).

4. Supporting Continuity of Care

mHealth solutions ensure ongoing engagement between women and healthcare providers, facilitating continuous monitoring of health indicators and follow-up services. This continuity is essential for managing chronic conditions, postpartum recovery, and ongoing reproductive health needs, leading to better overall wellness (Akorede et al., 2023; Adepoju et al., 2019).

Challenges and Barriers to mHealth Implementation

Despite the potential benefits of mHealth tools for advancing women's wellness in Zamfara State hospitals, several challenges and barriers may limit their effective adoption and impact.

1. Technological Infrastructure Limitations

Limited access to reliable electricity, internet connectivity, and mobile network coverage in remote areas of Zamfara hinders the effective deployment of mHealth tools. These infrastructural deficiencies can lead to inconsistent service delivery and reduced usability (Fagbamigbe et al., 2020).

2. Digital Literacy among Women and Health Workers

Low levels of digital literacy and familiarity with mobile technologies among women, especially in rural communities, pose significant barriers. Similarly, some healthcare workers may lack the training needed to utilise mHealth systems effectively, impeding adoption and integration into routine care (Ojo et al., 2019).

3. Privacy, Security, and Data Protection Concerns

Concerns about the confidentiality of personal health information can discourage women from engaging with mHealth services. Inadequate data protection policies and potential risks of data breaches threaten user trust and acceptance (Akinbo et al., 2021).

4. Socio-cultural Resistance and Gender Norms

Cultural beliefs, gender dynamics, and societal norms may restrict women's access to mobile devices or their participation in digital health initiatives. Resistance from communities or families can limit the reach and effectiveness of mHealth programs (Abdulbaqi et al., 2025; Adepoju et al., 2019).

Strategies for Effective Implementation

To realise the full potential of mHealth interventions in Zamfara State hospitals, it is essential to adopt comprehensive and context-specific strategies that address existing challenges and facilitate sustainable integration. Effective implementation hinges on building the capacity of healthcare workers, engaging communities, strengthening infrastructure, and establishing supportive policy frameworks. By focusing on these key areas, stakeholders can ensure that mHealth solutions are accessible, acceptable, and impactful in improving women's health outcomes.

1. Training and Capacity Building for Healthcare Workers

1. Conduct comprehensive training sessions to enhance digital literacy and familiarise healthcare providers with mHealth platforms.
2. Provide ongoing technical support and refresher courses to ensure sustained effective use.
3. Incorporate mHealth training into existing professional development programs to build confidence and competence.

2. Community Engagement and Sensitisation

1. Involve community leaders, religious figures, and local stakeholders to promote acceptance and trust in mHealth initiatives.
2. Conduct awareness campaigns highlighting the benefits of mHealth for women's health and wellness.
3. Address cultural concerns and misconceptions through culturally sensitive messaging to encourage women's participation.

3. Strengthening Hospital Infrastructure and Connectivity

1. Invest in reliable electricity supply solutions, such as solar power, to mitigate power outages.
2. Improve internet and mobile network coverage in rural and underserved areas through partnerships with telecom providers.
3. Equip hospitals with necessary devices (smartphones, tablets) and ensure maintenance and technical support are available.

4. Policy Recommendations and Support Frameworks

1. Develop and implement policies that promote data privacy, security, and ethical use of mHealth data.
2. Establish collaborations between government, NGOs, and private sector stakeholders to fund and sustain mHealth programs.
3. Incorporate mHealth strategies into national and regional health plans to ensure alignment and long-term commitment.

Conclusion

The successful implementation of mHealth tools in Zamfara State hospitals relies on strategic approaches that emphasise training healthcare workers, engaging communities, strengthening infrastructure, and establishing robust policy frameworks. These perspectives highlight the importance of a coordinated effort among stakeholders to ensure that mHealth initiatives are sustainable, culturally acceptable, and capable of improving health outcomes for women. The implications for health policy and hospital management include the need for integrating digital health strategies into national health plans, prioritising resource allocation for infrastructure development, and fostering collaborations across sectors.

Recommendation

To realize the full benefits of mHealth, it is recommended that, stakeholders including government agencies, NGOs, healthcare providers, community leaders, and development partners should work collaboratively to integrate mHealth strategies into state and national health plans; expand mobile network coverage in rural areas; promote policies that safeguard data security and equity in access; incorporate mHealth training into health professional curricula; and engage women and local leaders in awareness campaigns. Through these concerted efforts, mHealth can become a transformative force in reducing health inequities and promoting lifelong wellness among women in Zamfara State.

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