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Mediating Healthcare Communication in Nigeria: Chatbot Technologies and Doctor–Patient Engagement

Chinelo Ebele Uchendu[1], Timothy Ekeledirichukwu Onyejelem[2], Omolara Oluwabusayo Akin-Odukoya[3]
[1]Department of Mass Communication, Nnamdi Azikiwe University Awka Anambra State, Nigeria
[2]Department of Journalism and Media Studies, Federal University Otuoke, Bayelsa State
[3]Department of Mass Communication, Caleb University, Imota, Lagos, Nigeria

Abstract: *The Nigerian healthcare system continues to face persistent communication challenges arising from high patient-doctor ratios, time constraints, infrastructural deficits, and uneven access to medical information, particularly in underserved and rural communities. Within this context, digital health innovations, especially chatbot technologies are increasingly positioned as mediating tools capable of enhancing healthcare communication and supporting doctor-patient engagement. This study examines how chatbot-powered applications function as intermediaries in healthcare communication in Nigeria, focusing on their roles in information dissemination, patient education, preliminary consultation, and follow-up interaction. Based on the existing studies, Internet materials and journal publications, the paper explores the extent to which chatbots influence accessibility, clarity, responsiveness, and trust in doctor-patient interactions. The paper argues that chatbots significantly improve access to basic health information, reduce communication bottlenecks, and empower patients to engage more actively in their healthcare decisions. However, challenges related to language diversity, digital literacy, cultural sensitivity, data privacy, and the perceived absence of human empathy limit their full communicative potential. The paper concludes that while chatbot technologies cannot replace face-to-face medical consultations, they serve as critical complementary tools for mediating healthcare communication in Nigeria. It recommends context-sensitive design, regulatory oversight, and integration into broader health communication strategies to maximize their developmental and public health impact.*

Keywords: *Chatbot, Communication, Engagement, Healthcare, Mediating and Technologies*

I. Introduction

Healthcare communication remains a critical yet underdeveloped component of Nigeria's health system, where structural constraints such as inadequate manpower, overcrowded public hospitals, long waiting times, and uneven distribution of health facilities continue to undermine effective doctor-patient engagement. In many clinical encounters, limited consultation time restricts meaningful interaction, patient education, and shared decision-making, often resulting in misunderstanding, non-adherence to treatment, and reduced patient satisfaction. In this direction, communication gaps are further exacerbated by linguistic diversity, varying levels of health literacy, and socio-cultural beliefs about illness and care (Ahmed & Msughter, 2022). As healthcare delivery increasingly intersects with digital technologies, the need to interrogate how mediated communication tools can address these long-standing challenges has become both timely and necessary.

Chatbot technologies, powered by artificial intelligence and natural language processing, have emerged globally as innovative tools for mediating healthcare communication by providing real-time responses, health information, symptom guidance, and follow-up support. In Nigeria, their growing adoption reflects broader digital transformations in health communication, telemedicine, and mobile health interventions aimed at expanding access and

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efficiency. However, Msughter et al. (2020) observed that beyond their technical capabilities, chatbots raise important questions about the quality of interaction they enable, their influence on doctor-patient relationships, and their suitability within Nigeria's socio-cultural and infrastructural realities.

Traditional patterns of doctor-patient contact have changed dramatically as a result of the introduction of artificial intelligence (AI) technology into the healthcare industry (Msughter et al., 2023). The usage of chatbot-powered apps, which mimic human communication, offer real-time responses, and help with health-related duties like appointment scheduling, prescription reminders, and symptom checking, is one example of this breakthrough (Tsvetkov et al., 2021). These tools present a promising way to address the issues of efficiency and accessibility in healthcare delivery, especially in settings with a large patient load and a shortage of medical staff. Understanding how chatbot apps are affecting interpersonal interactions in clinical settings is crucial since doctor-patient contact is still a fundamental component of high-quality healthcare (Airaoje et al., 2024a). Thus, this paper situates chatbot-mediated healthcare communication within development communication and technology-mediated interaction frameworks, examining how these tools shape engagement, trust, and participation in the Nigerian healthcare context.

II. Review of Literatures

2.1 Theoretical Framework

The paper employs Uses and Gratifications Theory (UGT). Uses and Gratifications Theory (UGT) was articulated in its modern form by Elihu Katz, Jay G. Blumler and Michael Gurevitch in the early 1970s (Katz et al., 1974). The Theory built on earlier work in audience research and sought to shift attention from what media do to people, to what people do with media. Media users are active, goal-directed decision makers, users select media to satisfy specific psychological and social needs (e.g., information, personal identity, social interaction, entertainment), audience members are capable of articulating their motives; and media compete with other sources of satisfaction (Katz et al., 1974; Ruggiero, 2000). In short, the theory treats individuals as purposive actors who choose communication channels to meet needs.

Scholars have pointed out limitations of UGT. Ruggiero (2000) and McQuail (2010) note that UGT relies heavily on self-reports of motives (raising concerns about introspective accuracy and social desirability). Critics also argue UGT underestimates structural, institutional, and technological constraints that shape media use (e.g., access, cost, policy), and that it may overemphasize individual agency while downplaying social context (Ruggiero, 2000; McQuail, 2010). The principal strength of UGT is its user-centered orientation: it produces testable measures of motives and gratifications, which is useful when investigating why particular technologies are chosen (Whiting & Williams, 2013). It is flexible and adaptable across media types, including new digital tools. Its weakness lies in explanatory scope, UGT explains why people use media but is less able to explain how use patterns change because of institutional forces or diffusion dynamics (Ruggiero, 2000).

For this assessment, UGT helps explain why doctors and patients at COOUTH might adopt or repeatedly use a chatbot-powered app. Relevant gratifications in this context include quick access to information, convenience (reduced waiting time), anonymity when discussing sensitive issues, appointment scheduling, and reassurance (Vaidyam et al., 2019). Using UGT, the study can operationalize and measure these expected gratifications (via survey items and interview prompts) and assess whether the chatbot meets users' needs, a direct fit with an assessment focus on perceived usefulness and satisfaction. At the same time, because UGT

does not fully address systemic constraints (e.g., network reliability, hospital policy), findings based on UGT should be interpreted alongside structural factors identified in the empirical context.

2.2 Perspectives on Artificial Intelligence

Artificial Intelligence (AI) has become one of the most influential technological innovations of the 21st century, transforming industries and reshaping how human activities are carried out. AI is broadly defined as the ability of machines or computer systems to perform tasks that typically require human intelligence, such as reasoning, problem-solving, and decision-making (Russell & Norvig, 2016). In healthcare, AI extends beyond simple automation to sophisticated applications that analyze patient data, assist in medical diagnosis, and improve communication between healthcare providers and patients. This has positioned AI as an indispensable tool for improving efficiency, accuracy, and responsiveness within the health sector (Topol, 2019).

The relevance of AI in healthcare lies in its ability to analyze large volumes of medical data and provide insights that improve decision-making. For instance, AI-powered chatbots and mobile applications can interpret patient symptoms, recommend possible treatments, and guide individuals toward appropriate medical consultation (Shah et al., 2019). This ensures that patients receive timely feedback while also easing the workload on healthcare providers. The potential of AI in healthcare communication has therefore attracted significant global interest (Airaoje et al., 2023).

AI also enables a shift from reactive healthcare to predictive and preventive healthcare. Through machine learning and data analytics, AI systems can predict the likelihood of diseases and advise patients on preventive measures (Esteva et al., 2019). This not only improves patient outcomes but also fosters a proactive communication approach between doctors and patients. The predictive potential of AI also reassures patients, enhancing trust in healthcare systems.

Despite its benefits, the adoption of AI in healthcare communication is not without challenges. Ethical concerns such as data privacy, security, and algorithmic bias remain pressing issues (Jobin et al., 2019). Moreover, disparities in access to digital infrastructure, particularly in low- and middle-income countries, restrict the universal adoption of AI-powered tools. Patients in rural or underserved areas may not benefit equally from these innovations, thereby widening healthcare inequality. Summarily, AI represents a revolutionary tool for transforming healthcare delivery, especially in improving doctor-patient communication. Its ability to enhance efficiency, predict risks, and foster patient-centered care underscores its importance in modern healthcare.

2.3 Health Communication

Health communication is the process of sharing information, ideas, and messages to influence individual and community decisions that enhance health (Kreps, 2014). It plays a vital role in ensuring that patients receive accurate information, understand their medical conditions, and adhere to treatment instructions. Traditional health communication primarily relied on doctor-patient interactions, printed materials, and mass media campaigns. However, with technological advances, new methods such as social media platforms, mobile applications, and telemedicine have expanded the scope of health communication (Schiavo, 2014; Airaoje et al., 2024b).

The importance of health communication lies in its direct impact on patient behavior and outcomes. Effective communication increases patient adherence to treatment regimens, reduces anxiety, and improves overall satisfaction with healthcare services. Research has consistently shown that poor communication between doctors and patients often leads to non-compliance, medical errors, and mistrust (Aliough et al., 2023). This highlights the need

for innovative communication channels that address these barriers while strengthening the healthcare relationship.

The digital revolution has significantly transformed health communication. AI-powered apps, for instance, provide a more personalized and interactive way of engaging patients. They offer reminders for medication, guidance on lifestyle changes, and feedback on patient queries (Ventola, 2014). These innovations empower patients with knowledge and allow them to be active participants in their healthcare, creating a two-way communication system that is more effective than traditional one-way information dissemination.

However, challenges persist in achieving effective health communication. Barriers such as cultural differences, low literacy levels, and limited access to technology hinder effective understanding. Patients may misinterpret medical information or fail to trust automated communication systems. Designing communication strategies that are culturally sensitive and user-friendly is therefore critical for bridging these gaps.

However, Msughter et al. (2022) observed that health communication remains a vital component of healthcare delivery. The integration of AI-powered tools provides an opportunity to improve communication channels, enhance patient understanding, and support better health outcomes. The present study builds on this by examining how AI-powered applications improve communication between doctors and patients in a Nigerian teaching hospital.

2.4 Doctor-Patient Communication

Doctor-patient communication forms the foundation of healthcare practice, as it facilitates diagnosis, treatment, and patient management. It refers to the verbal and non-verbal exchanges that occur between medical practitioners (doctors) and patients in the process of healthcare delivery (Rao et al., 2007). Effective communication in this context involves not only the accurate transmission of medical information but also empathy, active listening, and mutual respect. These qualities foster trust and encourage patients to actively participate in their care.

Research shows that effective doctor-patient communication improves treatment adherence, enhances patient satisfaction, and reduces the likelihood of medical errors. Patients who perceive open communication with their doctors are more likely to report positive health outcomes and comply with treatment regimens (Namadi & Aondover, 2020). Conversely, communication breakdowns often lead to misunderstandings, misdiagnosis, and loss of trust. These outcomes highlight the central role of communication in ensuring quality healthcare.

The introduction of digital technologies, including AI-powered applications, has expanded the scope of doctor-patient communication beyond face-to-face encounters. Apps now allow patients to seek medical advice, receive reminders, and maintain contact with their doctors outside hospital settings (Lin et al., 2019). This ensures continuity of care and reduces the burden on healthcare systems. However, these technologies must complement, rather than replace, the human element of empathy and compassion in communication.

Doctor-patient communication is influenced by social, cultural, and institutional contexts. In teaching hospitals, where multiple providers interact with patients, consistency in communication becomes critical. AI-powered apps can help standardize information delivery, ensuring that patients receive accurate and timely advice regardless of who attends to them. However, patient acceptance of these tools and availability of infrastructure remains key determinants of their effectiveness.

In this contest, doctor-patient communication remains an indispensable aspect of healthcare practice. While AI tools provide new opportunities to strengthen communication, they must be carefully integrated to preserve the trust, empathy, and interpersonal connection that underpin effective medical practice.

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III. Result and Discussion

3.1 Artificial Intelligence-Powered Applications

AI-powered applications are software systems that incorporate artificial intelligence techniques to perform tasks requiring human-like reasoning and learning. In healthcare, these apps are designed to support clinical decision-making, improve efficiency, and enhance communication between providers and patients (Obada et al., 2024). Examples include apps that track symptoms, schedule appointments, provide medication reminders, and facilitate doctor-patient interaction through chatbots or teleconsultations.

The strength of AI-powered apps lies in their ability to process large amounts of health data and provide personalized feedback. For instance, natural language processing enables apps to interpret patient queries and provide relevant responses in real time. Similarly, machine learning algorithms can monitor patient progress and alert providers to potential risks. These features transform communication from static, one-way processes to dynamic, interactive exchanges that foster stronger relationships.

Globally, the adoption of AI-powered apps in healthcare communication has been on the rise. In developed countries, apps such as Ada Health and Buoy Health enable patients to conduct symptom checks and access healthcare remotely. In Nigeria and other developing countries, such applications hold great promise in bridging the communication gap between healthcare providers and patients, particularly in rural or underserved areas (Obada et al., 2021a).

Nevertheless, challenges such as poor internet connectivity, digital illiteracy, and skepticism about automated responses affect the effectiveness of AI-powered apps (Alami et al., 2020). Some patients perceive these tools as impersonal and may prefer direct human interaction. Addressing these challenges requires integrating AI applications with human oversight, ensuring that patients feel supported both technologically and emotionally.

AI-powered applications represent an innovative approach to improving healthcare communication. Their capacity to deliver personalized, accessible, and interactive healthcare information positions them as vital tools for enhancing doctor-patient relationships. Their assessment within the Nigerian healthcare context is crucial for understanding their effectiveness and addressing potential limitations (Obada et al., 2021b).

3.2 Chatbots and Doctor–Patient Communication

Chatbots are AI-driven conversational agents that simulate human interaction using natural language processing and machine learning. In healthcare, chatbots are increasingly being deployed as intermediaries between patients and healthcare providers, offering a platform for communication that is accessible, consistent, and available 24/7 (Kocaballi et al., 2020). They serve various purposes such as triaging patients, answering frequently asked questions, offering symptom checkers, and providing mental health support (Pate et al., 2020). These features make them particularly relevant in contexts where doctors face high patient loads and limited time for individual consultations.

The integration of chatbots into doctor-patient communication has introduced new dynamics in healthcare delivery. For patients, chatbots provide immediate responses to health-related queries, reducing the waiting time for medical advice (Usman et al., 2022). For doctors, chatbots serve as supportive tools that handle repetitive communication tasks, freeing up time to focus on more complex cases. This two-way interaction fosters better continuity of care, especially in teaching hospitals where patient numbers often exceed the available healthcare workforce.

Despite these benefits, the use of chatbots raises questions about the quality and empathy of communication. Scholars argue that human-to-human communication in healthcare cannot be fully replaced by AI, as empathy, trust, and emotional support remain

critical components of medical interaction. While chatbots can deliver accurate information, they may fail to interpret emotional cues or adapt communication styles to patient preferences. This limitation makes them complementary rather than substitutive in doctor-patient relationships.

Research also suggests that patient trust in chatbots depends on factors such as accuracy, privacy, and transparency. If patients perceive chatbots as unreliable or insecure, they may hesitate to engage with them (Zhou et al., 2019). Addressing these concerns requires robust design, ongoing updates, and integration with human oversight. Thus, while chatbots provide valuable assistance, they work best when used in synergy with traditional doctor-patient communication. Overall, chatbots play a growing role in enhancing doctor-patient communication by improving accessibility, reducing delays, and supporting doctors. However, they are most effective when integrated thoughtfully into healthcare systems, maintaining a balance between technological efficiency and the human empathy required in medical care.

3.3 Assessment of Chatbot Applications in Healthcare

Assessing chatbot applications in healthcare involves evaluating their effectiveness, efficiency, and impact on both patients and doctors. These assessments typically consider indicators such as accuracy of information, ease of use, patient satisfaction, and the extent to which chatbots support communication (Hile et al., 2022). In teaching hospitals, such evaluations are critical in determining whether chatbots genuinely improve healthcare outcomes or simply add another layer of complexity to existing communication systems.

International studies have revealed promising outcomes regarding chatbot performance in healthcare. For instance, Laranjo et al. (2018) found that chatbots can improve patient engagement and adherence to treatment regimens. Similarly, a study by Miner et al. (2016) demonstrated that chatbots could effectively support mental health interventions, providing patients with coping strategies and crisis support. These findings suggest that chatbots hold significant potential as supplementary tools in healthcare communication.

In developing countries, however, the assessment of chatbots remains limited. Challenges such as poor internet penetration, digital illiteracy, and inadequate healthcare infrastructure affect their performance. In Nigeria, for example, few studies have examined the effectiveness of chatbot applications within teaching hospitals, despite their growing relevance in addressing overcrowding, miscommunication, and delayed consultations. This gap underscores the need for empirical research that examines how patients and doctors perceive chatbot-powered apps in the Nigerian healthcare context.

Furthermore, researchers have raised concerns about the ethical and operational implications of chatbots. Issues such as data privacy, patient safety, and accountability in case of medical errors remain unresolved. Without proper regulation and monitoring, chatbots may pose risks to patient trust and health outcomes. This makes it necessary to establish frameworks for evaluating their performance within different healthcare sectors (Usman et al., 2022). Apparently, the assessment of chatbot applications is essential for understanding their role in enhancing healthcare delivery.

IV. Conclusion

This paper demonstrates that chatbot technologies represent a significant communicative intervention in Nigeria's healthcare system, functioning as mediators that bridge information gaps and extend the reach of healthcare services beyond traditional clinical settings. While chatbots enhance access to health information and encourage more active patient engagement, their effectiveness is shaped by contextual factors such as digital literacy, cultural expectations, language inclusivity, and ethical considerations surrounding data privacy. The paper concludes that chatbots should be understood not as substitutes for human

doctors, but as complementary communication tools capable of strengthening doctor-patient engagement when thoughtfully designed and appropriately integrated. For chatbot-mediated healthcare communication to achieve sustainable impact in Nigeria, policy support, contextual adaptation, and alignment with broader health communication strategies remain imperative.

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