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Digital Activism, Citizen Participation, and Vaccine Uptake in Nigeria's Integrated Measles-Rubella and Polio Campaign in Port Harcourt, Nigeria

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ABSTRACT

Background: Despite expanded immunisation efforts in Nigeria, measles, rubella, and polio remain significant public health challenges. Although digital media increasingly shape health communication and civic engagement, there is limited empirical evidence on how digital activism and citizen participation influence actual vaccine uptake during integrated vaccination campaigns.
Objective: This study investigated the influence of digital activism and citizen participation on vaccine uptake during the integrated measles-rubella and polio vaccination campaign in Port Harcourt City, Rivers State, Nigeria.
Method: The study employed a mixed-methods approach, combining a descriptive cross-sectional survey with qualitative interviews involving parents and guardians of vaccine-eligible children, digitally active citizens, and key stakeholders in Port Harcourt. Based on the Krejcie and Morgan sample size table, 384 respondents were proportionately selected using Bowley's allocation formula, while 10 key stakeholders were purposively selected for in-depth interviews. Data were collected using a structured questionnaire and semi-structured interview guide. Instrument validity was established through expert review, while methodological triangulation enhanced the credibility of the findings. Quantitative data were analysed using Weighted Mean Scores (WMS), whereas qualitative data were analysed thematically.
Results: The findings revealed that social media platforms and digital influencers constituted the predominant forms of digital activism during the campaign. Citizen participation occurred mainly through online information sharing, with relatively limited offline engagement. Although digital activism increased awareness and enhanced public trust in the vaccination campaign, it had a limited effect on reducing vaccine hesitancy or directly increasing vaccine uptake. Religious beliefs and concerns about vaccine safety emerged as the principal factors influencing vaccination decisions.
Conclusion: The study concludes that digital activism alone is insufficient to improve vaccine uptake, as increased awareness and online engagement do not necessarily translate into behavioural change.
Unique Contribution: This study contributes to the health communication literature by identifying a disconnect between digital participation and actual vaccine uptake. It further reconceptualises digital

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activism as a pre-behavioural communication mechanism that facilitates awareness and engagement but requires complementary interpersonal interventions to achieve meaningful behavioural outcomes.
Key Recommendation: Public health vaccination campaigns should integrate digital mobilisation with trusted interpersonal communication delivered through religious leaders, community influencers, and healthcare workers to improve vaccine uptake and address vaccine hesitancy more effectively.

Keywords: Digital activism, citizen participation, vaccine uptake, health communication, vaccine hesitancy.

BACKGROUND

The rapid expansion of digital media communication technologies has significantly transformed public health advocacy and civic engagement in sub-Saharan Africa, with Nigeria serving as a particularly salient example. The intersection of widespread mobile phone adoption, increasing social media use, and a persistent burden of vaccine-preventable diseases presents both opportunities and challenges for health communication. Although, vaccination remains one of the most effective interventions for reducing child mortality and morbidity (Plotkin et al., 2018), Nigeria continues to experience outbreaks of measles, rubella, and polio despite decades of immunisation initiatives. Measles can cause severe complications such as pneumonia and death, rubella poses risks of congenital deformities, and polio results in irreversible paralysis (WHO, 2025). While these diseases are preventable, persistent gaps in immunisation coverage and challenges in reaching at-risk populations perpetuate their transmission.

Recent data underscore the magnitude of the challenge. The Nigeria Centre for Disease Control (NCDC) reported thousands of suspected measles cases in 2024 (NCDC, 2024). While the nation is certified free of wild poliovirus, circulating vaccine-derived poliovirus (cVDPV2) persists (NPHCDA, 2025). Furthermore, millions of children remain zero-dose, having received no vaccinations (UNICEF Nigeria, 2025). These circumstances highlight the urgent need to strengthen vaccination campaigns, and in response, Nigeria has implemented integrated immunisation strategies that combine vaccines to enhance efficiency and coverage. The 2025 integrated measles–rubella and polio campaign, which targets over 100 million children, exemplifies this approach and seeks to interrupt disease transmission while bolstering community confidence in immunisation systems (WHO, 2025; Gavi.org, 2025).

The effectiveness of vaccination campaigns increasingly relies not only on vaccine availability but also on effective communication and citizen engagement. In this context, digital activism has emerged as a significant force shaping public health advocacy. Digital activism refers to the use of online platforms to mobilise citizens, disseminate information, and influence behaviour (Joyce, 2010). In Nigeria, platforms such as X, WhatsApp, Facebook, and Instagram have become integral to health communication, facilitating rapid information dissemination and grassroots mobilisation (Collins-Dike et al., 2025). While digital activism initially gained prominence in political movements, it has since expanded into health advocacy, where civil society actors and influencers promote vaccination and counter misinformation (Ejifoma, 2025).

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Citizen participation complements digital activism and entails the active involvement of individuals and communities in decision-making and collective action (Gaventa & Barrett, 2012; Okoro & Nwafor 2013). In the context of vaccination, participation involves engaging parents, religious leaders, and community influencers who shape public perceptions and behaviours. Digital media amplify the voices of these actors, bridging communication gaps between health authorities and the public. Collectively, digital activism and citizen participation provide avenues to broaden the reach and enhance the effectiveness of vaccination campaigns.

Despite these opportunities, significant challenges persist. Misinformation, particularly on platforms such as WhatsApp, continues to erode trust in health systems and contribute to vaccine hesitancy (Betsch et al., 2015; Nwafor et al., 2013). False claims about vaccine safety and government intentions spread rapidly, complicating public health messaging. Addressing these challenges requires coordinated strategies that combine credible online communication, trusted community voices, and improved digital literacy.

Although scholarship has addressed vaccine hesitancy, health communication campaigns, and the influence of digital media on public health outcomes, significant conceptual and empirical gaps persist. Most studies have focused on determinants of vaccine acceptance and hesitancy (Agbede et al., 2024; Ifeanyi et al., 2025), communication barriers in immunisation campaigns (Isiaka et al., 2024), and broader issues of health system trust (Familusi et al., 2025). Some research has examined digital activism in political and civic contexts, such as #EndSARS and electoral participation (Apata, 2025; Njoku & Dufugha, 2025). However, limited research has explored digital activism as a public health communication phenomenon, particularly within vaccination campaigns. Furthermore, most existing studies have treated communication exposure, vaccine attitudes, and behavioural outcomes as distinct phenomena, with minimal investigation into the interconnected pathways linking digital activism, citizen participation, and vaccine uptake.

Additionally, much of the current evidence is derived from studies conducted outside integrated vaccination contexts, relies primarily on single-method approaches, or gives limited consideration to how online mobilisation influences offline health behaviour. As a result, there remains insufficient theoretical and empirical understanding of whether digital participation simply generates awareness or facilitates meaningful behavioural outcomes, such as vaccination uptake. This gap is particularly significant in Nigeria, where digital platforms increasingly shape public engagement and health discourse.

Within this context, Nigeria's integrated measles–rubella and polio campaign offers a valuable opportunity to examine the intersection of digital mobilisation and public health. This study investigates the relationships among digital activism, citizen participation, and vaccination uptake in Port Harcourt City Local Government Area, Rivers State. Specifically, it explores the forms of digital activism associated with the campaign, patterns of participation across online

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and offline environments, the contribution of digital activism to engagement, the extent to which participation leads to vaccine uptake, and the factors influencing vaccination decisions. By analysing these dynamics, this study seeks to clarify how digital mobilisation can be effectively leveraged to strengthen vaccination campaigns and reduce the burden of vaccine-preventable diseases. Ultimately, it contributes to broader debates on communication, participation, and the role of digital technologies in public health outcomes in Nigeria.

OBJECTIVES AND RESEARCH QUESTIONS

This study examines the relationship between digital activism, citizen participation, and vaccine uptake in the integrated measles–rubella and polio campaign in Port Harcourt. Specifically, it seeks to tackle the following:

1. Which forms of digital activism are exhibited by digitally active citizens and stakeholders during the integrated measles–rubella and polio vaccination campaign in Port Harcourt City Local Government Area, Rivers State?
2. What is the extent of citizen participation among parents, guardians, and digitally active individuals in the integrated measles–rubella and polio campaign across both online and offline platforms in Port Harcourt City Local Government Area, Rivers State?
3. In what ways does digital activism affect citizen participation in integrated measles–rubella and polio vaccination activities among residents of Port Harcourt City Local Government Area, Rivers State?
4. To what degree does citizen participation lead to increased vaccine uptake among parents and guardians of vaccine-eligible children in Port Harcourt City Local Government Area, Rivers State?
5. Which factors influence citizens' decisions to accept or decline vaccination during the integrated measles–rubella and polio campaign in Port Harcourt City Local Government Area, Rivers State?

CONCEPTUAL, THEORETICAL AND EMPIRICAL FRAMEWORK

Digital activism involves the use of network platforms and digital tools to mobilise citizens, disseminate information, and challenge dominant narratives (Joyce, 2010). In Nigeria, its evolution from political movements such as #EndSARS to broader civic engagement demonstrates its potential to reshape public discourse (Apata, 2025; Njoku & Dufugha, 2025). Digital activism is diverse, including hashtags, influencer campaigns, and online forums, each exhibiting varying degrees of reach, credibility, and impact. Although it amplifies awareness, it may also facilitate the spread of misinformation, presenting both opportunities and challenges for public health communication.

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Aligwe and Nwafor (2017) opine that citizen participation complements digital activism by emphasising the active involvement of individuals and groups in collective action. Drawing on Arnstein's (1969) framework, participation in Nigeria's health sector is shaped by socio-economic and anthropological factors (Bamgboye et al., 2024). It occurs in hybrid forms: online participation through information sharing and digital engagement, and offline participation through community mobilisation and physical attendance at vaccination campaigns. Participation enhances trust, legitimacy, and accountability in public health interventions (Gaventa & Barrett, 2012), particularly where institutional trust is limited.

Vaccine hesitancy, defined as the delay or refusal of vaccination despite availability (WHO, 2019), remains a significant barrier in Nigeria. It is influenced by misinformation, religious beliefs, and safety concerns (Agbede et al., 2024; Ifeanyi et al., 2025). Exposure to false information, particularly on platforms such as WhatsApp, increases hesitancy, whereas trusted figures such as religious leaders can mitigate it (Betsch et al., 2015). These dynamics underscore the necessity of incorporating credible communication strategies into vaccination campaigns.

Health communication establishes the framework for disseminating information and influencing health behaviours. Effective strategies are culturally sensitive, tailored to specific audiences, and utilise multiple channels (Schiavo, 2014; Kreps & Thornton, 1992). In Nigeria, integrating traditional media with digital platforms improves campaign effectiveness, particularly in addressing misinformation and promoting vaccine uptake (Wakefield et al., 2010).

Social mobilisation further reinforces these processes by engaging communities and institutions in collective action (Hornik, 2002). In vaccination campaigns, mobilisation through religious leaders, traditional authorities, and grassroots groups is critical for overcoming hesitancy and guaranteeing uptake (Isiaka et al., 2024; Obregón & Waisbord, 2010). These efforts emphasise that vaccination is not solely a biomedical intervention but a socially embedded process requiring community ownership.

General confidence in health systems is a critical determinant of vaccination behaviour. Trust affects both vaccine acceptance and confidence in institutions (Gilson, 2003; Ozawa & Stack, 2013). In Nigeria, historical scepticism toward health interventions continues to influence public responses, highlighting the need for transparency and accountability to restore confidence (Familusi et al., 2025).

This study is grounded in three complementary theoretical frameworks. The Digital Public Sphere Theory describes how online platforms facilitate deliberation and shape public opinion (Habermas, 1989; Papacharissi, 2002). Social Mobilisation Theory focuses on collective engagement and community-driven change (Hornik, 2002), while the Health Belief Model addresses individual decision-making based on perceived risks, benefits, and barriers (Rosenstock, 1974). Collectively, these frameworks enable a multi-level analysis of the influence of digital activism on participation and, subsequently, on vaccine uptake.

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Empirical studies support these dynamics. Adewumi et al. (2025) highlight the impact of governance and distribution inequities on vaccine uptake, while Bamgboye et al. (2024) demonstrate that regional inequalities are shaped by socio-cultural factors. Agbede et al. (2024) identify misinformation and cultural beliefs as drivers of hesitancy, and Isiaka et al. (2024) underscore the significance of trusted community actors in mobilisation. Familusi et al. (2025) similarly identify weak institutional trust as a persistent barrier to effective health intervention implementation.

Collectively, these insights demonstrate the complex interactions among digital activism, citizen participation, and vaccine uptake. They provide a robust foundation for examining how communication and mobilisation strategies may be optimised to improve immunisation outcomes in Nigeria.

METHODS

A mixed-methods design was employed, integrating quantitative surveys and qualitative interviews to examine vaccine uptake, digital activism, and citizen participation in Port Harcourt City Local Government Area, Rivers State. The study population included parents and guardians of vaccine-eligible children, digitally active citizens, and key stakeholders involved in vaccination communication.

The study population included parents and guardians of vaccine-eligible children, digitally active citizens, and key stakeholders engaged in vaccination communication within Port Harcourt City Local Government Area and the wider Port Harcourt metropolitan area, Rivers State. The estimated combined population for these regions is 3,951,670 (World Population Review, 2026). Based on Krejcie and Morgan's sample size determination table, a sample size of 384 respondents was deemed sufficient. Bowley's proportional allocation formula was applied to ensure proportional representation. For the qualitative component, 10 interview participants community leaders, health workers, and digital activists were purposively selected.

Data collection involved a structured questionnaire using a four-point Likert scale, administered both online via Google Forms and in person. Semi-structured interviews were also conducted to capture in-depth perspectives on digital activism, trust, and barriers to participation. Quantitative data were analysed using Weighted Mean Scores (WMS) with a decision threshold of 2.5, and results were presented in a chart and descriptive summaries. Qualitative data underwent thematic analysis and were reported as emergent themes, each supported by narrative explanations. Instrument validity was confirmed through expert review, and reliability was enhanced by consistent administration and triangulation of findings.

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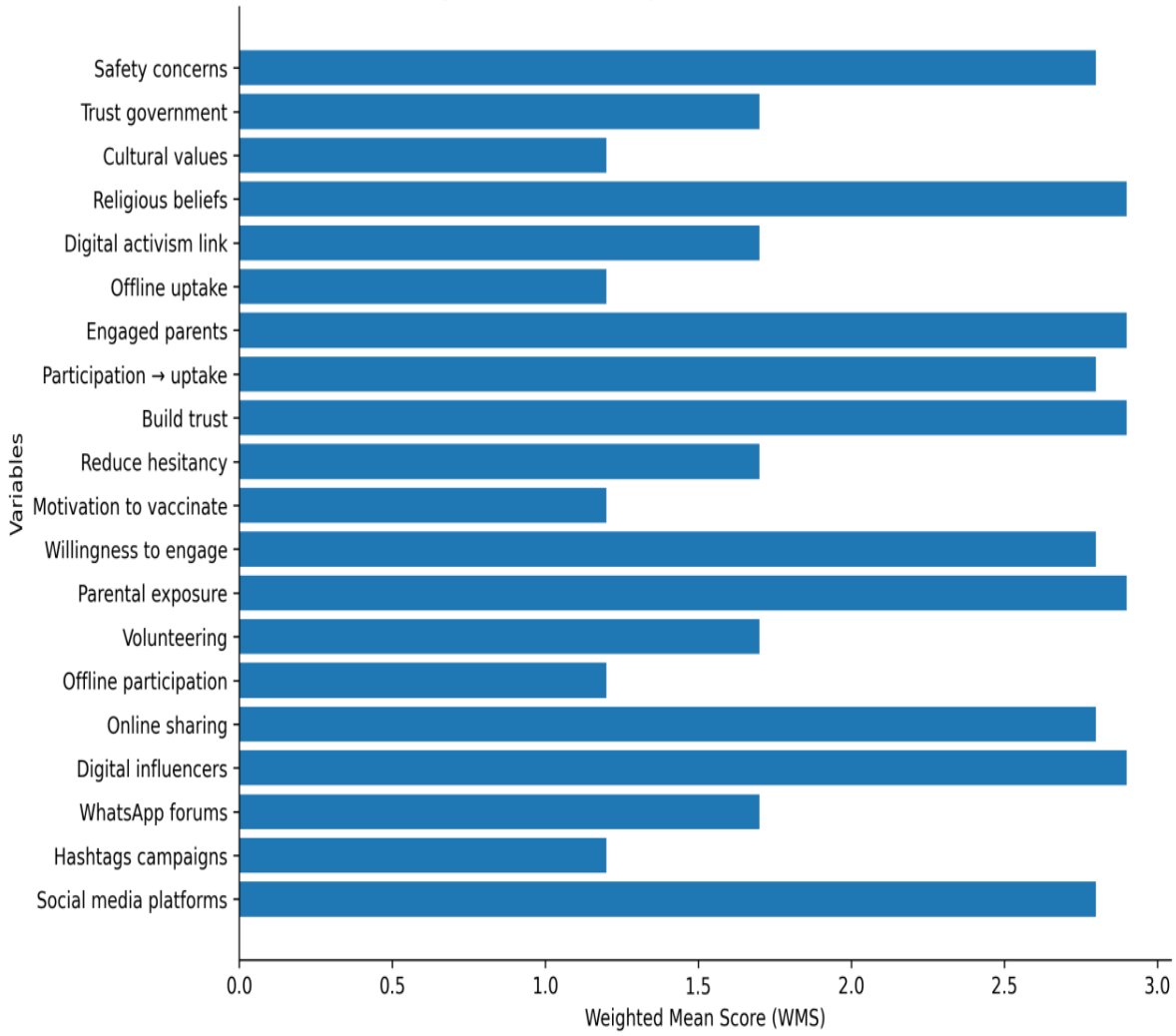
RESULTS

The results are structured according to the five research questions, integrating quantitative and qualitative findings to offer a comprehensive interpretation of the influence of digital activism and citizen participation on vaccine uptake in Port Harcourt City.

Figure 1
Digital Activism, Participation, and Vaccination Outcomes



Forms of Digital Activism (RQ1)

Figure 1 is a visual summary of the weighted mean scores for the key variables in this study. As shown in the figure, the most prominent forms of digital activism emerging around the integrated measles–rubella and polio vaccination campaign in Port Harcourt City are the use of social media platforms and the involvement of digital influencers and community leaders. These factors received strong acceptance (WMS = 2.8 and 2.9), indicating that respondents identified them as primary drivers of awareness and engagement.

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In contrast, hashtags, online campaigns, and WhatsApp forums were found to be less impactful, with weighted mean scores of 1.2 and 1.7 respectfully. These scores fell below the criterion mean and were therefore excluded, indicating that respondents did not perceive them as highly effective in shaping vaccination-related awareness or participation. This result suggests that although digital activism contributed significantly to campaign visibility, its effectiveness varied across different platforms and formats. More personalised, visible, and trust-based digital actors, such as influencers and community leaders, demonstrated a stronger mobilizing influence compared to generalized hashtag campaigns or WhatsApp-based discussions.

Qualitative responses reinforce this pattern, emphasising that platforms such as Facebook, WhatsApp, and Instagram are most effective when messages originate from trusted and recognisable figures. Generic hashtags and abstract campaigns were considered insufficiently engaging, highlighting the centrality of credibility and personalisation in digital activism.

These findings align with the Digital Public Sphere Theory, which conceptualises social media as arenas for deliberation and opinion formation (Habermas, 1989; Papacharissi, 2002). Influencers and community leaders function as discursive intermediaries, enhancing trust and amplifying message legitimacy. Similarly, Social Mobilisation Theory emphasises the role of trusted actors in facilitating collective action (Hornik, 2002). The results indicate that digital activism is most effective when integrated within relational trust networks rather than relying on fragmented digital tools.

Citizen Participation Patterns (RQ2)

Citizen participation is predominantly digital, with strong acceptance of online information sharing (WMS = 2.8) and exposure-driven engagement (WMS = 2.9). Conversely, offline participation, including attendance at sensitisation meetings and volunteering, was rejected (WMS = 1.2 and 1.7), signifying weak physical engagement.

Interview data indicate that while digital media effectively raise awareness, citizens, particularly parents, consistently rely on trusted community actors such as health workers and religious leaders for validation before taking action. This underscores a gap between digital exposure and actual participation.

The Health Belief Model (HBM) provides a useful explanatory lens for this outcome. Digital messages act as cues to action, increasing awareness and perceived benefits, but barriers such as time constraints, residual doubts, and safety concerns restrict offline engagement (Rosenstock, 1974). This result resonates with Isiaka et al. (2024), who emphasise that effective participation requires trust-building mechanisms beyond information dissemination.

Overall, participation in Port Harcourt is hybrid yet asymmetrical, with digital engagement prevailing and offline participation remaining limited.

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Influence of Digital Activism on Participation (RQ3)

The results indicate that digital activism significantly increases willingness to participate (WMS = 2.8) and fosters trust in health authorities (WMS = 2.9). However, it is less effective in reducing vaccine hesitancy or directly motivating vaccination uptake, as these variables were rejected (WMS = 1.2 and 1.7).

Qualitative results confirm that although exposure to digital campaigns enhances awareness and confidence, deep-seated concerns, particularly regarding safety and religious beliefs, persist. Respondents noted that online campaigns alone cannot overcome entrenched skepticism.

Within the HBM framework, digital activism enhances perceived benefits and cues to action but does not sufficiently reduce perceived barriers, particularly fears of side effects and ideological resistance. This finding is consistent with Agbede et al. (2024), who observed that cultural and safety concerns remain dominant drivers of hesitancy despite increased awareness. Thus, digital activism primarily serves as an enabling mechanism for engagement rather than a direct determinant of behavioral change.

Participation and Vaccine Uptake (RQ4)

The study shows that active participation is associated with greater vaccine uptake (WMS = 2.8), particularly when caregivers and guardians are directly involved (WMS = 2.9). However, offline attendance alone (WMS = 1.2) and digital activism (WMS = 1.7) do not significantly strengthen this relationship. This suggests that not all forms of participation are equally effective. Passive engagement, such as online interaction or occasional attendance, does not reliably translate into vaccination behavior. Instead, uptake is driven by intentional, decision-oriented participation.

Interview findings support this distinction. While online engagement is widespread, conversion into action is inconsistent, particularly among older caregivers. Younger participants were more likely to actively participate, indicating generational variation in participation modes.

The Social Mobilisation Theory explains this dynamic by stressing that sustained, community-based engagement, instead of isolated participation, is necessary for behavioural outcomes (Hornik, 2002). Similarly, Bamgboye et al. (2024) demonstrate that participation must be reinforced by trust and structured mobilisation to influence uptake. In essence, the findings reveal a participation–uptake gap, in which awareness and engagement do not automatically translate into vaccination behavior.

Determinants of Vaccination Decisions (RQ5)

The study shows religious beliefs (WMS = 2.9) and vaccine safety concerns (WMS = 2.8) as the most significant determinants of vaccination decisions. In contrast, cultural values and confidence in government institutions were rejected (WMS = 1.2 and 1.7), indicating weaker influence. Qualitative data further highlight that parents consistently prioritise religious

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convictions and perceived health risks over institutional messaging. Even when exposed to digital campaigns, these factors serve as decisive barriers.

The HBM again provides explanatory clarity. Religious beliefs and safety concerns constitute perceived barriers, which outweigh cues to action generated through digital activism. This is consistent with Agbede et al. (2024), who found that fear and belief systems override informational interventions in shaping vaccine behaviour. The limited role of institutional trust suggests that decision-making is more localised and personal, mediated through community and belief systems rather than formal authority structures.

A consistent pattern was identified across all research questions concerning the relationships among communication, participation, and vaccination behaviour. The findings indicate that digital activism effectively raises awareness and strengthens trust in vaccination campaigns; however, its impact on direct behavioural change is limited. Citizen participation primarily occurred through digital platforms, with offline engagement remaining comparatively weak. Vaccine uptake was more strongly associated with active, decision-oriented participation than with passive exposure to campaign messages or online interactions. Additionally, religious beliefs and concerns about vaccine safety emerged as the most significant determinants of vaccination behaviour, exerting greater influence on decision-making than broader cultural or institutional factors. Overall, these outcomes collectively indicate a critical structural issue, a disconnect between communication, participation, and behavioural outcomes.

To address this gap, vaccination campaigns should move beyond information dissemination toward integrated strategies that combine digital mobilisation with interpersonal trust-building, particularly through religious and community leaders. Only through such mixed approaches can awareness be effectively translated into sustained vaccine uptake.

CONCLUSIONS

Based on the results, this study concludes that digital activism, even though effective at expanding awareness and strengthening public confidence, is insufficient as a standalone mechanism for improving vaccination uptake. Vaccine behaviour is shaped not just by communication exposure but by the interaction of active citizen participation, interpersonal trust, and firmly established socio-cultural factors. The persistence of passive forms of engagement, alongside the impact of religious beliefs and vaccine safety concerns, suggests that awareness alone does not guarantee behavioural action. Therefore, effective vaccination campaigns in contexts such as Port Harcourt require integrated strategies that combine digital mobilisation with community-based engagement, trust-building mechanisms, and culturally attuned communication approaches that translate awareness into sustained health behaviour.

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RECOMMENDATIONS

1. Prioritise Influencer-Driven Digital Communication Vaccination campaigns should prioritise trusted digital influencers and community leaders as primary communication channels, ensuring that messages are credible, relatable, and tailored to specific platforms.
2. Create Structured Pathways from Online Engagement to Action Campaigns must deliberately convert digital engagement into offline behaviour through mechanisms such as appointment reminders, geo-targeted messaging, and integrated digital-to-physical mobilisation strategies.
3. Embed Trust-Building in Communication Techniques Digital messaging should be reinforced by health workers and community leaders who can provide real-time clarification and reassurance, particularly regarding vaccine safety.
4. Target Parents and Guardians as Primary Decision-Makers Communication and mobilisation efforts should prioritise parents and caregivers, employing tailored messaging and localised outreach to convert awareness into vaccination decisions.
5. Engage Religious Institutions and Address Safety Concerns Directly Given the central role of belief systems, campaigns should collaborate with religious leaders and develop clear, accessible, and culturally sensitive messaging that directly addresses vaccine safety concerns.

Ethical clearance

Ethical consent was sought and obtained from the participants used in this study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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The study was not funded.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' Contributions

Sarah Chidiebere Joe conceived and designed the study. Uge Prince, Okoroafor Joy, and Ibezim Happiness were responsible for data collection. Ugo Abraham and Uge Prince conducted the data analysis and interpretation, while Sarah Chidiebere Joe and Uge Prince prepared the initial manuscript draft. All authors critically reviewed and approved the final manuscript and accept responsibility for its content and similarity index.

Data availability statement
The datasets on which conclusions were made for this study are available on reasonable request.

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