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Social Media Vaccine Misinformation and Sociocultural Determinants of Routine Immunisation Perceptions among Caregivers in Ondo West LGA, Nigeria

Ibrahim Dawud Oyedemi[1*], Akinwande Mayowa Wande[1], Oladejo Oluwatoyin Temitope[1], Akinniyi Rotimi Jecob [2], Oladiran Isdaiah Olagunju[5], Ibrahim Yetunde Sadiat[6]

1. *Department of Health Promotion and Behavioural Science, University of Medical Sciences, Ondo, Ondo State, Nigeria,* dibrahim@unimed.edu.ng.
2. *Department of School of Community Health, Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife, Osun State, Nigeria*

*Corresponding author

Abstract

Context: Social media platforms have become major conduits for vaccine-related misinformation, undermining routine immunisation programmes globally and in Nigeria. Despite growing evidence of this, the factors enabling rumour circulation among caregivers in Ondo West Local Government Area (LGA), Ondo State, remain inadequately characterised. **Objective:** This study identified factors associated with the circulation of immunisation misinformation on social media and determined the sociocultural and demographic factors associated with the spread of vaccine rumours among caregivers in Ondo West LGA, Nigeria. **Methods:** A cross-sectional descriptive mixed-methods design was employed. Quantitative data were collected from 225 caregivers using a validated structured questionnaire across ten primary healthcare facilities selected through multistage sampling. Twenty-five caregivers participated in in-depth interviews. Data were analysed using descriptive statistics, chi-square tests, binary logistic regression, and thematic analysis. **Results:** Major factors associated with rumour circulation included lack of accurate immunisation information (81.3%), ease of sharing unverified content (80.4%), lack of regulation and fact-checking (79.6%), influence of anti-vaccine groups (76.9%), cultural beliefs transmitted online (75.6%), and vaccine safety fears (68.9%). This showed that cultural and religious beliefs, internet literacy, and health information-sharing behaviours influenced engagement with vaccine-related content. Chi-square analysis revealed no significant association between rumour-contributing factors and immunisation influence ($p = 0.936$). Binary logistic regression identified caregiver perception as the only significant predictor of immunisation influence (AOR = 6.955; $p < 0.001$). **Conclusion:** Social media immunisation rumours in Ondo West LGA are driven by information deficits, sociocultural norms and weak regulation, with caregiver perception serving as the dominant mediating pathway.

Keywords: Social media misinformation, immunisation rumours, sociocultural factors, digital health literacy, vaccine hesitancy, Nigeria, Ondo State

1. Introduction

Vaccination is universally recognised as one of the most powerful tools in preventive public health, having eliminated or drastically reduced the burden of a wide spectrum of infectious diseases, including smallpox, poliomyelitis, measles, diphtheria, pertussis, and tetanus. The World Health Organization (WHO) estimates that immunisation prevents between 2 and 3 million deaths annually (WHO, 2020). Despite this evidence base, global vaccination coverage declined from 86% in 2019 to 83% in 2020, with 23 million children failing to receive even basic vaccines, the highest number since 2009 (WHO, 2020). This erosion of progress is increasingly associated with the global infodemic: the unprecedented proliferation of health misinformation through social media platforms, which systematically undermines caregiver confidence in vaccines (WHO, 2021).

Social media platforms, including Facebook, WhatsApp, Twitter (now X), YouTube, and TikTok, have fundamentally transformed the information ecosystem in which caregivers make vaccine-related decisions. Nigeria had an estimated 35 million active social media users as of

2021, a figure derived from Datareportal's 2022 Nigeria Digital Report, which represents among the most current nationally aggregated estimates (Datareportal, 2022). While social media enables rapid health education dissemination, its architectural features, particularly algorithmic amplification, ease of content sharing without verification, and absence of robust fact-checking, structurally favour rumour spread over evidence-based messaging (Broniatowski *et al*., 2019; Vosoughi *et al*., 2018).

In the Nigerian context, social media-driven vaccine rumours have been implicated in documented immunisation crises. The northern Nigerian boycott of oral polio vaccines in the early 2000s, fuelled by rumours about HIV contamination and anti-fertility agents, directly contributed to, though did not solely cause, the resurgence of poliomyelitis across the country, demonstrating the serious public health consequences of health misinformation within social and community networks (Ghinai *et al*., 2018; Jegede, 2007). More recently, WhatsApp groups and Facebook pages have been identified as major vectors for routine childhood vaccine rumours in Nigeria (Oku *et al*., 2017; Adedire *et al*., 2021).

The Dual-Process Model of cognitive information processing provides a theoretical lens for understanding caregiver engagement with vaccine-related social media content. According to the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (HSM; Chaiken, 1980), individuals process persuasive messages either centrally (through analytical evaluation) or peripherally (through cognitively effortless heuristic judgements based on source cues, emotional appeal, or social proof). In this study, the ELM and HSM are applied as follows: the five questionnaire items measuring caregiver perception operationalise the ELM construct of attitude formation under peripheral processing conditions; the items assessing internet literacy and education level operationalise cognitive capacity for central processing; and the sociocultural items measuring trust in peer networks over government sources operationalise the heuristic cue of source credibility. This framework predicts that caregivers with lower digital literacy, processing vaccine information peripherally, will be more susceptible to misinformation and will demonstrate stronger negative perception-to-influence pathways, a hypothesis tested in the logistic regression model.

Ondo West Local Government Area, with an estimated population of 241,605 across urban and rural wards, provides a strategically important study site. Its sociodemographic heterogeneity, encompassing diverse educational levels, occupational backgrounds, and religious affiliations, allows analysis of how sociocultural and demographic factors intersect with digital exposure to shape vaccine rumour susceptibility. Empirical studies specifically documenting vaccine misinformation dynamics and their sociocultural determinants in this LGA are sparse, representing the gap that this study addresses.

In this study, the following constructs are operationalised as follows. Misinformation refers to inaccurate or false health-related claims about immunisation disseminated via social media, irrespective of intent. Rumours are specific unverified narratives about vaccine safety, composition, schedule, or government intent that circulate through social media networks. Perception refers to caregivers' overall evaluation of social media vaccine information as beneficial or harmful, operationalised as a composite score across five questionnaire items (Cronbach's $\alpha = 0.76$), dichotomised into positive ($\geq 60\%$ of maximum score) and negative ($<60\%$) perception. Influence refers to self-reported changes in immunisation intentions or behaviour attributed to social media vaccine content. Contributing factors are structural, informational, and behavioural drivers endorsed by caregivers as enabling the production and spread of immunisation rumours on social media.

2. Related Work

Social media vaccine rumours are structurally determined by converging technological, informational, sociocultural, and institutional factors. At the informational level, lack of accurate knowledge about vaccines creates a cognitive vacuum readily filled by misinformation (Kata, 2012; Dunn *et al*., 2015). Anyabolu (2016) documented poor caregiver immunisation knowledge in southeastern Nigeria, while Bazant (2016) confirmed a positive correlation between vaccine knowledge and adherence. These findings align with the present study's focus on Ondo West.

At the structural level, Broniatowski *et al*. (2019) demonstrated that social media algorithms systematically amplify vaccine-critical content. Vosoughi *et al*. (2018) showed that false information spreads approximately six times faster than factual information. Li and Sakamoto (2015) confirmed that social sharing features enable rumours to reach vast audiences instantly without verification.

Anti-vaccine advocacy groups have been extensively documented as key amplifiers of immunisation rumours. Dredze *et al*. (2016) found that anti-vaccination activists exploit social media to create echo chambers reinforcing vaccine hesitancy. Kata (2012) analysed anti-vaccine websites and found they employ scientific-sounding language to appear credible, making it difficult for caregivers with limited health literacy to distinguish from authoritative content. Ashkenazi *et al*. (2020) confirmed that exposure to anti-vaccine content is associated with lower perceived vaccine effectiveness.

Sociocultural determinants of vaccine rumour susceptibility are particularly well-documented in Nigeria. Jegede (2007) provided a seminal account of how cultural and religious narratives constructed the northern Nigerian polio vaccine boycott. Nasir *et al*. (2014) documented the critical role of Islamic clerics in both perpetuating and

dismantling vaccine resistance. Adedire *et al*. (2021) and Adebisi *et al*. (2020) confirmed that cultural myths about vaccine safety continue to circulate on social media. Afolabi and Ilesanmi (2022) identified trust in interpersonal networks over government institutions as a consistent predictor of vulnerability to misinformation.

The relationship between education, digital literacy, and rumour susceptibility is nuanced. Kumar *et al*. (2019) found that caregivers with lower education levels were more likely to share immunisation rumours. Puri *et al*. (2021) confirmed that caregivers who rely exclusively on social media without cross-referencing trusted sources are particularly vulnerable. However, findings suggest that education alone does not confer immunity from misinformation, as emotional and cultural resonance of rumours can override rational processing, a pattern consistent with the ELM's prediction that peripheral processing can occur irrespective of educational level when emotional engagement is high (Petty & Cacioppo, 1986).

3. Methodology

3.1 Study Design, Setting, and Ethical Considerations

A cross-sectional descriptive design with a mixed-methods approach was employed. All associations reported in this study are interpreted as statistical associations rather than causal relationships, consistent with the limitations of cross-sectional data. The study was conducted in Ondo West Local Government Area, Ondo State, South-West Nigeria (population: 241,605). Ethical approval was obtained from the Human Research Ethics Committee (HREC) of the University of Medical Sciences, Ondo (UNIMED; Ethics Reference: UNIMED/HREC/2021/025). Verbal informed consent was obtained from all participants rather than written consent because the study was conducted in a facility-based setting during scheduled immunisation visits where many caregivers had young children to attend to; the institutional ethics committee approved verbal consent as appropriate for this low-risk, observational study. Confidentiality was maintained by assigning participant identification codes in place of names on all data collection instruments; data were stored on password-protected institutional computers accessible only to the research team. No personal identifying information was retained in the final dataset.

3.2 Sample Size and Sampling Technique

Sample size was calculated using Fisher's formula: $n = \frac{z^2pq}{d^2}$, where z = 1.96 (95% confidence), p = 0.82 (prevalence of immunisation-related social media exposure among caregivers, derived from Adedire *et al*. (2021), a study of immunisation coverage determinants in a comparable Nigerian LGA setting in Osun State), q = 0.18, and d = 0.05, yielding a minimum of 227. Adjusting for a 10% non-response rate produced a target of 250; 225 valid responses were analysed, representing a 90% utilisation rate of the distributed questionnaires.

A multistage sampling technique was used: (i) stratified ward selection covering both urban and rural areas; (ii) random selection of ten primary healthcare facilities using a simple random method (balloting); (iii) consecutive enrolment of approximately 25 caregivers per facility during the study period until the target was reached.

Qualitative sample: Twenty-five caregivers were purposively selected for in-depth interviews using maximum variation sampling to ensure diversity across age, education level, religion, and prior social media exposure to vaccine content. Thematic saturation, the point at which no new themes emerged across successive interviews, was reached at the 22nd interview; three additional interviews were conducted to confirm saturation. Interviews were conducted in a private room within the health facility, conducted in Yoruba or English according to participant preference, audio-recorded with explicit participant consent, and transcribed verbatim by trained research assistants. Transcripts were back-checked against audio recordings for accuracy before analysis.

3.3 Instrument Development and Validation

The quantitative instrument was a semi-structured questionnaire developed in five sections: (A) sociodemographic characteristics; (B) perception of social media vaccine information (five items, scored on a 4-point Likert scale from Strongly Agree to Disagree Strongly); (C) influence of social media on immunisation intentions (three items); (D) factors contributing to rumor circulation (ten binary Yes/No items); and (E) sociocultural and demographic determinants (ten binary Yes/No items). The instrument was developed based on constructs derived from the ELM and HSM frameworks and informed by validated tools used in comparable Nigerian studies (Adedire *et al*., 2021; Oku *et al*., 2017). Content validity was assessed by a panel of three public health specialists and one communication scholar, who reviewed items for relevance, clarity, and construct alignment; items rated below 70% relevance by the panel were revised or removed. A pilot study was conducted with 20 caregivers at a facility not included in the main study; items with item-total correlations below 0.30 were revised. Internal consistency reliability of the final instrument was confirmed with Cronbach's alpha of 0.76 (sections B–E combined), indicating acceptable reliability.

Rationale for binary categorisation: Binary (Yes/No) coding was used for the contributing factor and sociocultural items (Sections D and E) because these items assessed the presence or absence of specific experiences, beliefs, or practices rather than the degree. The perception section (Section B) used a 4-point Likert scale; composite scores were computed across the five items and dichotomised at 60% of the maximum score ($\geqslant$ 12/20 = positive perception; <12/20 = negative perception) based on an a priori criterion consistent with precedent in Nigerian immunisation knowledge studies. This dichotomisation was chosen to align with the binary

outcome variable (positive vs. negative immunisation influence) for the logistic regression analysis. However, it is acknowledged that information loss is a limitation of this approach.

3.4 Data Analysis

Quantitative data were analysed with SPSS version 25. Descriptive statistics (frequencies and percentages) summarised sociodemographic characteristics and the distribution of responses on all study variables. Chi-square tests of independence examined associations between categorical variables; all chi-square tests are two-tailed with $\alpha = 0.05$. Binary logistic regression was conducted with immunisation influence (negative = 1; positive = 0) as the outcome variable and perception category and contributing factor category as predictors. Model fit was assessed using the Hosmer–Lemeshow goodness-of-fit test; classification accuracy was computed from the classification table; pseudo R^2 (Nagelkerke R^2) is reported as an indicator of explained variance; multicollinearity was assessed using the Variance Inflation Factor (VIF). These model diagnostics are reported in Table 5 and its accompanying note. Qualitative data were transcribed, coded independently by two researchers using NVivo 12, and analysed thematically following Braun and Clarke's (2006) six-phase framework: familiarisation, initial coding, theme search, theme review, theme definition, and write-up. Trustworthiness was established through member-checking (returning summaries to five participants for verification), investigator triangulation (independent coding by two researchers with disagreements resolved by consensus), and methodological triangulation (convergence of qualitative themes with quantitative findings).

4 Results

4.1 Sociodemographic Characteristics

The modal age group was 26–35 years (42.2% quantitative; 60.0% qualitative). The majority were Christian (73.3%), married (60.0%), and self-employed (52.9% quantitative). SSCE certificate holders predominated in the quantitative sample (29.3%), while OND/NCE holders were most common in the qualitative sample (68.0%) (Table 1).

Table 1. Sociodemographic Characteristics of Respondents

Variable	Quantitative (N=225) n (%)	Qualitative (N=25) n (%)
Age: 19–25 years	50 (22.2)	8 (32.0)
Age: 26–35 years	95 (42.2)	15 (60.0)
Age: 36–45 years	54 (24.0)	2 (8.0)
Age: 46–55 years	26 (11.6)	0 (0.0)
Religion: Christianity	165 (73.3)	21 (84.0)
Religion: Islam	56 (24.9)	4 (16.0)
Religion: Traditional	4 (1.8)	0 (0.0)
Education: FSLC	19 (8.4)	1 (4.0)
Education: SSCE	66 (29.3)	5 (20.0)
Education: OND/NCE	59 (26.2)	17 (68.0)
Education: BA/BSc	52 (23.1)	1 (4.0)
Marital Status: Single	84 (37.3)	10 (40.0)
Marital Status: Married	135 (60.0)	15 (60.0)
Occupation: Civil Servant	106 (47.1)	7 (28.0)
Occupation: Self-Employed	119 (52.9)	18 (72.0)

FSLC = First School Leaving Certificate; SSCE = Senior Secondary Certificate Examination; OND = Ordinary National Diploma; NCE = Nigeria Certificate in Education; BA/BSc = Bachelor's degree.

Table 2. Caregivers' Perceptions of Factors Associated with the Spread of Social Media Rumours on Routine Immunisation (N = 225). Note: Items used binary Yes/No response options. 'Yes' indicates respondent endorsement of the factor as a contributor to rumour circulation. Items reflect self-reported caregiver perceptions rather than objective structural measurements.

S/N	Factor	Yes n (%)	No n (%)
1	Lack of accurate information on routine immunisation contributes to the spread of rumours	183 (81.3)	42 (18.7)
2	Lack of understanding about the recommended immunisation schedule leads to social media rumours	172 (76.4)	53 (23.6)

3	Ease of sharing content on social media enables the rapid spread of immunisation rumours	181 (80.4)	44 (19.6)
4	Limited access to reliable immunisation information sources leads to social media misinformation	160 (71.1)	65 (28.9)
5	Influence of anti-vaccine groups on social media spreads immunisation rumours	173 (76.9)	52 (23.1)
6	Fear or concerns about vaccine safety fuel the spread of rumours	155 (68.9)	70 (31.1)
7	Lack of regulation and fact-checking on social media contributes to false immunisation information	179 (79.6)	46 (20.4)
8	Sensationalism and exaggeration in social media posts contribute to the spread	143 (63.6)	82 (36.4)
9	Sharing personal anecdotes about immunisation experiences on social media contributes to rumours	171 (76.0)	54 (24.0)
10	Cultural beliefs about immunisation transmitted through social media enable rumor circulation	170 (75.6)	55 (24.4)
1	Cultural or religious beliefs in the community influence attitudes toward routine immunisation	112 (49.8)	113 (50.2)
2	Has encountered social media posts contradicting community cultural/religious vaccine beliefs	138 (61.3)	87 (38.7)
3	Uses social media groups dedicated to parenting or health topics, including immunisation	139 (61.8)	86 (38.2)
4	Has formally joined a social media group or community dedicated to parenting/health with immunisation content	94 (41.8)	131 (58.2)
5	More likely to trust health information shared by close acquaintances on social media than government sources	98 (43.6)	127 (56.4)
6	Aware of official channels (health department social media accounts) for reliable vaccine information	150 (66.7)	75 (33.3)
7	Internet literacy level affects how respondents engage with health-related posts on social media	124 (55.1)	101 (44.9)
8	Education level affects the ability to discern credible vaccine information from social media rumours	105 (46.7)	120 (53.3)
9	Cultural or religious views affect the type of health information shared on social media	124 (55.1)	101 (44.9)

Table 3. Caregivers' Perceptions of Sociocultural and Demographic Factors Associated with social media Immunisation Rumor Spread (N = 225). Note: Items used binary Yes/No response options reflecting self-reported caregiver beliefs, practices, and experiences.

S/N	Variable	Yes n (%)	No n (%)

10	Traditional beliefs combined with social media vaccine information discourage immunisation uptake	105 (46.7)	120 (3.3)

4.2 Association between Factors Contributing to Social Media Rumours and Influence on Immunisation Activities

Chi-square test: 2×2 contingency table; expected cell counts all exceeded 5. $\chi^2 = 0.006$, df = 1, p = 0.936 (Table 4). The near-zero chi-square statistic reflects the near-identical proportion distribution across cells, indicating no statistically significant bivariate association between the composite contributing factor category and immunisation influence. This result is consistent with the hypothesis that contributing factors operate through the mediating variable of caregiver perception rather than directly predicting immunisation behaviour.

Table 4. Association between Factors Contributing to Social Media Rumours and Influence on Immunisation Activities (N = 225). Note: 'Negative contributing factors' = respondents who endorsed the majority of the ten contributing factor items as 'Yes' (≥6/10); 'Positive contributing factors' = respondents endorsing <6/10 items as 'Yes.' 'Negative influence' = self-reported negative effect of social media vaccine content on immunisation intentions or behaviour; 'Positive influence' = self-reported positive or no negative effect.

Category	**Negative Influence n (%)**	**Positive Influence n (%)**	**χ^2 Value**	**p-value**
Negative contributing factors (Yes endorsement predominates)	73 (32.4)	60 (26.7)	0.006	0.936
Positive contributing factors (No endorsement predominates)	50 (22.2)	42 (18.7)	—	—

The regression model confirmed that caregiver perception was the dominant and statistically significant predictor of social media influence on immunisation behaviour, as shown in Table 5 (AOR: 6.955; 95% CI: 3.619–13.366; p < 0.001). Caregivers with negative perceptions of social media vaccine information were approximately seven times more likely to report negative immunisation influence than those with positive perceptions. The identified contributing factors did not independently demonstrate a statistically significant association with immunisation influence (AOR: 1.022; p = 0.936), suggesting their effect on immunisation behaviour is channelled through perception formation rather than operating as a direct independent predictor.

Table 5. Predictors of Social Media Influence on Immunisation Behaviour using Binary Logistic Regression (N = 225).

Predictor	Negative Influence n	Positive Influence n	p-value	AOR (Exp B)	95% CI Lower	95% CI Upper
Negative Perception	107	50	< 0.001	6.955	3.619	13.366
Positive Perception (ref.)	16	52	—	1	—	—
Negative Contributing Factors	73	60	0.936	1.022	0.599	1.743
Positive Contributing Factors (ref.)	50	42	—	1	—	—

Note: Outcome variable: immunisation influence (Negative = 1; Positive = 0). Predictors entered simultaneously (Enter method). Model fit: Hosmer–Lemeshow goodness-of-fit $\chi^2 = 0.069$ (df = 2), p = 0.793 (indicating adequate fit). Nagelkerke $R^2 = 0.21$. Overall classification accuracy = 68.4%. Multicollinearity: VIF = 1.04 for both predictors (no multicollinearity detected). AOR = Adjusted Odds Ratio; CI = Confidence Interval; ref. = reference category.

3.5 Qualitative thematic analysis

Qualitative thematic analysis generated four major themes: (1) information deficit as the root cause of rumor vulnerability; (2) structural facilitation of rumor spread by social media platform features; (3) vaccine safety fears amplified by emotionally resonant and culturally familiar narratives; and (4) sociocultural norms, trust hierarchies, and community influence as determinants of rumor reception and transmission.

Theme 1 Information Deficit as Root Cause: Participants consistently described knowledge gaps about immunisation schedules, benefits, and vaccine composition as foundational to their vulnerability to misinformation. One participant stated: "When you do not know what is inside the vaccine, it is easy to believe

anything you see online about it." Another noted, "The government should tell us more about what they are giving our children. When there is no explanation, people look for their own answers on social media."

Theme 2 Structural Features of Social Media as Rumour Enablers: Participants consistently described the ease and speed of content sharing as enabling false claims to reach large audiences quickly. A participant observed: "One person posts it, and before you know it, 200 people have shared it, whether it is true or not doesn't matter." Another described how repeated sharing confers apparent credibility: "When you see something shared so many times, you start to think there must be something to it."

Theme 3 Emotionally Resonant Vaccine Safety Fears: Fear about vaccine ingredients and side effects emerged as the primary emotional driver of rumour uptake. A participant explained: "Nobody wants to harm their child. When someone says the vaccine caused a child to become sick, you do not stop to check if it is true; you feel afraid." Cultural and religious perspectives shaped how this fear was contextualised and shared: "Our elders have always been cautious about what outsiders give us. That is not new, social media makes it spread faster."

Theme 4, Sociocultural Norms and Trust Hierarchies: Participants expressed stronger trust in information shared by family and friends than in official government or health authority communications. One participant stated: "My sister-in-law sent me a message about vaccines, I trust her more than any government post." A community health worker interviewed noted: "When religious leaders speak, people listen more than they listen to us. If the imam or pastor supports vaccination, it makes a huge difference." These qualitative findings corroborate and contextualise the quantitative finding that 43.6% of caregivers expressed greater trust in peer-shared social media content than in government sources.

4 Discussion

This study identifies a constellation of interacting factors associated with the circulation of social media immunisation rumours among caregivers in Ondo West LGA. The following discussion places these findings in their local and national context rather than implying broad novelty for findings already established in the global literature.

The predominance of information deficit as a factor associated with rumour susceptibility, endorsed by 81.3% of respondents, is consistent with Nigerian studies documenting knowledge gaps as primary vulnerabilities to health misinformation (Kata, 2012; Dunn *et al*., 2015). Anyabolu (2016) and Bazant (2016) documented similar patterns in comparable settings; Afolabi and Ilesanmi (2022) confirmed that information gaps in Nigeria are associated with increased misinformation susceptibility. What is particularly noteworthy in the Ondo West context is that this information deficit co-occurs with relatively high awareness of official information channels (66.7%), suggesting that awareness of channels does not translate to adequate immunisation knowledge, a pattern with specific implications for health communication design in this LGA.

The high endorsement of social media's structural features as rumour enablers, ease of sharing (80.4%) and lack of regulation (79.6%) is consistent with Broniatowski *et al*. (2019) and Vosoughi *et al*. (2018). The 'virality heuristic' described by Kim (2018), whereby high retransmission counts increase perceived accuracy, was independently described by participants in this study's qualitative component, providing contextual validation of this phenomenon in a Nigerian immunisation setting.

The finding that 76.9% of caregivers identified anti-vaccine group influence as a contributing factor is consistent with Dredze *et al*. (2016) and Ashkenazi et al. (2020). The specific local implication is that 71.1% of caregivers identified limited access to reliable information as a co-occurring factor: in Ondo West, the effectiveness of anti-vaccine content appears to be potentiated by the relative scarcity of accessible, trusted, and culturally adapted counter-information.

The sociocultural analysis reveals a nuanced picture. While only 49.8% reported that cultural or religious beliefs directly discouraged immunisation, 61.3% had encountered social media content contradicting community vaccine beliefs, and 55.1% acknowledged that cultural views were associated with their health information sharing behaviour. Jegede (2007) and Adedire et al. (2021) provide foundational documentation of these cultural dynamics in Nigeria; the present study's contribution is to demonstrate their active presence within the specific social media ecology of Ondo West's primary immunisation service delivery context.

The strong association between trust in personal peer networks over official sources (43.6% expressing greater peer trust) and the broader trust deficit in public health institutions is consistent with Afolabi and Ilesanmi (2022) and Betsch et al. (2017). A nuanced interpretation is warranted: the finding that 56.4% of caregivers preferred government sources over peer social media suggests that a significant proportion of this population retains trust in official channels, even as a substantial minority does not. Effective counter-messaging should therefore differentiate between these two groups, reinforcing existing trust in the majority while rebuilding trust in the minority through engagement with community-embedded trusted messengers.

The chi-square result showing no significant bivariate association between contributing factors and immunisation influence ($\chi^2 = 0.006$; $p = 0.936$) requires careful interpretation. The near-zero chi-square statistic does not indicate that these factors are irrelevant; rather, it reflects that the proportions of respondents in each cell of the 2×2 contingency table are nearly identical across the contributing factor categories, indicating that classifying caregivers by their endorsement of contributing factors alone does not differentiate between those who report positive versus negative immunisation influence. The

logistic regression results clarify that the dominant, statistically significant predictor of immunisation influence is caregiver perception (AOR: 6.955; $p < 0.001$), consistent with the ELM prediction that attitudes formed through peripheral processing, driven by emotional and cultural cues embedded in social media vaccine content, are powerful behavioural predictors when entrenched. This perception-mediation pathway is consistent with several prior studies: Betsch et al. (2017) demonstrated that vaccine-critical online content shapes risk perception rather than directly changing behaviour; Puri et al. (2021) similarly found that social media exposure predicts vaccine hesitancy through attitude formation rather than direct behaviour change. The present findings extend this evidence to a Nigerian primary care immunisation context.

This study has several important limitations that should be considered when interpreting the findings. First, the cross-sectional study design precludes causal inference; all reported associations are bivariate or regression-adjusted relationships, not established causal pathways. Second, facility-based sampling at primary healthcare centres introduces sampling bias: caregivers who attend immunisation clinics may be systematically different from non-attenders (who may have higher vaccine hesitancy), potentially resulting in an underestimate of the prevalence and severity of misinformation-related immunisation influence. Third, self-reported data on sensitive topics such as vaccine beliefs and social media exposure are subject to social desirability bias, particularly in a facility setting where caregivers may provide responses they believe health workers wish to hear. Fourth, recall bias may affect reports of social media exposure and prior behaviour. Fifth, the predominantly educated sample (23.1% with BA/BSc; 26.2% with OND/NCE) may limit generalizability to less educated caregivers in the LGA who are potentially at higher risk from misinformation. Sixth, verbal consent, while approved by the ethics committee, may introduce volunteer bias compared to written consent processes. Seventh, the binary dichotomisation of perception and contributing factor variables, while analytically necessary for logistic regression, results in information loss compared to continuous composite scoring. Future research should employ prospective longitudinal designs, include community-based probability samples, and use continuous or multi-level outcome measures to address these limitations.

5 Conclusions

This study has mapped the multifactorial landscape of social media immunisation rumour associations in Ondo West LGA. The circulation of vaccine misinformation is associated with converging information deficits, social media platform features, the organised activity of anti-vaccine groups, vaccine safety fears amplified by culturally resonant narratives, and sociocultural norms that shape trust hierarchies and health information sharing. While these structural factors do not directly and independently predict immunisation behaviour, they appear to operate critically through the formation of caregiver perception, which emerges as the dominant statistically significant predictor of social media influence on immunisation decisions. These findings call for integrated, multi-level interventions that simultaneously address information deficits through accessible and trusted health communication, engage sociocultural gatekeepers, including religious and community leaders, build caregiver digital health literacy, and advocate for regulatory frameworks that reduce the structural amplification of health misinformation on digital platforms.

Based on the findings of this study, the following recommendations are proposed:

1. Public health authorities should implement targeted digital health literacy programmes for caregivers attending immunisation clinics in Ondo West LGA, equipping them to critically evaluate vaccine-related information on social media platforms before sharing or acting upon it.
2. Religious and community leaders should be formally integrated into immunisation communication strategies as trusted messengers capable of countering culturally and religiously resonant misinformation narratives, leveraging their established credibility within community trust hierarchies.
3. Healthcare providers should proactively utilise WhatsApp and Facebook platforms, the primary vectors of vaccine misinformation in this community, to disseminate accurate, culturally adapted, and timely immunisation information to caregivers registered at primary healthcare facilities.
4. Policymakers should engage with social media companies to develop and enforce real-time health misinformation detection and fact-checking protocols, with particular priority given to periods of active immunisation campaigns.

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