



Communication Strategies and Behaviour Change Outcomes in Malaria Prevention Campaigns in Abuloma Community, Rivers State, Nigeria

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ABSTRACT

Background: Malaria remains a major public health challenge in sub-Saharan Africa despite sustained prevention efforts. In Nigeria, communication strategies such as radio broadcasts, television advertisements, social media, printed materials, and community health outreach are used to promote preventive behaviours. However, persistent malaria prevalence suggests that awareness does not always translate into behaviour change.

Objective: This study assessed the impact of communication strategies in malaria prevention campaigns and their influence on behaviour change among residents of Abuloma Community, Rivers State, Nigeria.

Method: A descriptive survey design was adopted. Using Taro Yamane's formula, 345 respondents were selected. Data were collected through structured questionnaires and analysed using frequencies, percentages, mean scores, and chi-square statistics.

Result: Findings revealed high exposure to malaria prevention messages among residents. Radio broadcasts and community health workers emerged as the most influential communication channels. A statistically significant relationship was found between campaign exposure and the adoption of preventive behaviours. However, economic constraints, inconsistent message exposure, and cultural beliefs limited campaign effectiveness.

Conclusion: Communication strategies significantly promote malaria preventive behaviours, although their effectiveness is constrained by socio-economic and cultural factors.

Unique Contribution: The study provides empirical evidence linking communication-based malaria interventions to behaviour change and underscores the importance of community health workers and culturally relevant messaging.

Key Recommendation: Malaria prevention programmes should prioritise community-based, culturally sensitive, and sustained communication strategies while addressing economic barriers to preventive practice adoption.

Keywords: Malaria prevention, communication strategies, behaviour change, health campaigns, Abuloma



INTRODUCTION

Malaria remains a major global public health challenge, particularly in sub-Saharan Africa, where it continues to cause high morbidity and mortality despite decades of intervention. According to the World Health Organization (2024), malaria is caused by *Plasmodium* parasites transmitted through the bites of infected female *Anopheles* mosquitoes, with children under five years of age and pregnant women being the most vulnerable populations. Nigeria bears one of the highest malaria burdens globally owing to favourable climatic conditions for mosquito breeding, poor environmental sanitation, socioeconomic disparities, and limited access to quality healthcare services (Nweze et al., 2020; Adebayo et al., 2015; WHO, 2024).

To reduce this burden, government agencies and non-governmental organisations have implemented malaria prevention campaigns aimed at promoting preventive behaviours such as the use of insecticide-treated nets (ITNs), indoor residual spraying, environmental sanitation, and prompt diagnosis and treatment (Aligwe et al., 2019; Okumu & Moore, 2011). Communication is central to these interventions because their success depends largely on influencing people's knowledge, attitudes, beliefs, and behaviours. Consequently, malaria prevention campaigns employ a variety of communication strategies, including radio jingles, television advertisements, posters, flyers, social media, interpersonal communication, and community outreach programmes to increase awareness and encourage the adoption of recommended preventive practices (Okorie et al., 2022; Schiavo, 2014; Muoneke & Nwafor, 2024).

However, effective communication extends beyond the mere dissemination of information. Communication campaigns are successful only when audiences receive, understand, internalise, and translate campaign messages into sustained behavioural change. Previous studies indicate that although many individuals possess adequate knowledge of malaria prevention, they do not consistently practise recommended preventive measures such as sleeping under insecticide-treated nets, eliminating stagnant water around their homes, or seeking early medical attention when symptoms occur (Ajayi et al., 2006; Kilian et al., 2016). These findings suggest that increased awareness alone does not necessarily translate into behavioural adoption.

The persistent gap between awareness and behaviour raises concerns regarding the effectiveness of malaria prevention communication strategies. Although certain communication channels effectively increase awareness, they may be less successful in addressing behavioural barriers such as cultural misconceptions, economic constraints, low perceived susceptibility, message fatigue, and distrust of public health institutions (Ogueji et al., 2023). Therefore, the effectiveness of malaria prevention campaigns should be evaluated not only by the extent of message dissemination but also by their ability to produce measurable behavioural change.

At the community level, communication effectiveness is influenced by contextual factors such as literacy level, socio-cultural norms, language preference, media accessibility, and environmental conditions. Abuloma Community in Rivers State provides a suitable setting for examining these issues because of its semi-urban coastal environment, humid climate, drainage challenges, and high susceptibility to mosquito breeding. Despite repeated malaria prevention interventions,



malaria transmission remains prevalent within the community, highlighting the need to evaluate the effectiveness of communication-based interventions. Moreover, few empirical studies have specifically examined the relationship between malaria prevention communication strategies and behavioural change in localised community settings such as Abuloma. Existing studies have focused largely on malaria prevalence and awareness while paying relatively little attention to how communication influences preventive behaviour. This represents an important empirical gap that this study seeks to address.

Against this background, this study assessed the effectiveness of communication strategies employed in malaria prevention campaigns and examined their influence on malaria preventive behaviours among residents of Abuloma Community, Rivers State, Nigeria.

OBJECTIVES OF THE STUDY

The specific objectives of the study were to:

1. identify the communication strategies employed in malaria prevention campaigns in Abuloma Community;
2. determine residents' level of exposure to malaria prevention campaign messages;
3. assess the effectiveness of communication strategies in influencing malaria preventive behaviours among residents;
4. identify the barriers affecting the effectiveness of malaria prevention communication strategies; and
5. examine the relationship between exposure to malaria prevention campaign messages and the adoption of malaria preventive behaviours among residents.

RESEARCH HYPOTHESIS

The following null hypothesis guided the study:

H₀: There is no significant relationship between exposure to malaria prevention communication campaigns and the adoption of malaria preventive behaviours among residents of Abuloma Community, Rivers State.

METHOD

A descriptive survey research design was adopted to assess the effectiveness of communication strategies employed in malaria prevention campaigns and their influence on behaviour change among residents of Abuloma Community, Rivers State, Nigeria. This design enabled the systematic collection of quantitative data from a representative sample to describe existing conditions, communication patterns, behavioural responses, and relationships among variables without manipulating the study variables (Creswell, 2014).



The study was conducted in Abuloma Community, a semi-urban coastal settlement within the Port Harcourt metropolitan area of Rivers State, Nigeria. The community is characterised by dense residential settlements, proximity to water bodies, and humid environmental conditions that favour mosquito breeding and malaria transmission. Abuloma has also been the focus of several malaria prevention campaigns, making it an appropriate setting for examining the relationship between communication strategies and malaria preventive behaviour.

The study population comprised approximately 45,000 residents of Abuloma Community. Adults were selected because they are primarily responsible for household health decisions and malaria prevention practices. Using Taro Yamane's formula for finite populations at a 5% margin of error, a sample size of 345 respondents was determined.

A multistage sampling technique was employed to ensure representativeness and minimise sampling bias. First, Abuloma Community was purposively selected because of its high malaria burden and exposure to malaria prevention campaigns. The community was subsequently stratified into residential clusters to ensure broad geographical representation. Households within each cluster were selected using simple random sampling, and one eligible adult respondent was randomly selected from each household.

Data were collected using a structured questionnaire developed specifically for the study. The instrument consisted of sections on respondents' demographic characteristics, exposure to malaria prevention campaigns, communication channels, malaria preventive behaviours, and barriers to communication effectiveness. Both closed-ended and five-point Likert-scale items were included to facilitate quantitative analysis.

The instrument was subjected to face and content validation by experts in Communication Studies and Public Health, who assessed its relevance, clarity, and comprehensiveness. Their observations and recommendations were incorporated into the final version of the questionnaire. Reliability was established through a pilot study, and Cronbach's alpha yielded a coefficient of **0.78**, indicating satisfactory internal consistency.

The questionnaires were administered personally by the researchers, assisted by trained research assistants. Respondents were given adequate time to complete the instrument, and necessary clarifications were provided to ensure accurate and complete responses.

Data were analysed using both descriptive and inferential statistics. Frequencies, percentages, and mean scores were used to summarise respondents' demographic characteristics, campaign exposure, perceived effectiveness of communication strategies, and malaria preventive practices. The study hypothesis was tested using the chi-square test at the 0.05 level of significance to determine whether a significant relationship existed between exposure to malaria prevention

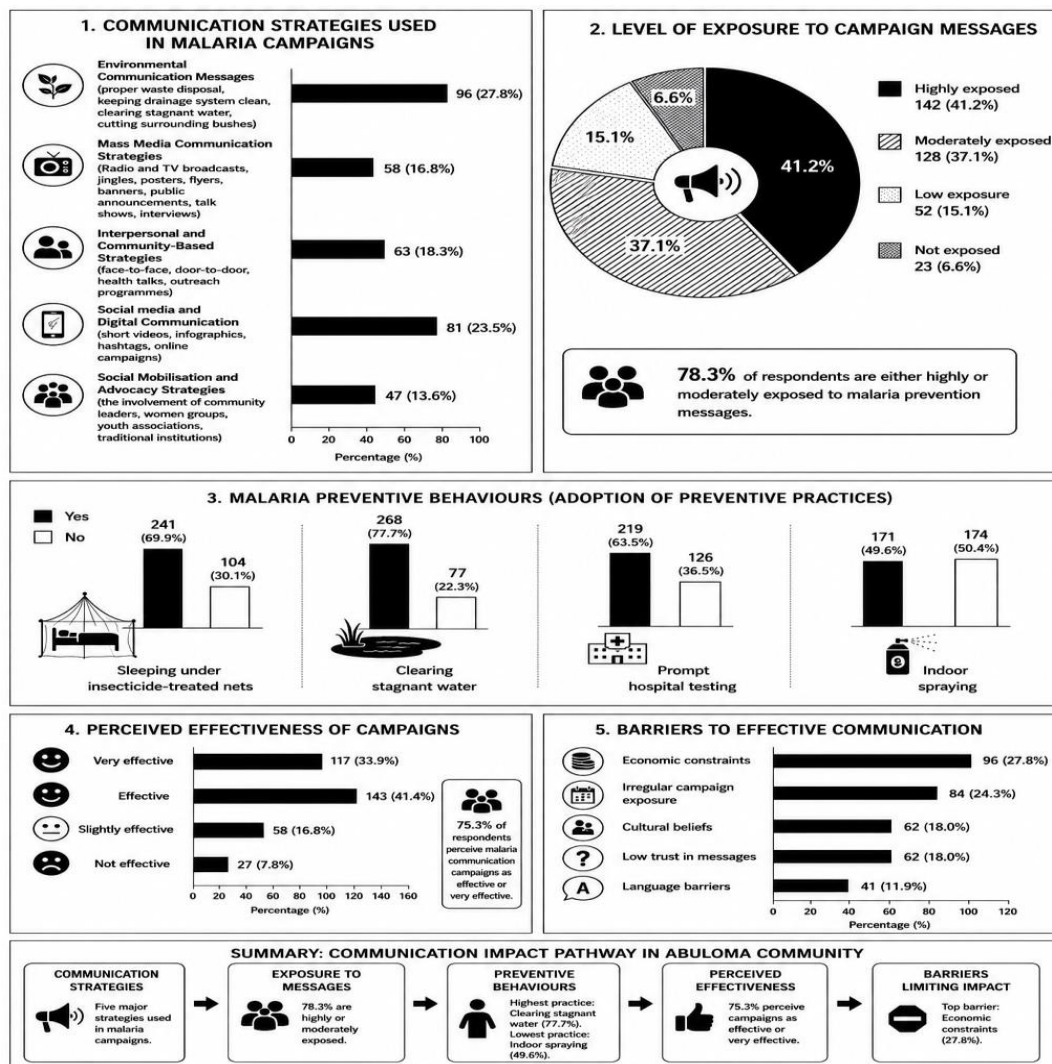
communication campaigns and the adoption of malaria preventive behaviours among residents of Abuloma Community.

RESULTS

This section presents the empirical findings of the study in line with the research questions and hypothesis.

Figure 1

Communication strategies, exposure levels, preventive behaviours, perceived effectiveness, and barriers associated with malaria prevention campaigns among residents of Abuloma Community, Rivers State (N = 345).



Research Question One: Communication Strategies Used in Malaria Campaigns



The figure indicates that malaria prevention campaigns in Abuloma Community employed multiple communication strategies, with environmental communication messages being the most prevalent (27.8%). These messages addressed appropriate waste disposal, eliminating stagnant water, maintaining clean drainage systems, and removing surrounding vegetation. Social media and digital communication strategies accounted for 23.5% of responses, underscoring the growing importance of online campaigns, infographics, and short videos in health communication. Interpersonal and community-based strategies constituted 18.3%, while mass media communication strategies, including radio and television broadcasts, accounted for 16.8%. Social mobilisation and advocacy strategies comprised the lowest proportion at 13.6%. Collectively, the data suggest that community malaria prevention campaigns depend primarily on a combination of environmental, digital, and interpersonal messaging, emphasising the value of both mediated and community-focused approaches in public health communication.

Research Question Two: Level of Exposure to Campaign Messages

The data indicate a relatively high level of exposure to malaria prevention campaign messages among residents of Abuloma Community. Specifically, 41.2% of respondents reported high exposure to campaign messages, while 37.1% indicated moderate exposure. In contrast, 15.1% reported low exposure, and 6.6% reported no exposure. Overall, 78.3% of respondents experienced either high or moderate exposure to malaria prevention communication, suggesting that the campaigns achieved substantial reach within the community. These results imply that communication efforts were sufficiently visible and accessible to a large proportion of residents.

Research Question Three: Malaria Preventive Behaviour

The data indicate varying levels of adoption of malaria prevention practices among respondents. Clearing stagnant water was the most frequently adopted preventive behaviour, with 77.7% of respondents participating. Use of insecticide-treated nets was also prevalent, with 69.9% reporting compliance. Additionally, 63.5% of respondents sought prompt hospital testing when malaria symptoms appeared. In contrast, indoor spraying had the lowest adoption rate, with only 49.6% of respondents engaging in this practice, while 50.4% did not. These findings suggest that environmental sanitation measures are more widely implemented than cost-intensive preventive methods such as indoor spraying, which may be limited by financial and accessibility barriers.

Research Question Four: Effectiveness of Communication Strategies

The figure indicates that respondents generally perceived malaria prevention communication campaigns as effective. Specifically, 41.4% of respondents described the campaigns as effective, and 33.9% rated them as very effective. In contrast, 16.8% considered the campaigns slightly effective, and only 7.8% regarded them as ineffective. In total, 75.3% of respondents perceived the communication campaigns as either effective or very effective, reflecting a positive assessment of the strategies employed. These findings suggest that the campaigns were successful in raising awareness and enhancing the community's understanding of malaria prevention.

Research Question Five: Barriers to Effective Communication



The figure identifies several barriers that limit the effectiveness of malaria prevention communication campaigns in the Abuloma Community. Economic constraints were the most significant barrier, accounting for 27.8% of responses. Irregular campaign exposure followed at 24.3%, indicating inconsistencies in message dissemination and campaign continuity. Cultural beliefs and low trust in campaign messages each accounted for 18.0% of responses, demonstrating that socio-cultural perceptions and credibility issues persist in influencing behavioral acceptance. Language barriers were the least significant obstacle at 11.9%. Overall, these findings indicate that despite relatively high awareness levels, structural and socio-economic challenges continue to impede the translation of communication exposure into sustained malaria preventive practices.

Test of Hypothesis

A chi-square test of independence was conducted at the 0.05 level of significance to assess whether exposure to malaria prevention communication campaigns significantly influenced the adoption of malaria preventive behaviours among residents of Abuloma Community.

Research Hypothesis

H₀: There is no significant association between exposure to malaria prevention communication campaigns and the adoption of malaria preventive behaviours among residents of Abuloma Community.

The results of the chi-square analysis are presented in Table 1.

Table 1

Chi-Square Analysis of the Relationship Between Exposure to Malaria Prevention Campaigns and Adoption of Preventive Behaviours Among Residents of Abuloma Community

Variables	χ^2	df	p
Exposure to malaria prevention campaigns × Adoption of preventive behaviours	18.742	4	.001

Note. χ^2 = Chi-square statistic; df = degrees of freedom; p = probability value. The result is statistically significant at $p < .05$.

The analysis yielded a chi-square value of 18.742 with 4 degrees of freedom and a p-value of 0.001. As the p-value is below the 0.05 significance threshold, the null hypothesis was rejected.

These findings indicate a statistically significant relationship between exposure to malaria prevention communication campaigns and the adoption of malaria preventive behaviours among residents of Abuloma Community. Increased exposure to malaria communication messages is associated with a higher likelihood of engaging in preventive practices, including clearing stagnant water, sleeping under insecticide-treated nets, and seeking prompt hospital testing.

The results corroborate the descriptive findings presented earlier in the study, particularly the high exposure levels among respondents and the relatively strong adoption of preventive



behaviours. These outcomes imply that communication campaigns play a crucial role in shaping behavioural outcomes in community malaria prevention efforts.

DISCUSSION

The study demonstrated that malaria prevention communication campaigns in Abuloma Community achieved substantial audience exposure and moderate influence on residents' behaviours. The campaigns employed diverse communication strategies, with environmental messaging, interpersonal communication, and online communication identified as the primary approaches. Environmental communication emphasized sanitation practices such as clearing stagnant water, proper waste disposal, and maintaining clean surroundings. Interpersonal communication was facilitated through direct engagement by community health workers and outreach activities. Digital strategies, including social media campaigns and online messaging, also played a significant role in raising awareness. These findings suggest that effective community malaria prevention depends on the integration of both traditional and contemporary communication channels for disseminating health information.

Most respondents reported moderate to high exposure to malaria prevention messages, indicating substantial reach within the community. This exposure was primarily attributed to radio broadcasts and interpersonal communication facilitated by community health workers. This finding aligns with Schiavo's (2014) assertion that effective health communication relies on the strategic use of multiple complementary channels to reach diverse audiences. The prominence of radio is consistent with Okorie et al. (2022), who found that radio remains one of the most accessible and affordable media in resource-poor communities due to its broad coverage and language adaptability.

The significant role of community health workers further underscores the importance of interpersonal communication in facilitating behavioural change. Unlike mass-mediated communication, interpersonal engagement allows for clarification, persuasion, feedback, and trust-building at both household and community levels (Schiavo, 2014). These findings indicate that malaria campaigns in Abuloma Community are enhanced by the integration of mass media with community-based communication approaches.

The study also revealed substantial adoption of malaria preventive behaviours among residents, particularly in relation to environmental sanitation practices and the use of insecticide-treated nets. Clearing stagnant water was identified as the most commonly adopted preventive behaviour, whereas indoor spraying exhibited the lowest level of compliance. This pattern suggests that residents are more inclined to adopt preventive measures perceived as affordable, accessible, and sustainable. Conversely, practices requiring greater financial investment or technical support tend to have lower adoption rates.

The findings also showed that most respondents perceived malaria communication campaigns as effective or very effective, indicating positive reception and acceptance of campaign messages within the community. This suggests that the campaigns have meaningfully increased awareness and public understanding of malaria prevention practices. However, the uneven adoption of



preventive behaviours demonstrates that awareness alone does not automatically result in uniform behavioural change.

This observation supports the assumptions of the Health Belief Model proposed by Rosenstock (1974), which posits that health actions are influenced by perceived susceptibility, severity, benefits, barriers, and self-efficacy. Although residents may recognize the benefits of malaria prevention, barriers such as cost, accessibility, and convenience can limit full compliance with recommended preventive practices. These findings reinforce the argument that behavioural awareness alone is insufficient to ensure behavioural compliance.

The chi-square analysis established a statistically significant relationship between exposure to malaria prevention communication campaigns and the adoption of preventive behaviours among residents. This finding confirms that exposure to communication interventions contributes significantly to behavioural change and malaria prevention practices within the community. Residents who are repeatedly exposed to malaria prevention messages are more likely to engage in preventive actions such as environmental sanitation, use of insecticide-treated nets, and prompt hospital testing.

This finding supports the propositions of the Diffusion of Innovations theory developed by Everett Rogers, which explains that exposure to information through communication channels influences the adoption of innovations and behaviours over time. According to Rogers (2003), innovations are more likely to diffuse successfully when communication messages are reinforced through social systems and opinion leaders. In the context of Abuloma Community, repeated exposure to malaria prevention messages via radio, community outreach, and interpersonal communication likely reinforced behavioural intentions and increased awareness of preventive practices. Nevertheless, the statistically significant relationship observed does not guarantee automatic or complete behavioural compliance. Instead, communication serves as an enabling factor that interacts with socio-economic and cultural realities to shape behavioural outcomes.

The study also identified several barriers limiting the effectiveness of malaria prevention communication campaigns. Economic constraints emerged as the most significant challenge affecting behavioural compliance. This finding indicates that many residents may understand recommended preventive measures but lack the financial resources to sustain their adoption. Consequently, communication campaigns alone may not achieve optimal outcomes without supportive socio-economic interventions. Preventive practices such as purchasing insecticide-treated nets, indoor spraying, or accessing regular healthcare services may remain difficult for low-income households despite high levels of awareness. This finding corroborates the position of Afolabi et al. (2021), who argued that socio-economic conditions significantly influence compliance with health behaviours in malaria-endemic communities.

Inconsistent exposure to campaign messages also emerged as a significant barrier. Irregular communication weakens message reinforcement and reduces behavioural retention over time. Behaviour change communication requires continuous repetition and reinforcement to sustain long-term behavioural modification (Schiavo, 2014). Cultural beliefs and low trust in campaign



messages were also identified as barriers to communication effectiveness. Traditional beliefs about illness causation may conflict with biomedical explanations of malaria transmission and prevention, influencing behavioural responses. Similarly, distrust in health authorities or campaign sources may reduce acceptance of recommended preventive measures. Language barriers, though less prevalent, also contributed to reduced comprehension among some respondents.

The findings therefore underscore the importance of adopting integrated, sustained, and participatory communication approaches in malaria prevention campaigns. The effectiveness of both radio and interpersonal communication demonstrates that combining mass media with community-based engagement enhances message reach, credibility, and behavioural influence. Communication strategies should therefore go beyond simple awareness-raising toward long-term behaviour-change interventions that encourage dialogue, feedback, and active community participation.

The study also highlights the necessity of addressing structural, social, and economic barriers in conjunction with communication efforts. Behaviour change cannot be achieved solely through information dissemination if residents lack the financial capacity or environmental support required to adopt preventive measures. Therefore, malaria prevention campaigns should be integrated with broader public health interventions, such as subsidised mosquito nets, improved access to healthcare, environmental sanitation programmes, and local support networks.

Overall, the results indicate that malaria prevention communication campaigns in Abuloma Community are relatively effective in creating awareness and influencing preventive behaviours. However, behavioural compliance remains inconsistent due to persistent socio-economic, cultural, and structural barriers. The statistically significant relationship between communication exposure and behaviour change confirms the importance of sustained, multi-channel, and community-led strategies in malaria prevention efforts.

CONCLUSION

The effectiveness of communication strategies employed in malaria prevention campaigns and their impact on behaviour change among residents of Abuloma Community in Rivers State, Nigeria, was evaluated. The findings indicate that residents are widely exposed to malaria prevention messages through diverse channels, including environmental communication, radio broadcasts, interpersonal communication, community mobilisation, and digital media platforms. Radio and community health workers were identified as the most influential communication channels, highlighting the ongoing significance of both mass media and interpersonal communication in public health campaigns within community contexts.

The analysis further demonstrates that communication campaigns have played a significant role in raising awareness and promoting the adoption of preventive behaviours against malaria. Preventive practices, including environmental sanitation and the use of insecticide-treated nets, exhibited relatively high compliance rates among respondents. Furthermore, chi-square analysis



revealed a statistically significant relationship between exposure to malaria prevention communication campaigns and the adoption of preventive behaviours, confirming the critical role of communication interventions in shaping health-related behavioural decisions.

Despite these positive outcomes, the findings indicate that behavioural change remains inconsistent across different malaria prevention practices. Preventive measures that require greater financial investment or sustained effort exhibited lower adoption rates. These results suggest that awareness alone does not ensure comprehensive behavioural compliance. Economic constraints, inconsistent exposure to campaign messages, cultural beliefs, and issues related to trust were identified as significant barriers that limit the effectiveness of malaria prevention communication campaigns within the community.

In conclusion, effective malaria prevention extends beyond the dissemination of messages to include the broader socio-economic and cultural contexts in which communication occurs. Achieving sustainable behaviour change requires integrated interventions that combine strategic communication with structural support systems to address economic limitations, improve healthcare access, enhance community trust, and maintain preventive practices over time. Therefore, malaria prevention campaigns should transition from short-term awareness initiatives to sustained, community-driven behaviour change programmes that are culturally responsive, participatory, and context-sensitive.

Unique Contributions of the Study

This study offers significant contributions to both academic scholarship and practical applications in health communication, behaviour change communication, and malaria prevention research.

First, the study provides empirical evidence from a community-level Nigerian context by analysing the influence of various communication strategies on residents' preventive behaviours against malaria in Abuloma Community, Rivers State. In light of the limited number of community-specific studies on malaria communication within the Niger Delta region, this research advances understanding of health communication practices in semi-urban and riverine communities.

Second, the study enhances understanding of the relationship between communication exposure and behavioural adoption by statistically demonstrating a significant association between exposure to malaria prevention campaigns and residents' adoption of preventive practices. This shifts the discourse from mere awareness creation to the measurable behavioural outcomes of communication interventions.

Third, the study demonstrates the continued importance of integrating mass media and interpersonal communication approaches in public health campaigns. The findings indicate that, although digital communication strategies are gaining prominence, traditional platforms such as radio and community health workers remain highly influential in shaping behavioural responses within local communities.



Fourth, the study contributes to behaviour change communication literature by highlighting the limitations of awareness-driven campaigns when socio-economic support systems are lacking. By identifying economic constraints, cultural beliefs, irregular campaign exposure, and trust-related issues as barriers to behavioural compliance, the research offers a more nuanced understanding of why communication exposure does not always result in sustained preventive action.

Fifth, the study provides context-specific recommendations to guide policymakers, health communication practitioners, non-governmental organisations, and public health agencies in developing more culturally sensitive, participatory, and sustainable malaria communication interventions for similar communities.

Finally, the study reinforces the application of the Health Belief Model and the Diffusion of Innovations theory in malaria prevention communication in Nigeria by demonstrating how exposure, perceived barriers, social influence, and communication reinforcement collectively influence preventive health behaviours.

RECOMMENDATIONS

Based on the study's findings, the following recommendations are presented:

- 1. Adopt Integrated Multi-Channel Communication Strategies**
Malaria prevention campaigns should incorporate radio broadcasts, interpersonal communication, community mobilisation, environmental communication, and digital media platforms to maximise message dissemination, reinforce key messages, and influence behaviour across diverse population groups.
- 2. Strengthen Community-Based Communication Structures**
Health authorities and development agencies should increase the involvement of community health workers, traditional rulers, religious leaders, women's groups, and youth associations in malaria communication campaigns to strengthen trust, credibility, and community participation.
- 3. Develop Culturally Sensitive and Context-Dependent Messages**
Communication messages should be adapted to the socio-cultural context, language preferences, and literacy levels of residents in Abuloma Community to improve comprehension, acceptance, and behavioural compliance.
- 4. Address Economic Barriers to Behavioural Compliance**
Government and relevant stakeholders should complement communication campaigns with supportive interventions such as subsidised or free insecticide-treated nets, improved environmental sanitation services, and affordable healthcare access to reduce financial barriers to preventive practices.
- 5. Ensure Continuous and Sustained Communication Campaigns**
Malaria communication campaigns should transition from periodic or seasonal sensitisation efforts to continuous communication models that consistently reinforce preventive behaviours.
- 6. Promote Participatory Behaviour Change Approaches**



Campaigns should promote dialogue, feedback mechanisms, and active community participation instead of relying exclusively on top-down information dissemination. Participatory communication fosters trust, ownership, and sustained behavioural change.

7. Strengthen Monitoring and Evaluation Mechanisms

Health authorities should establish routine monitoring and appraisal frameworks to assess the effectiveness of malaria communication strategies, identify communication deficiencies, and guide evidence-based improvements in campaign implementation.

8. Integrate Communication with Broader Public Health Interventions

Malaria prevention communication should be integrated into wider community health and environmental programmes to ensure that awareness-raising is supported by the enabling social, economic, and infrastructural conditions required for sustainable behaviour change.

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.

Acknowledgements

We acknowledge Benjamin Atte Ake and Kenule Baninwi for assisting us with the data collection process. We equally appreciate the Rivers State University Library staff for their cooperation and support.

Sources of funding

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. Benjamin Atte Ake and Kenule Baninwi were responsible for data collection. Burabari Valentine Biiiragbara and Senibo Blessed Ezegen conducted the data analysis and interpretation, while Sarah Chidiebere Joe and Anty Anita Amade 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.

Citation

Joe, S.C., Biiiragbara, B. V., Senibo, B. E., Baninwi, K. Ake, B. A., & Amade, A. A.(2026). Communication Strategies and Behaviour Change Outcomes in Malaria Prevention



Campaigns in Abuloma Community, Rivers State, Nigeria. *International Journal of Sub-Saharan African Research*, 4(2), 276-290

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