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Community Radio as a Public Health Communication Strategy for Addressing Health Misinformation in Rural Coastal Kenya

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Abstract

Background

Effective risk communication is essential for controlling infectious disease outbreaks; however, the COVID-19 pandemic was accompanied by an unprecedented infodemic that undermined public trust and adherence to recommended preventive measures. In rural low-resource settings, where access to digital media and formal health information is limited, community radio may provide a scalable platform for delivering evidence-based public health messages. This study evaluated the effectiveness of local dialect radio programming as a public health implementation strategy for improving COVID-19 awareness, mitigating misinformation, and promoting preventive health behaviors among rural communities in Lunga-Lunga Sub-County, Kwale County, Kenya.

Methods

A mixed-methods cross-sectional study was conducted among 100 active local radio listeners. Quantitative and qualitative data were collected using structured and semi-structured questionnaires. Associations between radio exposure and preventive behavioral compliance were assessed using chi-square tests and binary logistic regression.

Results

COVID-19 awareness was universal among participants, with 90.0% identifying local dialect radio as their primary source of pandemic information. More than 85.0% reported acquiring knowledge of key preventive measures, including hand hygiene, face mask use, and social distancing, through radio broadcasts. Frequent radio exposure was significantly associated with comprehensive adoption of preventive behaviors ($\chi^2 = 12.47$, $p = 0.001$) and independently predicted full behavioral compliance (OR = 4.82, 95% CI: 2.13–10.91). Although most participants adopted preventive measures because of improved health awareness, a small proportion reported compliance driven by enforcement measures.

Conclusions

Community radio is an effective, accessible, and cost-efficient public health implementation strategy for improving health literacy, countering misinformation, and promoting evidence-based preventive behaviors in rural settings. Integrating localized radio programming into routine risk communication and emergency preparedness strategies could strengthen community resilience and enhance responses to future infectious disease outbreaks and other public health priorities in resource-constrained settings.

Introduction

Effective risk communication is a cornerstone of public health emergency preparedness and response. During infectious disease outbreaks, timely dissemination of accurate, accessible, and culturally appropriate health information is essential for promoting protective behaviors, maintaining public trust, and mitigating the spread of misinformation. However, the COVID-19 pandemic exposed a parallel global "infodemic," characterized by the rapid dissemination of misinformation and disinformation that undermined public confidence in scientific recommendations and compromised the effectiveness of public health interventions [1]. The challenge was particularly pronounced in low- and middle-income countries (LMICs) [2], where limited digital access, low health literacy, and weak health communication systems constrained the delivery of reliable public health information [3].

Strengthening community-centered communication strategies has therefore emerged as a critical component of resilient health systems and effective outbreak response. Although digital platforms have transformed health communication globally, they remain inaccessible to many rural populations across sub-Saharan Africa. In these settings, trusted community-based communication channels continue to play a central role in disseminating health information, influencing risk perception, and promoting behavior change. Among these, local-language radio remains one of the most accessible, affordable, and trusted communication platforms, capable of reaching geographically dispersed and underserved populations regardless of literacy level or internet connectivity [2]. Beyond information dissemination, community radio represents a scalable implementation strategy that can facilitate community engagement, strengthen health literacy, counter misinformation, and support the adoption of evidence-based public health interventions during health emergencies.

In Kenya, misinformation surrounding COVID-19 spread rapidly through informal social networks and unverified communication channels, contributing to misconceptions regarding disease severity, preventive measures, and government response strategies [4]. These challenges were particularly evident in rural communities, where access to formal health services, digital media, and timely public health messaging was limited. Lunga-Lunga Sub-County in Kwale County exemplifies such a setting, characterized by predominantly agrarian livelihoods, limited communication infrastructure, and widespread dependence on local dialect radio as the principal source of public information. Consequently, local radio provided a unique opportunity to deliver culturally appropriate health messages and encourage community participation in COVID-19 prevention efforts.

This study is informed by Cultivation Theory, which posits that sustained exposure to media gradually shapes individuals' perceptions, beliefs, and behavioral norms [5]. Within the context of public health communication, repeated exposure to credible, locally relevant radio programming can reinforce accurate risk perceptions, increase trust in public health recommendations, and promote sustained adoption of preventive behaviors. The theory therefore provides a useful framework for understanding how community radio may function not merely as a communication channel but as an implementation mechanism through which evidence-based public health interventions are translated into population-level behavioral change [6].

Despite growing recognition of the importance of community engagement during public health emergencies, empirical evidence evaluating the effectiveness of community radio as a public health implementation strategy remains limited, particularly in rural African settings. Existing studies have largely focused on social media, urban communication environments, or descriptive assessments of public awareness, leaving an important evidence gap regarding the contribution of traditional media to health behavior change in underserved communities [7]. This study addresses that gap by evaluating the role of local dialect radio programming in improving COVID-19 awareness, reducing health misinformation, and promoting preventive behavioral compliance among rural residents of Lunga-Lunga Sub-County, coastal Kenya. By examining community radio as a practical, low-cost, and scalable implementation strategy, the study provides evidence to inform risk communication policies and strengthen preparedness for future infectious disease outbreaks and other public health priorities in resource-constrained settings. Ultimately improving public health outcomes during infectious disease outbreaks through effective implementation of evidence-based health communication strategies[5,6,8].

Conceptual Framework

Figure 1 illustrates the conceptual framework underpinning this study. Guided by Cultivation Theory, the framework conceptualizes community radio as a public health implementation strategy through which sustained exposure to culturally appropriate health messages enhances health knowledge, counters misinformation, strengthens risk perception, and promotes adoption of recommended preventive behaviors, ultimately improving public health outcomes during infectious disease outbreaks[5,6].

Source: Authors' conceptualization based on Cultivation Theory[5] and principles of public health implementation [8, 9].

Materials and Methods

Study Design

The study adopted a mixed-methods cross-sectional research design to collect concurrent quantitative numerical data and qualitative thematic data from active radio-listening residents of Lunga-Lunga Sub County. Cross-sectional design was selected for its efficacy in capturing real-time population-level attitudes, knowledge, and behavioral outcomes during a defined study period, while mixed methods allowed for robust statistical analysis of behavioral trends and contextual explanation of community perceptions [10]. The study focused exclusively on participants with regular, interactive radio listening habits to isolate the impact of radio program engagement on COVID-19 outcomes.

Study Setting and Population

The study was conducted in Lunga-Lunga Sub County, Kwale County, located in the coastal region of southern Kenya. The sub county is predominantly rural, with an agrarian economy, limited digital media

access, and high community dependence on local FM radio stations broadcasting in indigenous local dialects. The target population comprised adult community residents aged 18 years and above who actively listened to local radio programs and engaged with interactive radio segments (e.g., listener call-ins, community announcements, health talk shows) during the COVID-19 pandemic period. Figure 2 is the study area map.

Source

Adapted from Kwale County Integrated Development Plan 2023–2027 *(Kwale County Government, 2023); study area highlighted by the author.*

Sample Size and Sampling Procedure

A total of 100 participants were recruited for the study, achieving a 100% response rate. Purposive sampling was utilized to select active radio listeners, ensuring all participants had consistent exposure to local dialect radio programming during the pandemic. This sampling strategy was appropriate for the study's focus on isolating radio media impacts, as it excluded non-listeners and irregular listeners who could not provide relevant experiential data [11].

Data Collection Tools and Procedures

Primary data was collected using a combination of structured and semi-structured questionnaires administered via face-to-face interviews. Structured questionnaire items captured quantitative data on demographic characteristics, radio exposure frequency, COVID-19 information sources, awareness levels, and preventive behavioral compliance. Semi-structured open-ended questions elicited qualitative data on community misperceptions, motivations for behavioral compliance, fears related to pandemic regulations, and perceived value of radio health programming. All questionnaires were pretested with 10 community residents to validate clarity, cultural appropriateness, and relevance before full-scale data collection. Data collection was conducted ethically, with informed verbal consent obtained from all participants, and all responses were anonymized to ensure confidentiality.

Data Analysis

Mixed-methods data analysis was performed to comprehensively interpret study findings, combining descriptive statistical analysis, inferential statistical testing, and thematic qualitative analysis. All quantitative data was cleaned, coded, and analyzed using IBM SPSS Statistics 26.0 software.

Descriptive Statistical Analysis

Basic descriptive statistics including frequencies, percentages, and proportional distributions were computed to summarize participant demographic characteristics, radio exposure patterns, COVID-19

awareness levels, and prevalence of preventive health behaviors. These analyses provided baseline population-level trends for the study sample.

Inferential Statistical Analysis

Two key inferential statistical tests were utilized to test study hypotheses and identify significant relationships:

Chi-Square Test of Independence: This test was used to examine the statistical association between frequent local radio exposure (binary variable: high vs. low exposure) and adoption of comprehensive COVID-19 preventive behaviors (binary variable: full compliance vs. partial compliance). The test assessed whether radio media exposure was significantly correlated with positive health behavioral outcomes, with a significance threshold set at $p < 0.05$.

Binary Logistic Regression Analysis

A binary logistic regression model was constructed to identify independent predictors of full COVID-19 preventive behavior compliance. The dependent variable was full behavioral compliance (1 = compliant with all core preventive measures; 0 = partial/non-compliant), while the independent predictor variable was frequent local radio program exposure. The model generated odds ratios (OR) and 95% confidence intervals (CI) to quantify the magnitude and statistical significance of radio exposure as a predictive factor for compliant health behaviors.

Qualitative Thematic Analysis

Open-ended questionnaire responses were thematically coded to extract key qualitative insights, including community COVID-19 misperceptions, barriers to behavioral compliance, fear-driven compliance motivations, and community perceptions of local radio's role in pandemic education. Qualitative themes were triangulated with quantitative statistical results to contextualize and explain numerical findings.

Ethical Considerations

The study adhered to international ethical guidelines for human subject's research. Ethical approval was granted by KEMRI Scientific and Ethical Research Unit (KEMRI/SERU/CVBDR/XXX/4064). All participants provided voluntary informed consent prior to data collection. Participants were assured of anonymity, confidentiality, and the right to withdraw from the study at any stage without penalty. No identifying personal information was recorded in the final dataset.

Results

Participant Characteristics

A total of 100 community members participated in the study, yielding a 100% response rate. The gender distribution was nearly balanced, with 51.0% (n = 51) males and 49.0% (n = 49) females. Subsistence farming constituted the predominant occupation, reported by 58.0% (n = 58) of participants, whereas only 18.0% (n = 18) were engaged in full-time formal employment, reflecting the predominantly rural socioeconomic setting. The rest were engaged in different occupations such as motor bike riders, shopkeepers, short term casual work and charcoal burning.

Household water access demonstrated considerable reliance on unimproved sources. Nearly one-third of households (31.0%, n = 31) depended on river water for domestic use, 30.0% relied on dams, while only 5.0% (n = 5) reported access to piped water within the household. About 30.0% (n = 30) relied on water vendors, erratic rain storm and unreliable storage tanks from rain water. These findings highlight the limited water infrastructure characteristic of the study area. The sociodemographic characteristics of study participants are presented in Table 1.

Table 1
Sociodemographic Characteristics of Study Participants (N = 100)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	51	51.0
	Female	49	49.0
Occupation	Subsistence farming	58	58.0
	Health workers	6	6.0
	Primary school teachers	12	12.0
	Others	24	24.0
Primary household water source	River water	31	31.0
	Piped household water	5	5.0
	Dam water	30	30.0
	Others	34	34.0

COVID-19 Awareness and Primary Information Sources

Descriptive analysis confirmed 100% participant awareness of COVID-19 as a global and community-level infectious disease, indicating universal pandemic recognition within the study population. Despite full awareness, qualitative thematic analysis revealed a prominent community misperception: a substantial subset of participants reported never having observed a local community member infected with or deceased from COVID-19, fostering residual skepticism about the pandemic's local severity. Radio programming was confirmed as the dominant primary pandemic information source, far exceeding other conventional information channels. Radio programming was confirmed as the dominant primary pandemic information source: 90.0% of participants indicated that they first learned about

COVID-19 exclusively through local dialect radio broadcasts, far exceeding other information sources (television, social media, community health workers, and word-of-mouth). The distribution of primary COVID-19 information sources and community awareness status is summarized in Table 2.

Table 2
COVID-19 Awareness and Primary Sources of Information (N = 100)

Variable	Category	n	%
COVID-19 awareness	Aware	100	100.0
Primary information source	Local-language radio	90	90.0
	Television/social media/other	10	10.0

Radio-Derived COVID-19 Preventive Knowledge

Participants reported that local-language radio served as the principal medium for disseminating information on COVID-19 prevention. Overall, 85.0% (n = 85) indicated that they acquired knowledge of recommended preventive measures through radio broadcasts. The preventive messages most frequently recalled included information on COVID-19 transmission, hand hygiene (80.0%), physical distancing (79.0%), and appropriate face-mask use (85.0%). These findings suggest that radio programming played an important role in disseminating essential public health information during the pandemic, particularly in communities with limited access to digital media and formal health education channels. The distribution of radio-derived preventive knowledge is presented in Fig. 3.

Note

Participants could report more than one knowledge domain acquired through radio broadcasts.

Adoption of COVID-19 Preventive Behaviours

High levels of compliance with recommended COVID-19 preventive measures were observed among study participants. All respondents (100%, n = 100) reported regular handwashing as part of their routine preventive practices. Consistent face-mask use in public settings was reported by 90.0% (n = 90) of participants. Among participants who reported wearing face masks, 84.0% (n = 84) attributed their compliance primarily to health education messages received through local radio broadcasts. In contrast, only 6.0% (n = 6) indicated that mask use was motivated principally by concerns regarding enforcement measures, including police penalties and mandatory quarantine requirements. These findings suggest that health communication through community radio was a more influential driver of preventive behaviour than regulatory enforcement. The prevalence of preventive behaviours and reported motivations for mask use are summarised in Fig. 4.

Inferential Statistical Analysis Results

Chi-Square Test Results

Chi-square test of independence confirmed a statistically significant positive association between frequent local radio exposure and full adoption of multi-measure COVID-19 preventive behaviors (χ^2 = 12.47,df = 1,p = 0.001). Participants with high weekly radio exposure were significantly more likely to comply with all core preventive measures (handwashing, mask-wearing, social distancing) compared to participants with low radio exposure. This result validates radio programming as a key correlate of positive pandemic health behaviors in the study population. Table 3 presents chi-square test statistics.

Table 3
Chi-Square Test of Association between Radio Exposure and COVID-19 Preventive Behavior Compliance

Radio Exposure Frequency & Full Preventive Compliance			
Radio Exposure	Fully Compliant (n, %)	Not Fully Compliant (n, %)	Total (n)
Low Exposure	18 (36.0%)	32 (64.0%)	50
High Exposure	32 (64.0%)	18 (36.0%)	50
Total	50	50	N = 100
Chi-square statistics	Significant (p < 0.01)	-	-
χ^2	12.47	-	-
df	1	-	-
p-value	0.001	-	-
Key: χ^2 *– Chi square test, df – Degree of freedom, p-value – statistical significance*			

Binary Logistic Regression Results

Binary logistic regression analysis was conducted to determine whether frequent exposure to local-language radio broadcasts independently predicted full compliance with recommended COVID-19 preventive behaviours after adjustment for demographic variables. The regression model was statistically significant (Model χ^2 = 15.83, df = 1, p < 0.001), indicating that the predictor variables collectively improved the prediction of preventive behavioural compliance. The model explained approximately 21.4% of the variation in preventive behaviour (Nagelkerke R^2 = 0.214). Frequent exposure to local radio broadcasts was identified as a significant independent predictor of preventive behavioural compliance (β = 1.572, SE = 0.421, Wald = 13.926, p < 0.001). Participants with frequent radio exposure had 4.82 times higher odds of demonstrating full compliance with recommended COVID-19 preventive measures compared with those reporting lower radio exposure (OR = 4.82, 95% CI: 2.13–10.91). These findings indicate that frequent radio exposure was independently associated with increased adherence to recommended COVID-19 preventive practices (Table 4).

Table 4
Binary Logistic Regression Model Predicting Full COVID-19 Preventive Behavioral Compliance

Predictor	**β**	**SE**	**Wald χ^2**	**p-value**	**Adjusted OR**	**95% CI**
Frequent local radio exposure	1.572	0.421	13.926	< 0.001	4.82	2.13–10.91
Constant	-1.214	0.289	17.682	< 0.001	0.297	—
Model Summary						
Statistic	**Value**					
Model χ^2	15.83					
Degrees of freedom	1					
Model p-value	< 0.001					
Nagelkerke R^2	0.214					

Key: **β - Beta coefficient: SE - standard error: Wald χ^2 -** *Wald test statistic*: **p-value** - *statistical significance*: **Adjusted OR - Adjusted Odds Ratio: 95% CI – 95% Confidence Interval: Constant / Intercept: Model χ^2**: *Likelihood ratio test* **Nagelkerke R^2** - *Pseudo coefficient of determination*

Discussion

This mixed-methods study examined the impact of local dialect radio programming on COVID-19 awareness, misinformation mitigation, and preventive health behaviors in rural coastal Kenya, yielding robust empirical evidence for the value of traditional local media in rural pandemic health communication. The universal COVID-19 awareness rate (100%) across the study sample participants directly aligns with the dominant role of local radio as the primary pandemic information source for 90.0% of participants, confirming findings from prior African media and health studies that traditional radio remains the most accessible mass communication tool for remote rural communities [1,2].

Qualitative identification of residual community skepticism despite universal awareness provides critical context for understanding rural pandemic misinformation dynamics. Many participants doubted local COVID-19 prevalence due to lack of observable local infection or mortality cases, a perceptual gap partially rooted in limited local health surveillance visibility and persistent pre-pandemic viral myths circulating in rural Kenyan communities[4] during the pandemic. This finding underscores that awareness alone does not eliminate misperceptions, and sustained localized media education is required to contextualize public health guidance for rural community lived experiences.

Statistical analyses strongly validate the core study hypothesis: frequent local radio exposure is significantly associated with and predictive of comprehensive COVID-19 preventive behavioral compliance. The chi-square test confirmed a significant positive association between radio engagement

and health compliance, while logistic regression revealed that high radio exposure nearly quintuples the likelihood of full adherence to core preventive measures. These quantitative results align with cultivation theory's core premise: sustained, repeated exposure to media health content cultivates consistent health knowledge and normative behavioral adoption over time [6]. Local dialect radio programming effectively translated technical national public health guidelines into culturally accessible, community-relevant messaging, eliminating language and literacy barriers that hinder formal health communication in rural Kenya [2].

The study's high behavioral compliance rates (100% handwashing, 90% mask-wearing) demonstrate the tangible public health impact of radio-mediated health education. Importantly, the distinction between health-motivated compliance (84.0%) and enforcement-fear-driven compliance highlights a dual mechanism of pandemic behavioral adherence in rural settings. While radio successfully built voluntary health literacy and positive behavioral intentions, government law enforcement measures supplemented compliance, a trend observed in other African pandemic response studies [13]. Critically, the majority of compliance was intrinsically motivated by radio-derived health knowledge, indicating that local media can foster sustainable health behaviors beyond punitive enforcement.

Sociodemographic findings further contextualize study outcomes. The predominance of agrarian participants (58.4%) and limited formal employment and infrastructural access confirm the study site as a marginalized rural community with limited alternative health information channels. In such settings, local radio functions as a democratized public health platform, reaching low-literacy, low-income populations excluded from digital and print media health communication [14]. These findings contrast with urban Kenyan pandemic studies that highlight social media and television as primary information sources, further demonstrating the unique, irreplaceable role of local radio in rural marginalized regions [7]. Collectively, the study confirms that localized radio programming is not merely a passive information tool but an active public health intervention capable of mitigating infodemic risks, building health literacy, and driving compliant preventive behaviors during global health emergencies. The findings demonstrate that community radio represents an effective, culturally appropriate, and cost-efficient platform for delivering public health messages in rural settings. Beyond the COVID-19 pandemic, such platforms may support preparedness and response efforts for emerging infectious diseases, vaccination campaigns, antimicrobial resistance awareness, maternal and child health programmes, and other public health priorities where misinformation and limited access to digital media remain significant challenges.

Study Limitations

This study has several limitations. First, the purposive sampling of active radio listeners may limit the generalizability of the findings to populations with different media consumption patterns. Second, the cross-sectional design precludes causal inference and assessment of long-term changes in health knowledge and preventive behaviors. Third, as the study was conducted in a single rural sub-county in coastal Kenya, the findings may not be directly transferable to urban or other socioeconomically diverse settings. Finally, although local radio was the predominant source of COVID-19 information, the potential

influence of other communication channels, including community health workers, social media, and interpersonal communication, could not be fully disentangled.

Conclusion

This study demonstrates that community-based local radio programming was strongly associated with improved COVID-19 awareness, enhanced knowledge of preventive measures, and greater adherence to recommended preventive behaviors among rural communities in Kinango Sub-County, Kenya. Frequent exposure to local dialect radio significantly increased the likelihood of adopting comprehensive preventive practices, underscoring its effectiveness as a trusted and accessible public health communication platform in resource-limited settings. These findings highlight the value of community radio as a scalable and cost-effective intervention for strengthening risk communication, countering health misinformation, and promoting evidence-based health behaviors where access to digital media and formal health services is limited. Integrating local-language radio into national and county-level public health communication strategies could enhance community preparedness and response to future infectious disease outbreaks and other public health priorities.

Recommendations

Based on the study findings, the following evidence-based recommendations are proposed for government, public health agencies, and media stakeholders to strengthen rural public health emergency communication in Kenya and comparable rural settings across sub-Saharan Africa:

- Strategic integration of local radio into national emergency frameworks
- Optimize targeted health broadcast scheduling and placement
- Build professional capacity for local radio broadcasters Integrate radio programming with grassroots community outreach
- Scale indigenous-language media interventions for future crises:

Further multicenter and longitudinal studies are warranted to evaluate the long-term effectiveness and scalability of community radio as a sustainable health communication strategy across diverse rural settings.

Abbreviations

COVID
19 Coronavirus disease 2019

Declarations

Ethics statement (accordance)

In accordance this research was carried out following the guidelines of the ethics committee listed in the ethics statement (KEMRI/SERU/CVBDR/XXX/4064). This study was carried out following international ethical guidelines for human subject's research. All participants provided voluntary informed consent prior to data collection. Participants were assured of anonymity, confidentiality, and the right to withdraw from the study at any stage without penalty.

Consent to publish:

The authors declare that they have obtained all necessary consents from participants for publication of this research. All authors have read and approved the final manuscript for submission and publication.

Competing interests:

The authors declare that no potential conflict of interest.

Clinical Trial Number

Not applicable

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Author Contribution

Authors' ContributionsR. K: Data collection, data analysis, manuscript preparation, writing and submission. Amos Mwavita: Data collection, review of the manuscript. Lydia Kibe: Data collection, review and proof reading of the manuscript.

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Data Availability

Availability of data and materials: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Figures

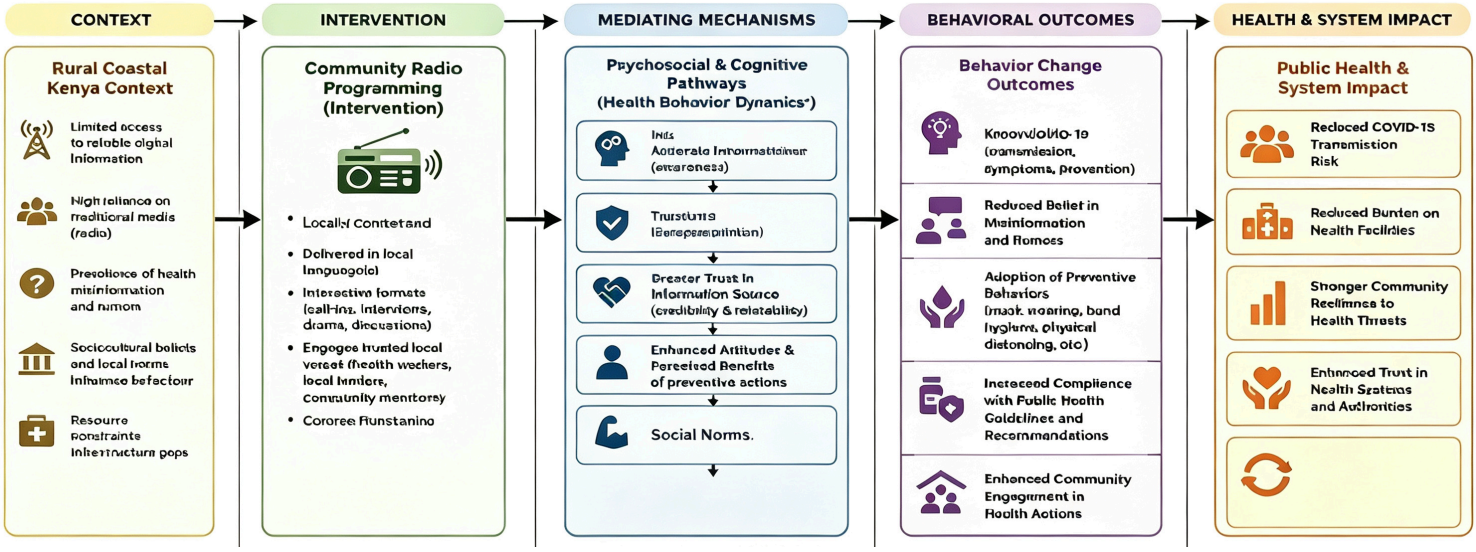


Figure 1

Source: Authors' conceptualization based on Cultivation Theory[5] and principles of public health implementation [8,9].

Community radio as a public health intervention mitigating covid-19 misinformation and fostering prevention behavioural compliance in a rural Coastal Kenya

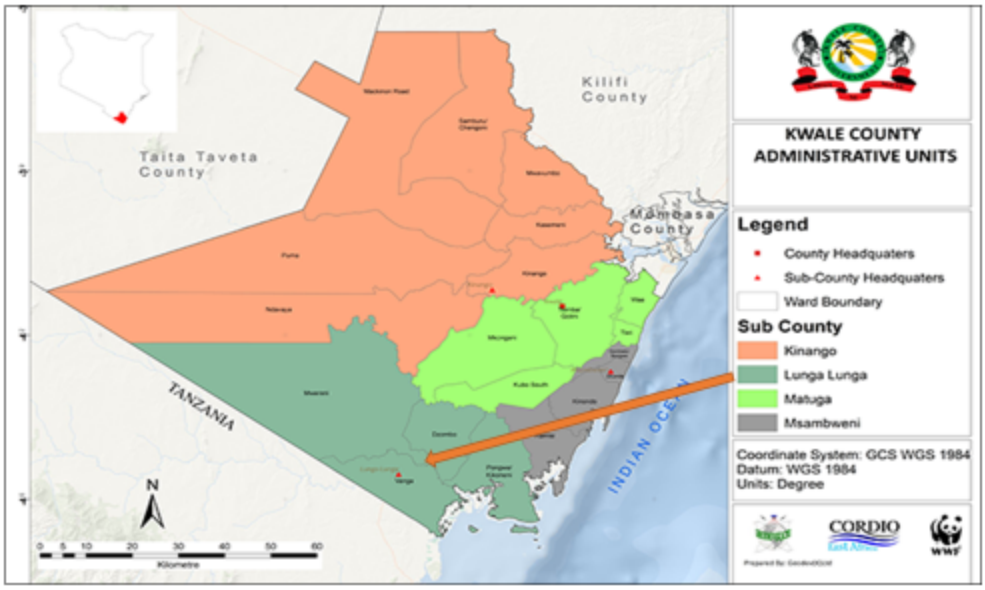


Figure 2

Map of Kwale County showing Lunga Lunga Sub-county

Source: *Adapted from* Kwale County Integrated Development Plan 2023–2027 *(Kwale County Government, 2023); study area highlighted by the author.*

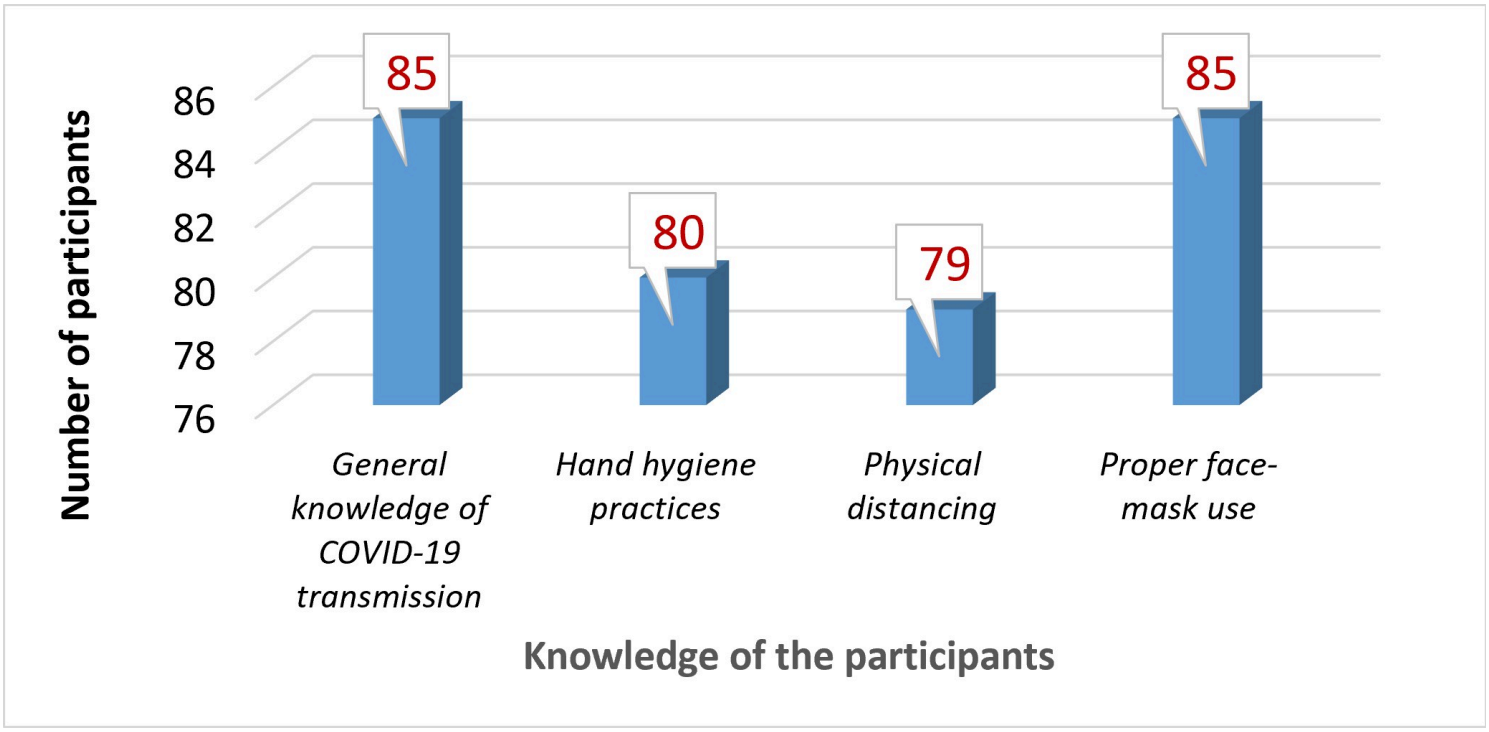


Figure 3

COVID-19 Preventive Knowledge Acquired through Local Radio (N = 100)

Note:*Participants could report more than one knowledge domain acquired through radio broadcasts.*

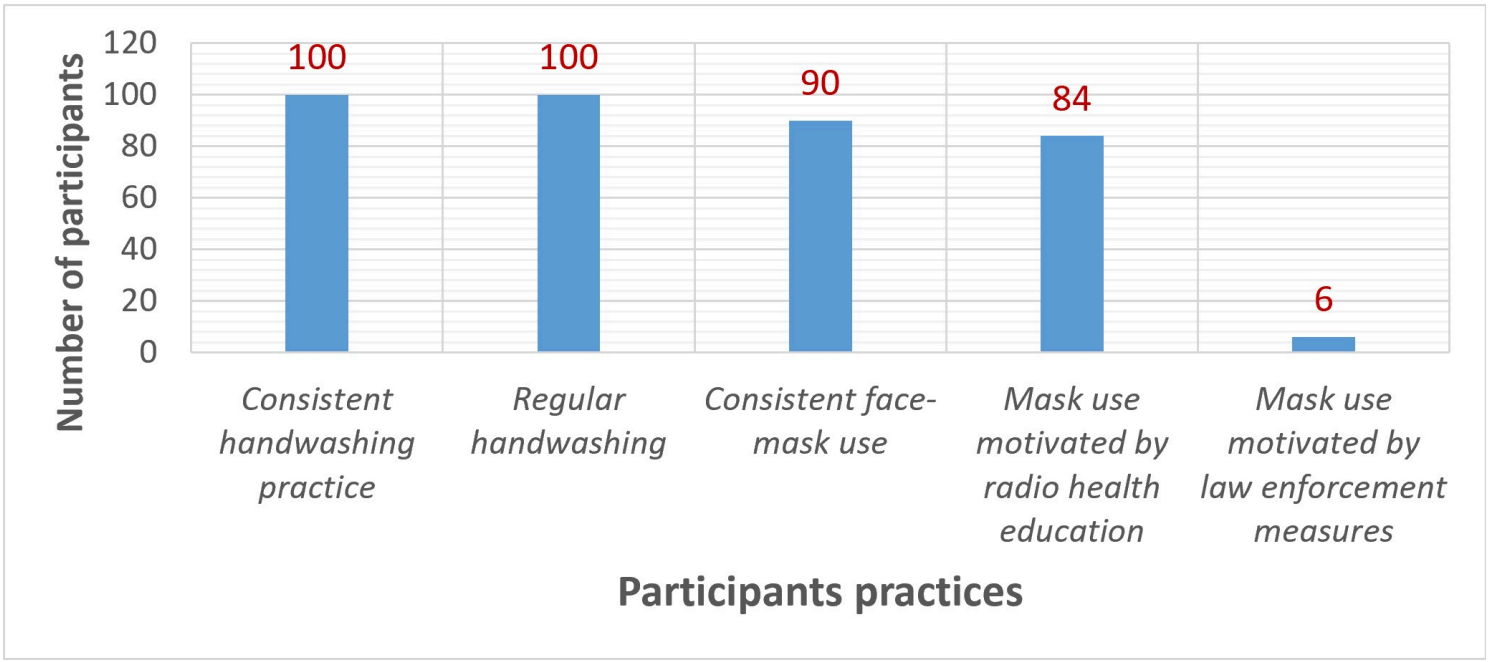


Figure 4

Adoption of COVID-19 Preventive Behaviours and Reported Motivation for Mask Use (N = 100)