SHORT REPORT

Mass media exposure and Lassa fever knowledge, attitudes and practices in rural Nigeria

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ABSTRACT

Lassa fever is a serious infectious disease that has eluded total eradication in Nigeria. The disease affects about 21% of the country's over 200 million population and currently has no preventive vaccines; hence, health stakeholders have continuously used the mass media as independent and complementary intervention tools to educate the public and create appropriate awareness on the best preventive protocol for the disease. This study examined the influence of public exposure to mass media sensitisation messages on Lassa fever-related knowledge, attitudes and practices among residents of eight rural communities in South-South Nigeria. It used a survey questionnaire to collect data from 384 respondents selected through multistage sampling. After controlling for confounding variables, the results of the hierarchical multiple regression analyses showed that increased exposure to mass media messages on Lassa fever prevention was significantly associated with higher knowledge ($\beta = .609$) and positive attitudes towards the prevention of the outbreak of the disease ($\beta = .600$). However, exposure to mass media sensitisation messages on the disease had no significant influence on public health practices related to Lassa fever. Thus, the study called on health communication practitioners and policy makers to design Lassa fever media messages in languages prevalently spoken in the rural communities, and package such messages in a manner that gives due consideration to the individual and cultural disposition of the target audience.

Key words: infectious disease, health promotion, Lassa fever, media exposure, risk communication

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INTRODUCTION

Nigeria is currently faced with the outbreak of multiple infectious diseases which have claimed tens of thousands of lives in the past years.[1] Among these worrisome communicable diseases, Lassa fever is considered one of the most vicious epidemics in the country, affecting about 21% of the country's over 200 million population and 30% of its geographical area.[1,2] Consequently, Nigeria has the highest fatality rates resulting from this endemic disease.[3,4] Out of the estimated annual Lassa fever-related 5,000 deaths in West Africa,[5] about 3,000 (60%) are said to occur in Nigeria.[6,7] Lassa fever is a non-gender and non-age prone acute viral disease caused by the Lassa virus, a single-stranded ribonucleic acid (RNA) virus belonging to the family of *Arenaviridae*.[8] The virus causes severe haemorrhagic fever that is characterised by sore throat, muscle aches, nausea, vomiting, chest and abdominal pain.[3] Its primary hosts are rodents of the genus *mastomys natalensis*, commonly known as the multimammate rats.[9]

The virus was first identified in Nigeria in 1969 following the death of two American missionary nurses working in Borno, a state in North-eastern Nigeria.[10] Since then, the disease has spread from the Yedseram River Valley, where the index cases were isolated, to all parts of Nigeria, leaving in its wake a high case fatality ratio.[8,7] Reports show that there were at least 3,498 suspected cases of the disease in 2018, 5,057 in 2019 and 6,791 in 2020.[1,11] Despite global efforts to tackle this public health challenge, there is still no effective vaccine for its prevention.[5,9] The disease is markedly prevalent in rural communities where there is limited access to orthodox medicine and a high degree of poverty and ignorance.[7] This is exacerbated by the socio-cultural practice of eating rodents in many Nigerian communities, which increases the chances of direct rodents-to-human transmission of the virus.[7,12]

In the past, the mass media have been used to sensitise the public on the most effective ways for preventing the outbreak of Lassa fever.[7] Media messages on the disease often revolve around its epidemiological causes, clinical features, transmission patterns and preventive measures.[13] Previous research has shown that exposure to mediated health information can significantly influence public knowledge, attitudes and practices related to serious public health challenges, such as Lassa fever.[14,15] This is because many people rely on media information to understand the health-related risks and clinical courses of serious health challenges, especially when in dire need of appropriate coping mechanisms.[16,17] Hence, this study investigates the influence of mass media sensitisation messages on public knowledge, attitudes and public health practices regarding the prevention of the spread of Lassa fever in Nigeria's rural communities.

To achieve this goal, the study was guided by three hypotheses. First, the study hypothesised that exposure to media messages on Lassa fever would be positively related to respondents' knowledge of the disease (H1). Arguably, the media play several roles in public health management, including creating awareness, stimulating a measurable increase in knowledge, encouraging the development of positive attitudes and influencing behavioural changes towards public health issues.[18] Besides, media outlets are considered effective means of spreading health-related information to a diverse audience with positive outcomes in terms of audience reach, public awareness and health knowledge.[19] Studies have shown that exposure to media sensitisation messages was significantly associated with

higher levels of awareness and improved knowledge towards certain risk issues, such as HIV/AIDS prevention, cancer screening and prevention, reduction in birth rate and increased child survival rate.[14,20] Similarly, research indicated that consistent exposure to media messages tends to result in increased knowledge of public health issues,[14,21] although the amount of knowledge gained might decrease when the media messages are national in scope rather than local.[18] For example, a study showed that mass media campaigns about alcohol consumption were often recalled by individuals exposed to such messages and that such frequent recalls tended to significantly influence their knowledge, attitudes and beliefs about alcohol consumption.[21]

Second, the study proposed that exposure to media messages on Lassa fever would be positively related to respondents' attitudes towards the prevention of the disease (H2). Previous research suggests a correlation between media exposure and public health attitudes. One of such studies found significant changes in public attitudes and beliefs about alcohol consumption due to exposure to media messages against excessive alcohol intake.[21] Another study found that mothers exposed to media campaigns on the utilisation of antenatal care services had positive attitudes towards the services, were more likely to attend antenatal visits than their non-exposed counterparts, take adequate rest during pregnancy and receive tetanus toxoid immunisation.[15]

Third, the study assumed that exposure to media messages on Lassa fever would be positively related to respondents' health practices towards the prevention of the disease (H3). Although changing unhealthy behaviours is considered the highest priority in public health education, this priority also constitutes one of the most difficult objectives to achieve in mediated health campaigns.[22] This is because the effectiveness of media health promotion and education efforts is inhibited by diverse factors.[7,23] The hierarchy of effects model developed by McGuire in 1989 suggests that the size of effects arising from mediated campaigns is often greater at the earlier steps (of awareness and knowledge) than the later stages (of attitudes and behavioural changes).[18] Nevertheless, scholars believe that media campaigns can produce positive changes or prevent negative changes in health-related behaviours across large populations.[20] Previous research also indicated that properly designed media health campaigns can have small-to-moderate effects not only on health knowledge and attitudes but also on behaviours.[19,24] For example, a study has shown that an increase in media campaign expenditure for smoking cessation was significantly associated with the higher success of attempts to quit smoking in England.[25] Similarly, another study found that the inclusion of mass media campaigns in tobacco control programmes was an effective way of changing adults' smoking behaviour and encouraging smoking cessation efforts.[19].

METHODS

Design and participants

The study adopted the survey research method, which is suitable for examining the peculiar factors motivating human behaviour.[26] The study's population was Nigeria's South-South geopolitical zone, which accounts for the highest ratio of Lassa fever infection in Nigeria.[1,11] The zone consists of six states, occupying about 85,303^2 km with a population strength of about 28,829,288 residents.[27] The study included 384 willing respondents drawn through the Cochran's sample size determination formula developed in 1963,[26] using multistage sampling. On the basis of Lassa fever prevalence, a purposive sampling technique was used to select Edo State (which has a high Lassa fever prevalence rate) and Delta State (which has a low Lassa fever prevalence rate) as study areas. In the second stage, one Local

Government Area (LGA) was selected to represent each state using simple random sampling. The simple random sampling technique was also used in the third stage to select four rural communities in each of the selected LGAs. Finally, systematic random sampling was used in the fourth stage to select the head of every tenth household or their representative in each of the studied communities. A questionnaire was used to collect data for the study.

Instrument and Measures

The questionnaire was designed with insights from previous studies on mass media exposure and audience knowledge, attitudes and practices related to public health issues. To ascertain the reliability of the instrument, a pilot survey of 20 respondents (representing 5% of the entire sample) was conducted and analysed using SPSS version 23. The pilot survey yielded an acceptable measure of internal consistency. In all the measured scales, there was no negative item in the inter-item correlation matrix, the values in the corrected item-total correlation were greater than 0.4 (indicating that the items measured the same construct), and the Cronbach's Alpha coefficient for each scale was above the minimum acceptable threshold of 0.7. Overall, the instrument showed an excellent psychometric property; hence, it was considered reliable for the collection of data for the study.

1. Mass media exposure

This measure consisted of three items on a 5-point Likert scale, ranging from 1 (Never) to 5 (Daily). Participants were required to indicate their frequency of exposure to media messages about Lassa fever on (1) Radio, (2) Television, and (3) Newspaper. *($\alpha = 0.89$).*

2. Lassa fever knowledge

Ten items on a 5-point Likert scale adapted from previous studies[7,13,21,28] were used to measure respondents' knowledge of the causes, clinical symptoms and treatment of Lassa fever. The items were: (1) Contact with rats, their faeces, blood or urine can cause Lassa fever infection; (2) Dog bites can result in Lassa fever infection; (3) Lassa fever is an airborne disease; (4) An infected person can transmit Lassa fever disease to other people; (5) Lassa fever can be transmitted to humans through mosquito bites; (6) Lassa fever can be transmitted by witches and wizards at night; (7) Contact with the dead body of Lassa fever patients can cause Lassa fever infection; (8) Bleeding, vomiting and diarrhoea are symptoms of Lassa fever; (9) There is a vaccine for preventing Lassa fever infection; and (10) Children and old people are the only ones at the risk of Lassa fever infection. Responses to these items ranged from 1 (Strongly Disagree) to 5 (Strongly Agree) ($\alpha = 0.89, \ \bar{X} = 3.21, SD = 1.22$).

3. Attitude towards Lassa fever prevention

Attitudes towards Lassa fever prevention was assessed using four items on a 5-point Likert scale adapted from previous studies.[7,8,13,29] The items were: (1) I believe that mass media messages against the spread of Lassa fever in my community are necessary and worthwhile initiatives; (2) Based on media sensitisation messages, I consider Lassa fever as a threat to human health that must be urgently tackled; (3) I believe that the recommended actions contained in the radio, television and newspaper messages on Lassa fever prevention are for my own good and benefit; and (4) From mass media messages, I understand that eating rats and other rodents is bad for my health. Responses to these items ranged from 1(Strongly Disagree) to 5 (Strongly Agree) ($\alpha = 0.89, \ \bar{X} = 3.43, SD = 1.33$).

4. Lassa fever-related health practices

Relying on previous studies,[13,29] a 5-point Likert scale on health practices related to Lassa fever was constructed, with

responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The items were: (1) As recommended in Lassa fever media messages, I have blocked all rat holes in my house to reduce the presence of rodents around my surroundings; (2) Given my exposure to Lassa fever media messages, I now maintain a cleaner and healthier environment to keep away rats; (3) I store food items in tightly-closed containers as a result of the Lassa fever media messages I receive; (4) I have stopped eating rats and other rodents as recommended in the media messages on Lassa fever prevention; and (5) In line with mass media messages, I engage in regular hand washing to prevent Lassa fever infection ($\alpha = 0.89, \bar{X} = 2.90, SD = 1.19$).

Data Analysis

The data were analysed using inferential statistics. Preliminary correlation analysis among key variables was ascertained using SPSS version 23, while hierarchical multiple regression was used to test the formulated hypotheses. Five control variables (sex, age, education, employment and marital status) were entered in Block 1 of the model based on their tendency to generally influence health knowledge, attitudes and practices.[12,17] Mass media exposure was entered in Block 2 of the model to assess the extent of its predictive relationship on the respondents' knowledge, attitudes and practices related to Lassa fever. Preliminary analyses were conducted to ensure the non-violation of the Gaussian assumption, linearity, multicollinearity and homoscedasticity.[30] Probability value for the study was determined at <0.05 significance level.

Ethical Compliance

The study adhered to ethical principles guiding the use of human participants in research. Ethical approval was granted by the Faculty of the Social Sciences Research Ethics Committee, Delta State University, Abraka, with approval number DELSU/FSS/FSSREC/01022021. Information about the objectives and nature of the research was made available to the participants, and a written informed consent was also obtained from the participants. To ensure respondent confidentiality, the questionnaire contained no identifying information.

RESULTS

Out of the 384 copies of the questionnaire that were administered, 381 were retrieved and found usable, amounting to a 99.2% response rate. Based on the usable data, 50.4% of the respondents were from Edo State, while 49.6% were from Delta State. A total of 52.2% were males, while 47.8% were females. The modal age range was 25-34 years and about 76.1% of the study's participants had various forms of active employment. On education, 11.3% of the respondents had no formal education, 12.9% had primary education, 32.3% had secondary education, 24.4% had technical/vocational education, while 19.2% had tertiary education. Correlation analysis of the key variables is shown in Table 1.

Table 1 Correlation analysis among key variables

	Variables	1	2	3
1	Media Exposure			
2	Lassa fever Knowledge	.727**		
3	Lassa fever Attitudes	.755**	.847**	
4	Lassa fever Practices	.052	.017	.127*

***.Correlation is significant at <0.01 level (2-tailed); *.Correlation is significant at <0.05 level (2-tailed); 1 = Media exposure; 2 = Lassa fever knowledge; 3 = Lassa fever attitude; 4 = Lassa fever practices.*

1. Media exposure and Lassa fever knowledge

Hierarchical multiple regression was used to assess the predictive influence of mass media exposure for Lassa fever-related information on respondents' overall knowledge of the disease, after controlling for the possible influence of five confounding variables (sex, age, education, employment and marital status). The confounding variables were entered at Step 1, explaining 61% of the variance in Lassa fever knowledge. After the media exposure variable was entered at Step 2, the total variance explained by the model as a whole was 88%, *F (6, 374) = 457.9, p* < .001. Overall, the data presented in Table 2 showed that mass media exposure alone explained an additional 27% of the variance in Lassa fever knowledge, after controlling for sex, age, education, employment and marital status, R^2 change = .071, *F Change (1, 374) = 220.5, p < .001.* In the final model, mass media exposure was statistically significant *(β = .609, p* < .001*),* indicating that the respondents' overall knowledge of Lassa fever tends to increase by .609, on average, for every unit increase in their extent of exposure to media messages on the prevention of the disease. Therefore, the results supported the assumption of H1.

Table 2 Regression analyses predicting the relationship between variables

H_a	Model	R^2	F	df1	df2	R^2 Change	F Change	β	P-value.
H_1	1	.610	318.8	6	374	.810	318.8	.609	<0.001
	2	.880	457.9	1	374	.071	220.5		
H_2	1	.427	125.8	6	374	.627	125.8	.600	<0.001
	2	.761	198.5	1	374	.135	210.5		
H_3	1	.115	9.732	6	374	.115	9.7	.257	>0.05
	2	.173	13.1	1	374	.058	26.4		

H_a = Hypotheses; R^2 = Coefficient of regression; F = Variance; df = Degree of Freedom; β = Unstandardised Beta; p-value = Probability Value

2. Media exposure and attitude towards Lassa fever

According to the results of the hierarchical regression analyses presented in Table 2, respondents' attitudes towards Lassa fever prevention were significantly explained by the extent of their exposure to media messages on the disease. When the confounding variables were entered in Step 1, they explained 42.7% of the variance in overall attitudes towards Lassa fever prevention, while the total variance explained by the model as a whole was 76.1%, *F (6, 374) = 198.5, p < .001*. After controlling for the likely influence of the five confounding variables, mass media exposure accounted for 33.4% of the variance in respondents' attitudes towards Lassa fever prevention, R^2 change = .135, *F Change (1, 374)* = 210.5*, p < .001.* The final model indicated that after accounting for all controls, mass media exposure was significantly associated *(β = .600, p* < .001*)* with an increment in respondents' positive attitudes towards Lassa fever prevention. Hence, H2 was supported.

3. Media exposure and Lassa fever-related practices

The results presented in Table 2 indicated a non-significant relationship between respondents' exposure to media sensitisation messages on Lassa fever prevention and their general health practices related to the prevention of the disease after accounting for all controls. The five confounding variables, which were entered in Step 1, explained about 11.5% of the variance in Lassa fever-related practices. After the media exposure variable was entered in Step 2, the total variance explained by the model as a whole was 17.3%, $F\ (6, 374) = 13.1$, $p > .05$. On the whole, mass media exposure alone explained an additional 5.8% of the variance in Lassa fever-related practices, after controlling for sex, age, education, employment and marital status, R^2 change = .058, $F\ Change\ (1, 374) = 2.64$, $p < .001$. However, the specific beta contribution of mass media exposure to respondents' Lassa fever-related practices was not statistically significant ($\beta = .257$, $p > .05$). Hence, H3 was rejected.

DISCUSSION

Analysing data collected from respondents in Nigeria's South-South geopolitical zone, this study seeks to advance empirical knowledge on how mass media messages influence the public's response to the prevention of communicable diseases, such as Lassa fever. The study showed that, after controlling for certain confounding variables like sex, age, education, employment and marital status, increased exposure to media messages on Lassa fever prevention tends to significantly influence public knowledge of the causes, modes of transmission and clinical symptoms of the haemorrhagic fever. This is consistent with previous studies indicating that increased exposure to media messages on any issue tends to increase the audience's knowledge and awareness of such issues.[18,21] In their study, Odionye et al.[13] asserted that constant media emphasis on Lassa fever-related threats and risks can result in increased public awareness and knowledge about the disease. Thus, the findings of the current study imply that carefully designed media messages that are reflective of the correct information on Lassa fever could become the linchpin for significant improvements in respondents' knowledge of the infectious disease which seems to be generally low in many Nigerian rural communities.[7,29]

Expectedly, increased knowledge of Lassa fever was significantly associated with increased positive attitudes towards the disease's prevention. The findings align with previous studies indicating that exposure to media health messages can sway public attitudes towards health issues.[14,15,21] For instance, a previous study showed that the attitudes of rural communities' dwellers in South-East Nigeria towards Lassa fever prevention and control were positively influenced by media campaigns on the disease.[13]

However, the present study found that after controlling for the influence of confounding variables, there are not many changes in the health practices of the respondents despite their high level of exposure to media messages on Lassa fever prevention. The results suggest that certain Lassa fever predisposing behaviours, such as rat consumption, open-air drying of food items and unhygienic environments that promote the seamless movement of rats in residential areas, remain prevalent.

Consistent with previous studies in support of McGuire's hierarchy of effects model,[21,22] the current study shows that the size of effects arising from media messages on Lassa fever was greater at the earlier steps (of awareness and knowledge) than the later stages (of attitudes and behavioural changes). Scholars argue that the effectiveness of mass media messages/campaigns on Lassa fever is

essentially limited by contents and undermined by poor network connection, broadcast timing, and socio-cultural incongruities that militate against individuals' willingness to adopt appropriate health and environmental behaviours that are critical to the prevention of the outbreak and spread of the disease in Nigeria.[7,23]

CONCLUSION AND IMPLICATIONS FOR PUBLIC HEALTH PROMOTION

The study has affirmed that the mass media remain crucial to the successful management and control of public health crises, particularly in terms of creating appropriate knowledge on the causes, clinical symptoms and modes of transmission of severe public health crises, such as the Lassa fever outbreak. Nevertheless, the study's outcome has shown that despite the reported positive relationship between respondents' exposure to media messages and the general changes in their knowledge and attitudes towards the prevention of Lassa fever outbreak, there is minimal or no influence of media messages on public health practices related to its prevention.

The findings of this study hold a number of implications for public health promotion and communication, especially when such communication is directed at rural dwellers. Foremost, the findings underscore the need for health communication practitioners to package Lassa fever media messages with due consideration to the individual and cultural disposition of the target audience. Besides, the endemic nature of Lassa fever in Nigeria warrants that the government and public-spirited organisations should sustain public sensitisation efforts on the most effective measures for preventing the outbreak of the disease. Also, the study shows the crucial place of proper timing, audience segmentation and appropriate consumer research to ensure that media messages on the prevention of Lassa fever meet the target audience at the right time and context. The findings also make a strong case for health policy formulators to incorporate opinion leaders in the dissemination of public health information, given their sometimes overriding influence on the chain of communication.

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