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Original Research Article

Perceptions and practices related to lassa fever transmission and prevention among rural residents of Akoko South West Local Government Area, Ondo state, Nigeria: a community-based cross-sectional study

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ABSTRACT

Background: Lassa fever remains a major public health challenge in Nigeria, especially in rural areas where environmental factors, hygiene behaviours and socio-cultural behaviours can affect the exposure and prevention. The aim of the study was to assess the community perceptions and self-reported practices about Lassa fever transmission and prevention in rural communities in Akoko South West local government area.
Methods: A community-based descriptive cross-sectional survey was conducted between March 2021 and May 2021 among 210 adult residents of selected rural communities in Akoko South West Local Government Area, Ondo State, Nigeria. Data were collected using a structured questionnaire assessing socio-demographic characteristics, perceptions and self-reported practices related to Lassa fever transmission and prevention. Responses were measured using a three-point Likert scale and analysed using descriptive statistics and chi-square (χ^2) tests, with statistical significance set at $p<0.05$.
Results: Most respondents perceived rats in households (84.3%) and dirty environments (92.4%) as contributors to Lassa fever transmission. Poor hygiene practices were perceived as a risk by 63.8% of respondents, while 51.0% perceived rat consumption as a risk behaviour. Environmental factors ($\chi^2=20.19$, $p<0.05$), poor hygiene practices ($\chi^2=18.72$, $p<0.05$), and cultural practices ($\chi^2=21.34$, $p<0.05$) were significantly associated with perceived transmission. Environmental sanitation (85.2%), avoidance of harmful cultural practices (70.5%), and early diagnosis and treatment (83.8%) were significantly associated with perceived prevention ($p<0.05$).
Conclusions: Community perceptions and self-reported practices play an important role in Lassa fever prevention in rural endemic settings. The findings support integrated public health interventions that combine environmental sanitation, hygiene promotion, culturally sensitive risk communication, and strengthened primary healthcare services.

Keywords: Lassa fever, Community perceptions, Preventive practices, Rural communities, Nigeria

INTRODUCTION

Lassa fever is an acute viral zoonotic disease caused by Lassa virus (LASV), an arenavirus that causes a haemorrhagic disease which can manifest as fever, malaise, sore throat, gastrointestinal symptoms and in severe cases, multi-organ involvement and bleeding.[1,2] The disease is endemic in parts of West Africa, including Nigeria, Sierra Leone, Guinea, and Liberia, where it remains a recurring public health threat.[2,3] The disease is caused by the multimammate rat (*Mastomys natalensis*), a peri-domestic rodent widely distributed in sub-Saharan Africa and closely associated with human settlements, particularly in rural settings.[2-4]

The modes of transmission include exposure to food or domestic items contaminated with rodent urine or faeces, and inhalation of contaminated aerosols.[1,2] Human-to-human transmission has been documented, especially via contact with blood and body fluids, and outbreaks can be heightened even in healthcare facilities when infection prevention and control (IPC) is poor.[4,5]

Evidence from Nigeria demonstrates that enhancing IPC practises in the Lassa fever treatment environment is vital in minimising healthcare-associated transmission and safeguarding healthcare staff.[5] In Nigeria, seasonal outbreaks of Lassa fever have a high morbidity and mortality rate, and the Nigeria Centre for Disease Control (NCDC) situation reports show that the case fatality ratio remains high in recent years.[6] Lassa fever has a non-specific clinical presentation in the initial stages, and thus may be mistaken with other common febrile diseases, including malaria and typhoid fever, which also leads to misdiagnosis and delayed treatment, especially in facilities with limited diagnostic capabilities.[3] Delayed presentation to healthcare facilities has been associated with poorer clinical outcomes in Nigerian treatment centres.[7]

The rural communities are disproportionately at risk because of environmental and socio-cultural factors that favour rodent infestation and human exposure, such as poor housing construction, inadequate sanitation, unsafe food storage, and limited access to health information and timely healthcare.[1,4] Public health messaging in Nigeria therefore emphasises household hygiene, safe storage of foodstuffs, and proper refuse disposal as key strategies to reduce rodent–human contact and lower transmission risk.[8]

Despite increasing research and response efforts, prevention has been difficult because there is no licensed vaccine, and there are continued limitations in applying sustained rodent control in endemic communities.[1-3] Furthermore, there are limited treatment options. Despite the widespread use of ribavirin in clinical practise, recent findings indicate ambiguities on its effectiveness and optimal dose, which supports the importance of enhancing case management approaches and more evidence-based interventions.[10]

Against this background, this study examines community perceptions and self-reported practices related to environmental, hygienic, and behavioural factors associated with perceived transmission and prevention of Lassa fever among rural residents of Akoko South West Local government area, Ondo State, Nigeria. The findings aim to generate context-specific evidence to inform targeted health education, risk communication, and community-based prevention strategies aligned with national Lassa fever control priorities.

METHODS

Study design

The survey design used for this study was a community-based descriptive cross-sectional survey design. The design was suitable to explain the characteristics of the population and study the relationships between categorical variables, especially perceptions and self-reported practises, at a single point in time. Cross-sectional study designs are widely used in public health research to characterise populations and assess associations between variables within a defined timeframe.[11] This approach was therefore suitable for identifying factors associated with perceived transmission and prevention of Lassa fever among rural residents.

Study area

This community-based cross-sectional study was conducted between March 2021 and May 2021 in Akoko South West Local Government Area (LGA), Ondo State, Nigeria. The period covered questionnaire administration, field supervision, and data validation processes. This LGA is also among the 18 local government areas in Ondo State, and it is found in the north-eastern region of the state.

It is located in the savannah ecological zone, which is a derivative of the rainforest, and it is mostly rural. The primary professions are agriculture and small-scale trade. Most communities are characterised by a high proportion of predominantly traditional housing structures and inadequate environmental sanitation and waste management facilities, conditions that may facilitate rodent infestation and increase the risk of transmission of rodent-borne diseases such as Lassa fever.[12]

Study population

The study population comprised adult residents (≥18 years) living in selected rural communities within Akoko South West LGA, including Ago Flower, Ose-Oba, Ago Ajayi, Ago Panu, and Ago Yeye. These are mostly agrarian and rural communities, and the living conditions are mostly related to higher exposure to zoonotic diseases.

Sample size and sampling technique

A multi-stage sampling method was used. The simple random sampling of the list of communities in the LGA

was used to select five rural communities in the first stage. The second stage involved the selection of households in each community through simple random sampling, and one respondent was selected per household in the community. 42 respondents were recruited from the communities to make the total population of 210 participants. The use of random sampling at each stage helped minimise selection bias and enhance representativeness. [13]

Eligibility criteria

The study included residents aged 18 years and above who had lived in Akoko South West local government area for at least six months prior to data collection and who were willing to provide informed consent. Residency for a minimum of six months was required to ensure adequate familiarity with community health practices and environmental conditions. Individuals who were temporary visitors, those who were critically ill at the time of data collection, and individuals who declined to provide consent were excluded from the study.

Data collection instrument

A structured questionnaire was used in data collection, and the questionnaire was designed by the researchers after examining relevant literature. There were two sections to the questionnaire. Section A involved the socio-demographic data of the respondents, such as age, sex, educational level, religion, and occupation. Section B evaluated the perception and practises of causes and prevention of Lassa fever. Section B responses were quantified on a three-point Likert scale (agree, undecided, disagree), as it is a simple and reliable method of quantifying attitudes and perceptions in health research.

A 3-point Likert scale makes it easier to respond to a set of items such as agree, neutral, and disagree, and therefore is appropriate in community-based research. Such a format helps decrease the cognitive load of the study participants, particularly those with different literacy levels, and helps to capture the main attitudinal trends.[14]

Validity of the instrument

Before data collection, face and content validity of the questionnaire were determined. Three health education and public health experts reviewed the instrument to determine the content clarity, relevance, and adequacy. One of the methods of determining content validity in survey research is expert review.

Adjustments were required depending on their recommendations, and then they were administered.

Reliability of the instrument

The reliability of the instrument was assessed using the test–retest method. Twenty copies of the questionnaire were administered to 20 respondents who were not part of the main study sample. The same instrument was re-administered to the same respondents after an interval of two weeks to assess stability over time. The two sets of scores were coded and analysed using the Pearson Product-Moment Correlation Coefficient (PPMCC). The resulting correlation coefficient ($r=0.75$) indicated a satisfactory level of reliability, suggesting that the instrument was stable and consistent over time.[15]

Data collection procedure

Two trained research assistants helped in the data collection process. The questionnaires were conducted face-to-face in the homes of the respondents. Where the respondent could not read or write, the question was read out, and the answers were taken. Questionnaires were picked as soon as they were completed in order to reduce missing data.

Data analysis

Descriptive statistics, including frequencies and percentages, were used to summarise respondents' socio-demographic characteristics and general response patterns. Responses obtained on the Likert scale were dichotomized into two groups: Agree and Not Agree (which included Undecided and Disagree) to ensure suitability for inferential analysis. The chi-square (χ^2) test was used to examine associations between respondents' perceptions and practices related to Lassa fever transmission and prevention. The strength of statistically significant associations was assessed using Cramer's V as a measure of effect size. All statistical tests were two-tailed, and statistical significance was set at $p<0.05$. All statistical analyses were performed using IBM SPSS Statistics for Windows (IBM Corp, Armonk, NY, USA).

Ethical considerations

The institutional ethics committee of the Department of Health Education, Adekunle Ajasin University, Ondo State, Nigeria, gave ethical approval to the study. Community leaders in the chosen rural communities also gave permission to carry out the study. All the participants were informed about the study and gave their consent before data collection.

The respondents were given voluntary participation and guaranteed confidentiality and anonymity. They were made aware of their right to drop out of the study without consequences.

RESULTS

Sociodemographic characteristics of respondents

A total of 210 respondents participated in the study. Females constituted 54.3%, while males accounted for 45.7%. More than half of the respondents had no formal education (54.8%).

Farming was the predominant occupation (51.4%), followed by students (27.1%). Christianity was the most commonly reported religion (52.4%). The largest age group was 20-25 years (19.0%), while respondents aged 57 years and above constituted 12.9%.

Factors associated with lassa fever transmission

Perceived environmental factors

Most respondents perceived environmental conditions favourable to rodent infestation as important contributors to Lassa fever transmission.

The majority agreed that the presence of rats in houses (84.3%) and dirty environments (92.4%) increased transmission risk. Chi-square analysis showed a statistically significant association between environmental sanitation-related perceptions and perceived Lassa fever transmission (χ^2=20.19, df=2, p<0.05; Cramér's V=0.31, indicating a moderate association).

Perceived hygiene practices

Poor hygiene practices were widely perceived as contributors to Lassa fever transmission. Approximately 63.8% of respondents agreed that poor personal hygiene increases the risk of infection, while unsafe food handling practices were also commonly reported. A statistically significant association was observed between hygiene-related perceptions and perceived transmission risk (χ^2=18.72, df=2, p<0.05; Cramér's V=0.30).

Perceived cultural practices

Cultural behaviours such as the consumption of rat meat and unsafe corpse handling were perceived as risky practices. Slightly more than half of respondents (51.0%) agreed that rat consumption could facilitate transmission. Chi-square analysis demonstrated a statistically significant association between cultural practice-related perceptions and perceived Lassa fever transmission (χ^2=21.34, df=2, p<0.05; Cramér's V=0.32).

Table 1: Sociodemographic characteristics of respondents (n=210).

Variables	Category	Frequency (N)	Percentage (%)
Sex	Male	96	45.7
	Female	114	54.3
Education	Formal education	95	45.2
	No formal education	115	54.8
Occupation	Farming	108	51.4
	Student	57	27.1
	Trading	25	11.9
	Civil servant	20	9.5
Religion	Christianity	110	52.4
	Islam	78	37.1
	Others	22	10.5
Age group (years)	20-25	40	19.0
	26-35	48	22.9
	36-45	44	21.0
	46-56	51	24.3
	≥57	27	12.9

Table 2: Association between respondents' perceptions of risk factors and perceived lassa fever transmission

Risk factors	Agree N (%)	Not agree N (%)	χ^2	df	P value	Cramér's V
Environmental factors	178 (84.8)	32 (15.2)	20.19	2	<0.05	0.31
Poor hygiene practices	134 (63.8)	76 (36.2)	18.72	2	<0.05	0.30
Cultural practices	107 (51.0)	103 (49.0)	21.34	2	<0.05	0.32

Table 3: Association between respondents' perceptions of preventive measures and perceived lassa fever prevention.

Preventive measure	Agree n (%)	Not agree n (%)	χ^2	df	P value	Cramér's V
Environmental sanitation	179 (85.2)	31 (14.8)	22.61	2	<0.05	0.33
Avoidance of harmful cultural practices	148 (70.5)	62 (29.5)	16.45	2	<0.05	0.28
Early diagnosis and treatment	176 (83.8)	34 (16.2)	19.83	2	<0.05	0.31

Perceived preventive measures against lassa fever

Environmental sanitation was widely recognised as a preventive measure, with 85.2% of respondents agreeing that proper waste disposal and rodent control could reduce disease risk. This perception was significantly associated with perceived prevention (χ^2=22.61, df=2, p<0.05; Cramér's V=0.33).

DISCUSSION

This research reports on the empirical evidence of community perceptions and self-reported practises regarding environmental, behavioural, cultural, and healthcare variables that affect perceived transmission and prevention of Lassa fever among the rural population of Akoko South West Local Government Area, Ondo State, Nigeria.

The significant association between environmental variables and perceived risk of Lassa fever transmission in the current study supports the well-known notion of the importance of rodent ecology in informing the community about the dynamics of the disease. Poor waste management, bushy environment, and rodent infestation in homes were generally viewed as environments that contribute to the thriving of the multimammate rat (*Mastomys natalensis),* the major reservoir of Lassa virus.[3,4]. Also, this aligns with the reports provided by WHO and CDC, which indicate that environmental degradation and poor sanitation are major risk factors that predispose zoonotic diseases in endemic environments.[1,2] However, although environmental exposure is commonly viewed as significant, the past research has shown that the presence of rodents does not always lead to infection, which implies that environmental factors do interact with human behaviour, housing quality, and health-seeking behaviour.[5,17,18] This highlights the importance of combined interventions involving environmental sanitation, behavioural and structural interventions.[19,20]

Poor hygiene practices were statistically significant and moderately related to the perceived risk of transmission of Lassa fever in this study. Storing food in an unsafe manner, lack of proper hand hygiene, and contamination of household utensils were often cited as practises that promote indirect exposure via rodent excreta.[5,21] These perceptions align with WHO recommendations that community hygiene is an essential part of Lassa fever prevention.[1] However, long-term bad hygiene in rural areas has been associated with greater socioeconomic limitations, such as poverty, overcrowding, and lack of clean water, which indicates that health education alone may be insufficient without addressing underlying structural determinants.[22]

In addition, Certain cultural and behavioural practices, including the consumption of rat meat and unsafe handling of corpses, were significantly associated with perceived risk of disease transmission. Viral haemorrhagic fever outbreaks in West Africa have been implicated in similar practices.[17,18] However, evidence from Ebola outbreaks indicates that culturally sensitive risk communication, rather than prohibition, is more effective in achieving sustained behaviour change.[23] This highlights the importance of participatory and community-based interventions in Lassa fever prevention.

Furthermore, environmental sanitation emerged as a significant factor associated with perceived prevention of Lassa fever. Improved waste management, rodent control and food protection were widely acknowledged by the respondents as preventive measures.[4,6] This perception aligns with classical public health theory linking sanitation improvements to reductions in communicable disease burden.[22] However, long-term sustainability, support of policy and community ownership are determinants of the effectiveness of sanitation interventions.[5,19]

Similarly, abandonment of harmful cultural practices was significantly associated with perceived disease prevention. Evidence suggests secondary transmission during outbreaks can be minimised by avoidance of unsafe burial practises and consumption of rodents.[10-12] Studies from southwestern Nigeria further demonstrate that adherence to safer practises through structured culturally sensitive health education can be enhanced without compromising cultural identity.[24] Early diagnosis and prompt treatment were also significantly associated with respondents' perceptions of Lassa fever prevention. Research indicates that early diagnosis leads to isolation and better clinical outcomes at an early stage.[7,9] However, late healthcare seeking is still prevalent in rural Nigeria because of misdiagnosis, poor diagnostic facilities, financial constraints, and the use of traditional healers.[7,25,26].

The findings of this study can be conceptualised using the health belief model, which suggests that perceptions of susceptibility, severity, benefits and barriers, and cues to action determine preventive behaviours of individuals.[27] In this study, the perception of the respondents in relation to environmental sanitation, hygiene behaviours, cultural behaviours, and early diagnosis represents the perceived vulnerability to Lassa fever and perceived advantages of preventive measures. These practises based on perceptions are core to the interpretation and reaction of rural populations to the risk of Lassa fever. Moreover, the multifactoriality of perceived Lassa fever risk in this study is reflective of other endemic diseases, including malaria, where environmental factors, poverty, housing, and health-seeking behaviour all contribute to vulnerability.[27,28]. Meanwhile, public health multicausality theory explains that disease outcomes arise from the interaction of biological, social, economic, and environmental factors rather than a single cause.[29] This reinforces the need for integrated, multisectoral interventions that address the shared structural determinants of infectious diseases. Overall, the findings suggest that effective Lassa fever control needs an integrated approach that comprises environmental sanitation, hygiene promotion, culturally

competent behaviour-change communication and improved rural healthcare systems. Community-level interventions and sustained health education initiatives should be prioritised by policymakers in alignment with national and global public health guidelines.

Notwithstanding these findings, this study has certain limitations. The cross-sectional design precludes causal inference between perceptions and preventive practices related to Lassa fever. In addition, reliance on self-reported data may have introduced recall and social desirability biases, particularly in relation to preventive behaviours. The dichotomisation of Likert-scale responses into two categories may have reduced variability and limited a more comprehensive interpretation of respondents' attitudes. Furthermore, as the study was conducted within a single Local Government Area in Ondo State, the generalisability of the findings to other regions with differing socio-cultural or epidemiological contexts may be limited.

CONCLUSION

This study provides community-based evidence on perceptions and self-reported practises in regard to the transmission and prevention of Lassa fever among rural dwellers in Akoko South West Local Government Area in Ondo State, Nigeria. The results indicate that environmental factors that promote rodent infestation, poor hygiene behaviour, and some cultural behaviours are greatly related to the perceived risk of Lassa fever transmission, whereas environmental sanitation, avoidance of harmful behaviour, and early diagnosis and treatment are greatly related to perceived prevention. These conclusions are based on the assumption that community perceptions influence everyday practices that may increase or reduce exposure to the Lassa virus. As this was a descriptive cross-sectional study relying on self-reported data, causal relationships and actual infection outcomes cannot be inferred. Nevertheless, perceptions are critical determinants of behaviour and are therefore highly relevant for public health planning and intervention design. The results indicate the multifactoriality of the Lassa fever risk in rural areas, whereby environmental, behavioural, cultural, and healthcare-related factors interact. This highlights the weakness of single-focus interventions and justifies the application of integrated and multisectoral strategies to prevent diseases. Culturally relevant risk communication, hygiene promotion and household environmental sanitation should be the priority of health education programmes without using methods that compromise local norms. It is also necessary to strengthen primary healthcare systems in order to assist in early diagnosis, referral, and community trust. This study contributes to the body of knowledge because it presents context-specific and perception-based evidence of an under-researched rural population, hence informing specific health education, behavioural change communication, and preventive interventions in accordance with national priorities in controlling Lassa fever in Nigeria.

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