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Socio-Cultural Determinants of Lassa Fever Transmission in Kailahun and Kenema Districts, Sierra Leone

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Abstract

Lassa fever remains endemic in Sierra Leone, despite efforts to eradicate it. This study examines the socio-cultural determinants of Lassa fever transmission in Sierra Leone. A cross-sectional survey of 1,033 randomly selected participants was conducted in two endemic districts (Kailahun and Kenema) in Sierra Leone. Structured questionnaires were used to gather data from household heads. Data analysis was conducted using SPSS version 28. Findings indicate a high awareness of Lassa fever (90.9%), with health centers (48.9%) being the primary source of information. However, knowledge of specific symptoms such as muscle aches (23.2%) and bleeding (23.2%) remained low. Misconceptions about transmission were evident, with only 54.7% recognizing direct rodent contact as a risk factor, and 3.1% attributed it to mosquito bites. Knowledge of preventive practices were inadequate, with only 12.8% being mentioning proper food storage and 4.3% recognizing personal protective equipment use. A high percentage (91.4%) reported using traps or other rodent control methods; however, 4.9% engaged in hunting and consuming rats. Proper food storage remains a critical issue, with only 56.5% using sealed containers while 18.8% used open containers, exposing food to rodent contamination. These findings highlight a mixed landscape of behavioural change, while some protective measures have been embraced, while other risk-associated cultural practices remain embedded in community life. Analysis revealed that older age groups (AOR = 5.505, p=0.011) had significantly higher odds of experiencing Lassa fever symptoms. Poor hygiene (AOR = 1.555, p=0.008) and improper waste disposal (AOR = 2.968, p=0.046) were also key risk factors. These findings underscore the need for public health interventions to improve knowledge, dispel myths, and promote preventive behaviors to mitigate Lassa fever transmission.

Keywords: *Lassa Fever, Rats, Symptoms, Transmission.*

Introduction

Lassa Fever is an acute viral hemorrhagic illness endemic to parts of West Africa, where it poses a significant public health challenge. Traditionally, much of the research surrounding Lassa Fever has focused on its virology, the development of diagnostic tools, and strategies for medical intervention [1]. However, an emerging body of evidence suggests that sociocultural practices play a critical role in sustaining the transmission of the disease. Social customs, traditional healing practices, community burial rituals, and housing architectures are among several factors that can influence exposure to the Lassa virus [2].

Several studies have underscored the complexity of Lassa Fever transmission dynamics by highlighting how traditional beliefs and practices may inadvertently facilitate viral spread. For example, local

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customs regarding rodent management—the primary reservoir of the virus—combined with cultural perceptions of illness, contribute to prolonged exposure and delayed access to formal healthcare [3]. Moreover, community rituals and familial caregiving practices sometimes counter recommended infection control measures, revealing an important intersection between cultural norms and public health outcomes [4].

Despite these insights, significant gaps remain in the literature with respect to fully characterizing the sociocultural determinants of Lassa Fever transmission. Previous investigations have often been confined to epidemiological frameworks, with limited integration of qualitative analyses that explore community perceptions and practices at a granular level [5]. Additionally, there is an underrepresentation of region-specific case studies that examine how local traditions and beliefs interact with structural determinants such as urbanization and access to healthcare [6]. This paucity of interdisciplinary studies leaves a critical gap in both understanding and addressing the underlying sociocultural factors that fuel Lassa Fever outbreaks.

This study examines how specific cultural practices contribute to the transmission and containment of Lassa Fever in Kailahun and Kenema districts, Sierra Leone. We argue that effective control and prevention strategies require an integrated approach that not only addresses medical and environmental factors but also considers the complexities of cultural practices and beliefs [7].

Methodology

Study Design

This study employs a descriptive and cross-sectional quantitative research design to assess the socio-cultural determinants of Lassa fever transmission in Kailahun and Kenema Districts, Sierra Leone. A descriptive style allows the researcher to describe the population, situation or phenomenon and draw conclusions based on the population variables [8]

Study Area and Population

Kailahun and Kenema, two districts in Eastern Sierra Leone, serve as the study areas for this research. These regions, which share borders with Liberia, are characterized by dense forests and have the country's highest reported cases of Lassa fever [9]. Kenema is home to the only Lassa fever isolation wards, staffed by full-time medical professionals. Kailahun District, located in the Eastern Province, comprises fourteen chiefdoms and shares international borders with Guinea to the north and Liberia to the northeast and south, with the Moa River marking part of its boundary. The district's economy primarily relies on rice, coffee, and cocoa farming and small-scale mining. Its vegetation includes savanna, woodland, and secondary forest growth, receiving 2,001–3,000 mm of rainfall annually [10]. The district has an area of about 2,859sq.m, with Kailahun town as the Chiefdom Headquarter. Kenema District, also in the Eastern Province, is the region's most populous, with 784,571 residents. It consists of sixteen chiefdoms and is bordered by Bo, Tonkolili, Kono, Kailahun, and Pujehun districts, as well as Liberia to the southeast. Its economy is driven by diamond mining, agriculture, and trade. While home to multiple ethnic groups, the Mende people form the majority population [11]. Covering 6,053 km², Kenema is the third-largest city in Sierra Leone after Freetown and Bo, with Tongo as its second-largest town [11]. The study population was heads of households from the Kailahun and Kenema districts, offering a broad scope of perspectives.

Household heads were engaged through structured questionnaires. Additionally, community members were observed during special cultural and social events, enriching the study with a holistic understanding of the region. This multifaceted approach aimed to

capture diverse viewpoints and experiences, maximizing the depth of the research findings.

Study Sampling

The sample was drawn using a multistage sampling technique, involving different strategies in each stage.

In the first stage, chiefdoms were selected. Four chiefdoms were purposively chosen per district based on the incidence of Lassa Fever (two chiefdoms with the two lowest incidence and two with the highest incidence) using data from. Finally, homes were randomly selected during the data collection stage using a systematic random selection technique.

Sample Size Calculation

Using Slovin's Formula:

$$n = \frac{N}{1 + Ne^2}$$

$$N = Total\ Population$$

$$e = error\ at\ 95\%\ confidence\ level$$

$$n = \frac{78700}{1 + 78700(0.05)^2} = 397.97 \approx 398$$

Sample size=398

With a projected confidence interval of 95% and an error margin of 5%, the estimated sample size is 398 persons. However, to cater to the cluster effect, this sample size was doubled to 796, further rounded up to 1033 persons for the quantitative study.

Inclusion and Exclusion Criteria

The inclusion criteria include adults aged 18 years and above who reside in the Kailahun and Kenema Districts. Individuals who had lived in the Kailahun and Kenema Districts for at least six months prior to the study were also included. Individuals willing to provide informed consent for participation were also included. Participants who had not lived in the Kailahun and Kenema Districts for more than six months were excluded from the studies.

Data Collection Procedure

Structured questionnaires were used to collect relevant information about socio-cultural factors influencing the prevention and control of Lassa Fever infection. The questionnaire was pretested in another district with ten people. Where necessary, appropriate corrections were made to the questionnaire after pretesting. It was further subjected to professional scrutiny by two public health experts who did not participate in the studies. The survey questionnaire was administered through in-person interviews, considering the target group's viability and accessibility. The interviews were conducted in the household head's local language. The requirements of the studies were explained to all participants, who were asked to sign or thumbprint an informed consent form depending on their educational level.

A data collection team was recruited and trained on the study methodology and survey tools to ensure precise implementation. Before deployment, rigorous pretesting and review of the survey tools were conducted to enhance their effectiveness. Comprehensive logistic support was provided to the team.

Data Analysis

Data were analyzed using SPSS version 28. Descriptive statistics, including frequencies and percentages, were used to summarize socio-demographic characteristics and socio-cultural factors associated with Lassa fever transmission. Chi-square tests were employed to assess associations between categorical variables, such as cultural practices and household behaviors. Multivariable logistic regression was conducted to identify independent predictors of Lassa fever transmission, with adjusted odds ratios (AOR) and 95% confidence intervals (CI) reported. Statistical significance was set at $p < 0.05$.

Ethical Consideration

Ethical approval was obtained from the Ministry of Health and Sanitation in Sierra Leone to ensure compliance with research standards. Measures were implemented to safeguard participants' privacy, confidentiality, and protection, including the use of coded identifiers. Interviewers explained the study's purpose and obtained written consent from participants before proceeding. Respondents had the right to withdraw at any time, and strict confidentiality was maintained. Ethical protocols were followed to respect participants' dignity and uphold the 'Do-no-Harm' principle. Collaboration with traditional and religious leaders fostered cultural sensitivity and community acceptance, while adherence to community entry protocols ensured proper engagement, with verbal informed consent obtained from all participants.

Results

Socio-demographic Characteristics of Participants

Table 1 illustrates the socio-demographic characteristics of the study participants (N = 1033). The sample was nearly evenly distributed across two regions, with 54.8% from Kailahun and 45.2% from Kenema. Within Kenema, Lower Bambara had the highest representation (53.5%), while Jaluahun was the most represented chiefdom in Kailahun (35.6%). The age distribution showed that the majority of participants (29.6%) were between 30-39 years, followed by 40-48 years (26.8%). More participants were female (58.1%) than male (41.9%). Most participants were married (67.8%), while 14.3% were single, 15.6% widowed, and 2.3% divorced/separated. In terms of occupation, nearly half (48.5%) were farmers, followed by traders (21.8%), and other occupations (23.2%). Household sizes varied, with most participants (49.6%) living in households of 5-8 members. Education levels showed that 48.6% had no formal education, while 33.9% attained secondary education. Religious affiliation was predominantly Islamic (65.4%), followed by Christianity (19.6%) and traditional beliefs (15.0%).

Table 1. Socio-demographic Characteristics of the Participants

Variables	Frequency (N = 1033)	Percentage (%)
Region		
Kenema	467	45.2
Kailahun	566	54.8
Chiefdom in Kenema		
Dodo	51	11.0
Kandu Lekpiama	74	15.8
Small Bo	92	19.7
Lower Bambara	250	53.5
Chiefdom in Kailahun		
Jawei	104	18.4
Mandu	136	24.1
Upper Bambara	124	21.9
Jaluahun	201	35.6
Age		
Under 20 years	30	2.9
20-29 years	187	18.1
30-39 years	306	29.6
40-48 years	277	26.8

50-59 years	155	15.0
60 years and above	78	7.6
Sex		
Male	433	41.9
Female	600	58.1
Marital Status		
Single	148	14.3
Widowed	161	15.6
Divorced/Separated	24	2.3
Married	700	67.8
Occupation		
Miner	5	0.5
Health worker	18	1.7
Teacher	44	4.3
Trader	225	21.8
Farmer	501	48.5
Others	240	23.2
Household Size		
2-4	215	20.8
5-8	512	49.6
9-12	256	24.8
Above 12	50	4.8
Education Level		
Non-formal Education	502	48.6
Primary	90	8.7
Secondary	350	33.9
Higher	91	8.8
Religion		
Traditional	155	15.0
Christianity	202	19.6
Islamic	676	65.4

Knowledge and Awareness of Lassa Fever

Table 2 shows the participants' knowledge and awareness of Lassa fever. A majority (76.4%) reported knowing the common symptoms of Lassa fever. Among specific symptoms, high fever (71.1%) and headache (55.4%) were the most recognized, while bleeding from gums/nose (23.2%) and muscle ache (23.2%) were the least known. Regarding transmission, handling and preparation of rats (55.0%) and direct contact with infected rodents (54.7%) were the most identified routes. However, misconceptions were evident, as 3.1% incorrectly believed mosquito bites could transmit the disease. Awareness of preventive measures was low. Only 11.7% recognized avoiding contact with rats as a preventive measure, and 12.8% acknowledged proper food storage to prevent contamination. The least recognized measures were using

personal protective equipment (4.3%) and vaccination (4.3%)

Table 2. Knowledge and Awareness of Lassa Fever

Variables	Frequency (N = 1033)	Percentage (%)
Do you know the common symptoms of Lassa fever?		
No	244	23.6
Yes	789	76.4
Symptoms associated with Lassa fever: High Fever		
No	299	28.9
Yes	734	71.1
Symptoms associated with Lassa fever: Headache		
No	461	44.6
Yes	572	55.4
Symptoms associated with Lassa fever: Sore Throat		
No	687	66.5
Yes	346	33.5
Symptoms associated with Lassa fever: Weakness		
No	638	61.8
Yes	395	38.2
Symptoms associated with Lassa fever: Muscles Ache		
No	793	76.8
Yes	240	23.2
Symptoms associated with Lassa fever: Nausea and or vomiting		
No	680	65.8
Yes	353	34.2
Symptoms associated with Lassa fever: Bleeding from gums and noses		
No	793	76.8
Yes	240	23.2
How is Lassa fever transmitted: Direct contact with infected rodents (n=931)		
No	422	45.3
Yes	509	54.7
How is Lassa fever transmitted: Handling and preparation of rats		
No	419	45.0
Yes	512	55.0
How is Lassa fever transmitted: Airborne transmission		
No	836	89.8
Yes	95	10.2
How is Lassa fever transmitted: Consumption of contaminated food		
No	480	51.6
Yes	451	48.4
How is Lassa fever transmitted: Mosquito bites		
No	902	96.9
Yes	29	3.1

Preventive measures against Lassa fever you are aware of: Avoiding contact with rats (n=94)		
No	83	88.3
Yes	11	11.7
Preventive measures against Lassa fever you are aware of: De-rating		
No	88	93.6
Yes	6	6.4
Preventive measures against Lassa fever you are aware of: Properly storing food to prevent rodent contamination		
No	82	87.2
Yes	12	12.8
Preventive measures against Lassa fever you are aware of: Using personal protective equipment		
No	90	95.7
Yes	4	4.3
Preventive measures against Lassa fever you are aware of: Getting vaccinated		
No	90	95.7
Yes	4	4.3
Preventive measures against Lassa fever you are aware of: Others		
No	87	92.6
Yes	7	7.4

Figure 1 presents the awareness of Lassa fever among the participants. The majority (90.9%) reported having heard of Lassa fever, while a small proportion (9.1%) were unaware of the disease. This indicates a high level of awareness among the respondents.

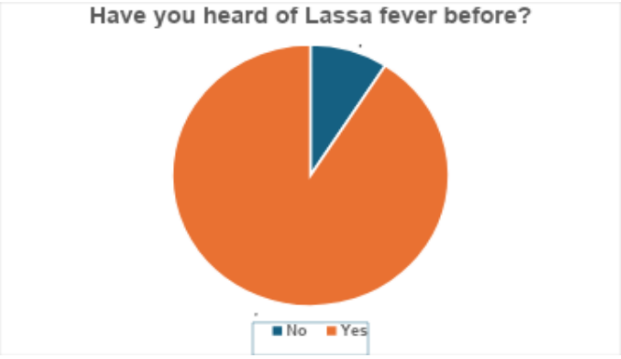

Figure 1. Awareness of Lassa Fever

Source of Information About Lassa Fever

Figure 2 illustrates the sources of information about Lassa fever among participants. The most common source was health centers and health workers (48.9%), followed by radio/TV (25.3%). A smaller percentage (8.0%) received information through community meetings or town hall discussions, while 9.1% reported not knowing their source of information. Other less common sources included markets (1.4%), billboards/campaigns (1.5%), schools/children (1.7%), and unspecified sources (4.2%).

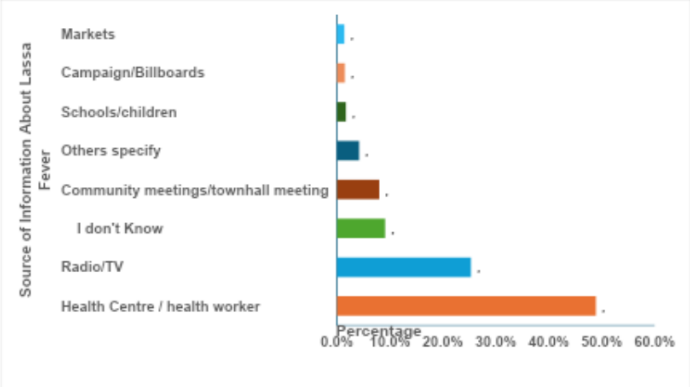

Figure 2. Source of Information About Lassa Fever

Cultural Practices Related to Lassa Fever Prevention and Risk Factors

Table 3 highlights cultural practices related to Lassa fever prevention and risk factors. The majority (91.4%) reported using traps or rodent control methods, while a small proportion (4.9%) engaged in hunting or capturing rats for consumption. Only 6.6% took no specific measures against rats, and 6.9% stated that rats were uncommon in their environment. Regarding food storage, more than half (56.5%) used sealed containers, while 18.8% stored food in open containers, increasing the risk of contamination. Additionally, 36.5% dried grains on the roadside, and 27.8% used the village drying floor, both of which may expose food to rodents. Environmental conditions varied, with 64.0% reporting the presence of open waste bins or dumpsites. A bushy environment was reported by 39.4%, while only 8.5% lived in well-kept, fenced surroundings. Handwashing practices also differed, with nearly 50% washing hands often, while 29.0% did so rarely, and 1.8% never washed hands with soap under running water.

Table 3. Cultural Practices Related to Lassa Fever Prevention and Risk Factors

Variables	Frequency (N = 1033)	Percentage (%)
How do you typically address the presence of rats in or around your living area: Use traps or other rodent control methods		
No	89	8.6
Yes	944	91.4
How do you typically address the presence of rats in or around your living area: Do not take any specific measures		
No	965	93.4
Yes	68	6.6
How do you typically address the presence of rats in or around your living area: Engage in hunting or capturing rats for consumption		
No	982	95.1
Yes	51	4.9
How do you typically address the presence of rats in or around your living area: Rats are not common in my environment		
No	962	93.1
Yes	71	6.9
Food storage methods		
Open containers/sacks	194	18.8

Sealed containers	584	56.5
Do not store grains	244	23.6
Others	11	1.1
Where do you dry grains and other food items: On the roadside		
No	656	63.5
Yes	377	36.5
Where do you dry grains and other food items: On the village drying floor		
No	746	72.2
Yes	287	27.8
Where do you dry grains and other food items:		
No	793	76.8
Yes	240	23.2
Where do you dry grains and other food items: Do not dry grains		
No	708	68.5
Yes	325	31.5
Where do you dry grains and other food items: Others		
No	911	88.2
Yes	122	11.8
Are there open waste bins or dumpsites in your surroundings?		
No	372	36.0
Yes	661	64.0
Condition of your surroundings: Well-kept with fence		
No	945	91.5
Yes	88	8.5
Condition of your surroundings: Littered		
No	911	88.2
Yes	122	11.8
Condition of your surroundings: Bushy		
No	626	60.6
Yes	407	39.4
How often do you wash your hands with soap under running water?		
Never	19	1.8
Rarely	300	29.0
Always	199	19.3
Often	515	49.9

Prevalence of Lassa Fever Symptoms Transmission

Figure 3 illustrates the prevalence of Lassa fever symptoms among the surveyed population. The majority of participants 655 (63.4%) never experienced Lassa fever symptoms, while 378 (36.6%) reported having had Lassa fever symptoms.

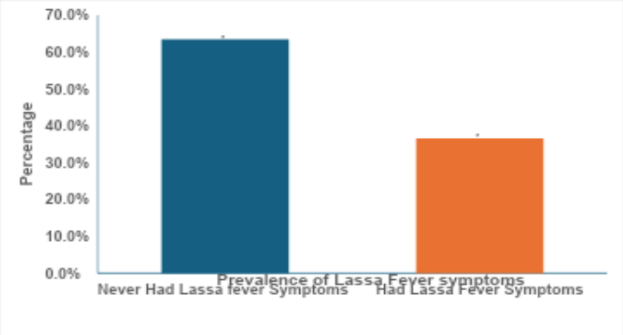

Figure 3. Prevalence of Lassa Fever Symptoms

Socio-Cultural Factors Associated with Lassa Fever Transmission in Sierra Leone

This study revealed significant associations between socio-cultural factors and Lassa fever symptom presentation across different demographic groups. A notable age-gradient effect was observed, with risk increasing substantially in older age groups - individuals aged 60 and above demonstrated the highest risk (AOR: 5.505, p=0.011), being over five times more likely to experience symptoms compared to those under 20. Educational background analysis showed a predominance of non-formal education in both symptomatic (56.1%) and asymptomatic (44.3%) groups, while secondary education suggested a potentially protective effect (AOR: 0.573, p=0.100), though not statistically significant. The religious distribution revealed that Islamic faith was predominant in the study population, with both Christianity (AOR: 1.729, p=0.030) and Islam (AOR: 26.404, p=0.022) showing significantly higher risks compared to traditional beliefs.

These findings have important implications for public health interventions and community-based approaches to Lassa fever prevention and control. The strong age-related gradient suggests the need for targeted interventions for older populations, while the educational patterns highlight the importance of inclusive health education programs across all educational levels. The significant associations with religious affiliation underscore the potential value of engaging religious institutions as partners in health education and prevention strategies. Future research should focus on understanding the mechanisms behind these socio-cultural associations, particularly the strong religious correlation with symptom presentation, while addressing potential confounding factors not captured in the current analysis. These insights can inform the development of more effective, culturally sensitive interventions that consider age, education, and religious factors in their design and implementation. Table 4 presents the study findings from both univariate and multivariate analyses of socio-cultural factors associated with Lassa fever transmission in Sierra Leone.

Table 4. Analysis of Socio-Cultural Factors Associated with Lassa Fever Transmission in Sierra Leone

Variable	Never Had Lassa fever Symptoms n (%)	Had Lassa Fever Symptoms n (%)	COR (95% CI)	P-value	AOR (95% CI)	P-value
Lassa Fever Symptoms Transmission	655 (63.4)	378 (36.6)	-	-	-	-

KPs Group						
Kenema	292 (44.6)	174 (46.0)	Ref	-	-	-
Kailahun	363 (55.4)	204 (54.0)	0.936 [0.726-1.207]	0.610	0.995 [0.735-1.347]	0.973
Age category (Years)						
Under 20	26 (4.0)	4 (1.1)	Ref	-	-	-
20-29	142 (21.7)	45 (11.9)	2.000 [0.662-6.042]	0.219	1.825 [0.575-5.793]	0.307
30-39	202 (30.8)	104 (27.5)	3.347 [1.138-9.844]	0.028*	3.195 [0.955-10.685]	0.050*
40-48	168 (25.6)	109 (28.8)	4.217 [1.432-12.417]	0.009*	3.611 [1.062-12.276]	0.040*
50-59	80 (12.2)	74 (19.6)	6.012 [2.003-18.046	0.001*	4.308 [1.224-15.165]	0.023*
60 and above	37 (5.6)	42 (11.1)	7.378 [2.356-23.109	0.001*	5.505 [1.488-20.369]	0.011*
Sex						
Male	275 (42.0%)	158 (41.8)	Ref	-	-	-
Female	380 (58.0%)	220 (58.2)	1.000 [0.774-1.293]	0.997	0.971 [0.709-1.332]	0.857
Marital Status						
Single	110 (16.8)	38 (10.1)	Ref	-	-	-
Widowed	74 (11.3)	87 (23.0)	3.403 [2.102-5.510]	<0.001*	1.772 [0.879-3.574]	0.110
Divorced/Separate d	18 (2.7)	6 (1.6)	0.965 [0.357-2.609]	0.944	0.491 [0.162-1.492]	0.210
Married	453 (69.2%)	247 (65.3)	1.569 [1.051-2.340]	0.027*	0.896 [0.521-1.538]	0.689
Occupation						
Miner	4 (0.6)	1 (0.3)	Ref	-	-	-
Health worker	13 (2.0)	5 (1.3)	1.538 [0.137-17.334]	0.727	0.58 [0.046-7.471]	0.834
Teacher	29 (4.4)	15 (4.0)	2.069 [0.212-	0.532	0.774 [0.070-	0.817

			20.192]		8.512]	
Trader	160 (24.4)	65 (17.2)	1.625 [0.178-14.816]	0.667	0.765 [0.079-7.438]	0.786
Farmer	291 (44.4)	210 (55.6)	2.863 [0.318-25.800]	0.348	1.369 [0.142-13.237]	0.944
Others	158 (24.1)	82 (21.7)	2.076 [0.228-18.876]	0.517	1.084 [0.112-10.485]	0.834
Household Size						
2-4	138 (21.1)	77 (20.4)	Ref	-	-	-
5-8	347 (53.0)	165 (43.7)	0.438 [0.235-0.818]	0.010*	0.688 [0.47-0.997]	0.048*
9-12	148 (22.6)	108 (28.6)	0.370 [0.206-0.667]	0.001*	0.951 [0.631-1.434]	0.810
Above 12	22 (3.4)	28 (7.4)	0.573 [0.311-1.056]	0.074	1.877 [0.957-3.679]	0.067
Respondent Education Level						
Non-formal Education	290 (44.3)	212 (56.1)	0.919 [0.582-1.453]	0.719	0.742 [0.377-1.461]	0.388
Primary	54 (8.2)	36 (9.5)	0.506 [0.377-0.680]	<0.001*	0.784 [0.359-1.710]	0.540
Secondary	256 (39.1)	94 (24.9)	0.903 [0.572-1.424]	0.660	0.573 [0.295-1.112]	0.100
Higher	55 (8.4)	36 (9.5)	Ref	-	-	-
Religion						
Traditional	113 (17.3)	42 (11.1)	Ref	-	-	-
Christianity	122 (18.6)	80 (21.2)	1.764 [1.122-2.774]	0.014*	1.729 [1.120-2.670]	0.030*
Islamic	420 (64.1)	256 (67.7)	1.630 [1.107-2.399]	0.013*	26.404 [14.987-46.518]	0.022*
Handwashing/Hy giene Practices						
Poor	215 (32.8)	104 (27.5)	Ref	-	-	-
Good	440 (67.2)	274 (72.5)	1.306 [0.988-2.726]	0.049*	1.555 [1.123-2.153	0.008*

Grains and Foods Storage Practices						
Do not store grains	163 (24.9)	81 (21.4)	Ref	-	-	-
Open containers/sacks	127 (19.4)	67 (17.7)	1.038 [0.696-1.546]	0.046*	0.557 [0.333-0.931]	0.025*
Sealed containers	360 (55.0)	224 (59.3)	1.252 [0.914-1.715]	0.161	0.954 [0.640-1.423]	0.817
Others	5 (0.8)	6 (1.6)	2.415 [0.716-8.150]	0.155	2.055 [0.552-7.653]	0.283
Rats Hunting/Consumption						
No	649 (99.1)	366 (96.8)	Ref	-	-	-
Yes	6 (0.9)	12 (3.2)	3.562 [1.326-9.569]	0.012*	0.648 [0.478-0.879]	0.005*
Waste Disposal Practices						
Poor	221 (33.7)	151 (39.9)	Ref	-	-	-
Good	434 (66.3)	227 (60.1)	0.760 [0.585-0.988]	0.040*	2.968 [1.020-8.638]	0.046*

Source: Field Survey *`*Significant at P<0.05*

Discussion

Knowledge and Awareness of Lassa Fever Transmission

The findings indicate a relatively high level of awareness of Lassa fever, with 90.9% of respondents having heard about the disease. This aligns with previous studies conducted in Ibadan, Nigeria, where awareness of Lassa fever in the affected community was 65%, while in the university community, it was 85% (16). However, despite this high awareness, only 76.4% of respondents demonstrated knowledge of the common symptoms, suggesting gaps in comprehensive understanding. The most recognized symptoms were high fever (71.1%), followed by headache (55.4%), while muscle ache (23.2%) and bleeding from gums and nose (23.2%) were the least recognized. This is consistent with findings from studies in Liberia and Africa, which revealed that fever and headaches were frequently acknowledged symptoms [12, 13].

While 54.7% of respondents identified direct contact with infected rodents as a mode of transmission, and 55.0% acknowledged the risk of handling and preparing rats, misconceptions remain. Less than half of the respondents (48.4%) were unaware that consuming contaminated food could lead to infection, and 10.2% believed in airborne transmission, which contradicts established evidence. Notably, 3.1% of respondents wrongly identified mosquito bites as a transmission mode, reinforcing the need for public health education to dispel misconceptions. These findings corroborate studies from endemic regions, indicating that while specific knowledge gaps persist regarding indirect transmission through food contamination, the majority of adults in the studied community knew that consuming food contaminated with rat faeces and urine transmits Lassa fever [14]. Public health

strategies should focus on strengthening knowledge about transmission pathways to improve preventive behaviors.

Preventive Measures Against Lassa Fever

The study found significant deficiencies in knowledge about preventive measures. Only 11.7% were aware of avoiding contact with rats, 6.4% recognized de-rating as a preventive measure, and a mere 12.8% identified proper food storage as essential for preventing rodent contamination. The limited awareness of personal protective equipment (4.3%) and vaccination (4.3%) is concerning, as these are critical in healthcare settings where nosocomial outbreaks have occurred. Comparable studies in Lassa fever-endemic regions, such as Nigeria, have reported similar gaps in preventive knowledge, particularly regarding food storage and hygiene practices [15]. These findings highlight the need for culturally tailored health education programs to promote rodent control and personal hygiene practices.

Cultural Practices and Lassa Fever Risk Factors

A high percentage (91.4%) of respondents reported using traps or other rodent control methods, which is encouraging. However, 4.9% engaged in hunting and consuming rats, which is considered a significant risk factor for Lassa fever transmission [16, 17]. Studies from Nigeria and Guinea have identified rodent consumption as a persistent cultural practice, posing challenges to disease prevention efforts [18].

Proper food storage remains a critical issue, with only 56.5% using sealed containers while 18.8% used open containers, exposing food to rodent contamination. Additionally, 64.0% of respondents reported the presence of open waste bins or dumpsites, which contribute to rodent proliferation. Prior studies in endemic areas suggest that poor waste management and open food storage increase household exposure to the Lassa virus [19]. Community interventions promoting environmental sanitation and rodent-proof storage are necessary to mitigate these risks.

Prevalence of Lassa Fever Symptoms and Risk Factors

The study found that 36.6% of respondents reported experiencing Lassa fever symptoms, highlighting the disease burden in the surveyed regions. This aligns with a study by Oshiokhayamhe et.al. (19), who found that many people who contract Lassa fever do not show any symptoms, but when symptoms appear, they usually include headaches, weakness, and fever. However, our findings were contrary to systematic review research, which revealed a broader spectrum of symptoms of Lassa fever among patients [20].

Multivariate analysis revealed that older individuals had a significantly higher likelihood of experiencing Lassa fever symptoms compared to younger age groups. The age categories 30-39 (AOR = 3.195, $p = 0.050$), 40-48 (AOR = 3.611, $p = 0.040$), 50-59 (AOR = 4.308, $p = 0.023$), and 60+ (AOR = 5.505, $p = 0.011$) all showed significantly elevated risks compared to those under 20 years. This trend aligns with existing literature that suggests older individuals may have prolonged exposure to Lassa fever risk factors, such as occupational hazards or cultural practices related to food storage and rodent control [21].

Household size also emerged as a significant factor influencing the likelihood of Lassa fever symptoms. Individuals in households with 5-8 members had a reduced risk (AOR = 0.688, $p = 0.048$) compared to smaller households, suggesting that larger families may implement more preventive measures such as shared hygiene and rodent control responsibilities. However, this protective association diminished for households with 9-12 members (and those with more than 12 members, possibly due to increased human-rodent

interaction and overcrowding, which has been reported as a risk factor in other studies. Religious affiliation was also a significant predictor of Lassa fever transmission. Both Christianity (AOR = 1.729, p = 0.030) and Islam (AOR = 26.404, p = 0.022) were significantly associated with Lassa fever symptoms compared to traditional religions. This might be linked to variations in cultural practices regarding rodent handling and food storage as well as cultural issues and taboos, as seen in other zoonotic disease studies [22].

Good handwashing and hygiene practices were significantly associated with lower odds of Lassa fever symptoms (AOR = 1.555, p = 0.008). This underscores the importance of basic hygiene in reducing disease transmission, corroborating findings from previous studies emphasizing hand hygiene in Lassa fever prevention [23, 24]. Food storage practices significantly influenced Lassa fever symptoms. Individuals who stored grains in open containers had a lower risk of Lassa fever symptoms (AOR = 0.557, p = 0.025) compared to those who did not store grains at all. This finding may be counterintuitive but could suggest that those not storing grains engage in other risky behaviors, such as frequent market purchases where contamination risks exist.

Consumption of rodents was a significant risk factor for Lassa fever symptoms in this study (AOR = 0.648, p = 0.005). Hunting and handling rodents, a common cultural practice in some regions has been well-documented as a major transmission route for Lassa fever [17, 18]. Public health interventions should emphasize behavioral change regarding rodent consumption. Poor waste disposal was associated with an increased risk of Lassa fever symptoms (AOR = 2.968, p = 0.046). Open waste bins attract rodents, increasing the likelihood of human contact with infected animals. This finding aligns with other studies that emphasize environmental sanitation as a key measure in Lassa fever prevention [25].

Conclusion

This study highlights critical socio-cultural determinants influencing Lassa fever transmission in Sierra Leone. While awareness levels are generally high, significant gaps in knowledge and preventive practices persist. The findings underscore the importance of age, household size, hygiene behaviors, and food storage practices in determining infection risk. Multivariate analysis identified poor hygiene and improper food storage as key predictors of transmission. These studies emphasize the need for targeted public health interventions, including community-based education campaigns, improved sanitation, and stricter food storage practices. Strengthening health promotion strategies and integrating socio-cultural factors into Lassa fever prevention programs will be essential for reducing disease burden and mitigating future outbreaks.

Study Limitation

This study has some methodological limitations. First, its cross-sectional design limits the ability to establish causal relationships between socio-cultural factors and Lassa fever transmission. Second, self-reported data may be subject to recall and social desirability biases, potentially affecting the accuracy of responses. Additionally, while efforts were made to ensure representative sampling, the reliance on household heads may not fully capture diverse community perspectives, particularly those of marginalized groups. Lastly, language and cultural nuances in questionnaire interpretation could influence data consistency, despite pretesting and interviewer training.

Conflict of Interest

There is no conflict of interest.

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