

Research Article

Determinants of Lassa Fever Knowledge, Misconceptions, and Health-Seeking Behaviour Among Adults in Urban Primary Healthcare Settings in Kano State, Nigeria

Nurudeen Aliyu ^{1,2}, Abdulbaqi Alhaji Magaji ^{1,3}, Abubakar Labaran Yusuf ^{4,5}, Ibrahim Umar Aliyu ⁶, Muhammad Adamu Abbas ^{7,8}, Ibrahim Musa Moi ⁹, Zainab Aliyu Abdulqadir ², Murtala Sabitu ², Adamu Ibrahim Abdullahi ³, Musa Yusuf ³ and Abuhuraira Ado Musa ^{3*}

¹Department of Public Health, Azman University, Kano State, Nigeria.

²Department of Medical Microbiology and Parasitology, Bayero University, Kano State, Nigeria.

³Department of Public Health, Sa'adu Zungur University, Bauchi State, Nigeria.

⁴Kano State Ministry of Health, Post Office Road, Kano, Nigeria.

⁵Department of Internal Medicine, Faculty of Clinical Sciences, Federal University Dutse, Nigeria.

⁶Department of Public Health and Disease Control, Ministry of Health, Kano State, Nigeria.

⁷Kano State Center for Disease Control and Prevention, Kano, Nigeria.

⁸Department of Community Medicine, Bayero University Kano, Nigeria.

⁹Department of Microbiology, Sa'adu Zungur University, Bauchi State, Nigeria.

*Corresponding author: mshurairah@gmail.com

Article Info

Keywords: Lassa fever, Knowledge, Misconceptions, Health-seeking behavior, Primary healthcare, Kano State, Nigeria.

Received: 27.08.2026;

Accepted: 04.10.2026;

Published: 11.10.2026

 © 2026 by the author's. The terms and conditions of the Creative Commons Attribution (CC BY) license apply to this open access article.

Abstract

Lassa fever remains a significant public health threat in Nigeria, characterized by recurrent outbreaks, expanding geographic distribution, and substantial mortality. Delayed healthcare presentation can hinder timely diagnosis and treatment, while misconceptions, stigma, and inappropriate health-seeking practices may further impede early care-seeking. This descriptive cross-sectional study assessed knowledge, misconceptions and health-seeking behaviour regarding haemorrhagic Lassa fever among adult patients attending Hoto Primary Health Care Centre, an urban facility in Kano State, Nigeria. A structured, interviewer-administered questionnaire was used to collect data from 147 of 150 sampled patients (98.0% response rate), selected by simple random sampling. Data were analysed using SPSS version 26, with chi-square tests applied to examine associations between socio-demographic characteristics and knowledge level. Overall, 66.7% of respondents demonstrated good knowledge of Lassa fever, driven by strong awareness of common symptoms and major transmission routes, although knowledge of the incubation period (59.9%) and hearing loss as a complication (62.6%) was weaker. Substantial misconceptions persisted, including beliefs that healthcare workers are more susceptible than the general population (56.5%) and that only people with poor hygiene are at risk (53.1%). Knowledge was significantly associated with sex ($p = 0.017$) and occupation ($p < 0.001$), but not age, education or prior exposure. While 70.7% of respondents preferred formal healthcare, only 43.5% intended to seek care within 24 hours and preventive practices were inconsistent. These findings indicate that generally satisfactory awareness does not exclude misconceptions or delayed care-seeking, underscoring the need for targeted, occupation- and gender-sensitive health education at primary care level.

1. Introduction

Viral haemorrhagic fevers represent one of the most difficult categories of emerging and re-emerging infectious diseases confronting global public health systems. Among these, Lassa fever a zoonotic, acute haemorrhagic illness caused by the Lassa virus, a member of the *Arenaviridae* family occupies a particularly concerning position given its high endemicity, substantial case-fatality burden, and potential for nosocomial and inter-continental transmission [1]. The World Health Organization has designated Lassa fever a priority pathogen requiring urgent research and public health intervention, reflecting its capacity to cause large-scale outbreaks in the absence of licensed vaccines and with limited therapeutic options [2]. Current epidemiological estimates suggest that the Lassa virus infects between 0.9 and 4.3 million individuals annually across West Africa, with disease burden concentrated among economically disadvantaged rural populations with constrained healthcare access [3]. Transmission occurs primarily through contact with excreta of *Mastomys natalensis*, the multimammate rat that serves as the principal zoonotic reservoir and commonly inhabits human dwellings throughout the sub-region [4]. The clinical presentation of Lassa fever, which initially resembles common febrile illnesses such as malaria and typhoid, frequently results in misdiagnosis, delayed treatment initiation and elevated mortality, particularly where confirmatory diagnostic capacity is limited [5].

Within West Africa, where Nigeria, Sierra Leone, Liberia, Guinea and Benin constitute the endemic core, the burden of Lassa fever is closely intertwined with poverty, inadequate sanitation and limited public health infrastructure. The disease is estimated to affect approximately two million persons annually across the sub-region, with 5,000 to 10,000 deaths reported each year, and Lassa fever accounts for as much as 10–16% of hospital admissions in high-burden settings in Sierra Leone and Liberia [6]. Knowledge, attitudes and practices (KAP) studies conducted across the sub-region have consistently identified deficits in community understanding of transmission dynamics, prevention strategies and appropriate health-seeking behaviour, with rural and periurban populations demonstrating the most pronounced gaps [7]. A cross-sectional study in Liberia similarly found that awareness varied considerably between endemic and non-endemic counties, reinforcing the argument that geographic and socioecological context substantially shapes both disease knowledge and perceived risk [8].

Nigeria bears the single greatest national burden of Lassa fever in sub-Saharan Africa, and its epidemiological trajectory has become increasingly concerning. The Nigeria Centre for Disease Control and Prevention recorded 1,309 confirmed cases with a case-fatality rate of 16.3% in 2024; by November 2025, cumulative figures for the year had reached 966 confirmed cases and 177 deaths, corresponding to a rising case-fatality rate of 18.3%, a trend attributed substantially to poor health-seeking behaviour, late presentation and environmental sanitation deficits in affected communities [9]. Reviews of national Lassa fever epidemiology have identified the 21–30-year age group as disproportionately affected and highlighted the persistent geographic concentration of cases in Ondo, Edo, Bauchi and Taraba States [10].

Empirical evidence assessing Lassa fever knowledge within Nigeria has expanded in recent years but remains geographically and methodologically constrained. Wada et al. [11], in a multi-centre cross-sectional study of 400 healthcare workers during the 2020 Katsina State outbreak, reported suboptimal knowledge of Lassa fever prevention and control, with training status, occupational category and workplace type identified as the strongest predictors of knowledge adequacy. Aromolaran et al. [12], investigating rural communities in Osun State, documented significant awareness deficits concerning transmission routes and preventive practices and recommended targeted community health education. Al-Mustapha et al. [4], in a study of 2,150 participants, found that although 87.5% had previously heard of Lassa fever, risk perception and preventive practice remained inconsistently linked to this awareness, suggesting that mere exposure to information does not reliably translate into protective behaviour. Among mothers of under-five children in an endemic Edo State community, [13] reported that 72% demonstrated good knowledge, with healthcare workers serving as the primary information source for 55.4% of respondents, underscoring the pivotal role of primary healthcare settings in knowledge dissemination.

Kano State, Nigeria's second most populous state, occupies a distinctive epidemiological position: it functions as a major commercial hub with extensive intra- and inter-state movement of people and goods, a characteristic that elevates both the risk of Lassa fever case importation and the potential for onward transmission should knowledge and health-seeking gaps go unaddressed. Within the Health Belief Model, adequate disease knowledge underpins the perceived susceptibility and severity constructs that motivate timely, appropriate health-seeking behaviour, while misconceptions function as cognitive and cultural barriers to preventive action [11, 13]. Assessing knowledge among patients attending a primary healthcare facility in this context is therefore both scientifically warranted and operationally relevant to strengthening facility-level risk communication and community-based prevention.

This study addressed the Determinants of Lassa Fever Knowledge, Misconceptions and Health-Seeking Behaviour Among Adults in Urban Primary Healthcare Settings in Kano State, Nigeria.

2. Methodology

2.1. Study Design and Setting

A descriptive cross-sectional survey design was employed, appropriate for estimating the prevalence of Lassa fever knowledge and its associated factors at a single point in time [14]. The study was conducted at Hotoro Primary Health Care Centre, a government-owned facility located in Nassarawa Local Government Area, Kano State, north-western Nigeria. Nassarawa LGA constitutes part of the densely populated urban core of Kano metropolis, characterised by a mix of formal and informal settlements and variable access to health services; Kano State. Hotoro PHC provides outpatient care, maternal and child health services, immunisation, family planning, health education and referral services and serves as a primary point of healthcare access for residents of Hotoro and neighbouring communities.

2.2. Study Population

The target population comprised adult patients attending Hotoro Primary Health Care Centre during the study period. Eligible participants were adults aged 18 years or older attending the facility who were willing to provide informed consent, able to understand and communicate in the language(s) used for the questionnaire, and clinically stable enough to complete an interviewer-administered questionnaire. Patients under 18 years of age; those who were critically ill, unconscious, or had severe cognitive impairment or mental illness precluding accurate comprehension of the questions; those who declined or withdrew consent; and non-patient companions accompanying registered patients were excluded.

2.3. Sample Size Determination

The minimum required sample size was calculated using the Kish formula for estimating a single population proportion.

$$n = \frac{Z^2 pq}{d^2} \quad (1)$$

where Z is the standard normal deviate at 95% confidence (1.96); p is the estimated proportion of patients with adequate Lassa fever knowledge, taken as 0.154 from Aromolaran et al. (2023); q = 1 - p = 0.846; and d is the desired precision (0.058). Substituting these parameters yielded $n = (1.96^2 \times 0.154 \times 0.846) / 0.058^2 = 148.8$, rounded up to a minimum sample size of 150. A total of 150 questionnaires were administered; 147 were successfully completed and retained for analysis, corresponding to a response rate of 98.0%.

2.4. Sampling Procedure

Eligible patients attending Hotoro PHC during the data collection period were assigned unique identification numbers and the required sample was drawn using simple random sampling (balloting) from the numbered list of eligible attendees until the target sample size was achieved.

2.5. Data Collection Instrument and Procedure

Data were collected using a structured, interviewer-administered questionnaire developed comprising sections on sociodemographic characteristics, Lassa fever knowledge (transmission, clinical features, prevention), sources of information, misconceptions, and health-seeking behaviour. The questionnaire was administered by interview by the principal researcher over a period of one week on weekdays. Completed questionnaires were reviewed daily for completeness and internal consistency.

2.6. Data Management and Statistical Analysis

Data were coded, entered, cleaned and analysed using IBM Statistical Package for the Social Sciences (SPSS), version 26. Descriptive statistics frequencies and percentages were computed for categorical variables, including sex, educational level, occupation and marital status, as well as for knowledge, information-source, misconception and health-seeking items. The specific inferential statistical procedures used to test the association between sociodemographic characteristics and knowledge level.

2.7. Ethical Considerations

Ethical approval for the study was obtained from the Kano State Ministry of Health. Ethical principles were observed throughout, including verbal or written informed consent prior to participation, voluntary participation with the right to withdraw at any stage without consequence for the care received, and strict confidentiality of all information provided, which was used solely for research purposes.

3. Result

A total of 150 questionnaires were administered to patients attending Hotoro Primary Health Care Centre, of which 147 were retrieved and analysed, yielding a response rate of 98.0%. The findings are summarised below in line with the study's objectives: socio-demographic profile, knowledge of Lassa fever, sources of information, prevalent misconceptions, the association between socio-demographic characteristics and knowledge, and health-seeking and preventive behaviour.

3.1. Socio-Demographic Characteristics

The sample was predominantly young and moderately educated. Respondents aged 18–27 years constituted 71.4% (n = 105) of the sample, and females accounted for 63.3% (n = 93). Educational attainment was concentrated at the secondary (42.9%) and tertiary (37.4%) levels, and traders formed the largest occupational group (37.4%), followed by civil servants (21.8%) and students (20.4%). Slightly under half of respondents were married (49.7%), and just over half resided in concrete or block buildings (51.0%). Most respondents rated their community condition as moderate (51.7%) or very good (37.4%). The socio-demographic characteristics of the respondents are presented in Table 1.

3.2. Knowledge of Haemorrhagic Lassa Fever

Transmission and Epidemiological Knowledge

Knowledge of transmission pathways was generally sound. Person-to-person transmission was correctly recognised by 75.5% of respondents, and 72.8% correctly identified contact with infected rodent urine or faeces as a route of transmission. Awareness of *Mastomys natalensis* as the primary reservoir stood at 71.4%, while 68.7% correctly named Lassa virus as the causative agent and 67.3% correctly identified the endemic countries. The weakest item in this domain was the incubation period, correctly identified by only 59.9% of respondents, indicating a specific and recurring gap in technical epidemiological knowledge.

Clinical Manifestations, Complications and Prevention

Recognition of early symptoms (fever, sore throat, malaise) was high at 76.2%, as was awareness of proper food storage as a preventive measure (76.2%) and of NCDC's coordinating role in the national response (76.2%). Knowledge that severe disease can cause bleeding was

Table 1: Socio-Demographic Characteristics of Respondents (N = 147)

Variable	Category	n	%
Age (years)	18–27	105	71.4
	28–37	35	23.8
	38–47	6	4.1
	48 and above	1	0.7
Sex	Male	54	36.7
	Female	93	63.3
Education	No formal education	13	8.8
	Primary	16	10.9
	Secondary	63	42.9
	Tertiary	55	37.4
Marital status	Single	64	43.5
	Married	73	49.7
	Divorced/Separated	10	6.8
Type of residence	Traditional mud house	52	35.4
	Concrete/block building	75	51.0
	Mixed brick/mud structure	18	12.2
Community condition	Very good	55	37.4
	Moderate	76	51.7
	Poor	13	8.8
	Very poor	2	1.4

reported by 71.4% of respondents. Awareness was comparatively weaker for hearing loss as a complication (62.6%), suggesting that less visible, longer-term sequelae are less well understood than acute or commonly publicised features of the disease.

Knowledge Classification

Using a predetermined 70% cut-off (score of 8–11 out of 11), 66.7% of respondents (n = 98) were classified as having good knowledge, while 33.3% (n = 49) had poor knowledge. The mean knowledge score was 7.78 out of 11. While this indicates a generally satisfactory level of knowledge, the item-level analysis shows that this aggregate figure conceals uneven performance across domains, with technical items (incubation period) and less visible complications (hearing loss) consistently underperforming relative to commonly discussed symptoms and transmission routes. The overall classification of respondents according to Lassa fever knowledge level is presented in Table 2.

Table 2: Overall Knowledge Classification (N = 147)

Knowledge level	Score range	n	%
Good knowledge	8–11	98	66.7
Poor knowledge	0–7	49	33.3
Total	—	147	100.0

3.3. Sources of Information

Respondents drew on multiple channels for Lassa fever information (multiple responses permitted). Radio and television broadcasts were the most frequently cited source (37.7%), closely followed by friends, family or relatives (36.3%) and social media platforms (29.3%). Health workers at health facilities were identified by 27.4% of respondents, community or religious leaders by 13.6%, and formal educational institutions by only 12.2%. The prominence of mass media and informal social networks, relative to health workers and schools, highlights both an opportunity and a risk: while mass media reaches a broad audience, information transmitted through informal networks is not necessarily accurate, which is consistent with the misconceptions identified in the following section.

3.4. Prevalent Misconceptions

Despite generally satisfactory overall knowledge, substantial misconceptions persisted. The most widely held misconception was that healthcare workers are more susceptible to Lassa fever than the general population (56.5% agreement), followed by the belief that only people with poor hygiene are susceptible (53.1%). Close to half of respondents (46.3%) believed that Lassa fever could be completely treated without hospital care, and 44.2% believed that drinking salt water could prevent or treat the disease. Respondents were evenly split on whether Lassa fever is transmitted in the same way as malaria (41.5% agree, 41.5% disagree, 17.0% not sure). These findings demonstrate that accurate knowledge and inaccurate beliefs can coexist within the same population, and that broad awareness of Lassa fever does not guarantee correct understanding of susceptibility, treatment or transmission.

3.5. Association Between Socio-Demographic Characteristics and Knowledge

Chi-square tests of association ($\alpha = 0.05$) showed that knowledge level was significantly associated with sex ($\chi^2 = 5.676$, $df = 1$, $p = 0.017$) and occupation ($\chi^2 = 21.401$, $df = 5$, $p < 0.001$), but not with age ($p = 0.815$), educational level ($p = 0.141$), or previous Lassa illness/exposure ($p = 0.527$). Descriptively, 74.1% of male respondents demonstrated good knowledge compared with 52.7% of females.

Across occupational groups, good knowledge was highest among civil servants (78.1%) and healthcare professionals (72.2%), and lowest among students (30.0%) and farmers (20.0%). These associations are descriptive of statistically significant differences in classification and should not be interpreted as evidence of a causal relationship, since related factors such as occupational exposure and access to information were not controlled for. The results of the chi-square tests examining the association between socio-demographic characteristics and knowledge level are presented in Table 3.

Table 3: Association Between Socio-Demographic Characteristics and Knowledge Level

Variable	χ^2	df	p-value	Decision
Age	0.943	3	0.815	Not significant
Sex	5.676	1	0.017	Significant
Educational level	5.454	3	0.141	Not significant
Occupation	21.401	5	<0.001	Significant
Previous Lassa illness/exposure	2.227	3	0.527	Not significant

3.6. Health-Seeking Behaviour

Most respondents (70.7%) reported that they would immediately visit a hospital or primary healthcare centre if they developed Lassa fever-like symptoms, while smaller proportions would first purchase over-the-counter drugs (13.6%), consult a traditional healer or use herbs (8.2%), wait and observe symptoms (4.1%), or contact a healthcare worker by telephone (3.4%). However, intended promptness of care-seeking was notably lower than the preference for formal care: only 43.5% would seek care immediately or within 24 hours, while 20.4% would wait 2–3 days, 19.7% would wait about a week, and 16.3% would wait until symptoms became severe. This gap between the choice of provider and the timing of presentation suggests that health education should address not only where to seek care, but also the urgency of doing so.

3.7. Reported Preventive Practices

Food protection was the most widely reported preventive practice, with 60.5% of respondents storing food in rodent-proof containers, followed by proper household waste disposal (43.5%), use of rat traps or rodenticides (34.0%), and regular handwashing (32.7%). Only 21.1% reported actively avoiding contact with rodents or their excreta, despite this being central to reducing zoonotic exposure, and just 3.4% reported practising none of the listed measures. This pattern indicates reasonably good uptake of practical, household-level measures but comparatively limited attention to direct avoidance of rodent contact.

Overall, the results indicate that patients attending Hotoro Primary Health Care Centre possess a generally satisfactory level of knowledge of Lassa fever (66.7% classified as having good knowledge), driven largely by strong awareness of common symptoms and major transmission routes. However, this aggregate picture masks persistent gaps in technical knowledge (incubation period), awareness of specific complications (hearing loss), and, notably, the coexistence of substantial misconceptions regarding susceptibility, transmission and treatment. Knowledge was significantly associated with sex and occupation but not with age, education, or prior exposure, suggesting that occupational and social exposure to health information may matter more than demographic attributes alone. Health-seeking intentions favoured formal healthcare, but a meaningful proportion of respondents anticipated delaying care, and self-reported preventive practices, while generally encouraging, showed comparatively low direct avoidance of rodent contact. Taken together, these findings point to the need for targeted, occupation- and gender-sensitive health education that reinforces accurate transmission and prevention messages, corrects specific misconceptions and emphasises the urgency, and not merely the destination, of care-seeking.

4. Discussions

The discussion situates the study's descriptive and inferential findings within the existing Lassa fever literature, comparing the present sample of 147 patients attending Hotoro Primary Health Care Centre (PHC), Kano State, with previous studies conducted among healthcare workers, rural communities and endemic southern populations. The overall pattern that emerges is one of qualified agreement with the literature: the study confirms several established patterns while also demonstrating that findings from other populations and settings cannot be assumed to transfer directly to PHC patients in Kano.

The sample was predominantly young (71.4% aged 18–27 years), female (63.3%) and moderately well educated (42.9% secondary, 37.4% tertiary), with traders forming the largest occupational group. The concentration of respondents in the younger age bracket is compatible with epidemiological literature identifying the 21–30-year age group as disproportionately affected by Lassa fever in Nigeria, although the present study measured knowledge rather than disease incidence, so this should be read as demographic context rather than evidence of elevated risk. The relatively high educational profile and diverse occupational composition also distinguish the sample from prior studies that focused specifically on healthcare workers [11] or rural community residents [12], positioning the present study as an intermediate population, PHC patients, that has been comparatively underexamined in the literature.

Overall, 66.7% of respondents demonstrated good knowledge and 33.3% poor knowledge, a result broadly comparable to, though somewhat lower than, the 72% good knowledge reported by [13] among mothers in an endemic Edo State community, a difference plausibly attributable to greater sustained health-worker engagement in endemic settings. The finding aligns with [4] in demonstrating that high general awareness does not automatically translate into accurate or comprehensive knowledge. By contrast, the present results depart markedly from the more substantial deficits reported by [11] among healthcare workers in Katsina State and [12] among rural Osun State residents, a divergence attributed to differences in occupational exposure, healthcare contact, outbreak experience and geographical setting rather than to any single explanatory factor.

At the item level, knowledge of major transmission routes was comparatively strong: person-to-person transmission (75.5%), rodent excreta contact (72.8%) and the primary reservoir (71.4%) were all well recognised, contrasting with the significant deficits in these same

areas reported by [12] among rural residents. However, the incubation period was the weakest item (59.9%), consistent with a broader pattern in the literature whereby knowledge diminishes as questions become more technical. Similarly, common early symptoms (76.2%) and bleeding as a severe manifestation (71.4%) were well known, whereas hearing loss as a complication was less well recognised (62.6%), a gap consistent with [15], who highlighted the social and stigma-related consequences of hearing impairment among Lassa fever survivors that may go unaddressed when this complication is poorly known.

Radio and television broadcasts were the most frequently cited source of information (37.7%), followed by friends, family and relatives (36.3%), social media (29.3%) and health workers (27.4%). The prominence of broadcast media is consistent with [16] and [17], both of whom linked mass-media exposure to higher Lassa fever knowledge and identified radio as an effective communication channel. The present study departs, however, from [13], where health workers were the dominant information source (55.4%) among mothers in an endemic Edo State community, a difference likely reflecting more intensive facility-based health education in areas of recurrent Lassa fever activity. The relatively strong contribution of interpersonal networks and social media is consistent with the literature's recognition of these channels as increasingly important, while also carrying an acknowledged risk of transmitting inaccurate information.

Substantial misconceptions were identified alongside generally favourable knowledge, most notably the belief that only people with poor hygiene are susceptible (53.1%), that the disease can be fully treated without hospital care (46.3%), and that salt water can prevent or treat it (44.2%). These findings reinforce the conclusion of [4] that awareness does not guarantee freedom from misconception, and align with the literature's identification of hygiene-related beliefs as a recurring form of Lassa fever misinformation. The present findings differ, however, from [18], whose multi-state rumour surveillance, including Kano, documented supernatural explanations such as witchcraft or divine punishment; the present study instead found misconceptions concentrated around susceptibility, treatment and transmission. This divergence likely reflects differences in instrument design and scope, structured misconception items versus open rumour surveillance, rather than a genuine absence of supernatural beliefs in the study population. The persistence of the belief that hospital treatment is unnecessary is particularly significant given its plausible link to delayed presentation, a connection also drawn by [19].

Knowledge level was significantly associated with sex ($p = 0.017$) and occupation ($p < 0.001$), but not with age, educational level or previous Lassa illness/exposure. The occupational association is consistent with [11], who identified occupational category and workplace type as strong predictors of knowledge adequacy among healthcare workers, suggesting that occupational context shapes exposure to health information across different populations, even if the underlying mechanisms differ between healthcare workers and PHC patients. The significant sex association is harder to reconcile with the literature, which reports an inconsistent direction of gender effects across studies, and should therefore be treated as context-specific to this sample rather than generalisable. The absence of an educational association is notable given the general expectation that education facilitates access to health information; this may partly reflect the sample's relatively homogeneous, comparatively high educational profile, which limited variation between groups. Collectively, these results reinforce the broader conclusion that socio-demographic predictors of Lassa fever knowledge are population- and context-dependent, and that findings from healthcare workers, rural communities or endemic settings should not be assumed to apply to Kano PHC patients.

Most respondents (70.7%) indicated they would first seek care at a hospital or PHC, a considerably higher proportion than the 51.15% reported in a comparable Bauchi State study, plausibly because the present sample was already engaged with a healthcare facility and therefore more familiar with formal services. This favourable pattern was tempered by findings on timing: only 43.5% would seek care immediately or within 24 hours, with the remainder anticipating delays of several days or until symptoms became severe. This gap between provider preference and promptness echoes [19], who identified factors associated with delayed presentation, and underscores the time-sensitive nature of Lassa fever management emphasised in the wider literature and national reports. Preventive-practice findings showed a similar disconnect between knowledge and behaviour: food storage in rodent-proof containers was widely practised, but direct avoidance of rodent contact was comparatively rare, mirroring [12] observation of a weak relationship between knowledge scores and preventive practice. Together, these findings support the broader conclusion that knowledge, perception and behaviour are related but distinct constructs that do not necessarily move in tandem.

Across all five objectives, the discussion demonstrates that the present findings are neither uniformly consistent with, nor uniformly divergent from, the wider Lassa fever literature. Where the study sample shares characteristics with previously studied populations, such as facility-based patient status or occupational diversity, similar patterns emerge, notably in transmission knowledge and preference for formal healthcare. Where the population differs meaningfully, whether in geographical and epidemiological context (Kano versus endemic southern states), occupational composition (PHC patients versus healthcare workers or rural residents), or instrument design (structured misconception items versus rumour surveillance), the present study diverges from prior findings in magnitude, direction or emphasis. This pattern reinforces a central methodological caution repeated throughout the discussion: Lassa fever knowledge, misconceptions and health-seeking behaviour should be understood as context-specific phenomena, and findings from one population, setting or instrument should not be generalised to another without due consideration of these differences.

5. Conclusion

The study concludes that patients attending Hotoro Primary Health Care Centre possess a generally satisfactory awareness of Lassa fever, but that this awareness does not consistently translate into comprehensive and accurate knowledge, with clear strengths in recognising major transmission routes and preventive measures alongside notable gaps in more technical areas such as the incubation period and post-infection complications, particularly hearing loss. Misconceptions remain an important challenge, as beliefs in supernatural causation, confidence in herbal remedies, and the perception that susceptibility is limited to people with poor hygiene may undermine appropriate prevention and treatment-seeking behaviour. Although healthcare workers and health facilities were identified as important sources of information, the finding that 68.1% of respondents rarely or never received Lassa fever information through the facility points to a gap between the availability of healthcare professionals as potential sources and the systematic delivery of facility-based health education. Respondents generally showed a positive orientation toward formal healthcare, with 70.7% indicating they would seek hospital or facility-based care first, yet only 43.5% would do so within 24 hours, demonstrating that willingness to use formal healthcare does not necessarily translate into prompt presentation. Financial cost was the most frequently reported barrier to healthcare utilisation, followed by preference for traditional or spiritual treatment and distance from healthcare facilities, indicating that improving Lassa fever outcomes requires addressing practical and socio-cultural barriers in addition to raising knowledge. Finally, while rodent-proof food storage was relatively common, avoidance of direct contact with

rodents and their excreta was considerably less frequently reported, showing that preventive behaviour remains incomplete even where awareness of Lassa fever exists.

5.1. Recommendations

Recommendations to Hotoro Primary Health Care Centre

Hotoro Primary Health Care Centre should institute regular Lassa fever health education sessions incorporated into routine outpatient care rather than relying mainly on patients' exposure to external information sources, with particular emphasis on the knowledge gaps identified in this study, including transmission pathways, the incubation period, clinical manifestations and post-infection complications such as hearing loss; healthcare workers should provide clear and repeated information to correct misconceptions that Lassa fever is caused by supernatural forces or can be adequately treated with herbal remedies alone, and should educate patients that susceptibility is not determined solely by personal hygiene but can occur under appropriate environmental and epidemiological conditions; patients should be actively encouraged to seek medical attention as soon as possible, preferably within 24 hours of developing symptoms suggestive of Lassa fever, especially where relevant exposure exists; and all such education should be delivered in simple, culturally appropriate language, supported where necessary by local-language educational materials.

Recommendations to Kano State Ministry of Health

The Kano State Ministry of Health should develop and implement targeted Lassa fever risk-communication programmes for primary healthcare facilities and surrounding communities, strengthening collaboration with relevant public-health agencies, including the Nigeria Centre for Disease Control and Prevention, to produce standardised educational materials; these risk-communication programmes should directly address supernatural beliefs, misconceptions concerning herbal remedies and incorrect perceptions of susceptibility while respecting the cultural context of the target population, and should actively involve community and religious leaders given their potential influence on community beliefs, perceptions and healthcare-seeking decisions; public-health campaigns should also make greater use of radio, television and social media, in view of their demonstrated importance as sources of health information within the study population.

Recommendations for Strengthening Health-Seeking Behaviour

Efforts to strengthen health-seeking behaviour should emphasise, through health education, that early presentation to a health facility is important once Lassa fever-like symptoms occur rather than waiting until symptoms become severe, with community messages addressing the consequences of delayed presentation and discouraging exclusive reliance on self-medication, herbal remedies or spiritual treatment when serious febrile illness is suspected; health authorities should also explore measures to reduce financial barriers to accessing appropriate healthcare, particularly for vulnerable members of the community, and should strengthen referral and linkage systems between primary healthcare facilities and higher-level facilities to facilitate the timely management of suspected Lassa fever cases.

Recommendations for Preventive Practices

Preventive-practice interventions should reinforce safe food storage in rodent-proof containers, proper household waste disposal and effective rodent-control measures, while placing particular emphasis on avoiding direct contact with rodents and their urine, faeces and other excreta, since this was among the least frequently reported preventive practices; community environmental-health programmes should promote measures that reduce rodent access to households, food and domestic environments, and households should be encouraged to maintain appropriate environmental sanitation and adopt practical measures that reduce conditions favourable to rodent infestation.

Suggestions for Further Studies

Further research should extend this study to other primary healthcare centres within Nassarawa Local Government Area and other Local Government Areas of Kano State to determine whether the findings observed at Hotoro PHC are representative of the wider population, and should include community members who do not routinely attend healthcare facilities in order to compare their knowledge and health-seeking behaviour with those of PHC patients; qualitative studies should also be conducted to explore the cultural and social factors underlying supernatural beliefs, herbal-remedy use and perceptions of Lassa fever susceptibility, while future studies should examine whether the reported intention to seek healthcare within 24 hours corresponds with actual health-seeking behaviour, evaluate the effectiveness of structured facility-based Lassa fever education through intervention studies, and assess the knowledge and communication practices of healthcare workers regarding Lassa fever given their importance as a source of information to patients.

Article Information

Ethical Approval: The study was approved by the Health Research Ethics Committee, Ministry of Health, Kano State, Nigeria (Approval No. NHREC/17/03/2018, Dated 24TH, June (2026)).

Informed Consent: Informed consent was obtained from all participants before their participation in the study.

Data Availability Statement: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: No external funding was received for this study.

Author Contributions: N.A. - Writing – Original Draft; A.A.M. - Writing – Original Draft; A.L.Y. - Writing – Review & Editing; I.U.A. - Writing – Review & Editing; M.A.A. - Methodology; I.M.M. - Data Curation; Z.A.A. - Data Curation; M.S. - Conceptualization; A.I.A. - Formal Analysis; M.Y. - Supervision; A.A.M. - Supervision.

AI Use Disclosure: No generative artificial intelligence tools were used in the preparation of this manuscript.

References

- [1] C. Alope, N. A. Obasi, P. M. Aja, C. U. Emelike, C. O. Egwu, and O. Jeje. Combating Lassa fever in West African sub-region: Progress, challenges, and future perspectives. *Viruses*, 15(2):440, 2023.
- [2] G. Sulis, A. Peebles, and N. E. Basta. Lassa fever vaccine candidates: A scoping review of vaccine clinical trials. *Tropical Medicine and International Health*, 28(6):420–431, 2023.
- [3] S. M. Moore, E. Rapheal, S. Mendoza Guerrero, N. E. Dean, and S. T. Stoddard. Estimation of Lassa fever incidence rates in West Africa: Development of a modelling framework to inform vaccine trial design. *PLOS Neglected Tropical Diseases*, 19(7):e0012751, 2025.
- [4] A. I. Al-Mustapha, I. M. Adesiyun, T. G. Orum, O. A. Ogundijo, A. N. Lawal, O. E. Nzedibe, L. O. Onyeka, K. U. Muhammad, L. Odetayo, M. Oyewo, S. O. Muhammad, E. O. Atadiose, L. I. Adebudo, D. A. Adetunji, H. J. Jantiku, A. O. Akintule, R. C. Nwachukwu, and A. T. Abubakar. Lassa fever in Nigeria: Epidemiology and risk perception. *Scientific Reports*, 14(1):27669, 2024.
- [5] R. F. Garry. Lassa fever - the road ahead. *Nature Reviews Microbiology*, 21(2):87–96, 2023. URL <https://doi.org/10.1038/s41579-022-00789-8>.
- [6] K. A. Akowuah, M. S. Ofori, D. Pratt, A. Abankwa, E. Y. Bonney, and N. Enimil. The epidemiology of Lassa fever in Ghana: A study on the 2023 Lassa fever outbreak in Ghana. *Frontiers in Public Health*, 13:1542842, 2025.
- [7] A. B. Kamara, A. Moseray, P. Fatoma, A. Mayei, J. Lamin, O. Sankoh, and M. K. Rogers. Analysing the association between perceived knowledge and attitudes on Lassa fever infections and mortality risk factors in Lower Bambara Chiefdom. *BMC Public Health*, 24(1):1684, 2024. URL <https://doi.org/10.1186/s12889-024-19170-w>.
- [8] D. Dolopei, C. Morris, B. Forkpa, and P. Korvah. Knowledge, attitudes and practices (KAP) regarding Lassa fever disease among adults in endemic and non-endemic counties of Liberia, 2018: A cross-sectional study. *Journal of Interventional Epidemiology and Public Health*, 4(9), 2021.
- [9] CIDRAP – Center for Infectious Disease Research and Policy. Lassa fever’s death toll in Nigeria climbs in 2025. URL <https://www.cidrap.umn.edu/lassa/lassa-fever-s-death-toll-nigeria-climbs-2025>. University of Minnesota, Published November 6, 2025.
- [10] D. Asogun, B. Arogundade, F. Unuabonah, O. Olugbenro, J. Asogun, F. Aluede, and D. Ehichioya. A review of the epidemiology of Lassa fever in Nigeria. *Microorganisms*, 13(6):1419, 2025. URL <https://doi.org/10.3390/microorganisms13061419>.
- [11] Y. H. Wada, I. A. Ogunyinka, K. B. Yusuff, C. L. Ochu, M. Yahaya, G. M. Khalid, Y. B. Mutalub, and S. B. Adeniyi. Knowledge of Lassa fever, its prevention and control practices and their predictors among healthcare workers during an outbreak in Northern Nigeria: A multi-centre cross-sectional assessment. *PLOS Neglected Tropical Diseases*, 16(3):e0010259, 2022.
- [12] O. Aromolaran, T. K. Samson, and O. I. Falodun. Knowledge and practices associated with Lassa fever in rural Nigeria: Implications for prevention and control. *Journal of Public Health in Africa*, 14(9):2001, 2023.
- [13] S. A. Saka, D. O. Ojo, N. M. Mezu, C. O. Uzuegbu, O. Ighodaro, O. O. Illoh, O. N. Emekolom, O. A. Akpa, E. A. Obiora, and A. P. Muogbo. Knowledge, perception and preventive practices of Lassa fever among mothers of under-five children in an endemic community in Edo State, Nigeria. *BMC Public Health*, 25(1):837, 2025.
- [14] O. I. Alenoghena, D. Ehigialua, N. S. Awunor, and S. Yerumoh. Knowledge and risk factors for Lassa fever amongst students of Federal Polytechnic Auch, Edo State, Nigeria. *Journal of Public Health and Epidemiology*, 13(1):45–53, 2021.
- [15] K. C. Best, E. Ameh, C. Weldon, D. Shwe, I. M. Maigari, I. Turaki, N. D. Ma’an, C. S. Yilgwan, T. Makishima, S. Weaver, S. Paessler, and N. Y. Shehu. Double stigma: A Cross-sectional Study of Lassa Patients with Hearing Loss in North Central Nigeria. *Frontiers in Public Health*, 12:1395939, 2024. URL <https://doi.org/10.3389/fpubh.2024.1395939>.
- [16] C. A. Ben-Enukora, B. K. Adeyeye, E. Adesina, O. O. P. Ajakaiye, and O. Adekanye. Risk communication sources and knowledge of Lassa fever in Nigeria: An impact analysis. *Heliyon*, 8(11):e11335, 2022. URL <https://doi.org/10.1016/j.heliyon.2022.e11335>.
- [17] J. A. Erubami. Mass Media Exposure and Lassa Fever Knowledge, Attitudes and Practices in Rural Nigeria. *Journal of Public Health and Development*, 20(1):244–253, 2022.
- [18] H. Ajayi, S. Oko, K. Agbaoye, A. Erim, A. Nwankwo, and V. Ihekweazu. Lassa fever misinformation: A multi-state case study of Lagos, Kano, Niger, Cross River and Ebonyi states. *Journal of Interventional Epidemiology and Public Health*, 8(Conf Proc 5), 2025. URL <https://doi.org/10.37432/JIEPH-CONFPR05-00270>. [Conference abstract].

- [19] N. L. Chandra, H. Bolt, C. Dan-Nwafor, O. Ipadeola, E. Ilori, G. Namara, A. T. Olayinka, W. Ukponu, A. Iniobong, M. Amedu, A. Akano, K. O. Akabike, U. Okhwarobo, S. Fagbemi, E. Sampson, S. Newitt, N. Q. Verlander, D. G. Bausch, O. le Polain de Waroux, and C. Ihekweazu. Factors Associated with Delayed Presentation to Healthcare Facilities for Lassa Fever Cases, Nigeria 2019: A retrospective cohort study. *BMC Infectious Diseases*, 21:163, 2021.