Infectious disease

Knowledge, attitude and practice of Lassa fever prevention among adults in Bali Local Government Area, Taraba State, Nigeria

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Key words

Knowledge • Practice • Attitude • Lassa fever prevention • Nigeria.

Summary

Introduction. *Lassa fever (LF), a public health problem of great importance endemic in West Africa, is an acute and sometimes fatal viral haemorrhagic disease which leads to mortality. The current study assessed the knowledge, attitude and practice of Lassa fever prevention among adults in Bali Local Government Area, Taraba State, Nigeria.*

Methods. *Descriptive study design and Cross sectional study design was used for this study. A simple and systematic random sampling technique was used to draw samples of 399 participants for the study. A structured questionnaire was used for data collection after being validated and its reliability tested. The data collected was analysed using frequencies, percentage the hypotheses were tested using Data analysis was done using SPSS version 21, frequency, mean standard deviation, and chi square were performed to ascertain the value of the variables the hypotheses were tested using chi-square statistics at ≤0.05 level of significance.*

Results. *Findings from the study revealed that75% of the respondents had knowledge of the Lassa fever and the preventive practices. It was also shown that about 66.7% were aware of the varied preventive measures at their disposal. The study further shows that 56% had positive attitudes that could affect their practice of preventive measures of Lassa fever. The acceptability level according to this study was very high (89%) among the adults of Bali L.G.A in Taraba state.*

Conclusions. *The study therefore, recommends that there should be a call for educational intervention to improve the knowledge of Lassa fever among community members in Bali LGA this will help towards its preventive practices. This is based on the expectation that good knowledge of Lassa fever can reduce the rate and spread of the Infection.*

Introduction

It have been documented that the earliest cases of Lassa fever were thought to have occurred between 1920 and 1950, in Nigeria, Sierra Leone and Central African Republic and perhaps in other West African countries [8]. However, the disease became recognized and named in 1960 after two missionary nurses died and a third suffered a grave apparently communicable febrile systemic illness while working in Nigeria. The index patient was working in a mission hospital in Lassa town, Borno State, North-Eastern Nigeria when she fell critically ill and was transferred to Evangel Hospital, Jos Plateau State (now Bingham University Teaching Hospital, Jos) where she subsequently died. The second nurse, who was a staff of Evangel Hospital, cared for the index patient on presentation and she later developed comparable symptoms like the index case culminating in her death days later.

Lassa fever is an acute viral hemorrhagic illness caused by Lassa virus, a member of the virus family "*Arenaviridae*". The disease is endemic in various West African countries including Nigeria where Lassa fever virus infections rate per annum is estimated at 100,000 to 300,000 with approximately 5,000 deaths [17]. Outbreaks of the disease have been reported in various parts of Nigeria since it was first reported in 1969 with the worst outbreak recorded in 2012 where 623 cases including 70 deaths were reported from 19 out of 36 states, and case fatality rate put at 37.9% [31].

The interaction between man and his environment is a major aspect to be considered in understanding the epidemiology of diseases. The transmission of Lassa fever is closely related to environmental factors intricately woven around the vector, the rodent *Mastomysnatalensis* [42, 39]. Other environmental factors such as overcrowding, poor food and personal hygiene and poor housekeeping are implicated in the transmission of the Lassa virus (Public Health Agency of Canada, 2011) [43]. Exposed food items, consumption of uncooked, poorly cooked and inadequately reheated foods are also important risk considerations.

In 2012, there were 1,723 cases and 112 deaths in Nigeria. Last year, 12 people died out of 375 infected, according to the Nigeria Center for Disease Control. Nigeria had an outbreak of Lassa fever in the year 2012 with 1,723 cases, 112 deaths, 201 laboratory-confirmed cases, and a case fatality rate of 6.50 [11, 21]. Between January 1 and April 15, 2018, 1,849 suspected cases have been reported from 21 states (Abia, Adamawa,Anambra,

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Bauchi, Benue, Delta, Ebonyi, Edo, Ekiti, Federal Capital Territory, Gombe, Imo, Kaduna, Kogi, Lagos, Nasarawa, Ondo, Osun, Plateau, Rivers, and Taraba). Out of these, 413 patients were confirmed with Lassa fever, nine were classified as suspected, 1,422 tested negative, and the remaining five laboratory results were pending. Of the 413 confirmed and the nine probable Lassa fever cases, 114 deaths were reported (case fatality rate for confirmed cases is 25.4% and for confirmed and probable cases combined is 27%). As of April, 27 health care workers in seven states (Abia, Benue, Ebonyi, Edo, Kogi, Nasarawa, and Ondo) have been infected since January 1, 2018, eight of whom have died [21].

Taraba State is one of the three high burdened states with frequent occurrences of Lassa fever outbreaks [37]. Abakaliki Local Government Area (LGA) had the highest proportion of confirmed Lassa fever cases during the 2018 and 2019 outbreaks in the State [41]. Researches carried out in places around the country have revealed that knowledge of the disease is deficient among many and inadequate among quite a large population making it hard for people to prevent the incident of an outbreak [24-26, 30]. In response to the poor knowledge of the public, the federal government put up various measures to prevent further spread of the diseases and treatment when it occurs. Such measures are the enhancement of disease surveillance, social health education through mass media, increased the number of diagnostic centers from 6 to 12, and also inaugurated a 15-member multisectoral Lassa fever Eradication Committee charged with fashioning and implementing the multifaceted response strategies against the outbreak [33, 40].

Statement of the Problem

Lassa fever being a highly contagious disease endemic in West Africa, including Nigeria and Taraba state [25, 38] needs a robust public measures including early detection, effective treatment and widespread education on prevention to control its spread and mitigate its impact. The overall regional and global risks are through its primary mode of transmission through contact with food or household items contaminated with rat excreta. Due to drying of food items along high ways and outside houses over the night, constant burning of bushes, poor hygiene practices, and overcrowding in homes which causes logging of baggages and properties these give rise to these rats gaining entrance into the houses, all these factors put together may facilitate the increase in rodent man contact or contamination of food source by infected mastomys rat, it is against this background that the researcher have designed this study todetermine knowledge, attitude, practice of Lassa fever prevention among adult of Bali LGA.

Materials and Methods

Population of the Study

It comprised of all adult in Bali L.G.A where the sample for the study was drawned. The current estimated number of adults 18yrs and above 176,634 was derived by the researcher accordingto Bali Local government Commission.

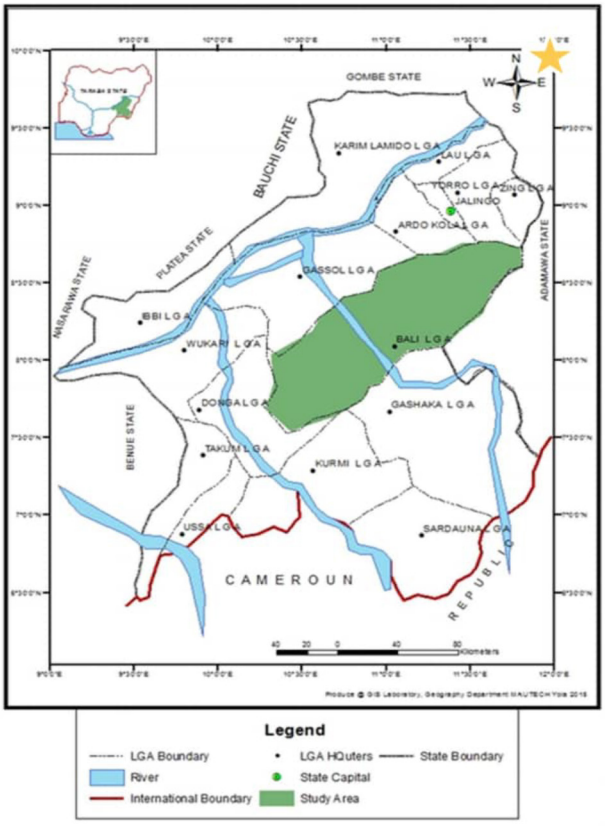
Study Area

Taraba state was carved out from the then defunct Gongola state (now Adamawa state) on the 27th August 1991, by the then Military Administration of General Ibrahim Babangida. The state derived its name from one of the three major rivers in the state and it has a land area of 59400 square kilometers with the headquarter situated in Jalingo. The state is made up of 16 local government areas namely, Ardo Kola, Bali, Jalingo, Zing, Yorro, Lau, Karim Lamido, Wukari, Ibi, Gassol, Gashaka, Sardauna, Kurmi, Donga, Takum, Ussa L.G.A. Bali L.G.A being the main study area for this study is situated in the north central part of the state with headquarter in Bali town about 50 km from Jalingo as shown in Figure 1. It was created in 1976 with population estimated to be 208,935 people at the 2006 census and comprising of Fulani, Mumuye, Jukun, Chamba and other ethnic groups. Bali has a latitude of 8.1554˚ North and longitude 10.9685˚ East. Christianity and Islam are the major religions practiced in Bali L.G.A.

Sample size calculation

Sample size was derived using TaroYamane'formula for finite population.

Fig. 1. Map of Taraba state showing Bali LGA.



Source: Ministry of lands and survey Jalingo, Taraba state.

Using Taro Yamane' formula for finite population.
The Yamane sample size states that:

$$n = N/ (1+N (e) 2)$$

Where: n signifies sample size
N signifies the population size under study (176,634)
e signifies the margin error (it could be 0.10, 0.05 or 0.01)

$$n =176,634/ (1+176,634 (0.05) 2)$$
$$n = 176,634/ (1+34,486(0.0025)$$
$$n =176,634/ (1+441.59)$$
$$n =176,634/ 441.59$$
$$n = 399$$

Sampling Technique

Multi-stage sampling method was used for this study.

In stage one: Selection by cluster

The communities in Bali L.G.A was clustered along existing twenty traditional communities which includes Bali A, Bali B, Mai hula, Sabin dale, Gazabu, Jatau, Sansani, Mayokam, Bakundi, Pangri, Sarkindawa, Ardo tinba, Badokoshi, Aka, Daniya, Dakka, Garba chede, Maigoge, Bayire, Sabon gida.

In Stage two: Selection of communities proportionately

Simple random sampling technique by (balloting without replacement) was used to select both rural and semi-urban communities. Six rural communities were selected which were, Gazabu, Jatau, Sansani, Mayokam, Dakka, Sabon gida and four semi-urban communities were selected which included Bali A, Bayire, Pangri, Bali B. The proportional sample size for each of the selected communities were obtained.

Stage four: Selection of house-hold

This stage involved the selection of the households by systematic random sampling technique. The determined sampling interval for each of the selected communities was employed where 5 was the interval for each selection. The researcher located the centre of each selected communities, divided it into four sections, randomly selected one sector, located the centre of that sector and spun a pen to determine the direction to begin the sampling. The first respondent (head of house hold) sampled was selected by simple random sampling by balloting without replacement. Sampling intervals were obtained for the various communities and it was maintained until the desired number of households was gotten. This was done for three weeks until the desired sample size of 399 respondents was achieved. Written informed consents were obtained from the participants.

Validity of Instruments

The Instrument for data collection was a self-structured questionnaire which was drafted under supervision then went for validation by three experts in the field of Public health, two from Imo state and one from Taraba state. Correction made was used to finalize the instrument for content relevance and appropriateness of language.

Reliability of the Instrument

The questionnaire was administered to 20 respondents with similar characteristics to those in the target population. The reliability of the instrument was tested using Chrombach Alpha Coefficient of Reliability test, and a coefficient of (r = 0.84) was deemed reliable.

Data Collection

A pretested self-structured survey questionnaire was used for data collection, containing closed-ended questions with 4 sections. Section A is the demographic variables of the respondent which is age, gender, marital status, level of education, occupation and religion. Section B contains 10 questions to ascertain their level of knowledge of Lassa fever. Section C contains questions on attitude towards Lassa fever with 10. Section D are the Lassa fever prevention practices which contains 24 questions after being validated and its reliability tested. The questionnaire had a total of 50 closed ended questions on a study on knowledge, attitude and practice of Lassa fever prevention among adults in Bali Local Government Area Taraba State.

Data analysis

Data analysis was performed in IBM-SPSS Statistics version 23. Initial analysis involved construction of frequency distribution and manipulations. The average number of responses was used to compute the overall knowledge and preventive practices in each case and such scores were used to establish a cut-off point scoring 1 per point for each correct answer which were 10 questions, where 7 to 10 is graded as high knowledge, 4-6 as moderate knowledge and below 4 as poor knowledge as well as for the occurrence of preventive practices. The correct answers are indicated on table 4.2 with *. Chi square test (χ^2) was used to test for significant association between the factors and the knowledge or preventive practices. Fisher exact test was conducted at 2 by 2 table where chi-square test assumptions were hard to meet. Statistical tests were performed at 5% level of significant and probability value ($p \leq 0.05$) was used to interpret significance.

Ethical Considerations

Ethical approval to undertake the study was obtained from Research and Ethics Committee of Taraba State Ministry of Health Jalingo, Nigeria. The participants were briefed on the objectives of the study, and their oral and written consent was also obtained before proceeding with the research. It is a descriptive cross-sectional survey, which is a type of design where the researcher does not alter the exposure status but measures the outcome and the exposure(s) in the population under observation. This design was successfully used in related studies of [31, 26].

Results

Table I, shows the demographic status of respondents in Bali LGA, a total of 399 participants were involved in the study but 385 recorded, majority of the participants were within ages 38-47 years 83 (21.6%) and 196 (50.9%) of the respondents are female, Majority of the respondents are married, 231 (60%). In terms of educational attainment, Majority attended secondary education 154 (40%). The participants cut across all religio us faith, 126 (32.7%) are of the Islamic faith, while majority were of the Christian faith with farming as their major occupation.

Table II Present the knowledge of the respondents on Lassa fever prevention. Their knowledge were poor 48.3% as indicated that more than half of the respondents don't know that Lassa fever is a severe disease caused by germ virus, 105 (27.3%) believed that Lassa fever is gotten from eating too much oil. The respondents that are aware that the incubation period of Lassa fever ranges from 1-7 days although are very few, although 175 (45.5%) stated that one can be infected with Lassa fever due to handling food and household items contaminated with rat's faeces and urine. Few were of the opinion that the Lassa fever can be spread through sitting close to an infected person. About 107 (27.8%) affirmed that the disease can cause bleeding and death if not immediately handled. According to 230 (85.8%) of respondents, Lassa fever can be avoided by eliminating rat from the environment, proper environmental hygiene, and protecting food from being contaminated.

Table III shows distribution of respondents by correct knowledge of Lassa Fever Prevention responses Overall knowledge in each case and scores were used to establish a cut-off point scoring 1 per point for each question which were 10 questions, where 7 to 10 is graded as high knowledge 4-6 as moderate knowledge and below 4 as poor knowledge. The classification of knowledge based on High, moderate and poor in percentage is shown in Figure 2 which was determined by scoring the highest score to the correct response and a lower number to a wrong answer. The general average of the total score was calculated to determine the cut-off score (3.24). The average scores of individual scores was also determined.

Table IV, showed that more than half of the respondents strongly agreed and agreed that anyone can be infected with Lassa fever, 29.6% and 33.5% strongly agreed and agreed respectively that Lassa fever is not a spiritual attack. Very few respondents were of the opinion strongly that environmental sanitation can limit rats in the environment, 36.9% of the respondents believed that Lassa fever can best be treated randomly and argued that it can be best treated by the native doctors. Negative and positive attitude was determined by scoring the highest score to the most positive attitude response and a lowest score to the most negative attitude, the general average of the total score was calculated to determine the cut-off score (2.8). The average scores of individual scores was also determined. Figure 3 showed the respondents' percentage level of attitude towards Lassa fever (Score > 2.8 = negative attitude; score ≥ 2.8 = positive attitude).

Tab. I. Distribution of respondent by Socio-economic Characteristics of adults in Bali LGA.

Variables	Frequency (F)	Percent (%)
Age		
18–27	69	17.9
28–37	61	15.8
38–47	83	21.6
48–57	66	17.1
58-67	41	10.6
68-77	17	4.4
78 and above	48	12.5
Total	385	100.0
Gender		
Female	196	50.9
Male	189	49.1
Total	385	100.0
Marital Status		
Divorced	15	3.9
Married	231	60.0
Separated	32	8.3
Single	81	21.0
Widowed	26	6.8
Total	385	100.0
Educational level		
No formal education	79	20.5
Primary	83	21.6
Secondary	154	40.0
Tertiary	69	17.9
Total	385	100.0
Occupation		
Applicant	19	5.0
Business/Trading	75	19.5
Farming	126	32.7
Public/CivilService	99	25.7
Student	66	17.1
Total	385	100.0
Religion		
Christianity	177	46.0
Islam	126	32.7
Traditional worshiper	82	21.3
Total	385	100.0

Table V reveled 32.7% of the respondents are of the opinion that Lassa fever can be prevented by good food protection policy, 36.6% believed that fruits are to be washed thoroughly with water before eating, and half of the respondent said the best way to safe guard your food items from Lassa fever is by eradicating rat and by regular environmental sanitation practice.

Table V also shows that very few respondents cook their food very well before eating on a daily basis. With 28.3% believing that it kills germs when food are prepared very well before eating. 4.2% washes their hands always with soap and water after visiting the toilet, 33.0% washes their hands before eating while very few don't as shown in Table V. Not many take 20 seconds and above for a single session of hand washing as well as using handkerchief to dry off their hands after washing. A

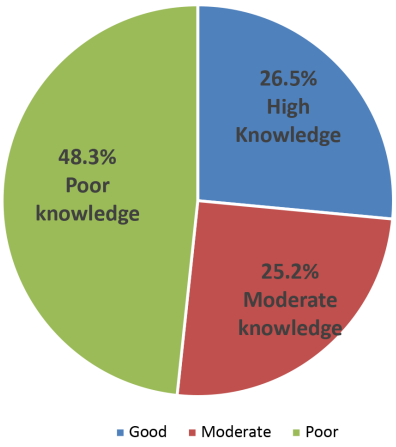
Tab. II. Distribution of respondents by knowledge of Lassa fever prevention.

Variables	Frequency (F)	Percent (%)	Correct answer
What is Lassa fever			
A severe illness caused by germ	126	32.7	*
Another form of malaria	99	25.7	
Disease caused by eating too Much oil	105	27.3	
Fever caused by evil spirit	55	14.3	
Total	385	100.0	
Lassa fever vector			
Monkey	53	13.8	
Mosquito	97	25.2	
None of the above	28	7.3	
Rat	207	53.8	*
Total	385	100.0	
How can Lassa fever be contacted			
Eating over-cooked cow meat	85	22.1	
Items contaminated with rat's faeces and urine	175	45.5	*
None of the above	48	12.5	
Prolonged mosquito bites	77	20.0	
Total	385	100.0	
Early Signs and symptoms of Lassa fever except			
Cough	73	19.0	
Fever	157	40.8	
Headache	58	15.1	
Vomiting	97	25.2	*
Total	385	100.0	
Lassa fever can be prevented through except?			
Eliminating mosquitoes	55	14.3	*
Eliminating rat in the environment	150	39.0	
Proper environmental sanitation	92	23.9	
Protecting food from being contaminated	88	22.9	
Total	385	100.0	
Community ways of controlling Lassa fever			
All of the above	39	10.1	*
Good environmental hygiene	140	36.4	
Keeping cats at home	85	22.1	
Storing grains and food stuffs in rodent-proof containers	121	31.4	
Total	385	100.0	
How can Lassa fever spread			
Contact with the body fluid of infected person	117	30.4	*
Shaking hand	75	19.5	
Sitting close to infected person	137	35.6	
Taking the infected person to hospital	56	14.5	
Total	385	100.0	
What to do one Lassa fever is suspected			
Seek health care immediately	180	46.8	*
Try self-medication first	90	23.4	
Visit a spiritualist	51	13.2	
Watch the situation for sometimes	64	16.6	
Total	385	100.0	
Lassa fever can cause			
All of the above	68	17.7	*
Bleeding	107	27.8	
Death	137	35.6	
Facial swelling	73	19.0	
Total	385	100.0	
How long it takes signs and symptoms to manifest			
1-7 days	94	24.4	
21-28 days	104	27.0	
30-60 days	66	17.1	
7-21 days	121	31.4	*
Total	385	100.0	

Tab. III. Distribution of Respondents by correct knowledge of Lassa Fever Prevention responses.

Variables	Correct		InCorrect		Difference	
	F	%	F	%	F	%
What is Lassa fever?	126	32.7	259	67.3	-133	-34.6
Lassa fever vector?	207	53.8	178	46.2	29	7.6
How can Lassa fever be contacted?	175	45.5	210	54.5	-35	-9.0
Signs and symptoms of Lassa fever?	157	40.8	228	59.2	-71	-18.4
Lassa fever can be prevented through?	331	86.0	54	14.0	277	71.9
Community ways of controlling Lassa fever?	261	67.8	124	32.2	137	35.6
How can Lassa fever spread?	117	30.4	268	69.6	-151	-39.2
What to do when Lassa fever is suspected?	180	46.8	205	53.2	-25	-6.4
Lassa fever can cause?	244	63.4	141	36.6	103	26.8
How long it takes signs and symptoms to manifest?	121	31.4	264	68.6	-143	-37.2

Fig. 2. Level of knowledge of respondents about Lassa fever.



good number of respondents do not hunt for rat or other rodents and do not also eat raw meat or even rodent. Half of the respondents sometimes assist friends and family members who are ill in their activities of daily living as all respondent have never assisted friends or family members who have Lassa fever. Not many always seek health care from the health facility promptly. Good and poor practice was determined by scoring the highest score to the most good practice response and a lowest score to the most poor practice, the general average of the total score was calculated to determine the cut-off score (2.5). The average scores of individual scores was also determined. Figure 4 shows the percentage level of Lassa fever preventive practices by the respondent (Score > 2.5 = negative practice; score ≥ 2.5 = positive practice).

Table VI Shows a cross tabulation of the socio-demographic characteristics of respondents and their knowledge about Lassa fever, results shows a significant relationship between age, gender, marital status, educational status, occupation and religion of respondents and their knowledge about Lassa fever (p-value = < 0.001, 0.042, < 0.001, 0.031, 0.039 and < 0.001 respectively).

Table VII shows the association between the socio demographic characteristics of respondents and their attitude toward Lassa fever disease, results shows a significant relationship between the respondents attitude, educational status and occupation of the respondents (p-value = < 0.001, < 0.001 and 0.049 respectively). No significant relationship was established between attitude and respondents gender, marital status and religion (p-value = 0.201, 0.131 and 0.501 respectively).

Table VIII shows a cross tabulation between knowledge and attitude and knowledge and practice of respondents about Lassa fever. Association was established between knowledge and attitude (p = 0.023) and knowledge and practice (p = 0.033).

Hypotheses Testing

In this study, two null Hypotheses were tested to determine which of the predictor variables produced greater influence on the outcome variable of knowledge and attitudes in the prevention of Lassa fever disease. Chi-square analysis was used in conducting this test at 0.05 level of significance. Decision rule applied was that if $p \leq 0.05$, then the Null Hypotheses will be rejected in favor of alternative hypotheses and if $p \geq 0.05$, then the Null Hypotheses will be accepted and the alternative rejected.

Ho: 1.

There is no significant relationship between knowledge and attitude of Lassa fever prevention among adults of Bali L.G.A in Taraba state

HA: 1.

As suggested by our results (see Table VIII) a significant relationship between knowledge and attitude of Lassa fever prevention among adults of Bali L.G.A in Taraba state was identified (p = 0.033)

Ho: 2.

There is no significant relationship between knowledge and practice of Lassa fever prevention among adults of Bali L.G.A in Taraba state.

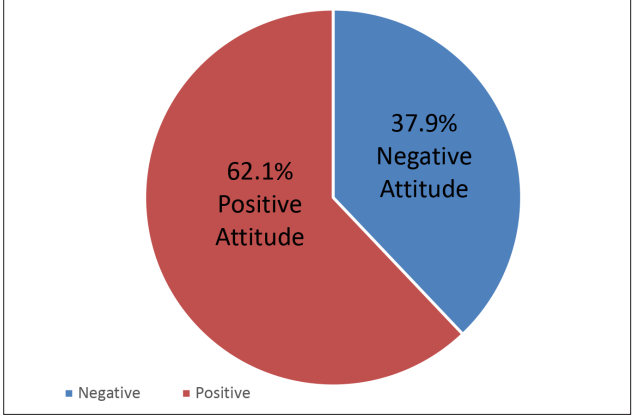
HA: 2.

Results from this study shown above, a p-value of 0.023 less than statistically significant differences at 0.05 level of significance. The null hypothesis is therefore rejected and the alternate hypothesis accepted.

Tab. IV. Distribution of Respondent based on attitude towards Lassa Fever Prevention.

Variables	Frequency (N)	Percent (%)
Anybody no matter the socio-economic status can be infected with Lassa fever		
Strongly Agree	127	33.0
Agree	127	33.0
Strongly disagree	30	7.8
Disagree	101	26.2
Total	385	100.0
Lassa fever is not as a result of spiritual attack		
Strongly Agree	114	29.6
Agree	129	33.5
Strongly disagree	45	11.7
Disagree	97	25.3
Total	385	100.0
Environmental sanitation limits the presence of rats in the Environment		
Strongly Agree	114	29.6
Agree	136	35.3
Strongly disagree	27	7.0
Disagree	108	28.1
Total	385	100.0
Absence of rat in the house is a preventive measure for Lassa fever		
Strongly Agree	114	29.6
Agree	129	33.5
Strongly disagree	45	11.7
Disagree	97	25.2
Total	385	100.0
Body fluid of anyone who is suffering from Lassa fever should be avoided		
Strongly Agree	116	30.1
Agree	132	34.3
Strongly disagree	30	7.8
Disagree	107	27.8
Total	385	100.0
Treatment of Lassa fever should be prompt to reduce the risk of death		
Strongly Agree	102	26.5
Agree	144	37.4
Strongly disagree	35	9.1
Disagree	104	27.0
Total	385	100.0
Lassa fever is not a death sentence		
Strongly Agree	113	29.4
Agree	130	33.8
Strongly disagree	45	11.7
Disagree	97	25.2
Total	385	100.0
Lassa fever should be managed in the health facility by trained health personnel		
Strongly Agree	114	29.6
Agree	129	33.5
Strongly disagree	45	11.7
Disagree	97	25.2
Total	385	100.0
Those who have Lassa fever should not be stigmatized		
Strongly Agree	103	26.8
Agree	144	37.4
Strongly disagree	42	10.9
Disagree	96	24.9
Total	385	100.0
Lassa fever is a very serious illness		
Strongly Agree	114	29.6
Agree	129	33.5
Strongly disagree	45	11.7
Disagree	97	25.2
Total	385	100.0

Fig. 3. Attitude Level of respondents about Lassa Fever.



Therefore, we conclude by saying there is a significant relationship between attitudes and the prevention/control of Lassa fever infection among adults of Bali L.G.A in Taraba state.

Discussion

Summary of main results

Various knowledge variables were used to test their knowledge of the subject matter. Such variables definition of Lassa fever causes of Lassa fever, transmission of Lassa fever, vectors of Lassa fever, incubation and signs/symptoms of Lassa fever. 48.3% of the respondents had a poor knowledge; few of them (26.5%) still had good knowledge of the subject under consideration. These findings are definitely not in line with a study carried out in Nigeria to determine the outbreak of Lassa fever disease [27, 36]. They observed from their study that most of the respondents had high knowledge about the Lassa fever infection especially urban settlers which

Tab. V. Distribution of respondents by their practice.

Variables	Frequency (N)	Percent (%)
Safeguards your food items in the house		
Always	124	32.2
Never	131	34.0
Sometimes	130	33.8
Total	385	100.0
How can you safe guard your food items from rats		
Covering food items properly	126	32.7
Nothing	37	9.6
Rat poison	76	19.7
Using rat gum	103	26.8
Using rat trap	43	11.2
Total	385	100.0
How often do you carry out environmental sanitation		
Once a month	57	14.8
Once in a week	103	26.8
Once in three week	103	26.8
Once in two week	122	31.7
Total	385	100.0
How do you store your household refuse		
Covered container	225	58.4
Open container	57	14.8
Standard refuse bin	103	26.8
Total	385	100.0
Washes fruits thoroughly with water before eating		
Always	141	36.6
Never	51	13.2
Sometimes	193	50.1
Total	385	100.0
Why do you wash fruits thoroughly before eating		
	51	13.2
I do not wash fruits before eating	82	21.3
No reason	60	15.6
To kill germs that can cause disease	94	24.4
To make it look appetizing	98	25.5
Total	385	100.0

Tab. V (*follows*). Distribution of respondents by their practice.

Variables	Frequency (N)	Percent (%)
If you do not wash fruits thoroughly before eating,why		
	334	86.8
I wash fruits thoroughly before eating	12	3.1
It is not necessary to wash fruits before eating	16	4.2
No reason	9	2.3
Water is not available for washing	14	3.6
Total	385	100.0
Do you cook your food very well before eating		
Never	20	5.2
Always	65	16.9
Sometimes	300	77.9
Total	385	100.0
Why do you cook your food very well before eating		
I do not cook my food very well before eating	88	22.9
No reason	64	16.6
To kill germs that can cause disease	109	28.3
To make the food delicious	104	27.0
Total	385	100.0
Why don't you cook your food very well before eating		
I cook my food very well before eating	370	96.1
I enjoy food that is not cooked to tender	7	1.8
No reason	4	1.0
To save cooking fuel	4	1.0
Total	385	100.0
Washes your hands with soap and water or ash and water after visiting the toilet		
Always	164	42.6
Never	21	5.5
Sometimes	200	51.9
Total	385	100.0
Washes your hands with soap and water or ash and water before eating food		
Always	127	33.0
Never	38	9.9
Sometimes	220	57.1
Total	385	100.0
Washes your hands with soap and water or ash and water when you return home		
Always	127	33.0
Never	38	9.9
Sometimes	220	57.1
Total	385	100.0
Washes your hands with soap and water or ash and water after attending to a sick person		
Always	118	30.6
Never	38	9.9
Sometimes	229	59.5
Total	385	100.0
Washes your hands with soap and water or ash and water after handling dirt/garbage		
Always	107	27.8
Never	38	9.9
Sometimes	240	62.3
Total	385	100.0
How long does your single session of hand washing last		
	20	5.2
10-120 seconds and above seconds	78	20.3
15-19 seconds	6	1.6
20 seconds and above	109	28.3
5-9 seconds	82	21.3
Less than 5 seconds	90	23.4
Total	385	100.0

Tab. V (*follows*). Distribution of respondents by their practice.

Variables	Frequency (N)	Percent (%)
What do you use in drying your hands after washing		
Dryer	24	6.2
Hand towel	95	24.7
Handkerchief	100	26.0
Old clothes	79	20.5
Paper napkin	87	22.6
Total	385	100.0
Do you hunt for rats or other rodents?		
Always	31	8.1
Never	281	73.0
Sometimes	73	19.0
Total	385	100.0
Do you eat raw meat or other rodents?		
Never	306	79.5
Sometimes	79	20.5
Total	385	100.0
If you eat rat meat or other rodents, how do you prepare it for eating?		
	306	79.5
Boiling	21	5.5
Roasting	58	15.1
Total	385	100.0
Assists friends or family members who are ill in their activities of daily living?		
Always	141	36.6
Never	37	9.6
Sometimes	207	53.8
Total	385	100.0
Have assisted in caring for friends or family members who have Lassa fever?		
No	385	100.0
Will you assist in caring for a friend or a family member whom you are aware has lassa fever		
No	75	19.5
Yes	310	80.5
Total	385	100.0
Do you seek health care from the health facility promptly		
Always	83	21.6
Never	7	1.8
Sometimes	295	76.6
Total	385	100.0

Fig. 4. Level of Practice of respondents of Lassa fever prevention..

has been able to help them to adopt some preventive measures against frequent outbreaks. Also NCDC, [38] noted get the fact, get the factual and correct information on Lassa fever from social media, radio, television and newspaper; be knowledgeable about how to response to outbreak. This helps minimize fear and will curtail the spread of the infection.

Various attitudes were identified from this study which may have effects on either the outbreak or the spread of Lassa fever disease in a given community. 62.1% of the respondents believed that they are at risk of developing the disease Lassa fever irrespective of their status, race, sex and religious background. This agrees with the findings of [4] in a study titled knowledge, attitudes and practices regarding Lassa fever disease among adults in endemic and non-endemic countries of Liberia. They find out that majority of the respondents in their

Tab. VI. Association between socio-demographic characteristics and knowledge.

Variables		Knowledge			Total	X^2	p-value
		Good	Moderate	Poor			
Age	18–27	17(24.6)	14(20.3)	38(55.1)	69	445.668	< 0.001
	28–37	15(24.6)	14(23.0)	32(52.5)	61		
	38–47	22(26.8)	23(28.0)	37(45.1)	82		
	48–57	11(16.7)	15(22.7)	40(60.6)	66		
	58-67	21(36.8)	21(36.8)	15(26.3)	57		
	68-77	0(0.0)	1(100.0)	0(0.0)	1		
	78 and above	16(32.7)	9(18.4)	24(49.0)	49		
	Total	102	97	186	385		
Gender	Female	52(26.5)	41(20.9)	103(52.6)	196	625.793	0.042
	Male	50(26.5)	56(29.6)	83(43.9)	189		
	Total	102	97	186	385		
Marital Status	Divorced	3(21.4)	4(28.6)	7(50.0)	14	427.683	< 0.001
	Married	67(28.9)	55(23.7)	110(47.4)	232		
	Separated	9(28.1)	5(15.6)	18(56.3)	32		
	Single	16(19.8)	24(29.6)	41(50.0)	81		
	Widowed	7(26.9)	9(34.6)	10(38.5)	26		
	Total	102	97	186	385		
Educational Status	No formal education	20(25.3)	19(24.1)	40(50.6)	79	523.816	0.031
	Primary	26(31.3)	18(21.7)	39(47.0)	83		
	Secondary	37(24.0)	40(26.0)	77(50.0)	154		
	Tertiary	19(27.5)	20(29.0)	30(43.5)	69		
	Total	102	97	186	385		
Occupation	Applicant	4(21.1)	3(15.8)	12(63.2)	19	550.973	0.039
	Business/Trading	15(19.7)	21(27.6)	40(52.6)	76		
	Farming	29(23.2)	39(31.2)	57(45.6)	125		
	Public/CivilService	44(44.4)	17(17.2)	38(38.4)	99		
	Student	10(15.2)	17(25.8)	39(59.1)	66		
	Total	102	97	186	385		
Religion	Christianity	45(25.4)	43(24.3)	89(50.3)	177	421.790	< 0.001
	Islam	40(28.4)	36(25.5)	65(46.1)	141		
	Traditional worshiper	17(25.4)	18(26.9)	32(47.8)	67		
	Total	102	97	186	385		

study believed they are at risk of getting LF; with 52% (231/442) in the non-endemic counties. Also 63.1% of the respondents believed that the disease is not as a result of spiritual attack and that environmental sanitation can greatly limit the occurrence of the disease [4]. However with the poor knowledge of Lassa fever observed among the studied group the overall preventive practices seems to be high 57.7%. Lassa fever preventive practices were also found to be low (45.2%) Findings of this study are in conformity with 51% poor practice toward Lassa fever in a descriptive survey research design done by Abdulkadir and Mohammed in North-Eastern part of Nigeria [22], but the result of the findings are in consistent with66.4% good preventive practices in a descriptive cross-sectional study design by Ossai *et al.*(2020) [23]. The differences in these results could be as a result of different available information about Lassa fever in the areas, and also the location of the study area towards exposure of information about Lassa fever. The study observed that high-risk behaviours and attitudes emanating from societal beliefs among community and households' members have been long associated with the transmission of infectious diseases.

Generalizability

Given the specific characteristics of the study population in Bali Local Government Area, the generalizability of the results may be restricted to similar communities in Taraba State due to comparable socio-economic characteristics. However, to assess the applicability of these findings more broadly, further research involving diverse population is recommended.

Limitation of the Study

On carrying this study, the researcher had limited scope, limited generalizability with different cultural norms and demographics,some of the respondent were reluctant and needed close guide in answering the questionnaire; it took the researcher extra time and effort to stay with respondents to ensure proper filling of the questionnaire.

Implication

The study is believed to have made impact towards informing health policies and strategies at state and national level to improve better surveillance system, community development which can lead to increased awareness towards better preventive practices, the

Tab. VII. Association between socio-demographic characteristics and attitude.

Variable		Attitude		Total	X^2	p-values
		Negative	Positive			
Age	18–27	29(42.0)	40(58.0)	69	551.618	< 0.001
	28–37	41(67.2)	20(32.8)	61		
	38–47	19(23.2)	63(76.8)	82		
	48–57	50(75.8)	16(24.2)	66		
	58-67	5(8.8)	52(91.2)	57		
	68-77	1(100.0)	0(0.0)	1		
	78 and above	1(2.0)	48(98.0)	49		
	Total	146	239	385		
Gender	Female	102(52.0)	94(48.0)	196	4579.69	0.201
	Male	44(23.3)	145(76.7)	189		
	Total	146	239	385		
Marital Status	Divorced	3(21.4)	11(78.6)	14	9306.36	0.131
	Married	91(39.2)	141(60.8)	232		
	Separated	17(53.1)	15(46.9)	32		
	Single	30(37.0)	51(63.0)	81		
	Widowed	5(19.2)	21(80.8)	26		
	Total	146	239	385		
Educational Status	No formal education	41(51.9)	38(48.1)	79	465.233	< 0.001
	Primary	25(30.1)	58(69.9)	83		
	Secondary	74(48.1)	80(51.9)	154		
	Tertiary	6(8.7)	63(91.3)	69		
	Total	146	239	385		
Occupation	Applicant	19(100.0)	0(0.0)	19	463.892[a]	0.049
	Business/Trading	22(28.9)	54(71.1)	76		
	Farming	36(28.8)	89(71.2)	125		
	Public/CivilService	42(42.4)	57(57.6)	99		
	Student	27(40.9)	39(59.1)	66		
	Total	146	239	385		
Religion	Christianity	82(46.3)	95(53.7)	177	43201.9[a]	0.501
	Islam	45(31.9)	96(68.1)	141		
	Traditional worshiper	19(28.4)	48(71.6)	67		
	Total	146	239	385		

Tab. VIII. Association of Knowledge, Attitude and Practice Towards Lassa Fever Prevention.

Variable		Knowledge			Total	X^2	p-value
		Good	Moderate	Poor			
Attitude	Negative	21(14.4)	43(29.5)	82(56.2)	146	6342.62	0.023
	Positive	81(33.9)	54(22.6)	104(43.5)	239		
	Total	102	97	186	385		
Practice	Good	59(26.6)	54(24.3)	109(49.1)	222	8646.21	0.033
	Poor	43(26.4)	43(26.4)	77(47.2)	163		
	Total	102	97	186	385		

findings of the research can also be used to develop training programs for health care providers in the state towards response to Lassa fever outbreak. It can be used for intervention that address and modify risk behaviors.

Conclusions

Lassa fever virus outbreak, a poverty-related infectious diseases outbreak remains a public health threat and burden on vulnerable populations in West Africa and Nigeria in particular. Robust and sustainable leadership commitment and investment of all stakeholders and affected communities in Lassa fever outbreaks prevention and containment is crucial and requires strengthening integrated Lassa fever outbreak surveillance quality data gathering to support evidence data sharing, contextual local and regional outbreak early warning alert, preparedness and response systems. Collaborative 'One Health' approach operational research is needed in understanding spatio-geographical risk factors patterns, reservoir(s) mapping and phylogenetic in guiding evidence-based, appropriately

tailored, timely integrated programs, strategic interventions and implementation against the zoonotic disease epidemics and pandemics threats in Nigeria. Moreover, fostering local community to regional re-merging and emerging epidemics and pandemics data sharing, coordinated invasive pathogens epidemiology surveillance and early warning indicators metrics capacity building, monitoring and evaluation is crucial for timely and quality risk communication and operational research.

Suggestion for Further Studies

Similar studies could be carried out in other LGA.A more elaborate research on environmental health education programmes should be undertaken to cover a wider geographical area of Taraba State.

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Data availability

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of interest statement

We declare no conflict of interest.

Authors' contributions

CN: Concept. SI: Methodology. BN: Proof Reading. LI: Formatting. GA: Data collection.

References

[1] Adewuyi G M, Fowotade A, Adewuyi B T. Lassa Fever: Another Infectious Menace. Afr J Clin Exp Microbiol 2009;10:144-55. https://doi.org/10.4314/ajcem.v10i3.43407

[2] Blumberg L, Enria D, Bausch DG.Viral Haemorrhagic Fevers, In: Manson's Tropical Diseases. Saunders 2014.

[3] Dahmane A, van Griensven J, Van Herp M, Van den Bergh R, Nzomukunda Y, Prior J, Alders P, Jambai A, Zachariah R. Constraints in the diagnosis and treatment of Lassa Fever and the effect on mortality in hospitalized children and women with obstetric conditions in a rural district hospital in Sierra Leone. Trans R Soc Trop Med Hyg 2014;108:126-32. https://doi.org/10.1093/trstmh/tru009.

[4] Dolopei D, Amo-Addae M, Adewuyi P, Himiede W, Fulton S, Lawubah, Woods O, Gbearr O, Deodeh V.K, Sanley A, Kullie M.W, Tamatia G, Muyan J, Gbabow L, Bunnah T.G, Sackie A, Duo H, Leyhen D, Paye E, Phebe T. Knowledge, attitudes and practices (KAP) regarding Lassa fever disease among adults in endemic and non-endemic Counties of Liberia, 2018: A Cross-sectional study. J Interv Epidemiol Public Health 2021;4:9. https://doi.org/10.11604/JIEPH.supp.2021.4.1.1081.

[5] Ireye F, Ejiyere H, Aigbiremolen A O, Famiyesin O E, Rowland-Udoh E A, Ogeyemhe C O, Okudo I, Onimisi AB. Knowledge, Attitude and Infection Prevention and Control Practices Regarding Lassa Fever among Healthcare Workers in Edo State, Nigeria. Int J Prev Treat 2019;8:21-7 https://doi.org/10.5923/j.ijpt.20190801.03.

[6] Haas WH, Breuer T, Pfaff G, Schmitz H, Kohler P, Asper M. Imported Lassa fever in Germany: Surveillance and management of contact persons. Clin Infect Dis 2003;36:1254-7. https://doi.org/10.1086/374853.

[7] McCormick JB, Fisher-Hoch SP. Lassa fever. Curr Top Microbiol Immunol 2002;262:75-109. https://doi.org/10.1007/978-3-642-56029-3_4.

[8] Merson L, Bourner J, Jalloh S, Erber A, Salam AP, Flahault A, Olliaro PL. Clinical characterization of Lassa fever: A systematic review of clinical reports and research to inform clinical trial design. PLoSNegl Trop Dis 2021;15:e0009788. https://doi.org/10.1371/journal.pntd.0009788.

[9] Mofolorunsho K C. Outbreak of lassa fever in Nigeria: Measures for prevention and control. Pan African Medical Jorunal 2016;23(210). https://doi.org/10.11604/pamj.2016.23.210.

[10] Mylne AQ, Pigott DM, Longbottom J, Shearer F, Duda KA, Messina JP, Weiss DJ, Moyes CL, Golding N, Hay SI. Mapping the zoonotic niche of Lassa fever in Africa. Trans R Soc Trop Med Hyg 2015;109:483-92. https://doi.org/10.1093/trstmh/trv047.

[11] Nigeria Centre for Disease Control. Experts Meet to Discuss Lassa Fever Control. Wkly Epidemiol Rep 2017:1-12. Available at: http://www.ncdc.gov.ng/reports/weekly (Accessed on: 5/09/2017).

[12] Ogoina D. Lassa fever:A clinical and epidemiological review. Niger Delta Jorunal Medical Research 2015;1:16-22.

[13] Ogboghodo EO, Adam VY, Omuemu VO, Okojie OH. Knowledge, Attitude and Preventive Practices Against Lassa Fever Among Residents in a Rural Community in Southern Nigeria. West Afr J Med 2019;36:165-71.

[14] Richmond JK, Baglole DJ. Lassa fever: epidemiology, clinical features, and social consequences. BMJ 2003;327:1271-5. https://doi.org/10.1136/bmj.327.7426.1271.

[15] Tambo E, Ugwu EC, Ngogang JY. Need of surveillance response systems to combat Ebola outbreaks and other emerging infectious diseases in African countries. Infect Dis Poverty 2014;3:29. https://doi.org/10.1186/2049-9957-3-29.

[16] WHO. Clinical Management of Patients with Viral Haemorrhagic Fever: A Pocket Guide for the Front-line Health Worker. Interim Emergency Guidance-Generic Draft For West African Adaptation 2014. Available at: https://iris.who.int/bitstream/handle/10665/130883/WHO_HSE_PED_AIP_14.05.pdf?sequence=2 (Accessed on: 14/08/2023).

[17] WHO. Introduction to lassa fever managing infectious hazard 2015. Available at:https://cdn.who.int/media/docs/default-source/documents/emergencies/health-topics---lassa-fever/lassa-fever-introduction.pdf?sfvrsn=b1b96509_2&download=true (Accessed on: 01/7/2023).

[18] WHO.IMAI District Clinician Manual: Hospital Care for Adolescentsand Adults. Guidelines for the Management of Common Illnesses with Limited Resources 2011. Available at: http://

apps.who.int/iris/bitstream/10665/77751/1/9789241548281_Vol1_eng. pdf (Accessed on: 22/07/2023).

[19] WHO, NCDC. Technical Guidelines for Integrated Disease Surveillance and Response in Nigeria. Abuja; March 2013. Available at: https://ncdc.gov.ng/themes/common/docs/protocols/4_1476085948.pdf (Accessed on: 16/08/2023).

[20] WHO, CDC. Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. Brazzaville and Atlanta 2010. Available at: https://www.afro.who.int/sites/default/files/2017-06/IDSR-Technical-Guidelines_Final_2010_0.pdf (Accessed on: 16/08/2023).

[21] World Health Organization. Lassa fever-Nigeria. Disease Outbreak News 2018. Availableat: http://www.who.int/csr/don/20-april-2018-lassa-fever-nigeria/en/ (Accessed on: 5/07/2023).

[22] Abdulkadir S, MohammedAS. Assessment of knowledge of Lassa fever among residents in North-Eastern Nigeria. Int J Health Scie Res 2019:197-202.

[23] Ossai, E.N., Onwe, O.E., Okeagu, N.P., Ugwuoru, A., Laura, Eze, T. K. &Nwede, A. S.Knowledge and preventive practices against Lassa fever among heads of households in Abakaliki metropolis Southeast Nigeria: A cross-sectional study. Proc Singap Healthc 2020;29:73-80. https://doi.org/10.1177/2010105819899120.

[24] Aigbiremolen AO, Duru CB, Awunor NS, Abejegah C, Abah SO, Asogun AD. Knowledge and application of infectious disease control measures among primary care workers in Nigeria: the Lassa fever example. Int J Basic, Appl Innov Res 2012;1:122-129.

[25] Akinwumi AA, Ademola AO, Oladimeji A E, Abiodun O C, Oghenevo A G, Adebola A O, Olarewaju O P, Olayinka AA, Ojo B F. Knowledge of Lassa fever among students of a college of education: Call for inclusion in curriculum. J Adv Med Med Res 2016;16;1-8. https://doi.org/10.9734/BJMMR/2016/26857.

[26] Akunne M O, Isah A, Anene-Okeke C G, Oguejiofor F A. Assessment of knowledge of Lassa fever infection among the undergraduate students of University of Nigeria, Nsukka, Enugu State, Nigeria. Int Res J Pharm Med Sci 2018;1:6-9. https://doi.org/10.5281/zenodo.2538556.

[27] Amoran O, Onwube O. Infection control and practice of standard precautions among healthcare workers in northern Nigeria. J Glob Infect Dis 2013;5;156-63. https://doi.org/10.4103/0974-777X.122010.

[28] Centers for Disease Control and Prevention (2019, January). Lassa fever. Available at: https://www.cdc.gov/vhf/lassa/index.html (Accessed on: 29/8/2023).

[29] Fidelis C, Olajolumo J. Assessment of the level of knowledge and universal cross-infection control practices against Lassa fever among health workers in Sokoto, Nigeria: A hospital survey during Lassa fever outbreak in Nigeria. Int J Adv Med Health Res 2018;5:57-65. https://doi.org/10.4103/IJAMR.IJAMR_11_18.

[30] Ighedosa SU., Asemota O, Aighewi IT., Odigie E A., Usifoh S F., Omorogbe C E., Asemota D O, Osaghae V G, Faboya T N E, Erahuyi O. Knowledge. Attitude and prevention practices of Lassa fever by staff of University of Benin, Benin City. Nigerian Soc Exp Biol J 2017;17:82-90.

[31] Nwonwu E U, Alo C, Una A F, Madubueze U C, Eze I, Eze N C, Ogbonnaya L U,Akamike I C.Knowledge of Lassa fever and its determinants among traders in Izzi community in south-east Nigeria. Arch Curr Res Int 2018;13;1-9. https://doi.org/10.9734/ACRI/2018/39904.

[32] Ossai EN, Onwe OE, Okeagu NP, Ugwuoru AL, Eze TK, Nwede AS. Knowledge and preventive practices against Lassa fever among heads of households in Abakaliki metropolis, Southeast Nigeria: a cross-sectional study. Proc Singap Healthc 2020;29:73-80. https://doi.org/10.1177/2010105819899120.

[33] Reuben C R, Gyar S D. Knowledge, attitudes and practices of Lassa fever in and around Lafia, central Nigeria. Int J Public Health Epidemiol Res 2016;2:14-19.

[34] Usifoh S F, Ighedosa S U, Aighewi I T, Asemota O D, Odigie E A, Faboya T. Impact of Lassa fever on the practice and consumption of stored food by University of Benin Community, in Benin City, Nigeria. J Community Med Prim Health Care. 2018;30:66-76.

[35] World Health Organization (2017, July). Lassa fever: Key fact. Available at:https://www.who.int/news-room/fact-sheets/detail/lassa-fever (Accessed on: 20/07/2023).

[36] World Health Organization. Lassa fever-Nigeria 2018. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/01-march-2018-lassa-fever-nigeria-en (Accessed on: 16/7/2023).

[37] Nigeria Center for Disease Control. Press release: NCDC reviews Lassa fever outbreak response amidst reducing number of cases 2019. Available at: https://ncdc.gov.ng/news/164/press-release%3A-ncdc-reviews-lassa-fever-outbreak-response-amidst-reducing-number-of-cases (Accessed on: 7/10/2023).

[38] Olayiwola J O,Bakarey A S. Epidemiological Trends of Lassa Fever Outbreaks and Insights for Future Control in Nigeria. Int J Trop Dis Health 2017;24:1-14. https://doi.org/10.9734/IJTDH/2017/32823.

[39] Kelly JD, Barrie MB, Ross RA, Temple BA, Moses LM, Bausch DG. Housing equity for health equity: a rights-based approach to the control of Lassa fever in post-war Sierra Leone. BMC Int Health Hum Rights 2013;2:2. https://doi.org/10.1186/1472-698X-13-2.

[40] Wogu JO. Mass media awareness campaign and the prevention of the spread of Lassa fever in the rural communities of Ebonyi State, Nigeria: Impact evaluation. J Public Health Afr 2018 21;9:882. https://doi.org/10.4081/jphia.2018.882.

[41] Usuwa IS, Akpa CO, Umeokonkwo CD, Umoke M, Oguanuo CS, Olorukooba AA, Bamgboye E, Balogun MS. Knowledge and risk perception towards Lassa fever infection among residents of affected communities in Ebonyi State, Nigeria: implications for risk communication. BMC Public Health 2020;20:217. https://doi.org/10.1186/s12889-020-8299-3.

[42] Lecompte E, Fichet-Calvet E, Daffis S, Koulémou K, Sylla O, Kourouma F, Doré A, Soropogui B, Aniskin V, Allali B, Kouassi Kan S, Lalis A, Koivogui L, Günther S, Denys C, terMeulen J. Mastomysnatalensis and Lassa fever, West Africa. Emerg Infect Dis 2006;12:1971-4. https://doi.org/10.3201/eid1212.060812.

[43] Muanya, C. Poor hygiene,poverty, ignorance fuel Lassa Fever epidemic in Nigeria. The Guardian 2016. Available at: http://guardian.ng/sunday-magazine/poor-hygiene-poverty-ignorance-fuel-lassa-fever-epidemic-in-nigeria/ (Accessed on: 19/10/2023).

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