

Knowledge of Lassa Fever Disease and Preventive Measures among Secondary School Teachers in Enugu East Local Government Area

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Abstract

The study was conducted to ascertain the knowledge of lassa fever disease and its preventive measures among secondary school teachers in Enugu East Local Government Area. Four specific objectives with the corresponding four research questions and two null hypotheses guided the study. The study adopted the descriptive research design. The population for the study consisted of 635 teachers in public secondary schools in Enugu East Local Government Area. Sample size for the study consisted of 225 teachers in the public secondary schools in Enugu East LG using multistage sampling procedure; simple random sampling technique of balloting without replacement. The instrument for data collection was Knowledge of Lassa fever Disease and its Preventive Measures Questionnaire (KLFDPMQ). Frequencies and percentages were used for answering the research questions while Chi-square statistics were used for testing the null hypotheses. Results among others indicated that secondary school teachers' possessed low knowledge (49.5%) of lassa fever disease, average knowledge (55.5%) of lassa fever preventive measures. Overall level of Knowledge of lassa fever preventive measures possessed by secondary school teachers was average knowledge. Also, at 0.05 level of significance, there was significant difference in the level of knowledge of lassa fever preventive measures possessed secondary school teachers based on age and location. Based on the findings, the study recommended that Minister of Education in collaboration with Minister of health should organize seminars and workshops in school halls and town halls to enlighten the teachers on lassa fevers' mode of transmission and its preventive measures.

Keywords: Lassa fever disease, its preventive measures, Knowledge, Secondary school teachers

Introduction

Lassa fever occurs in both sexes and all age groups. It is a zoonotic disease whose reservoir is the multimammate rat of the genus *Mastomys*. Lassa fever is a viral haemorrhagic fever caused by a single stranded RNA virus belonging to the *Arenaviridae* family, (March, Ajayi, Nwigwe, Azuogu, Onyire & Nwonwu, 2013). The virus is a member of the virus family *Arenaviridae*, is a single-stranded RNA virus and is zoonotic, or animal-borne, transmitted by rats. It has the potential to cause tens of thousands of deaths. Even after recovery, the virus remains in body fluids, including semen (WHO, 2000). It has been known since the 1950s, but the virus was not identified until 1969, when two missionary nurses died from it in the town of Lassa in Nigeria (WHO, 2017).

Lassa fever, a viral haemorrhagic fever transmitted by rats, is endemic in West Africa (Nigeria inclusive) and may kill tens of thousands of people each year. Peak incidence was thought to be in the dry season (January to March), but data collected in Sierra Leone shows peaks in the overlap with the wet season (May to November) (Saka, Gubio, Kerecvel, Saka & Oyemakinde, 2017). They are probably the most common rodent in tropical Africa and are found predominantly in rural areas and in dwellings more often than in surrounding countryside. Lassa fever is endemic in West Africa, with 300,000 to 500,000 cases and 5000 deaths occurring yearly across Nigeria, Sierra Leone, Guinea, and Liberia. However, between 70-80% of Lassa virus infections remain asymptomatic, mild or self-limiting and in most cases may pass unnoticed (Nasir, Sani, Augusto & Pereira, 2015). Lassa fever is a communicable disease that is; it can be transmitted from one person to another person.

Communicable disease is defined as an illness that arises from transmission of an infectious agent (viruses, bacteria, chlamydiae, rickettsiae, fungi, protozoa or metozoa) or its toxic product from an infected person, animal or reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector, or environment (Uduak, 2018). The rodent, once infected is able to excrete virus in urine for an extended period, maybe for the rest of its life. *Mastomys* rodents breed frequently, produce large numbers of offspring, and are numerous in the savannas and forests of west, central, and east Africa. The virus is excreted for up to 3 - 9 weeks in urine and up to 3 months of infectious material, or when broken skin and mucous membranes are directly

exposed to infectious material. The virus may also be spread between humans through direct contact with the blood, feces, urine or other bodily secretions of a person infected with Lassa fever. Infection is in a persistent asymptomatic state in rodents.

Additionally, *Mastomys* readily colonize human homes and areas where food is stored. All of these factors contribute to the relatively efficient spread of Lassa virus from infected rodents to humans. The virus may also be spread between humans through direct contact with blood, feces, urine or other bodily secretions of a person infected with Lassa fever. Infection is in a persistent asymptomatic state in rodents. Because *Mastomys* rodents often live in and around homes and scavenge on leftover human food items or poorly stored food, direct contact transmission is common. *Mastomys* rodents are sometimes consumed as a food source and infection may occur when rodents are caught and prepared. Contact with the virus may also occur when a person inhales tiny particles in the air contaminated with infected rodent excretions. This aerosol or airborne transmission may occur during cleaning activities, such as sweeping.

Transmission of Lassa virus to humans occurs most commonly through ingestion or inhalation. *Mastomys* rodents shed the virus in urine and droppings and direct contact with these materials, through touching soiled objects, eating contaminated food, or exposure to open cuts or sores, can lead to infection. Many persons infected by the virus do not develop symptoms, but when symptoms occur they typically include fever, weakness, headaches, vomiting, and muscle pains. Less commonly there may be bleeding from the mouth or gastrointestinal tract. Direct contact with infected rodents is not the only way in which people are infected; person-to-person transmission may occur after exposure to virus in blood, tissue, secretions, or excretions of a Lassa virus-infected individual. Casual contact such as skin-to-skin contact without exchange of body fluids does not spread Lassa virus. Lassa virus may be spread through contaminated medical equipment, such as reused needles.

Lassa fever presents with symptoms and signs indistinguishable from those of febrile illnesses such as malaria and other viral haemorrhagic fevers such as Ebola. It is difficult to diagnose clinically but should be suspected in patients with fever ($\geq 38^{\circ}\text{C}$) not responding adequately to antimalarial and antibiotic drugs. The most useful clinical predictors of Lassa fever are fever, pharyngitis, retrosternal pain, and proteinuria for diagnosis; and fever, sore throat, and vomiting. Even after recovery, there may be residual problems such as sensorineural hearing loss. The initial presentation of Lassa fever may be with non-specific symptoms similar to what is seen in the more common febrile illnesses such as malaria or typhoid fever. In such a setting therefore, timely diagnosis of Lassa fever may be difficult (Chime, Chime, Ndibuagu, Ekochin, Arinze-Onyia & Oti, 2020). Complications include mucosal bleeding, sensorineural hearing deficit, pleural effusion and pericardial effusion. The outcome is related to the degree of viraemia, not the antibody response, and is worse with high levels of aspartate aminotransferase.

In majority of Lassa fever virus infections (approximately 80%) in endemic areas, the symptoms are mild and are undiagnosed. Mild symptoms include slight fever, general malaise and weakness, and headache. In 20% of infected individuals, however, disease may progress to more serious symptoms including hemorrhaging (in gums, eyes, or nose, as examples), respiratory distress, repeated vomiting, facial swelling, pain in the chest, back, and abdomen, and shock with significant fatality (40-50%) especially during epidemic outbreaks (Richmond & Baglole, 2017; CDC fact sheet on lassa fever; 2015). Generally, the incubation period ranges from 6 to 21 days [McCormick, et al., 2017; Lassa Fever | Viral Hemorrhagic Fever Consortium, 2017].

Knowledge is the ability to envisage information about a particular situation, having an understanding of a situation that may result in a healthy outcome. Knowledge is the familiarity and awareness of something such as facts, information, description or skill which is acquired through experience or education (Agu, Agbaje and Nnamdi, 2020). According to (Oparah et al 2019) knowledge is the possession of information, skill and understanding gained through learning and experience. Uduma (2000) defined knowledge as the ability to comprehend phenomena, the acquisition of positive information through some capacity which humans presumably have in common. Knowledge of Lassa fever, its mode of transmission, control measures, and the seriousness of the disease are essential knowledge of Lassa fever disease secondary school teachers need for putting up some preventive measures.

Preventive measures are those strategies that will help curb the outcome of an illness or unhealthy situation. According to Tobin, Asogun, Isah, Ugege, Ebhodaghe, (2013) in their study, precautionary measures to be taken to prevent spread of lassa fever in health care facilities, were stated as adequate health education and good hand washing. It was practiced by 100 (76.3%) and 91 (61.5%) respondents respectively. Although the prevention of human contact with the *Mastomys* rodents is an essential factor in the control of Lassa fever, widespread prevention of such contact is presently impractical in endemic regions of West Africa, so the provision of a vaccine for community and hospital use is an imperative public health need because vaccination is the most viable control measure (Yunusa & Egenti, 2015). Lassa virus vaccine development is hampered by high cost of bio containment requirement, the absence of an appropriate small animal model, genetic diversity of Lassa virus species, and high

HIV prevalence in Lassa fever endemic areas (Lukashevich & Pushko, 2016). Ogbu, Ajuluchukwu and Uneke (2007) explained the glycoprotein confers protection but its duration is unknown and if the nucleoprotein is also included there may be a better duration of protection but it is unclear whether the nucleoprotein as a vaccine may enhance the infection.

Lassa fever outbreaks in endemic areas are invariably fuelled by every activity or factor that promotes increased contact between man and rodents. They include poor sanitation, crowding, deforestation, rodent hunting, bush burning, civil unrest, and agricultural activities such as rice cultivation that provides food supplies for rodents (Richmond & Baglolle, 2017). However, Individual and community preventive strategies include keeping good and healthy personal hygiene, cleaning of homes and the surrounding environment, and waste should be emptied far away from homes. Spreading of food where rats can have access to it, e.g. by the road side, should be avoided. Storage of foodstuff and water should be done in rat proof containers (Ogoina, 2013). Also Control of rodents by avoiding bush burning, setting traps in and around homes to reduce rat population, blockage of all rat hideouts, and avoidance of contact with rats such as rat hunting for consumption are some preventive measures for secondary school teachers should know communicate the same to the students under their care hence reducing both morbidity and mortality rate. Thus, this study wants to identify whether secondary school teachers in Enugu East have the knowledge of lassa fever and its preventive measures.

Secondary school teachers are those teachers that mainly educate adolescents in their secondary level of education. Education is the main tool for imparting knowledge, skills and attitudes relevant to ones contribution to the development of society (Anugwon, 2009). Teachers constitute one group of professionals who have regular contact not only with their students in schools but with the community members who look at them as change agents and role models. The importance of secondary education in the educational system cannot be overemphasized. Apart from serving as the link between primary and tertiary education, it provides an opportunity for a child to acquire additional knowledge, skills, and traits beyond the primary level through their teachers. Teachers are the fulcrum on which the lever of educational system rests (Achimugu, 2012; Ojewusi and Arulogun, 2015). Teachers in secondary school especially due to their influence they have over adolescent and community at large are seen as role model and key stakeholders in dispensing the knowledge and preventive measures of lassa fever (LF) in Enugu east. Certain factors such as age, educational qualification, location and gender can however affect knowledge and preventive measures of lassa fever among secondary school. Age and location was considered in this work.

Enugu is a state in southeastern Nigeria. The principal cities in the state are Enugu, Nsukka, Agbani and Awgu. Enugu State consists of 17 Local Government Areas, Enugu East is inclusive. In Enugu East LGA, there are many private secondary schools and eleven public secondary schools where these teachers are teaching. In the LGA there are health programmes going on, but much has not been done concerning Lassa fever. Moreover, few studies have been carried out on the subject matter in the study area. Therefore, the need to study Lassa fever disease; its knowledge and preventive measures among secondary school teachers becomes timely. This is because when secondary school teachers have knowledge in this area they will dispense the same and knowledge acquired at early stage of adolescent stage help to equip them with knowledge of Lassa fever and the preventive measures hence reducing its outcome and inculcating same to the community at large.

Purpose of the study

The purpose of this study therefore was to find out the knowledge of Lassa fever disease and its preventive measures among secondary school teachers in Enugu East LGA of Enugu state, Nigeria. To achieve this purpose, six research questions were posed thus;

1. What is the level of knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area?
2. What is the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area?
3. What is the level of knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area based on age?
4. What is the level of knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area based on location?
5. What is the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age?
6. What is the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on location?

Hypotheses

1. There is no significant level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age.
2. There is no significant level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on location.

Method

To achieve the objective of the study, the cross-sectional survey research design was employed. The population for the study consisted of all teachers in public secondary schools in Enugu East Local Government Area of Enugu state. The total population of teachers in secondary schools in Enugu East LGA of Enugu state during 2019/2020 academic year was seven thousand five hundred and twenty-four (7524) (Post-Primary School Management Board-PPSMB Enugu East, 2019). A sample of 380 secondary school teachers was chosen for the study. This sample was determined using Yaro Yamen formula. Multi stage sampling procedure was used to select the respondents. First stage involved the use of simple random sampling three secondary schools from urban and rural areas respectively. Second stage is by use of purposive sampling to select senior secondary school teacher and junior secondary school teachers. The third stage involved the use of systematic random sampling to select 64 teachers from the sampled schools. This procedure yielded a total of 384 secondary school teachers used for the study.

The instrument used to collect data was researcher's structured questionnaire titled Knowledge of Lassa fever Disease and Preventive Measure Questionnaire (KLFDPMQ). The KLFDPMQ consist of three sections A, B and C. Section A sought information on respondents' bio data, section B elicited information on respondents' knowledge on Lassa fever while section C elicited information on respondents' knowledge on Lassa fever preventive measures. The instrument was face validated by three experts from Department of Human Kinetics and Health Education, University of Nigeria, Nsukka. Data were collected by the researchers and two research assistants. Of the 384 questionnaires distributed, 372 were completely filled and used for analysis. Data was analysed using SPSS version 22. Frequencies and percentages were used to answer the research questions. In determining the knowledge of Lassa fever and its preventive measures, Ashur's (1977) modified by Okafor (1997) criteria for determining knowledge was used. According to these criteria, scores below 20 per cent were considered very low level of knowledge (VLK), 20-39 per cent was considered low level of knowledge (LK), 40-59 per cent was an average level of knowledge (AK), 60-80 per cent was considered high level of knowledge (HK) while a score above 80 per cent was considered very high level of knowledge (VHK).

Results

Table 1: socio-demographic variables of secondary school teachers in Enugu East Local Government Area (n=372)

Age	frequency	%
20-35	126	33.87
36-50	148	39.78
51-65	98	26.34
Location	frequency	%
Urban	215	57.80
Rural	157	42.20

Table 1 reveals the socio-demographic variables of secondary school teachers in Enugu East Local Government area. The data shows that majority is within the age bracket 36-50 years and majority 57.80 per cent is living in the urban.

Table 2: Knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area (n=372)

Signs and Symptoms	Yes (%)	No (%)	Knowledge
1. Fever	261(70.16)	111(29.84)	HK
2. sore throat	123(33.06)	249 (66.93)	LK
3. chest pain	96 (25.81)	276(74.19)	LK
4. Facial swelling	204(54.84)	168(45.16)	AK
5. Anemia	76 (20.43)	296 (79.57)	LK
6. Nausea and vomiting	159 (42.74)	213 (57.26)	AK
7. Dry mouth	121(32.53)	251(67.47)	LK
8. Fatigue	217(58.33)	155 (41.67)	AK
9. Diarrhoea	180 (48.39)	192(51.61)	AK
10. Abdominal pain	198 (53.23)	174(46.77)	AK
11. Headache	244 (65.59)	128(34.41)	HK
12. Skin rash	135 (36.29)	237(63.71)	LK

Below 20=VLK, 20-39=LK, 40-59=AK, 60-80=HK, 80 & Above=VHK

Table 2 reveals the Knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area. The secondary school teachers have low knowledge on some signs and symptoms such as sore throat (33.06%), chest pain (25.81%), anemia (20.43%), dry mouth (32.53%) and skin rash (36.29%). They have average knowledge of some symptoms such as facial swelling (54.84%), nausea and vomiting (42.74%), fatigue (58.33%), diarrhea (48.39%) and abdominal pain (53.23%). They have high knowledge on signs and symptoms such as fever (70.16%) and headache (65.59%). The data revealed that secondary school teachers in Enugu East Local Government Area have low knowledge in most of the signs and symptoms of lassa fever disease.

Table 3: Knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area (n=372)

Preventive measures	Yes (%)	No (%)	Knowledge
13. Adequate hand washing	210 (56.45)	162(43.55)	AK
14. Maintenance of clean environment	261 (70.16)	111(29.84)	HK
15. Maintenance of personal hygiene	164(44.09)	208(55.91)	AK
16. Dumping refuse far from resident area	102(27.41)	270(72.58)	LK
17. Avoidance of rodent consumption	114(30.65)	258(69.35)	LK
18. Safe food storage	265(71.24)	107(28.76)	HK
19. Good housing standards	93 (25.00)	279(75.00)	LK
20. Avoidance of bush burning	84(22.58)	288(77.42)	LK
21. Blockage of all rat hideouts	215(57.80)	157(42.20)	AK
22. Avoid rat hunting	174(44.77)	198(63.46)	AK
23. Avoid contacts with rat	204(54.84)	168(45.16)	AK
24. Avoid spreading food on road side	91(24.46)	281(75.54)	LK
25. Using good water storage to store water	78 (20.97)	294(79.03)	LK

Below 20=VLK, 20-39=LK, 40-59=AK, 60-80=HK, 80 & Above=VHK

Table 3 reveals the knowledge of lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area. The secondary school teachers have low knowledge on some lassa fever disease preventive measures such as; dumping refuse far from resident area (27.41%), avoidance of rodent consumption (30.65%), good housing standards (25.00%), avoidance of bush burning (22.58%), avoid spreading food on road side (24.46%) and using good water storage to store water (20.97%).

Table 4: Level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age (n=372)

Age	Levels of knowledge					Total
	VLK	LK	AK	HK	VHK	
20-35	0	70(53.85)	46(27.71)	10(13.16)	0	126
36-50	0	45(34.61)	85(51.20)	18(23.68)	0	148
51-65	0	15(11.54)	35(21.09)	48(63.16)	0	98
Overall	0	130(100)	166(100)	76 (100)	0	372

Table 4 shows the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age. The ages between 20-35 years have highest respondent with low knowledge level (53.85%), the ages between 36-50 years have highest respondent with average knowledge level (51.20%), while ages between 51-65 years have highest respondent with high knowledge level (63.16%). The data in this table revealed that age determines the level of knowledge because respondents within the age 51-65 years possess high knowledge on the lassa fever disease preventive measures. Also the data indicated that no age bracket have very low knowledge and very high knowledge.

Table 5: Level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East LGA based on locations (n=372)

Locations	Levels of knowledge					Total
	VLK	LK	AK	HK	VHK	
Urban	0	41(31.54)	124(74.70)	50(65.79)	0	215
Rural	0	89(68.46)	42(25.30)	26(34.21)	0	157
Overall	0	130(100)	166(100)	76 (100)	0	372

Table 5 revealed the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East LGA based on locations. The urban location has the highest respondent with Average knowledge (74.70%) while majority of the respondents (68.46%) from rural location have low knowledge level. The data implies that location determines the level of knowledge because respondents from urban location possess both more average knowledge and high knowledge on lassa fever disease preventive measures. It also indicated that the locations did not have very low knowledge and very high knowledge.

Table 6: Summary of Chi-square (χ^2) Test of significant difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age (n=372).

Age	Levels of knowledge			χ^2 cal	χ^2 crit	df	p-val	decision
	LK	AK	HK					
20-35	70(53.85)	46(27.72)	10(13.16)					
36-50	45(34.61)	85(51.20)	18(23.68)	89.71	15.51	8	0.05	reject
51-65	15(11.54)	35(21.08)	48(63.16)					

From the above table highest proportion of the respondents aged 36-50 years had the highest average knowledge (51.20%) level of Lassa fever disease preventive measures, while the respondents aged 51-65 years have the highest proportion of respondent with high knowledge level (63.16%). The difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers based on age was significant at 0.05 level of significance. This implies that knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area differs according to different age group.

Table 7: Summary of chi-square (χ^2) significant difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on Location (n=372).

Locations	Levels of knowledge			χ^2 cal	χ^2 crit	df	p-val	decision
	LK	AK	HK					
Urban	41(75.13)	124(95.94)	50(43.92)	61.57	9.49	4	0.05	reject
Rural	89(54.87)	42(70.06)	26(32.08)					

The table 7 above shows that higher proportion of respondent in rural location had low knowledge about Lassa fever disease preventive measures, while greater proportion of respondents in urban location have average knowledge (95.94%) and high knowledge(43.92%) respectively about Lassa fever disease preventive measures. The cal. Value of 61.57 is greater than the crit. Value of 9.49 with degree of freedom 4, at 0.05 alpha level, hence the difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers based on location was rejected. This implies that knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area differs significantly in the two locations.

Decision

Table 1 reveals the socio-demographic variables of secondary school teachers in Enugu East Local Government area. The data shows that the majority is within the age bracket 36-50 years and majority 57.80 per cent is living in the urban. Similarly, study conducted by Saka, Gubio, Kerecvel, Saka and Oyemakinde (2017) on Lassa Fever Epidemic in Nigeria, Over 50% of the cases are aged between 25-40 years.

Table 2 reveals the Knowledge of Lassa fever disease possessed by secondary school teachers in Enugu East Local Government Area. The data revealed that secondary school teachers in Enugu East Local Government Area have low knowledge in most of the signs and symptoms of lassa fever disease. This study is contrary to the study conducted by Uduak (2018), reveals that about three-quarters of the respondents knew that LFV is found in rats and transmitted through the consumption of foodstuffs contaminated with rat feces and urine but less than a quarter of the respondents knew that inhalation was also a route of transmission. Hence, it is not an impressive result and shows that more awareness and sensitization programs on LFV need to be embarked on by the government

Table 3 reveals that secondary school teachers in Enugu East Local Government Area possessed low knowledge of lassa fever disease preventive measures. It is in agreement with the study conducted by Saka, Gubio, Kerecvel, Saka & Oyemakinde (2017) on Lassa Fever Epidemic in Nigeria - Outbreak Investigation, Risk Factors and Empirical Analysis from 2012 to 2016. It confirmed that Nigeria is experiencing an outbreak and resurgence of LF, with a high number of cases and deaths as well as a large geographical distribution (Saka, Gubio, Kerecvel, Saka & Oyemakinde, 2017). At the beginning of February, statistics by the Nigeria Center for Disease Control (NCDC), the number outbreak has spread widely (WHO, 2016; Minicuci, et al. 2016). Study have showed that LF, endemic in Nigeria and other West-African countries, is an acute viral hemorrhagic illness (Asogun et al. 2012), which is mainly transmitted by rodents. As found in this study symptoms include fever, vomiting and diarrhoea. In severe cases, the disease also causes bleedings. Morbidity and mortality due to Lassa fever recorded over a period of five years was higher than that of West Africa region (WHO, 2005). Therefore it is important that knowledge of lassa fever preventive measure should be made known via health personals, poster, fliers and media.

Table 4 shows the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age. The data in this table revealed that age determines the level of knowledge because respondents within the age 51-65 years possess high knowledge on the lassa fever disease preventive measures. In contrast, Tobin, Asogun, Isah, Ugege, Ebhodaghe, (2013) opined that One hundred and thirty five (135) health workers participated in the study, the mean age of respondents was 34.5 + 10.9 years.

Table 5 revealed the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East LGA based on locations. The data implies that location determines the level of knowledge because respondents from urban location possess both more average knowledge and high knowledge on lassa fever disease preventive measures. Similar to the findings of Akinbodewa et al. (2016) and Asogun et al. (2012) more than half of the respondents had knowledge of the role of rat (*Mastomys* spp.) in the transmission of the Lassa virus,. However, respondents from the university community were 3 times more likely to have good knowledge of the role of rat in Lassa virus transmission than respondents from the affected local community. The knowledge of the respondents on general prevention of Lassa fever in both local and university

communities was low, similar to the report of Olalekan (2015). In a similar pattern, respondents from the university community were 3 times more likely to have good knowledge of general prevention of Lassa fever than those from local communities.

Table 6 revealed a significant difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on age. Similarly, some studies indicated that the younger age 20-35 has more knowledge than older age 55-70 years (Minicuci, Naidoo, Chatterji, et al. (2016); Asogun, Okokhere, Tobin, Okogbenin, Akpede, et al. (2012).

Table 7 reveals that there is a significant difference on the level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area based on Location. Similar to the findings of Omeh, Achinge and Echekwube, (2017) and Ogoina, (2013) rural dwellers in West Africa are at risk of Lassa fever because of proximity to animal reservoir, open construction of African villages, the practice of drying grains by road sides or outside homes and unprotected grain storage within homes. All these factors are known to facilitate increased rodent-man contact or contamination of food sources by infected rodent secretions (Ogoina, 2013). Lassa fever outbreaks in endemic areas are invariably fuelled by every activity or factor that promotes increased contact between man and rodent. They include poor sanitation, crowding, deforestation, rodent hunting, bush burning, civil unrest, and agricultural activities such as rice cultivation that provide food supplies for rodents

Conclusion

Based on the findings and discussions of the study, the following conclusions were reached.

- Overall, secondary school teachers in Enugu East Local Government Area possessed average level of knowledge of Lassa fever disease preventive measures.
- The level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area was based on age, because most of the secondary school teachers aged 51-65 years (63.16%) have high knowledge
- The level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers in Enugu East Local Government Area was based on location, this because most secondary school teachers in urban location (65.79%) have high knowledge.
- Secondary school teachers in Enugu East L G A had significant difference on level of knowledge of Lassa fever disease preventive measures possessed by secondary school teachers based on age and location at 0.05 level of significance.

Recommendations

On the bases of the findings and conclusions, the following recommendations were made:

State Ministry of Health in conjunction with State Ministry of Education should endeavor to organize seminars and workshops for secondary school teachers' especially younger ones and those living in rural areas.

Heads of Schools in collaboration with primary health care coordinators should embark on activate surveillance systems; maintain universal precaution and community mobilization to ensure that the resurgence does not escalate to epidemic proportion

Secondary school teachers should be given in-house training on these preventive measures to enable them dispense the same to the student under their watch and community at large.

Reference

- Achimugu, L. (2012). The agonies of Nigerian teachers. Ibadan: Heinemann Educational Books.
Journal of Nepal English Language Teachers' Association (NELTA), (17) 1-2.
ISSN: 2091-0487
- Agu, B. N., Agbaje, O. S., & Nnamdi, O. C. (2020) Knowledge of effects of maternal nutrition on birth outcomes among pregnant women attending antenatal care services in Owerri municipal LGA, Imo State. *Nigeria Journal of Health Promotion*, 13, 113-122
- Akinbodewa, A.A., Adejumo, O.A., Alli, E.O., Olarewaju, C.A., Akinbodewa, G.O., Adejumo, O.A., Osho, P.O., Akinfiresoye, A.O. & Balogun, F.O. (2016). Knowledge of Lassa fever among students of a college of education: Call for inclusion in curriculum. *British Journal of Medical Research*, 16, 1-8.
- Asogun D, Okokhere P, Tobin E, Okogbenin SA, Akpede G, et al. (2012) Lassa fever practice challenges in Nigeria. *International Journal of Infectious Diseases* 16: e69.20. <http://pulse.ng/health/lassa-fever-physician-advocates-war-against-rats-id4636312.html>

- Asogun, D.A., Adomeh, D.I., Ehimuan, J., Odiya, I., Hass, M., Gabriel, M., Ölschläger, S., Becker-Ziaja, B., Folarin, O., Phelan, E. & Ehiane, P.E. (2012). Molecular diagnostics for Lassa fever at Irrua specialist teaching hospital, Nigeria: Lessons learnt from two years of laboratory operation. *PLoS Neglected Tropical Diseases*, 6: e1839.
- Azeez-Akande, O. A. (2016). Review of lassa fever, an emerging old world haemorrhagic viral disease in sub-Saharan Africa. *African Journal Clinical Experimental Microbiology* 17(4):282–9. <https://www.ajol.info/index.php/ajcem/article/viewFile/140149/129903> DOI:10.4314/AJCEM.V17I4.9 Corpus ID: 78377941
- Carey D, Kemp G, White H, Pinneo L, Addy R, et al. (1972). Lassa fever epidemiological aspects of the 1970 epidemic, Jos, Nigeria. *Trans R Soc Trop Med Hyg* 66: 402–408.
- CDC (2015). fact sheet on lassa fever;. <https://www.cdc.gov/vhf/lassa/pdf/factsheet.pdf>
- Chime, P., Chime, E. , Ndiubuagu, E. , Ekochin, F. , Arinze-Onyia, S. & Oti, B. (2020). Lassa Fever Case Report: Challenges in Making Early Diagnosis. *Advances in Infectious Diseases*, 10, 228-234. doi: 10.4236/aid.2020.105020.
- Cummins, D., McCormick, J. B., Bennett, D., Samba, J. A., Farrar, B., Machine, S. J., et al. (1990). Acute sensorineural deafness in Lassa fever. *Journal of American Medical Association*, 264, 2093-2096.
- Fisher-Hoch, S. P., Hutwagner, L., Brown, B., McCormick, J. B. (2000) Effective vaccine for lassa fever. *Journal Virology American Society for Microbiology*, 74(15), 6777–6783. <http://www.ncbi.nlm.nih.gov/pubmed/10888616> (Cited 2017 Aug 11)
- Fisher-Hoch, S. P., McCormick, J. B. (2001). Towards a human Lassa fever vaccine. *Revised Medical Virology*, 11, 331-341.
- Hadi, C.M., Goba, A., Khan, S.H., Bangura, J., Sankoh, M., Koroma, S., Juana, B., Bah, A., Coulibaly, M. and Bausch, D.G. (2010). Ribavirin for Lassa fever post-exposure prophylaxis. *Emergency Infectious Diseases*, 16: 2009.
- Johnson, K. M., McCormick, J.B., Webb, P. A., Smith, E.S., Elliott, L. H. & King, I.J. (1987). Clinical virology of Lassa fever in hospitalized patients. *Journal Infectious Diseases*, 155, 456-464.
- Lassa Fever | Viral Hemorrhagic Fever Consortium; 2017. http://vhfc.org/lassa_fever (Cited 2017 Aug 3)
- Liao, B. S., Byl, F.M. & Adour, K. K. (1992). Audiometric comparison of Lassa fever hearing loss and idiopathic sudden hearing loss: evidence for viral cause. *Otolaryngol Head Neck Surgery*, 106:226-9. doi: 10.1177/019459989210600303.
- Lukashevich, I.S. & Pushko, P. (2016). Vaccine platforms to control Lassa fever. *Expert Rev Vaccines*. Taylor & Francis. 15(9):1135–50. <https://www.tandfonline.com/doi/full/10.1080/14760584.2016.1184575>
- McCormick JB, King IJ, Webb PA, Johnson KM, O'Sullivan R, Smith ES, et al. (1987). A case-control study of the clinical diagnosis and course of Lassa fever. *Journal of Infectious Diseases*, 155, 445-455.
- Minicuci N, Naidoo N, Chatterji S, et al. (2016). Data resource profile: Cross-national and cross-study sociodemographic and health-related harmonized domains from SAGE plus ELSA, HRS and SHARE (SAGE+, Wave 1). *International Journal of Epidemiology* 45, 1403-1403j
- Nasir, I. A., Sani, F. M., Augusto, J. & Pereira, A. (2015). Outbreaks, pathogen containment and laboratory investigations of lassa fever in Nigeria: How prepared are we? *International Journal Tropical Disease Health*. 10(1):1–10. www.sciencedomain.org (Cited 2017 Jul 11)
- Ogbu, O., Ajuluchukwu, E. & Uneke, C. J. (2007). Lassa fever in West African sub-region: An overview. *Journal of Vector Borne Diseases*, 44, 1–11. <http://www.mrcindia.org/journal/issues/441001.pdf> (Cited 2017 Jul 10)
- Ogoina, D. (2013) Lassa fever: A clinical and epidemiological review. *Niger Delta Journal Medicine Resources*;1(1):1–10.
- Ojewusi, A. A. & Arulogun, O. S. (2015). Breast cancer knowledge and screening practices among female secondary schools teachers in an urban local government area, Ibadan, Nigeria . *academic journal*, 7,11-25.DOI:10.5897/CRO16.0101
- Olalekan, A.W. (2015). Community awareness and perception towards rodent control: Implications for prevention and control of Lassa fever in urban slums of southwestern Nigeria. *Malta Journal of Health Sciences*, 2, 26-32. <https://www.um.edu.mt/library/oar/handle/123456789/5051>
- Olayemi A, Cadar D, Magassouba N, Obadare A, Kourouma F, Oyeyiola A, et al. (2016). New hosts of the lassa virus. *Scientific Report, Emerging Infectious Diseases* 24(3) DOI:10.3201/eid2403.171905
- Omeh, D. J. , Achinge, G. I. & Echekwube, P. O (2017). Lassa Fever in West Africa: A Clinical and Epidemiological Review. *Journal of Advances in Medicine and Medical Research*, 24, 6. ISSN: 2456-8899, ISSN: 2231-0614



- Oparah, J. S., Fidelis, N. M. & Nwankwo, C. U. (2019). Knowledge of causes and preventive measures of maternal and infant mortality among mothers in Onuimo Local Government Area, Imo States. *Nigeria Journal of Health Promotion*. 12, 105-112
- Richmond, J. K. & Baglolle, D. J. (2017). Lassa fever: epidemiology, clinical features, and social consequences. *British Medical Journal*, 327, 1271-1275. <https://doi.org/10.1136/bmj.327.7426.1271>
- Saka, J.M., Gubio, A.B., Kerecvel, Y.S., Saka, A. O, Oyemakinde, A. (2017) Lassa Fever Epidemic in Nigeria - Outbreak Investigation, Risk Factors and Empirical Analysis from 2012 To 2016. *Journal Community Public Health Nursing*, 3, 170. doi:10.4172/2471-9846.1000170
- Tobin, E.A. , Asogun, D. A., Isah, E.C. , Ugege, O.G. & Ebhodaghe, P. (2013). Assessment of knowledge and attitude towards Lassa fever among Primary care providers in an endemic suburban community of Edo state: implications for control. *Journal of Medicine and Medical Sciences*, 4(8) 311-318, DOI: <http://dx.doi.org/10.14303/jmms.2013.095>
- Uduak, M. E. (2018). "Knowledge, Attitude and Practice to Lassa Fever Virus among Shop Owners in 4 Community Markets in a Military Barrack in Kaduna State, Nigeria". *EC Veterinary Science* 3(3), 379-387.
- Uduma, P., O. (2000) *Concept of knowledge*. Retrieved from <http://nchib.knowledge-24871>. Accessed On 20/09/2016
- WHO fact sheet on lassa fever; 2017. Available:<http://www.who.int/mediacentre/factsheets/fs179/en/>
- World Health Organization (2005). Update on lassa fever in West Africa. <https://apps.who.int/iris/handle/10665/232737>
- World Health Organization (2000). WHO Lassa fever fact sheet No 179. Geneva: WHO.
- Yunusa, T. & Egenti, N. (2015). Understanding lassa fever virus and diversification of the rodent vector in the tropics. *International Journal on Current Medical Research*, 4(6), 372-378. <http://wrpjourals.com/sites/default/files/issues-pdf/1155.pdf> (Cited 2017 Jul 11)