Knowledge, Attitude And Practice Relating To Ebola Virus Disease (EVD) Among Residents Of Some Military Barracks In Kaduna State, Nigeria

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Abstract: The most widespread epidemic of Ebola Virus Disease (EVD) in history is still currently ongoing in three West African countries. A cross sectional study was designed to assess knowledge, attitude and practice of residents of some military barracks in Kaduna, Kaduna state, Nigeria towards EVD. Structured questionnaires were prepared and administered to 300 residents by face to face interview. The questionnaire sought information on demographic characteristics of the residents, Ebola awareness, knowledge, attitude and practice towards EVD. Associations between demographic variables and categorized knowledge, attitude or practice scores were assessed using χ^2 analysis. Out of the 300 respondents, 282(94%) knew that EVD is a highly infectious viral disease, 293(97.7%) knew that EVD is transmitted through contact with infected body fluids and 300(100%) agreed it is good to wash hands often. Respondents who had tertiary education were 0.3 times more likely to have good knowledge (OR=0.34, 95% CI on OR =0.16-0.74) than those with less education. Positive attitude towards EVD increased with increase in age of respondents, with respondents within the age group 20-30 more likely to have negative attitude (OR=2.54, 95% CI on OR =0.86-7.52). Residents of 'Barrack C' were 2.45 times more likely to have good practice than other residents. The findings in this study show that the respondents have a good knowledge, positive attitude and practice towards EVD nonetheless, awareness programs should continue, proper medical care is provided for the sick and protective gears should be available to health care workers.

I. INTRODUCTION

Ebola virus disease (EVD), Ebola hemorrhagic fever (EHF), or simply Ebola is a concerned public health issue in the Sub-Saharan Africa region and globally caused by an Ebola virus. Symptoms start two days to three weeks after contracting the virus, with a fever, sore throat, muscle pain, and headaches. Typically, vomiting, diarrhea, and rash follow, along with decreased function of the liver and kidneys. Around this time, affected people may begin to bleed both within the body and externally [12].

The virus may be acquired upon contact with blood or bodily fluids of an infected human or other animal. Spreading through the air has not been documented in the natural environment [12, 13]. Fruit bats are believed to be carriers and may spread the virus without being affected. Once human infection occurs, the disease may spread between people, as well. Male survivors may be able to transmit the disease via semen for nearly two months. To make the diagnosis, typically other diseases with similar symptoms such as malaria, cholera and other viral hemorrhagic fevers are first excluded. To confirm the diagnosis, blood samples are tested for viral antibodies, viral RNA, or the virus itself [3, 4, 13].

The present ongoing outbreak of EVD in West Africa, with a reported case fatality rate (CFR) of about 71% [5, 12] began in Guinea in December 2013 [9] then, spread to Liberia and Sierra Leone. A small outbreak of twenty cases occurred in Nigeria, and one case occurred in Senegal. The latter two countries were declared disease-free on 20 October 2014 after a 42 day waiting period [6]. In April 2015, the World Health Organization (WHO) reported a total of 25,898 suspected cases and 10,730 deaths.

Some countries have encountered difficulties in their efforts to control the epidemic [7]. In some areas, people have become suspicious of both the government and hospitals, some of which have been attacked by angry protesters who believe either that the disease is a hoax or that the hospitals are responsible for the disease. Many of the areas seriously affected by the outbreak are areas of extreme poverty with limited access to the soap and running water needed to help control the spread of disease [12]. Other factors include reliance on traditional medicine and cultural practices that involve physical contact with the deceased, especially death customs such as washing and kissing the body of the deceased [14, 15]. Some hospitals lack basic supplies and are understaffed, increasing the chance of staff catching the virus themselves. In August 2014, the WHO reported that ten percent of the dead have been health care workers [18].

A study conducted in Kailahun and Kenema regions of Sierra Leone, revealed that only 26.7% and 21.4% respectively, knew that avoiding the dead remains of an infected individual is a way of preventing the transmission of EVD. In addition, the same study illustrated that only 13.3% and 7.1% respectively, knew isolating a family member or neighbor suspected to have contracted EVD is a method limiting the transmission of the disease [11].

A study to determine how prepared Nigerian schools were for EVD prevention and control revealed; 62.9% carried out awareness-raising activities on school assembly ground and 55.2% had some preventive measures in place [10].

In a 26 September statement, the WHO said, "The Ebola epidemic ravaging parts of West Africa is the most severe acute public health emergency seen in modern times". Many have compared this epidemic to the 14th century Black Death pandemic in Europe [7]. No specific treatment for the disease is yet available [19]. Efforts to help those who are infected are supportive and include giving either oral rehydration therapy or intravenous fluids [8, 16]. The disease has a high risk of death, killing between 50% and 90% of those infected with the virus [17].

Gladly, Nigeria was able to stamp out EVD and has been commended by the International community on her success [17]. This has gone a long way to show that if an infected person is cared for properly then, the disease is not a "death sentence" as previously thought. Nigeria is currently being used by other countries as role models to give hope to the infected [18].

II. MATERIALS AND METHODS

A cross sectional study was carried out in four military barracks in Kaduna State, Nigeria. A structured questionnaire was designed and administered by face to face interview, to 300 households within the study area between 5th – 30th June 2015. The household head was selected given his/her influential role on the decisions and practices within the household. Streets were selected by picking every other street along major streets within the study area. An adult in every fifth household was interviewed in Pigeon and English language.

Households that were unwilling to participate in the study were excluded. The options for the choice questions were "Yes", "No" and "don't know/undecided". A marking scheme containing expected correct answers was prepared and used to mark and score the responses. Don't know/undecided responses were considered as wrong answers. For each correct and incorrect answer one and zero points were assigned respectively. The questionnaire was made up of five (5) sections. The demographic information of the respondent was contained in section A. Information on respondents general awareness about Ebola was contained in section B, this had questions on how he/she heard about Ebola, whether he/she knows the telephone hotlines to call and what Ebola is call in his/her local language. Section C contained information about knowledge of Ebola, which included questions on mode of transmission, clinical signs/symptoms & preventive measures. Questions on attitude of respondent towards EVD were provided in section D such as; reuse of injection needles, having direct contact with corpse and participating in EVD vaccine trials. Section E contained questions on practice of the respondents towards EVD. The study was explained to the respondents and questionnaires were completed anonymously. The questionnaire reliability was assessed by the Cronbach's alpha method.

Data were processed using SPSS Version 20 and analysed using χ^2 test of association and odds ratio; confidence intervals (95%) were calculated for odds ratios. Values of $p<0.05$ were considered significant in the χ^2 analysis. Relationships between non-categorized scores were assessed using logistic regression analysis.

The project was approved by the Public Health Specialty Group, Ahmadu Bello University Study Centre, College of Veterinary Surgeons, Nigeria.

III. RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

A total of 300 people participated in the study, 230 males and 70 females with age distribution of 20-30 years (48.3%), 30-40 years (36.3%), and above 40 years (15.3%). Of the 300 respondents, 149(49.7%) were from 'Barrack A', 51(17%) were from 'Barrack B', 51(17%) were from Barrack 'C' while 49(16.3%) were from 'Barrack D'. One hundred and thirty-seven (45.7%) were single while 163(54.3%) were married. Respondents that were commissioned were 62(20.7%) while non-commissioned were 238(79.3%). Based on the level of education of respondents, 29(9.7%) had no formal education, 26(8.7%) had primary school education, 147(49%) had secondary school education and 98(32.7%) had tertiary education.

AWARENESS OF EVD

Respondents who had been visited by health officials before this study were 220(73.3%). Majority of the respondents 293(97.7%) were aware that EVD is transmitted through contact with infected body fluids. Television serves as

the main source of information on Ebola as 126(42%) 'frequently' follow news about the outbreak of Ebola through the television/radio, 25(8.3%) heard through the social media/mobile phone, 15(5%) from newspapers/pamphlets, 9(3%) from church/mosque while 3(1%) from health officials and 122(40.7%) respondents heard through all the above named channels of information. One hundred and thirty-seven (45.7%) respondents knew the telephone hot lines to call while 163(54.3%) did not (Table 1).

Awareness Item	Frequency (N=300)	Percentage (%)
Health officers have talked to me about EVD		
Yes	220	73.3
No	80	26.7
EVD is transmitted through contact with infected body fluids		
Yes	293	97.7
No	7	2.3
How did you hear about EVD		
Television/Radio	126	42.0
Social media/Mobile phone	25	8.3
Newspapers/pamphlets	15	5.0
Church/Mosque	9	3.0
Health officials	3	1.0
All of the above	122	40.7
Do you know the telephone hot lines to call		
Yes	137	45.7
No	163	54.3

Table 1: Respondents awareness of EVD

KNOWLEDGE OF EVD

The mean knowledge score of respondents was 14.5 out of 18 items scored. Majority 291(97%) knew that EVD was ongoing in West Africa, 203(67.7%) knew that EVD does not kill all its victims, 278(92.7%), had heard of persons who survived EVD, 281(93.7%), knew that there were EVD cases in West Africa and 284(94.7%), knew the first case in Nigeria was not diagnosed in Sokoto State. Two hundred and eighty-five (95%) respondents affirmed, that all persons from infected countries did not have EVD, 282(94%) knew that Ebola was a highly infectious viral disease while 253(84.3%) knew, that EVD is found in bats. Also, 293(97.7%) knew that EVD could be spread by eating infected bats, monkeys & bush meat, 274(91.3%) knew that bats, monkeys & bush meat were the possible common source of Ebola virus in Nigeria, 245(81.7%) believed that if you consume fruits that have been partially eaten/bitten by bats or animals, it is likely to be EVD infected. One hundred and ninety-six (65.3%) respondents knew that EVD is not transmitted to humans & animals through insect bites, 211(70.3%) knew EVD is not transmitted through inhalation of contaminated air while, 258(86%) knew that humans can be infected with Ebola and could transmit the disease as well. Most of the respondents 286(95.3%) knew that family members of infected patients were at risk of EVD while, 282(94%) believed that those involved in preparing corpse for burial are at more risk of becoming infected with Ebola. Almost all the respondents 292(97.3%) knew the clinical signs of EVD and 187(62.3%) knew there is no approved vaccination and treatment against Ebola (Table 2). The associations of demographic characteristic of respondents with categorized knowledge scores were assessed (Table 3). Respondents who had formal education were less likely to have poor knowledge (OR=0.240, 95% CI on OR 0.088-

0.653) (Table 4). Level of knowledge on Ebola increased with increased level of education.

Knowledge	Frequency (%)		
	Yes	No	Don't know
Ebola is an ongoing disease in West Africa	291(97%)	99(3%)	0(0%)
EVD kills all its victims	97(32.3%)	203(67.7%)	0(0%)
Some persons have survived EVD	278(92%)	22(7.3%)	0(0%)
There have been EVD cases in West Africa	281(93.7%)	8(2.7%)	11(3.7%)
The first EVD case in Nigeria was diagnosed in Sokoto State	2(0.7%)	284(94.7%)	14(4.7%)
All persons from infected countries have EVD	11(3.7%)	285(95%)	4(1.3%)
Ebola is a highly infectious viral disease	282(94%)	7(2.3%)	11(3.7%)
Ebola virus is found in bats	253(84.3%)	26(8.7%)	21(7%)
Ebola can be spread by eating infected bats, monkeys & bush meat	293(97.7%)	5(1.7%)	2(0.7%)
Bats, monkeys & bush meat are the possible common source of Ebola virus in Nigeria	274(91.3%)	17(5.7%)	9(3%)
If you eat fruits that have been partially eaten/bitten by bats or animals, it is likely to be EVD infected	245(81.7%)	19(6.3%)	36(12%)
Bite from insects can transmit EVD to humans and animals	57(19%)	196(65.3%)	47(15.7%)
EVD is transmitted through inhalation of contaminated air	37(12.3%)	211(70.3%)	52(17.3%)
Humans can be infected with Ebola and can transmit the disease as well	258(86%)	17(5.7%)	25(8.3%)
Family members of infected patients are at risk of EVD	286(95.3%)	3(1%)	11(3.7%)
Those involved in preparing corpse for burial are at more risk of becoming infected with Ebola virus	282(94%)	16(5.3%)	2(0.7%)
Fever, vomiting, diarrhea & bleeding are signs of Ebola in humans	292(97.3%)	3(1%)	5(1.7%)
There is approved vaccination and treatment against Ebola	187(62.3%)	45(15%)	68(22.7%)

Table 2: Responses of respondents to knowledge of EVD

Variable	Poor Knowledge	Good Knowledge	χ2	df	p-value
Address					
Barrack A	46(30.872)	103(69.127)	6.236	3	0.10
Barrack B		9(17.647)	42(82.352)		
Barrack C	12(23.529)	39(76.470)			
Barrack D	8(16.326)	41(83.673)			
Age					
20-30	32(22.068)	113(77.931)	5.811	2	0.05
31-40	25(22.935)	84(77.064)			
>40	18(39.130)	28(60.869)			
Sex					
Male	57(24.782)	173(75.217)	0.025	1	0.87
Female	18(25.714)	52(74.285)			
Marital status					
Single	40(29.197)	97(70.802)	2.369	1	1.12
Married	35(21.472)	128(78.529)			
Rank					
Commission	12(19.354)	50(80.645)	1.328	1	0.24
Non-commission	63(26.470)	175(73.529)			
Qualification					
No formal education	16(55.172)	13(44.827)	32.777	3	0.00
Primary	13(50.0)	13(50.0)			
Secondary	35(23.809)	112(76.190)			
Tertiary	11(11.224)	87(88.775)			
Religion					
Christianity	135(72.972)	50(27.027)	1.058	1	0.30
Islam	90(78.260)	25(21.739)			
Household No.					
1-2	48(64.0)	27(36.0)	9.311	3	0.02
3-4	68(73.118)	25(26.881)			
5-6	45(80.357)	11(19.642)			
>6	64(84.210)	12(15.789)			
Ethnic group					
Hausa/Fulani	81(79.411)	21(20.588)	6.252	4	0.18
Yoruba	34(80.952)	8(19.047)			
Igbo/Ibibio	44(74.576)	15(25.423)			
Idoma/Igala/Tiv	21(60.0)	14(40.0)			
Others	45(72.580)	17(27.419)			

Table 3: Associations of demographic variables of the respondents with knowledge of EVD

Variable	Poor knowledge	Good knowledge	Crude odds ratio (95%CI)	Adjusted odds ratio (95%CI) Poor	Adjusted odds ratio (95% CI) Good
Address					
Barrack A	46(30.872)	103(69.127)	1.000		
Barrack B	9(17.647)	42(82.352)	0.61(0.22-1.70)		
Barrack C	12(23.529)	39(76.470)	0.75(0.22-2.55)		
Barrack D	8(16.326)	41(83.673)	0.67(0.20-2.16)		
Age					
20-30	32(22.068)	113(77.931)	1.000		
31-40	25(22.935)	84(77.064)	3.97(1.62-9.71)	0.37(0.17-0.83)	2.64(1.20-5.78)
>40	18(39.130)	28(60.869)	2.11(0.87-5.10)	0.44(0.19-0.99)	2.25(1.00-5.09)
Sex					
Male	57(24.782)	173(75.217)	1.000		
Female	18(25.714)	52(74.285)	1.38(0.61-3.11)		
Marital status					
Single	40(29.197)	97(70.802)	1.000		
Married	35(21.472)	128(78.529)	0.65(0.31-1.39)		
Rank					
Commission	12(19.354)	50(80.645)	1.000		

Non-commission	63(26.470)	175(73.529)	0.97(0.35-2.62)			
Qualification						
No education	16(55.172)	13(44.827)	1.000			
Primary	13(50.0)	13(50.0)	0.07(0.02-0.24)	9.94(3.67-26.88)	0.10(0.03-0.27)	
Secondary	35(23.809)	112(76.190)	0.12(0.03-0.43)	6.99(2.53-19.29)	0.14(0.05-0.39)	
Tertiary	11(11.224)	87(88.775)	0.24(0.08-0.65)	2.88(1.34-6.19)	0.34(0.16-0.74)	
Religion						
Christianity	135(72.972)	50(27.027)	1.000			
Islam	90(78.260)	25(21.739)	0.40(0.19-0.81)			
Household No.						
1-2	48(64.0)	27(36.0)	1.000			
3-4	68(73.118)	25(26.881)	0.29(0.11-0.77)	2.97(1.28-6.86)	0.33(0.14-0.77)	
5-6	45(80.357)	11(19.642)	0.39(0.15-0.98)	1.83(0.81-4.14)	0.54(0.24-1.22)	
>6	64(84.210)	12(15.789)	0.70(0.24-2.00)	1.41(0.53-3.70)	0.70(0.27-1.86)	
Ethnic group						
Hausa/Fulani	81(79.411)	21(20.588)	1.000			
Yoruba	34(80.952)	8(19.047)	1.45(0.59-3.54)			
Igbo/Ibibio	44(74.576)	15(25.423)	2.38(0.77-7.40)			
Idoma/Igala/Tiv	21(60.0)	14(40.0)	1.94(0.73-5.15)			
Others	45(72.580)	17(27.419)	0.56(0.19-1.61)			

Table 4: Associations of demographic variables with knowledge of EVD using Logistic Regression Analysis

ATTITUDE TOWARDS EVD

Majority of the respondents 216(72%) said that, they did not allow members of their household to eat fruits that have been partially eaten/bitten by bats or animals, 218(72.7%) said they avoided contact with people suspected of EVD, 290(96.7%) said that they had symptoms like fever, vomiting, bleeding, etc., they would report to the hospital while 176(58.7%) said that they would not sit in a vehicle with someone from an infected country. Most of the respondents 221(73.7%) agreed to avoid funeral rites that require direct contact with the corpse, 201(67%) said that they would avoid reuse of injection needles but, 186(62%) disagreed to welcome a person who has recovered from EVD to their homes. One hundred and ninety-five (65%) were of the opinion that people who have had direct contact with EVD patients should be separated from people who have not while majority 229(76.3%) affirmed that they would participate in an EVD vaccine trial (Table 5). Categorized attitude scores showed an association with rank and educational qualification of respondents (χ^2 =15.822, df=1, p=0.000 and χ^2 =20.819, df=3, p=0.000 respectively) (Table 6). Positive attitude towards Ebola increased with increase in level of education, with respondents with no formal education more likely to have negative attitude (Table 7).

Attitude items	Frequency (%)	
	Agree	Disagree
I do not allow members of my household to eat fruits that have been partially eaten/bitten by bats or animals in my compound	216(72)	84(28)
I will avoid contact with people suspected of EVD	218(72.7)	82(27.3)
If I have symptoms like fever, vomiting, diarrhea, bleeding, etc., I will report to the hospital	290(96.7)	10(3.3)
I will sit in a vehicle with someone from Ebola infected country	124(41.3)	176(58.7)
I will avoid funeral rituals that require direct contact with the corpse	221(73.7)	79(26.3)
I avoid reuse of injection needles	201(67.0)	99(33.0)
I will not welcome a person who has recovered from EVD to my home	114(38.0)	186(62.0)
People who have had direct contact with EVD patients should be separated from people who have not	195(65.0)	105(35.0)
I will participate in an EVD vaccine trial	229(76.3)	71(23.7)

Table 5: Responses of respondents on attitude towards EVD

Variable	Negative attitude	Positive attitude	χ^2	df	p-value
Address					
Barrack A	33(22.14)	116(77.85)	18.504	3	0.00
Barrack B	6(11.76)	45(88.23)			

Barrack C	8(15.68)	43(84.31)			
Barrack D	22(44.89)	27(55.10)			
Age					
20-30	44(30.34)	101(69.65)	8.579	2	0.01
31-40	18(16.51)	91(83.48)			
>40	7(15.21)	39(84.78)			
Sex					
Male	50(21.73)	180(78.26)	0.885	1	0.34
Female	19(27.14)	51(72.85)			
Marital status					
Single	32(23.35)	105(76.64)	0.018	1	0.89
Married	37(22.69)	126(77.30)			
Rank					
Commission	26(41.93)	36(58.06)	15.822	1	0.00
Non-commission	43(18.06)	195(81.93)			
Qualification					
No formal education	11(37.93)	18(62.06)	20.819	3	0.00
Primary	6(23.07)	20(76.92)			
Secondary	18(12.24)	129(87.75)			
Tertiary	34(34.69)	64(65.30)			
Religion					
Christianity	134(72.43)	51(27.56)	5.685	1	0.01
Islam	97(84.34)	18(15.65)			
Household No.					
1-2	45(60.00)	30(40.00)	24.144	3	0.00
3-4	77(82.79)	16(17.20)			
5-6	40(71.42)	16(28.57)			
>6	69(90.78)	7(9.21)			
Ethnic group					
Hausa/Fulani	71(69.60)	31(30.39)	11.415	4	0.02
Yoruba	40(95.23)	2(4.76)			
Igbo/Ibibio	44(74.57)	15(25.42)			
Idoma/Igala/Tiv	28(80.00)	7(20.00)			
Others	48(77.41)	14(22.58)			

Table 6: Associations of demographic variables of the respondents with attitude to EVD

Variable	Negative attitude	Positive attitude	Crude odds ratio(95%CI)	Adjusted odds ratio (95% CI) Negative	Adjusted odds ratio (95% CI) Positive
Address					
Barrack A	33(22.14)	116(77.85)	1.000		
Barrack B	6(11.76)	45(88.23)	5.66(2.26-14.14)	0.19(0.07-0.47)	5.14(2.09-12.60)
Barrack C	8(15.68)	43(84.31)	8.12(2.45-26.93)	0.12(0.03-0.41)	7.81(2.39-25.51)
Barrack D	22(44.89)	27(55.10)	4.16(1.38-12.52)	0.24(0.08-0.74)	4.04(1.34-12.16)
Age					
20-30	44(3034)	101(69.65)	1.000		
31-40	18(16.51)	91(83.48)	0.37(0.12-1.11)	2.54(0.86-7.52)	0.39(0.13-1.16)
>40	7(15.21)	39(84.78)	0.71(0.22-2.29)	1.57(0.50-4.92)	0.63(0.20-1.99)
Sex					
Male	50(21.73)	180(78.26)	1.000		
Female	19(27.14)	51(72.85)	1.25(0.55-2.83)		
Marital status					
Single	32(23.35)	105(76.64)	1.000		
Married	37(22.69)	126(77.30)	0.76(0.35-1.64)		
Rank					
Commission	26(41.93)	36(58.06)	1.000		
Non-commission	43(18.06)	195(81.93)	0.52(0.21-1.28)	1.82(0.74-4.43)	0.54(0.22-1.33)
Qualification					
No education	11(37.93)	8(62.06)	1.000		
Primary	6(23.07)	20(76.92)	0.46(0.15-1.45)	2.04(0.66-6.33)	0.48(0.15-1.50)
Secondary	18(12.24)	129(87.75)	1.08(0.28-4.11)	0.88(0.24-3.25)	1.13(0.30-4.17)
Tertiary	34(34.69)	64(65.30)	2.07(0.83-5.13)	0.48(0.19-1.18)	2.06(0.84-5.04)
Religion					
Christianity	134(72.43)	51(27.56)	1.000		
Islam	97(84.34)	18(15.65)	0.61(0.27-1.36)	1.72(0.79-3.76)	0.57(0.26-1.26)
Household No.					
1-2	45(60.00)	30(40.00)	1.000		
3-4	77(82.79)	16(17.20)	0.22(0.07-0.62)	4.34(1.54-12.20)	0.23(0.08-0.64)
5-6	40(71.42)	16(28.57)	0.59(0.20-1.73)	1.65(0.57-4.79)	0.60(0.20-1.74)
>6	69(90.78)	7(9.21)	0.61(0.20-1.89)	1.59(0.52-4.82)	0.62(0.20-1.90)
Ethnic group					
Hausa/Fulani	71(69.60)	31(30.39)	1.000		
Yoruba	40(95.23)	2(4.761)	0.65(0.25-1.66)	1.64(0.65-4.09)	0.61(0.24-1.52)
Igbo/Ibibio	44(74.57)	15(25.42)	4.09(0.75-22.31)	0.24(0.04-1.30)	4.14(0.76-22.36)
Idoma/Igala/Tiv	28(80.00)	7(20.00)	0.72(0.26-2.02)	1.33(0.48-3.68)	0.75(0.27-2.07)
Others	48(77.41)	14(22.58)	0.79(0. 23-2.72)	1.35(0.40-4.55)	0.73(0.22-2.48)

Table 7: Associations of demographic variables with attitude of EVD using Logistic Regression Analysis

PRACTICES TOWARDS EVD

All the respondents 300(100%) affirmed that it was good to wash hands with soap & water since the outbreak of EVD, 295(98.3%) said that washing hands often could prevent EVD, 290(96.7%) agreed that it was good to avoid contact with blood and body fluids of other people. One hundred and ninety-five (65%) said that it was good to take antibiotics regularly for EVD prevention while 131(43.7%) said that they would not drink traditional herbs to prevent them from

contracting EVD. Most of the respondents 288(96%) agreed that medical workers should always wear protective clothing while 298(99.3%) said that undertakers should wear protective clothing (Table 8). Respondents of the age groups 20-30, 31-40 and married respondents had higher acceptable practice scores than unmarried respondents. There was statistically significant difference in the educational qualification characteristic of respondent, with those with secondary and tertiary educational qualification having higher practice scores (χ^2 =33.411, df=3, p=0.000) (Table 9). Good practice increased with increasing level of education. Also, the respondents from 'Barrack C' had higher acceptable practice scores, followed by those from 'Barrack D' (χ^2 =13.661, df=3, p=0.003) (Table 10). There was statistical significant association between the age groups (OR=2.905, 95% CI on OR=1.097-7.693) and marital status of respondents (OR=0.893, 95% CI on OR=0.384-2.075), with good practice decreasing with level of educational qualification (Table 10).

Practice items	Frequency (%)		
	Yes	No	Don't know
It is good to wash hands with soap & water since the outbreak of EVD	300(100)	0(0)	0(0)
Washing hands often can prevent EVD	295(98.30)	3(1.00)	2(0.70)
It is good to avoid contact with blood & body fluids of other people	290(96.70)	10(3.30)	0(0)
It is good to take antibiotics regularly for EVD Prevention	195(65.00)	56(18.70)	49(16.30)
It is good to drink traditional herbs to prevent you from contracting EVD	60(20.00)	131(43.70)	109(36.30)
Medical workers should always wear protective clothing	288(96.00)	12(4.00)	0(0)
Undertakers should wear protective clothing	298(99.30)	2(0.70)	0(0)

Table 8: Responses of respondents on practice towards EVD

Variable	Poor practice	Good practice	χ^2	df	p-value
Address					
Barrack A	35(23.48)	114(76.51)	13.661	3	0.00
Barrack B	6(11.76)	45(88.23)			
Barrack C	2(3.92)	49(96.07)			
Barrack D	5(10.20)	44(8979)			
Age					
20-30	24(16.55)	121(83.44)	8.009	2	0.01
31-40	11(10.09)	98(89.90)			
>40	13(28.26)	33(71.73)			
Sex					
Male	38(16.52)	192(83.47)	0.200	1	0.65
Female	10(14.28)	60(85.71)			
Marital status					
Single	26(18.97)	111(81.02)	1.664	1	0.19
Married	37(22.69)	126(77.30)			
Rank					
Commission	10(16.12)	52(83.87)	0.001	1	0.97
Non-commission	38(15.96)	200(84.03)			
Qualification					
No formal education	12(41.37)	17(58.62)	33.411	3	0.00
Primary	11(42.30)	15(57.69)			
Secondary	15(10.20)	132(89.79)			
Tertiary	10(10.20)	88(89.79)			
Religion					
Christianity	151(81.62)	34(18.37)	2.031	1	0.15
Islam	101(87.82)	14(12.17)			
Household No.					
1-2	61(81.33)	14(18.66)	3.897	3	0.27
3-4	74(79.56)	19(20.43)			
5-6	50(89.28)	6(10.71)			
>6	67(88.15)	9(11.84)			
Ethnic group					
Hausa/Fulani	89(87.25)	13(12.74)	4.569	4	0.33
Yoruba	38(90.47)	4(9.52)			
Igbo/Ibibio	49(83.05)	10(16.94)			
Idoma/Igala/Tiv	28(80.00)	7(20.00)			
Others	48(77.41)	14(22.58)			

Table 9: Associations of demographic variables of respondents with practice of EVD

Variable	Poor practice	Good practice	Crude odds ratio(95%CI)	Adjusted odds ratio(95%CI) Poor	Adjusted odds ratio(95%CI) Good
Address					
Barrack A	35(23.48)	114(76.51)	1.000		
Barrack B	6(11.76)	45(88.23)	5.66(0.17-1.82)	1.94(0.66-5.68)	0.51(0.17-1.50)
Barrack C	2(3.92)	49(96.07)	0.84(0.20-3.48)	1.34(0.35-5.07)	0.74(0.19-2.82)
Barrack D	5(10.20)	44(89.79)	2.58(0.42-15.71)	0.40(0.07-2.34)	2.45(0.42-14.09)
Age					
20-30	24(16.55)	121(83.44)	1.000		
31-40	11(10.09)	98(89.90)	2.90(1.09-7.69)	0.37(0.14-0.93)	2.68(1.06-6.74)
>40	13(28.26)	33(71.73)	3.20(1.10-9.27)	0.27(0.10-0.74)	3.63(1.34-9.84)
Sex					
Male	38(16.52)	192(83.47)	1.000		
Female	10(14.28)	60(85.71)	0.97(0.37-2.53)		
Marital status					
Single	26(18.97)	111(81.02)	1.000		
Married	22(13.49)	141(86.50)	0.89(0.38-2.07)		
Rank					
Commission	10(16.12)	52(83.87)	1.000		
Non-commission	38(15.96)	200(84.03)	0.73(0.25-2.12)		
Qualification					
No education	12(41.37)	17(58.62)	1.000		
Primary	11(57.69)	15(57.69)	0.11(0.03-0.39)	7.31(2.43-21.92)	0.13(0.04-0.41)
Secondary	15(10.20)	132(89.79)	0.17(0.04-0.65)	4.66(1.57-13.80)	0.21(0.07-0.63)
Tertiary	10(10.20)	88(89.79)	0.58(0.19-1.78)	1.27(0.52-3.08)	0.78(0.32-1.88)
Religion					
Christianity	51(81.62)	34(18.37)	1.000		
Islam	101(87.82)	14(12.17)	0.40(0.17-0.97)	2.37(1.05-5.31)	0.42(0.18-0.94)
Household No.					
1-2	61(81.33)	14(18.66)	1.000		
3-4	74(79.56)	19(20.43)	0.79(0.25-2.47)		
5-6	50(89.28)	6(10.71)	0.50(0.17-1.41)		
>6	67(88.15)	9(11.84)	1.31(0.35-4.82)		
Ethnic group					
Hausa/Fulani	89(87.25)	13(12.74)	1.000		
Yoruba	38(90.47)	4(9.523)	1.92(0.70-5.27)		
Igbo/Ibibio	49(83.05)	10(16.94)	2.71(0.68-10.79)		
Idoma/Igala/Tiv	28(80.00)	7(20.00)	1.86(0.62-5.54)		
Others	48(77.41)	14(22.58)	1.40(0. 40-4.95)		

Table 10: Associations of demographic variables with practice of EVD using Logistic Regression Analysis

MISCONCEPTIONS ABOUT EVD

There are serious misconceptions:
✓ Almost a 20% of the respondents think one can get Ebola from Mosquitoes/insect bites.
✓ 12% also believe Ebola is airborne.
✓ 20% believe Ebola can be prevented successfully by drinking traditional herbs.
✓ 65% believe that taking antibiotics is good for prevention against Ebola.

STIGMA AND DISCRIMINATION TOWARDS EVD VICTIMS

There is very high level of stigma and discrimination towards Ebola victims:
✓ About 60% will not sit in a vehicle with someone from an EVD infected country.
✓ 62% would not welcome someone who has recovered from EVD into their homes.
✓ 35% not believe that EVD infected people should be separated from uninfected people.
✓ 3.3% will not go to the hospital if they have symptoms resembling Ebola.

IV. DISCUSSIONS

Overall, Ebola awareness was high, based on the median correct responses for the 39 statements in the scored section of the KAP survey. At the same time, this survey revealed several important areas of concern as Nigeria sought to prevent the occurrence of Ebola epidemic.

The findings in this report are subject to at least two main limitations. First, the selection of communities within Kaduna State was non-random. Second, a standardized form was used for the survey, but none of the responses was open-ended.

Therefore, limited information was available beyond the binary agree or disagree responses.

This Ebola KAP is believed to be the first survey that was conducted during this Ebola outbreak to assess the effectiveness of initial Ebola messaging at the community level across a wide geographical area in Kaduna state. The recent recurrence of Ebola cases in Liberia highlights the continued risk for transmission in the region. Future health awareness activities, especially in Guinea and Sierra Leone where the epidemic is not fully contained, might benefit from emphasizing the signs and symptoms of Ebola, addressing fears about seeking treatment and placing additional focus on communities where incidence of Ebola is low as a preparedness measure. A follow-up survey might be needed to assess the current Ebola awareness among the public more than a year after this Ebola outbreak began. Continued efforts are needed to address cultural practices and beliefs to interrupt Ebola transmission.

In this study, education played a vital role in the level of knowledge, attitude and practice of the respondents towards Ebola Virus Disease (EVD) as, the respondents who had tertiary education scored higher than those in the other categories. This may be because the respondents in this group had access to various mass media on EVD as previous studies have shown that EVD thrived more in remote areas occupied by less educated populations lacking basic needs [2, 11]. Almost all of the respondents (98%) knew that EVD was transmitted by contact with infected body fluids. This is an impressive result, compared with findings from the independent Ebola surveys conducted by the Lagos State Government and the Centre for Public Policy Alternatives [1], showing that the various awareness and sensitization programs on EVD presently embarked on by the government and development partners was making gains.

The mean knowledge score in this study was 14.5 out of 18 and 94% of the respondents scored above average which is higher than scores from previous studies [11]. This may be because this study was conducted in a more enlightened population (Military Cantonment). Here, every home visited had a television set, radio set and the respondents also, owned mobile telephone sets. These are the fastest routes of communication presently as shown by the number of respondents that had heard about EVD through these media. More than 70% of the respondents were visited by health officials indicating how serious the military authority rose to the EVD challenge. As, it is the responsibility of the military authority to bury her deceased personnel, trained military undertakers perform this act ensuring proper handling of the corpse as recommended by the WHO [16] thus, traditional burial customs observed by civilian populations are not practiced this, limits the number of people that come in contact with the deceased corpse.

The average score for respondents' attitude towards EVD was 6.8 out of 9 with 96.7% agreeing to seek prompt medical attention when sick or take their sick dependents to the hospital. This is not surprising because, any incapacitated military personnel will be put 'out of strength' by the authority. To this end, there are well equipped medical facilities in the cantonment in addition; the authority carries out fitness tests regularly to determine those that will remain 'on the job'. Medical treatments for military personnel and their dependents are free in military hospitals so, there is no fear of incurring huge medical bills [1, 2].

Almost everything is given to military personnel free such as, housing, electricity, pipe borne water, medical treatment, etc., this maybe the reason why 100% of the respondents had good attitude of hand washing with soap and water since the outbreak of EVD as, the authority apart from educating her personnel on the preventive measures of EVD, provided them with free soaps and sanitizers needed for frequent washing of hands. Compared to other studies [1, 11] where respondents believed that non-medical practice will prevent EVD only 20% respondents from this study agreed that drinking traditional herbs will prevent EVD. This may be because, the military setting and training does not encourage personnel to have strong ties with their religion, local customs and traditions [2, 15] thus, mandated to use the medical facilities when the need arises. There was an average score of 5.2 out of 7 in the attitude of the respondents towards EVD.

V. CONCLUSIONS

Majority of the sampled population have good knowledge of the Ebola virus disease, the mode of transmission and preventive measures. Some of the perceptions that Ebola can be spread through mosquito bites, traditional herbs and antibiotics can be used for prevention are not consistent with generally acceptable scientific beliefs. Most of people know their first point of call for medical service would be the hospital if suspected to have Ebola signs and some do not mind being monitored in quarantine centers if suspected to have come in contact with an Ebola patient.

VI. RECOMMENDATIONS

There is still need for more advocacy and sensitization of the general public on EVD and its mode of operations. This may take the form of community awareness campaigns or other means such as use of print and electronic media. More emphasis should be placed on television, radio, mobile telephone and social media campaigns, as these are the main information media used by people to get news on Ebola.

There is need for legislative measure to ensure that all healthcare institutions have basic resources such as isolation centers and kits for the management of Ebola in their facilities. To this end, the government must be willing to provide modern isolation equipment to each Local Government Area, subsidize or provide free standard equipment gowns, gloves and masks. Also, give life insurance policy to health workers and make it compulsory for undertakers to use protective gear.

ACKNOWLEDGEMENTS

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