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EVALUATION OF KNOWLEDGE, ATTITUDE AND PRACTICES RELATING TO EBOLA VIRUS DISEASE (EVD) PREVENTION AND CONTROL IN OGUN STATE, NIGERIA

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ABSTRACT

A cross sectional study was carried out from 1st June to 30th June, 2015, to assess the knowledge, attitude and practices related to the prevention and control of Ebola Virus Disease in Ogun State, Nigeria. A semi-structured questionnaire was used to gather data from 300 respondents selected by multistage sampling technique across four local governments in the state. The data collected included socio-demographics, awareness, knowledge, practices and misconceptions about EVD among the respondents. Knowledge of respondents about EVD was assessed on 20 items with a 3-points rating scale of good >14, fair 10-14 and poor <10. Of the 308 respondents that took part in the study, 111 (36%) were males and 127 (41.2%) rural dwellers and 43 (14%) of the respondents were between the ages of 9-18, 139 (45.1%) were between the ages of 19-25, 83 (26.9%) were between the ages of 26-35 and the remaining 43 (14%) were above 35 years of age. Five (1.6%) of the respondents had no formal education, 9 (2.9%) had primary education, 133 (43.2%) had secondary education and 161 (52.3%) had tertiary education. All the respondents (100%) have heard of Ebola. Only 2.6% had poor knowledge of Ebola with 12% being able to identify four misconceptions surrounding Ebola transmission and prevention. Respondents in the study reported various changes in practices such as avoidance of physical contact (33.4%), regular hand washing with soap and water (69.2%) and hand cleaning with other disinfectants (61.7%), nevertheless 73.1% of the respondents will not report infected member of the family. Television was the major source of receiving information with the internet being the trusted source of receiving information on Ebola by the respondents. In Ogun State, awareness and comprehensive knowledge on Ebola Virus Disease transmission is high with good knowledge on misconceptions. There is need to emphasize importance of reporting suspected case(s) to the hospital

Keywords: Ebola, Epidemic, knowledge, practices, Ogun State

INTRODUCTION

Ebola virus disease (EVD is an acute, viral, hemorrhagic and often fatal disease of humans and other primates. It is a dreaded, highly contagious disease, and has become a major Public Health concern in the developing countries worldwide. Ebola virus belongs to the family *Filoviridae*, in the order Mononegavirales which includes *Rhabdoviridae* and *Paramyxoviridae* (Muyembe-Tamfum *et*

al., 2012). Signs and symptoms typically start as a fever, sore throat, muscle pain, and headaches between two days and three weeks after contracting the virus. Then, vomiting, diarrhea and rash usually follow, along with decreased function of the liver and kidneys, this is often followed by internal and external bleeding (WHO, 2014a). The case fatality is between 25 percent and 90 percent, averaging out at 50 percent.

The virus is highly transmissible by direct contact with infected blood, secretions, tissues, organs and other bodily fluids from dead or living infected persons (Bausch *et al.,* 2007). Transmission via inanimate objects contaminated with infected bodily fluids (fomites) is possible (Colebunders *et al.,* 2000). Fruit bats are believed to be the normal carrier in nature, able to spread the virus without being affected by it. Humans become infected by contact with the bats or with a living or dead animal that has been infected by bats. Other diseases such as malaria, cholera, typhoid fever, meningitis and other viral hemorrhagic fevers may resemble EVD. According to the WHO, the control of EVD outbreak requires coordinated medical services, along with some level of community engagement. Prevention includes limiting the spread of disease from infected animals to humans by handling potentially infected bush meat only while wearing protective clothing and by thoroughly cooking it before consumption, wearing proper protective clothing and washing hands when around a person with the disease, as well as handling of samples of body fluids *and tissues from people with special caution"* (WHO, 2014a).

The incubation period is usually four to ten days but can vary from 2 to 21 days (Charles, 2014). Recovery may begin between 7 and 14 days after the start of symptoms (Magill and Alan, 2013). Death, if it occurs, follows typically 6 to 16 days from the start of symptoms and is often due to low blood pressure from fluid loss (Ruzek, 2014). In general, bleeding often indicates a worse outcome, and this blood loss may result in death (Gatherer, 2014). People are often in a coma near the end of life and those who survive often have ongoing muscle and joint pain, liver inflammation, and decreased hearing among other difficulties (Magill and Alan, 2013). Additionally they develop antibodies against Ebola that last at least 10 years but it is unclear if they are immune to repeated infections. If someone survives Ebola, they can no longer transmit the disease (CDC, 2014).

Outbreak in West Africa, (first cases notified in March, 2014), is the largest and most complex Ebola outbreak since the Ebola virus was first reported in 1976 (WHO, 2014b). There have been more cases and deaths in this outbreak than all others combined. It has also spread between countries starting in Guinea then spreading across land borders to Sierra Leone and Liberia, by air (1 traveller only) to Nigeria, and by land (1 traveller) to Senegal (CDC, 2014). Aside from the human cost, the outbreak has severely eroded the economies of the affected countries (Joshi *et al.,* 2015). Hence, assessing the knowledge, attitude and practices associated with EVD prevention and control in order to identify knowledge gap that may encourage widespread of the disease in case of reintroduction to Nigeria is required.

METHODOLOGY

Study area

The study was carried out in selected local government areas in Ogun State, Nigeria. Ogun State is located on the coordinates 7º

0'N 3º 35'E. The state occupies a total land mass of 16,980.55km², a total population of 3,751,140 and a population density of 220/ km², as revealed in the 2006 census. It is located in western Nigeria; it borders Lagos State to the south, Oyo and Osun States to the north, Ondo State to the east and the republic of Benin to the west. It has 20 local government areas and 4 geopolitical zones (Canback, 2008).

STUDY DESIGN

A cross-sectional survey was carried out in the selected local government areas in Ogun State. This study involved 308 face to face interviews with the respondents.

SAMPLE SIZE AND SAMPLING TECHNIQUE

Epi info software was used to get the sample size with the following factors; 90% confidence level, 5% confidence limit; 50% expected frequency and a 10% non-response rate. Hence the minimum sample size was calculated to be 300. A Multi-stage Sampling Technique was used to select the respondents. Three border local governments; Ipokia, Imeko Afon, Ijebu North and one other; Abeokuta South was purposively selected for the study. Convenient sampling technique was used in selecting respondents from those selected local governments.

Data were collected using semi- structured questionnaire focusing on socio-demographic characteristics, disease knowledge, sources of information, and outbreak prevention readiness of Ebola virus disease in Ogun State. Knowledge, attitude and practices related to Ebola virus disease was also assessed using sets of questions ranging from agent and symptoms of Ebola virus disease to mode of transmission and methods of prevention at community levels; risk factors associated with the transmission of the disease such as hand washing practices, handling of corpses, handling of infected individual and general health safety behaviours. The questionnaire was initially subjected to a pilot test on 50 respondents before usage.

Knowledge was determined after interviews were completed by scoring the respondents from 20 questions based on comprehensive knowledge about Ebola. Respondents that scored below 10 were considered as having poor knowledge while those that got 10-14 questions correctly were considered good, excellent knowledge involved getting 15-20 questions correctly.

DATA ANALYSIS

Descriptive data were presented as charts and in frequency distribution tables. Chi-square test of association was used with confidence level set at $P < 0.05$ to ascertain associations between categories of respondents and Knowledge, Attitude, and Practices variables.

Figure 1: Ogun State showing the study area

RESULTS

Socio-demographic characteristics of the respondents.

Of the 308 respondents that took part in the study, 36% were males, while the remaining 64% were females. The rural dweller constitutes 41.2% of the respondents while the remaining 58.8% were urban dwellers. Fourteen percent of the respondents were between the ages of 9-18, 45.1% were between the ages of 19-25, 26.9% were between the ages of 26-35 and the remaining 14% were above 35 years of age. Christians constituted 73.4% of the respondents while Muslims constituted 26.6% of the total respondents. 72.1% were single, 26.0% were married, 1% were divorced and only 1% were widowed. Five (1.6%) of the respondents had no formal education, 2.9% had primary education, 43.2% had secondary education and 52.3% had tertiary education. Civil servants constituted 33.8% of the respondents, 9.1% were self-employed and 57.1% were students (Table 1).

TABLE 1: SOCIO DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Variables	Frequency	(%)
Location		
Rural dweller	127	41.2
Urban dweller	181	58.8
Sex		
Male	111	36.0
Female	197	64.0
Age		
9-18	43	14.0
19-25	139	45.1
26-35	83	26.9
Above 35 years	43	14.0
Religion		
Christianity	226	73.4
Islam	82	26.6
Marital status		
Single	222	72.1
Married	80	26.0
Divorced	3	1.0
Widowed	3	1.0
Educational level		
No formal education	5	1.6
Primary education	9	2.9
Secondary education	133	43.2
Tertiary education	161	52.3
Occupation		
Civil servant	104	33.8
Self-employed	28	9.1
Student	176	57.1

Awareness and knowledge on EVD outbreak in Nigeria

All the respondents (100%) had heard of Ebola, nearly everyone (95.1%) knew that it had been reported in the country, 73.4% have heard of people who survived the disease, 97.4% believe that it can be transmitted from man to man and 93.2% believed that it is preventable. Out of the total respondents, 62.7% associated the cause of Ebola to be a virus however, 58.1% believed that it can be cured and 50% believed that vaccines are available for the disease (Tables 2 and 3).

Table 4 presents the respondents perception on the modes of transmission of EVD. On a scale of poor to excellent, respondents responses to modes of transmission were graded: 44% had excellent response, 53% were good while the remaining 3% were poor.

Respondents' knowledge on EVD prevention

The respondents identified avoiding contact with blood or body fluid of an infected person 82.1% and avoiding funeral rites that requires handling of a person who died of Ebola as means of prevention of EVD (77.9%). All the respondents (100%) agreed that a suspected person can limit the spread of Ebola by reporting to the hospital and 89.3% believed that a suspected person with Ebola has a higher chance of survival if he/she goes immediately to a health facility (Table 5). When graded on a scale of very poor to excellent, 1% of the respondents had very poor knowledge on the prevention of Ebola, 2% had poor, 8% had fair, and 25% had good, while the remaining 64% had excellent knowledge on the prevention of Ebola.

Reported practices during Ebola outbreak in Nigeria

Table 6 shows the practices of the respondents during the outbreak of EVD in Nigeria. One hundred and ninety four (63.1%) of the respondents engaged washing their hands with soap and water during the outbreak of Ebola in Nigeria. One hundred and seventy five (56.8%) cleaned their hands with other disinfectants during the Ebola outbreak, 25.6% of the respondents engaged in drinking of traditional herbs during the disease outbreak, 63.6% of the respondents did not wear gloves and protective clothing while 75% did not avoid physical contact with people during the Ebola outbreak in Nigeria. One hundred and seventeen of the respondents (38.1%) did not report any signs of fever and headache to the hospital while only one hundred and five did not. When respondents responses were graded, 24% were excellent, 48% were good while 29% were poor.

Respondents' knowledge on misconceptions

Only 12% of the respondents could identify four misconceptions about EVD, others 56.2% , 23.1%, 8.4% and 0.3% could identify three, two, one and zero respectively.

Respondents' sources of information on EVD

Table 8 presents the various sources of information by the respondents. Television was the primary channel of receiving information on EVD (43.5%), however internet (41.6%) was the most trusted channel of information (Table 9).

Areas needing additional information by respondents

Forty (13%) of the respondents would like more information on the cause of Ebola,

15% on the signs and symptoms associated with EVD, 26% on the ways of preventing EVD and 46% on the medical care and treatment of EVD (Table 10).

Knowledge on reporting, isolation and quarantine

There was a high acceptance (83.1%) of quarantining of a person who has had direct contact with those diagnosed with Ebola. Nearly everyone (91.2%) believes that individual diagnosed of Ebola should be admitted into an Ebola treatment centre, however, 73.1% of the respondents would keep the information secret if any of their relatives contact Ebola.

Table 2: Percentage of Respondents on Knowledge of Outbreak of EVD

		Believe it existed in Nigeria	Heard of survivors	Transmitted from man to man	Can be prevented	Can be cured	Are vaccines available?
		yes	yes	yes	yes	yes	yes
Location	Rural dweller	96.9	74.8	96.1	93.7	55.1	50.4
	Urban dweller	93.9	72.9	98.3	92.8	60.2	49.7
Sex	Male	98.2	76.6	96.4	94.6	62.2	56.8
	Female	93.4	72.1	98.0	92.4	55.8	46.2
Age	9-18	97.7	72.1	100.0	90.7	32.6	37.2
	19-25	95.7	71.9	97.8	95.7	61.9	52.5
	26-35	96.4	74.7	95.2	92.8	57.8	55.4
	Above 35 years	88.4	79.1	97.7	88.4	72.1	44.2
Religion	Christianity	96.0	77.4	97.8	92.5	61.1	50.4
	Islam	92.7	63.4	96.3	95.1	50.0	48.8
Marital status	Single	95.5	72.5	98.6	93.7	53.6	47.3
	Married	93.8	77.5	93.8	92.5	70.0	56.3
	Divorced	100.0	100.0	100.0	100.0	100.0	100.0
	Widowed	100.0	33.3	100.0	66.7	33.3	33.3
Educational level	No formal education	100.0	80.0	100.0	80.0	80.0	60.0
	Primary education	100.0	55.6	100.0	100.0	88.9	55.6
	Secondary education	94.0	69.2	97.0	91.7	53.4	54.1
	Tertiary education	95.7	78.3	97.5	94.4	59.6	46.0
Occupation	Civil servant	94.2	79.8	97.1	92.3	64.4	54.8
	Self-employed	96.4	67.9	89.3	82.1	60.7	32.1
	Student	95.5	71.0	98.9	95.5	54.0	50.0
Total		95.1	73.7	97.4	93.2	58.1	50.0

Table 3: Causes of Ebola and Percentage Distribution of Respondents Indicating the Causes of Ebola

		what causes Ebola					p value
		bacteria	fungi	virus	evil spirit	no idea	
Location of respondents	Rural dweller	1.6	15.0	50.4	3.9	29.1	0.00
	Urban dweller	8.3	12.7	71.3	1.1	6.6	
Sex of respondent	Male	7.2	18.9	57.7	1.8	14.4	0.056
	Female	4.6	10.7	65.5	2.5	16.8	
Age of respondent	9-18	4.7	11.6	62.8	2.3	18.6	
	19-25	5.8	13.7	64.0	.7	15.8	
	26-35	4.8	14.5	59.0	2.4	19.3	
	Above 35 years	7.0	14.0	65.1	7.0	7.0	
Religion of respondent	Christianity	5.8	13.3	67.3	1.3	12.4	0.011
	Islam	4.9	14.6	50.0	4.9	25.6	
	Traditional	.0	.0	.0	.0	.0	
	Others	.0	.0	.0	.0	.0	
Marital status of respondent	Single	5.4	13.1	61.3	.9	19.4	0.009
	Married	6.3	16.3	66.3	5.0	6.3	
	Divorced	.0	.0	66.7	33.3	.0	
	Widowed	.0	.0	66.7	.0	33.3	
Educational level	No formal education	.0	.0	80.0	20.0	.0	0.00
	Primary education	.0	11.1	22.2	22.2	44.4	
	Secondary education	6.8	13.5	55.6	2.3	21.8	
	Tertiary education	5.0	14.3	70.2	.6	9.9	
Occupation of respondents	Civil servant	5.8	17.3	70.2	1.0	5.8	0.00
	Self-employed	.0	21.4	35.7	14.3	28.6	
	Student	6.3	10.2	62.5	1.1	19.9	
Total		5.5	13.6	62.7	2.3	15.9	

Table 4: Perceived Mode of Transmission and Percentage Distribution of Respondents with Adequate Knowledge on the Means of Transmission of EVD

		person who is infected but not showing any signs or symp-toms	eating and preparation of bushmeat	eating of wild fruits	contact with blood of an infected person	contact with semen of an infected person	ingestion of breast milk from an infect-ed person	shaking hands and other physical contacts with an infected person	contact with other fluid from an infected person
		yes	yes	yes	yes	yes	yes	yes	yes
Location	Rural dweller	70.9	80.3	43.3	96.9	87.4	90.6	88.2	89.0
	Urban dweller	77.9	84.5	47.5	92.8	91.2	90.1	94.5	97.2
Sex	Male	80.2	82.0	47.7	95.5	89.2	91.0	92.8	96.4
	Female	72.1	83.2	44.7	93.9	89.8	89.8	91.4	92.4
Age	9-18	79.1	81.4	39.5	95.3	93.0	88.4	90.7	93.0
	19-25	77.0	79.9	52.5	95.7	90.6	92.1	92.1	95.7
	26-35	77.1	85.5	43.4	94.0	91.6	91.6	91.6	92.8
	Above 35 years	60.5	88.4	34.9	90.7	79.1	83.7	93.0	90.7
Religion	Christianity	78.3	81.9	45.6	94.7	91.2	92.0	92.5	95.1
	Islam	65.9	85.4	46.3	93.9	85.4	85.4	90.2	90.2
Marital status	Single	78.8	82.4	46.4	95.9	92.3	92.3	91.9	95.5
	Married	66.3	85.0	41.3	92.5	82.5	85.0	95.0	90.0
	Divorced	66.7	66.7	100.0	33.3	66.7	100.0	33.3	100.0
	Widowed	33.3	66.7	66.7	100.0	100.0	66.7	66.7	66.7
Educa-tional level	No formal education	40.0	80.0	40.0	80.0	80.0	100.0	80.0	100.0
	Primary education	77.8	77.8	44.4	100.0	88.9	77.8	77.8	77.8
	Secondary education	75.2	85.0	49.6	94.0	88.7	91.0	88.7	94.0
	Tertiary education	75.8	81.4	42.9	95.0	90.7	90.1	95.7	94.4
Occupa-tion	Civil servant	76.0	85.6	47.1	92.3	90.4	89.4	93.3	95.2
	Self-employed	60.7	82.1	42.9	100.0	82.1	92.9	92.9	82.1
	Student	76.7	81.3	45.5	94.9	90.3	90.3	90.9	94.9
Total		75.0	82.8	45.8	94.5	89.6	90.3	91.9	93.8

Table 5: Knowledge on Means of Prevention of Evd And Percentage Distribution of Respondents who Correctly Identifies the Means of Prevention of EVD

		avoiding contact with blood or body fluids of an infected person	avoiding funeral or burial rites that requires handling of a person who died of EVD	a suspected person can limit the spread of EVD by reporting in the hospital	a suspected person with EVD has higher chance of survival if he/she goes immediately to a health facility	p value
		yes	yes	yes	yes	
Location	Rural dweller	85.0	71.7	90.6	89.0	0.026
	Urban dweller	89.5	82.3	95.6	93.4	
Sex	Male	88.3	83.8	90.1	90.1	0.000
	Female	87.3	74.6	95.4	92.4	
Age	9-18	88.4	81.4	90.7	90.7	0.001
	19-25	82.7	76.3	91.4	89.9	
	26-35	90.4	77.1	98.8	92.8	
	Above 35 years	97.7	81.4	93.0	95.3	
Religion	Christianity	88.1	79.2	93.8	90.7	0.056
	Islam	86.6	74.4	92.7	93.9	
	Traditional	.0	.0	.0	.0	
	Others	.0	.0	.0	.0	
Marital status	Single	83.8	78.4	92.3	90.5	0.011
	Married	97.5	78.8	98.8	95.0	
	Divorced	100.0	33.3	33.3	66.7	
	Widowed	100.0	66.7	100.0	100.0	
Educational level	No formal education	100.0	100.0	80.0	80.0	0.032
	Primary education	88.9	77.8	100.0	100.0	
	Secondary education	82.0	76.7	92.5	90.2	
	Tertiary education	91.9	78.3	94.4	92.5	
Occupation	Civil servant	93.3	76.9	96.2	95.2	0.000
	Self-employed	82.1	82.1	100.0	89.3	
	Student	85.2	77.8	90.9	89.8	
Total		87.7	77.9	93.5	91.6	

Table 6: Percentage Distribution of Reported Practices of Respondents Towards EVD Prevention

		regular hand wash-ing with soap and water	hand cleaning with other disinfectants	drinking of traditional herbs	wearing gloves and protective clothing	avoiding physical contact with people	reporting fever , head-ache and other signs to the hospital	P value
		yes	yes	yes	Yes	yes	yes	
Location	Rural dweller	57.5	52.0	26.0	49.6	32.3	63.0	0.002
	Urban dweller	77.3	68.5	28.7	47.5	34.3	68.0	
Sex	Male	62.2	61.3	42.3	44.1	39.6	55.0	0.002
	Female	73.1	61.9	19.3	50.8	29.9	72.1	
Age	9-18	53.5	46.5	18.6	18.6	9.3	53.5	0.000
	19-25	68.3	64.0	30.9	43.2	31.7	66.9	
	26-35	73.5	63.9	30.1	65.1	48.2	71.1	
	Above 35 years	79.1	65.1	20.9	62.8	34.9	65.1	
Religion	Christianity	71.7	64.6	24.8	49.6	32.7	65.9	0.56
	Islam	62.2	53.7	35.4	45.1	35.4	65.9	
Marital status	Single	66.7	60.4	28.8	41.4	27.0	64.0	0.000
	Married	75.0	63.8	22.5	65.0	51.3	68.8	
	Divorced	100.0	100.0	33.3	100.0	.0	100.0	
	Widowed	66.7	66.7	66.7	66.7	66.7	100.0	
Educational level	No formal education	100.0	60.0	60.0	60.0	20.0	80.0	0.867
	Primary education	55.6	66.7	66.7	33.3	55.6	66.7	
	Secondary education	65.4	57.1	32.3	36.8	30.1	60.2	
	Tertiary education	72.0	65.2	20.5	58.4	35.4	70.2	
Occupation	Civil servant	82.7	71.2	25.0	71.2	44.2	72.1	0.001
	Self-employed	57.1	57.1	50.0	39.3	46.4	67.9	
	Student	63.1	56.8	25.6	36.4	25.0	61.9	
Total		69.2	61.7	27.6	48.4	33.4	65.9	

Table 7: Misconceptions on EVD Mode of Transmission and Cure and Percentage Distribution of Who have Misconceptions on the Mode of Transmission and Cure ff EVD

		mosquito bites	traditional healers can treat EVD virus disease efficiently	spiritual water can cure the disease	bathing with salt and hot water can prevent the disease	p value
		yes	yes	yes	yes	
Location	Rural dweller	44.9	12.6	18.1	37.0	0.000
	Urban dweller	23.8	8.3	17.1	18.2	
Sex	Male	36.0	13.5	15.3	28.8	0.025
	Female	30.5	8.1	18.8	24.4	
Age	9-18	32.6	4.7	14.0	16.3	0.000
	19-25	35.3	13.7	23.0	28.8	
	26-35	31.3	9.6	15.7	30.1	
	Above 35 years	25.6	4.7	7.0	18.6	
Religion	Christianity	31.4	9.3	16.4	24.8	0.000
	Islam	35.4	12.2	20.7	29.3	
	Traditional	.0	.0	.0	.0	
	Others	.0	.0	.0	.0	
Marital status	Single	36.9	11.7	20.3	27.9	0.007
	Married	20.0	6.3	8.8	18.8	
	Divorced	33.3	.0	33.3	100.0	
	Widowed	33.3	.0	33.3	.0	
Educational level	No formal education	20.0	.0	60.0	80.0	0.000
	Primary education	22.2	33.3	44.4	33.3	
	Secondary education	44.4	13.5	24.1	33.8	
	Tertiary education	23.6	6.2	9.3	17.4	
Occupation	Civil servant	25.0	4.8	7.7	16.3	0.007
	Self-employed	35.7	21.4	28.6	42.9	
	Student	36.4	11.4	21.6	29.0	
Total		32.5	10.1	17.5	26	

Table 8: Current Means of Receiving Information on EVD and Percentage Distribution of who Reported to Have Learned About EVD from the following Means

		source of information							p value
		friends	print	Radio	televi-sion	internet	text books	religious houses	
Location	Rural dweller	10.70	8.70	27.50	33.60	16.10	3.40	0.00	0.02
	Urban dweller	5.70	5.70	23.30	52.80	10.10	0.60	1.90	
Sex	Male	5.80	9.10	21.50	45.50	15.70	2.50	0.00	0.001
	Female	9.60	5.90	27.80	42.20	11.20	1.60	1.60	
Age	18-sep	16.70	0.00	22.20	38.90	16.70	5.60	0.00	0.019
	19-25	10.90	6.50	31.20	39.10	12.30	0.00	0.00	
	26-35	4.10	11.30	15.50	47.40	17.50	4.10	0.00	
	Above 35 years	0.00	5.40	32.40	54.10	0.00	0.00	8.10	
Religion	Christianity	8.70	9.60	25.50	44.70	8.70	2.90	1.40	0.032
	Islam	7.20	2.10	25.80	42.30	22.70	0.00	0.00	
Marital status	Single	12.20	9.30	27.30	36.10	12.70	2.40	0.00	0.000
	Married	0.00	3.20	14.70	63.20	14.70	1.10	3.20	
	Divorced	0.00	0.00	100.00	0.00	0.00	0.00	0.00	
	Widowed	0.00	0.00	100.00	0.00	0.00	0.00	0.00	
Educational level	No formal education	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.022
	Primary education	28.60	14.30	28.60	28.60	0.00	0.00	0.00	
	Secondary education	6.30	7.10	28.60	45.20	10.30	2.40	0.00	
	Tertiary education	8.10	6.80	23.60	45.30	12.40	1.90	1.90	
Occupation	Civil servant	10.90	7.00	19.50	46.90	10.90	2.30	2.30	0.056
	Self-employed	12.00	16.00	32.00	24.00	16.00	0.00	0.00	
	Student	5.20	5.80	29.00	43.90	14.20	1.90	0.00	
Total		8.10	7.10	25.30	43.50	13.00	1.90	1.10	

Table 9: Trusted Source of Information about EVD and Percentage Distribution of who Identified various means to be Trusted in Getting Information about EVD

		Trusted source of receiving information on EVD					p value
		print	radio	television	internet	text books	
Location	Rural dweller	2.5	35.0	25.0	35.0	2.5	0.020
	Urban dweller	3.1	9.3	43.3	44.3	.0	
Sex	Male	1.8	10.9	32.7	52.7	1.8	0.000
	Female	3.7	20.7	41.5	34.1	.0	
Age	9-18	4.3	21.7	17.4	56.5	.0	0.021
	19-25	.0	20.0	46.7	33.3	.0	
	26-35	2.6	13.2	34.2	50.0	.0	
	Above 35 years	12.5	6.3	43.8	31.3	6.3	
Religion	Christianity	3.8	14.4	41.3	39.4	1.0	0.015
	Islam	.0	24.2	27.3	48.5	.0	
	Traditional	.0	.0	.0	.0	.0	
	Others	.0	.0	.0	.0	.0	
Marital status	Single	2.0	21.0	37.0	40.0	.0	0.000
	Married	2.9	2.9	42.9	48.6	2.9	
	Divorced	.0	100.0	.0	.0	.0	
	Widowed	100.0	.0	.0	.0	.0	
Educational level	No formal education	.0	.0	100.0	.0	.0	0.015
	Primary education	.0	.0	100.0	.0	.0	
	Secondary education	3.0	28.4	43.3	25.4	.0	
	Tertiary education	2.9	5.9	30.9	58.8	1.5	
Occupation	Civiler servant	2.3	4.5	34.1	56.8	2.3	0.02
	Self-employed	12.5	25.0	62.5	.0	.0	
	Student	2.4	22.4	37.6	37.6	.0	
Total		2.9	16.8	38.0	41.6	.7	

Table 10: Areas Needing Additional Information And Percentages Distribution Of Respondents Who Want To Get More Information About EVD

		causes of EVD	signs and symptoms of EVD	ways of preventing EVD	medical care and treatment of EVD	p value
Location	Rural dweller	13	17	37	33	0.000
	Urban dweller	13	14	20	53	
Sex	Male	13	14	24	49	0.286
	Female	14	16	27	43	
Age	9-18	12	14	21	53	0.186
	19-25	12	18	27	43	
	26-35	19	12	22	47	
	Above 35 years	10	12	38	40	
Religion	Christianity	13	16	24	47	0.507
	Islam	15	12	33	40	
Marital status	Single	12	18	25	45	0.676
	Married	17	8	29	46	
	Divorced	0	0	50	50	
	Widowed	0	0	50	50	
Educational level	No formal education	0	25	25	50	0.003
	Primary education	47	21	0	32	
	Secondary education	14	18	26	42	
	Tertiary education	11	12	26	51	
Occupation	Civil servant	11	8	25	56	0.003
	Self-employed	27	23	27	23	
	Student	17	17	25	41	
Total		13	15	26	46	

DISCUSSION

Awareness on EVD

The 100% awareness of EVD in the study area is comparable to what was reported in studies conducted in Guinea, Sierra Leone and Liberia, but higher than (92.5%) what was obtained in Kwara State, Nigeria (Shittu *et al.,* 2015). The difference in awareness between Kwara and Ogun State may likely be due to disparity in level of education of respondents. This is because Sierra Leone, Guinea and Liberia were most affected by EVD (UNICEF, 2014). In Sierra Leone, 717 cases (631 confirmed), and 298 deaths (42% case fatality rate) was recorded compared to Nigeria in which a total of 20 EVD cases (19 laboratory confirmed, one probable) was recorded (Government of Sierra Leone, 2014). About 73.7% of respondents have heard of people that survived the disease, which was lesser when compared to the 77% from Sierra Leone (Catholic Relief Services, 2014). More than one- third (38.5%) of the respondents believed mosquito bites can transmit the infection, a value higher than the 0.8% realized in Kwara State and the 26% from Lagos State (Shittu *et al.,* 2015 and Gidado *et al.,* 2015). This shows that the understanding of misconception is higher in Kwara State than in Ogun State. About 1 in 2 (26%) of the respondents believed that bathing with salt and hot water can prevent the disease. This finding was higher than what was obtained in Lagos, Kwara and Bayelsa States with 6%, 13.2% and 7.1% respectively (Gidado *et al.,* 2015; Shittu *et al.,* 2015 and Lliyasu *et al.,* 2015), but less than 41.5% obtained in Sierra Leone (Catholic Relief Services, 2014). Every 1 in 5 believed spiritual water can cure the disease. Though level of awareness is high, knowledge about non-vaccine availability is poor as 50% of the respondents believed that vaccines are available compared to 22% obtained in Kwara State (Shittu *et al.,* 2015). This may be due to differences in their sources of information.

Comprehensive knowledge on EVD transmission is high

Comprehensive knowledge on EVD transmission is generally high. Only 3% of the total respondents have poor knowledge on EVD transmission, this was far lower than the 39% reported by Shittu *et al.,* 2015 in Kwara State and in Sierra Leone (Catholic Relief Services, 2014). Though knowledge on transmission was good (55%), 75% of the respondents still believed that EVD can be transmitted from a person who is infected but not showing any clinical signs. Ninety four percent of the respondents identified contact with fluid from an infected person as a means of transmission and this is in line with the findings of Lliyasu *et al.,* (2015), who reported that most respondents 91.4%, 98.6% and 100% from Kano, Bayelsa and Calabar respectively identified contact with patient secretions as a means of transmitting the infection. Knowledge on the aetiology of the EVD was good as 62.7% of the respondents who associated the infection with a virus and this was higher than 50% reported by Lliyasu and others (2015) and 41.2% by Catholic Relief Services (2014).

In this study, 76% of the respondents were able to identify misconceptions about EVD compared to the 50% obtained in Sierra Leone (Catholic Relief Services, 2014). This may be one of the reasons EVD was curtailed early in Nigeria. The varying level of misconceptions reported from this study is probably as a result of different channels in which information is received concerning the disease. It was also observed that during the outbreak, various myths and opinions on the

cure or prevention of EVD was spreading across the social media sites as supported by Oyeyemi *et al.,* (2014). Evidence reveals that myths and harmful misconceptions are not limited to Nigeria alone (The Washington post, 2014), as a recent survey in Sierra Leone indicated that 2 in 5 respondents believed that bathing with salt and hot water could protect them from Ebola (Focus 1000, 2014).

Reported practices during EVD outbreak in Nigeria

Nearly everyone (86.4%) reported changes in behavior during the EVD outbreak. However, the percentage of people reporting that they avoided physical contact is alarmingly low (33.4%), this was also observed to be lower than the 36% reported in Sierra Leone. Both regular hand washing with soap and water (69.2%) and hand cleaning with other disinfectants (61.7%) is higher than the reported 66% and 37% for the same practice in Sierra Leone, and lesser than the 74.5% reported by Shittu and others (2015) for regular and thorough hand washing. Only 28% wore gloves and protective clothing. 1 in 2 of the respondents did not wash their hands with soap and water regularly, 1 in every 2 of the respondents did not clean their hands with disinfectants, 1 in 2 drank traditional herbs during the outbreak and 1 in 2 did not report fever, headache, and other signs to the hospital during the outbreak. These findings highlight the inherent difficulty in changing culturally entrenched practices such as hugs and handshakes as forms of greeting in African community (Lliyasu *et al.,* 2015). Respondents within the age range of 9-18 years found it most difficult to avoid physical contact during the outbreak (9.3%).

Positive attitudes towards prevention and medical care seeking attitude

- 82.1% agree with the statement that one should avoid contact with blood or body fluids of an infected person.
- 82.1% agree that avoiding funeral or burial rites that requires handling of a person who died of Ebola can prevent transmission a value higher than the 26.7% and 21.4% reported by the International Federation of Red Cross and Red Crescent Societies (2014).
- 100% agree with the statement that " a suspected person can limit the spread of Ebola by reporting to the hospital
- 89.3% agree with the statement that "a suspected person with Ebola has higher chance of survival if he/she goes immediately to a health facility.

Despite identification of communal burial practices in which contact occurs between people and the corpse, it was expected that 100% of the respondents should avoid burial or funeral rites which requires handling of a person who died of Ebola.

Major source of information on ebola

The major sources of information of the respondents were television (43.5%) and radio (25.3%). This is in agreement with the report of Gidado *et al.* (2015) but contrary to the report from urban dwellers in Kwara State (Shittu *et al.,* 2015) and Sierra Leone (Catholic Relief Services, 2014) where radio was reported to be the most preferred channel of receiving information about Ebola. Though majority of the respondents (43.5%) got their information on Ebola via the television, the internet was still the most trusted source of the information channels (41.62%). Television (43.3%) and internet (44.3%) were more trusted amongst the urban dwellers compared to the rural dwellers with 25% and 35% respectively. Amongst the urban dwellers, radio and internet both with 35% each is the most trusted channel of

receiving information on Ebola. The choice of the internet as the most trusted source of information may probably be due to the fact that the internet is easily accessible any day and anytime. Despite the high rate of affordability, the rapid dissemination of information through internet and social media may play a crucial role in this development as people were in dire need of receiving information faster.

Attitude towards reporting EVD outbreak

Despite the fact that the respondents have good knowledge about modes of transmission and prevention of EVD, 73.1% of the respondents would keep the information secret if a family member contracts Ebola. This is far higher than what was obtained in Sierra Leone (Catholic Relief Services, 2014). This could be due to the fear of stigmatization by the community. The report from Sierra Leone shows that there was a very high level of stigma and discrimination towards Ebola victims such that 76% of respondents would not be welcoming towards a neighbor who has recovered from Ebola (Catholic Relief Services, 2014). This will however be counter-productive as it will lead to uncontrollable spread of the disease which was observed in the severely affected countries.

Attitude towards isolation and quarantine of affected individual

Nine in every ten of the respondents agree with the fact that a person diagnosed of EVD be admitted into an Ebola treatment centre. Five in every six of the respondents agreed that quarantine protocol should be instituted for someone with direct contact with those diagnosed with Ebola.

In conclusion, awareness and understanding of EVD transmission is high in Ogun State. Respondents also have positive attitude towards prevention. Serious misconceptions such as bathing with salt and hot water, and use of spiritual water as a means of treatment were identified. This development calls for more efforts towards enlightenment of the populace on the importance of early reporting of disease and measures to be taken towards effective prevention and eradication. The internet could mislead because both valid and invalid information can be sourced from the internet. Emphasis should be placed on prevention, medical care and treatment of EVD, as well as enlightening the public on the dangers associated with stigmatization and discrimination against EVD patients.

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