



## Knowledge and Attitude towards Ebola Virus Disease among Commercial Tricycle (Keke) Riders in Abakaliki, South-East Nigeria

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### Authors' contributions

This work was carried out in collaboration between all authors. Author EUN designed the study. Authors EUN and NCE performed the statistical analysis. Authors EUN, SN, NN, EC and CN wrote the protocol and all authors wrote the first draft of the manuscript. Authors EUN, NCE and BNA managed the analyses of the study. Authors NCE, SN, NN, EC and CN managed the literature searches. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** Ebola virus disease (EVD) is a severe, often fatal disease in humans and non-human primates (such as Monkeys, Gorillas and Chimpanzees).

Ebola first appeared in 1976 in 2 simultaneous outbreaks in Nzara, Sudan and in Yambuku, Democratic Republic of Congo. No cases of Zaire Ebola virus has ever been reported in West Africa until the recent outbreak.

The study was carried out to ascertain the knowledge and attitude towards Ebola virus disease among commercial tricycle (Keke) riders in Abakaliki in case of recurrence.

**Methods:** A descriptive cross-sectional study design was used for the survey. Data were collected using semi-structured interviewer administered questionnaire from 300 commercial tricyclists selected using systematic sampling technique.

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**Results:** Majority of the respondents (99.33%) were aware of EVD. Fifty seven percent (57%) of respondents had good knowledge of EVD. Respondents with non-formal education had 37.5% good knowledge while those with formal education had 52.1% good knowledge. Concerning their attitude towards EVD, 75% of the respondents had negative attitude. Respondents with non-formal education had higher negative attitude (81.2%).  
**Conclusion:** There is need for more sensitization of the public as some of the respondents had negative attitude towards EVD.

*Keywords: Ebola; knowledge; attitude; tricycle (Keke) riders.*

## 1. INTRODUCTION

Ebola virus disease (EVD) formerly known as Ebola haemorrhagic fever is a severe, often fatal disease in humans and non-human primates. It is caused by Ebola virus of the family *Filoviridae*. The suspected reservoirs include fruit bats and non-human primates [1]. EVD is transmitted by physical contact with body fluids, secretions, breast milk, tissues or semen from infected persons or immediately after death especially during funeral rites [2].

There is no specific treatment and so infected persons die within few days of infection with 50-90% case fatality rate with Zaire Ebola Virus being the most lethal with case fatality rate (CFR) of up to 90% [3-7]. The African countries that were mainly affected included Liberia, Sierra Leone, Guinea and Nigeria. United States of America, United Kingdom, Spain and Italy also reported imported EVD cases [8,9]. On 20<sup>th</sup> July 2014, Nigeria recorded the index imported case. A widespread panic followed the declaration of an outbreak on 24<sup>th</sup> July by Nigerian authorities [10,11]. The outbreak in Nigeria ended with 8 deaths (40% case fatality rate) in September 2014 [7]. EVD in Nigeria was successfully contained following concerted efforts by national and international agencies. Consequently Nigeria was declared EVD free by the World Health Organisation (WHO) on 20<sup>th</sup> October 2014. Following the misconceptions about EVD, fear and unusual behaviours exhibited by the general public [12] during the outbreak in Nigeria, It was necessary to investigate the public's knowledge and attitude towards Ebola virus disease. Therefore, this study was carried out to ascertain the knowledge and attitude towards Ebola virus disease among commercial tricycle (Keke) riders in Abakaliki. This group of people was chosen because of their close contact with people from different areas and their knowledge or attitude towards could help curb or promote the spread of future EVD outbreaks.

## 2. MATERIALS AND METHODS

The study was conducted in Abakaliki, the capital city of Ebonyi State. Commercial tricycle business in Abakaliki was introduced in less than a decade ago and has since then in conjunction with commercial motorcycles become the major means of transportation.

The population of registered commercial tricyclists in Abakaliki is 1000 (Abakaliki Commercial Tricycle Union, July 2015). The study area has ten tricycle parks. Seven of the ten parks were randomly selected for the study. The seven parks are "Presco" junction, "Vanco" junction, Spera-indeo, Abacha round about, Mile 50, Kpirikpiri and Rice mill.

Abakaliki is located in the South-Eastern Nigeria, with all the other major tribes in Nigeria represented (though in minority proportions). Majority of the dwellers are farmers, traders, artisans and educated salary earners in public and private services.

The sample size was calculated to be 286 using the formula for population less than 10,000 [13]. In anticipation of 5% non-response rate, the sample size was increased to 300. The respondents were selected from the seven parks using systematic sampling technique. The total number of commercial cyclists in each park was noted from their register and the sampling interval calculated. Respondents were selected as they arrived at the park for the day's business using systematic sampling technique.

### 2.1 Instrument and Data Collection

The study was carried out using a pre-tested, semi-structured interviewer administered questionnaire designed after a thorough review of relevant literature [13]. The questionnaire was used to collect information on socio demographic characteristics, knowledge and attitude towards Ebola virus disease from the respondents.

Ethical clearance for this study was obtained from the Research & Ethics Committee of the Federal Teaching Hospital Abakaliki.

Permission was obtained from the commercial tricycle union leaders to conduct the study and informed consent was also obtained from sampled tricyclists before the administration of the questionnaires.

### 2.2 Data Analysis

Data was analysed using Statistical Package for Social Sciences (SPSS) Software, Version 20. Association between variables was determined using chi-squared test and statistical significance was determined by a p-value <0.05.

Three (3) questions with 22 response options were used to assess respondent's knowledge of EVD. Respondents were required to choose from among three options-“Yes”, “No”, “Don't know”. Respondents answers were graded as correct (score of 1) or incorrect answers (score of 0) and total score of the correct answers were used to categorize respondents. The score range was between 0 and 15 and converted to 100%. A score of 50 and above was categorized as good knowledge and below 50 as poor knowledge. Poor knowledge = 0-6 response options answered correctly, good knowledge = 7-13 response options answered correctly.

Three 3 questions using a 3 point likert scale was used to determine respondents' attitude toward EVD. Respondents were asked to indicate their level of agreement to the statements. For positive questions; agree =3, indifferent =2 and disagree =1. For negative questions; agree =1, indifferent =2 and disagree =3. Mean score also known as cut-off point equal to sum of the likert scores divided by 3. The total score of the respondent was calculated and divided by 3 (number of attitudinal questions) to give the mean respondents score. A score less than 2.5 was graded as negative attitude while score of 2.6 and above as positive attitude.

### 3. RESULTS

Three hundred commercial tricyclists were interviewed, and all the sampled tricyclists participated in the study. The socio demographic characteristics of the respondents as shown in Table 1 revealed that 65.7% of the respondents were aged 39 years and below and the mean age of the respondents was 36.8 years. Majority

(94%) of the respondents had formal education at various levels and 30.7% had never been married.

**Table 1. Socio-demographic characteristics of respondents**

Variables	Frequency	Percent (%)
<b>Age group (years)</b>		
19 years and below	5	1.67
20-29	92	30.67
30-39	100	33.33
40-49	65	21.67
50-59	24	8.00
60 years and above	14	4.67
<b>Educational status</b>		
Non-formal	18	6.00
Primary	71	23.67
Secondary	163	54.33
Tertiary	48	16.00
<b>Marital status</b>		
Single	92	30.67
Married	198	66.00
Separated	2	0.67
Divorced	6	2.00
Widowed	2	0.67

**Table 2. Respondents' awareness of Ebola Virus Disease (EVD)**

Have you heard of EVD	Frequency	Percent (%)
Yes	298	99.33
No	2	0.67
Total	300	100

Table 2 showed that 298 respondents reported hearing about Ebola virus disease, giving 99.3% awareness.

**Table 3. Respondents' sources of information about EVD**

Sources of information	Frequency	Percent (%)
Radio	75	25.20
Television	45	15.10
Neighbors	44	14.70
Colleague	34	11.40
Relatives	32	10.70
Religious leaders	31	10.40
Health workers	30	10.10
Others	7	2.40

Table 3 showed that the commonest source of information about EVD among those who reported awareness is Radio (25.2%) followed by the Television (15.1%). Health worker and others

were the least mentioned (10.1% and 2.4% respectively) sources.

The Table 4 shows respondents' knowledge of EVD. Good knowledge of EVD was assessed by

the total score of the correct answers as described in the analysis plan. After conversion of thirteen correct answers, 57% of the respondents had good knowledge of EVD.

**Table 4. Respondents' knowledge of EVD**

<b>Etiology of EVD</b>	<b>Yes (%)</b>	<b>No (%)</b>	<b>Don't know (%)</b>
Virus	153 (51.30)	42 (14.09)	123 (41.27)
Bacteria	52 (17.50)	147 (49.32)	99 (33.22)
Parasite	3 (1.00)	73 (24.49)	222 (74.49)
Fungi	14 (4.70)	82 (27.51)	202 (67.78)
Evil spirit	14 (4.70)	99 (33.22)	185 (62.08)
Curse from gods	3 (1.00)	158 (53.02)	137 (45.97)
Others	57 (19.30)	139 (46.64)	102 (34.22)
<b>Signs and symptoms</b>			
Fever	169 (56.33)	98 (32.88)	31 (10.40)
Diarrhea	118 (39.33)	101 (33.89)	79 (26.51)
Vomiting	131 (43.69)	97 (32.55)	70 (23.48)
Headache	116 (38.67)	102 (34.22)	80 (26.84)
Unexplained bleeding	97 (32.33)	156 (52.34)	45 (15.10)
Muscle pain	77 (25.69)	83 (27.85)	138 (46.30)
Stomach pain	62 (20.67)	103 (34.56)	133 (44.63)
Others	0 (0.00)	0 (0.00)	30 (10.06)
<b>Route of transmission</b>			
Handshake/hugging	154 (51.33)	69 (23.15)	75 (25.16)
Eating bush meat	152 (50.67)	84 (28.18)	62 (20.80)
Contact with body fluid of an infected person	114 (38.00)	76 (25.50)	108 (36.24)
Sex with an infected	111 (37.00)	110 (36.91)	77 (25.83)
Eating with an infected person	81 (27.00)	133 (44.63)	84 (28.18)
Evil spirit	6 (2.00)	104 (34.89)	188 (63.08)

**Table 5. Respondents' attitude towards EVD**

<b>What do you think about Ebola</b>	<b>Agree (%)</b>	<b>Indifferent (%)</b>	<b>Disagree (%)</b>
Do you feel EVD really exist	270 (90.60)	8 (2.68)	20 (6.71)
<b>What do you feel should be done if your friend is suspected to have EVD</b>			
Run away	60 (20.10)	220 (73.82)	18 (6.04)
Inform health authority	80 (26.80)	209 (70.13)	9 (3.02)
Take him or her to hospital	125 (41.94)	30 (10.06)	135 (45.30)
Take care of him/her at home	7 (2.35)	35 (11.74)	256 (85.90)
Take him/her to native doctor	11 (3.70)	22 (7.38)	262 (87.91)
Take him/her to church	10 (3.40)	257 (86.24)	31 (10.40)
Do nothing	5 (1.70)	0	18 (6.04)
<b>What do you feel should be done if someone is infected with EVD</b>			
Conceal the news	9 (3.00)	271 (90.93)	18 (6.04)
Go to hospital for care	259 (86.33)	27 (9.06)	12 (4.02)
Go to religious place of worship for prayers	25 (8.33)	268 (89.93)	5 (1.67)
Go to native doctor	6 (2.00)	257 (86.24)	35 (11.74)
Stay at home for care	1 (0.33)	22 (7.38)	275 (92.28)

**Table 6. Relationship between socio-demographics and knowledge of EVD**

Variables	Knowledge		X <sup>2</sup>	p-value
	Poor	Good		
<b>Age group (years)</b>				
39 and below	95 (48.5)	101 (51.5)	91.5	<0.01
40 and above	50 (49.0)	52 (51.0)		
<b>Educational status</b>				
Non formal	10 (62.5)	6 (37.5)	29.4	<0.001
Formal education	135 (47.9)	147 (52.1)		

**Table 7. Relationship between socio-demographic characteristics and attitude towards EVD**

Socio-demographic characteristics	Attitude		X <sup>2</sup>	p-value
	Negative	Positive		
<b>Age (year)</b>				
39 and below	51(26.0)	145(74.0)	7.2	<0.01
40 and above	42(41.2)	60(58.8)		
<b>Educational Status</b>				
Non formal	13(81.2)	3(18.8)	20.2	<0.001
Formal Education	80(28.4)	202(71.6)		

Table 4 showed respondents' attitude towards EVD. Positive attitude towards EVD was assessed by the total score divided by 3 as described in the analysis plan. Twenty five percent (25%) of the respondents had positive attitude towards EVD while 75% showed negative attitude.

Knowledge of Ebola virus disease was significantly associated with age and educational background of respondents. About 51% of those 39 years and below and those 40 years and above had good knowledge of EVD. Only 37.5% of respondents with non-formal education and 52% of those with formal education had good knowledge of EVD.

Attitude was significantly associated with age and educational status of the respondents. About 81.2% of respondents with non-formal education demonstrated significant negative attitude towards Ebola virus disease.

#### 4. DISCUSSION

Commercial tricycle business been one of the major means of transportation in Nigeria, makes it an easy means of transmission of Ebola virus in Nigeria, this study therefore assess the Knowledge and attitude towards Ebola Virus Disease among commercial tricycle (Keke) riders in Abakaliki, Nigeria which makes this important and will add to body of knowledge.

This study found 99.3% awareness of EVD. This may be due to repeated radio and TV sensitization programme on viral hemorrhagic

diseases in Ebonyi State. The commonest source of information about EVD among those who reported awareness is Radio (65.1%) followed by the Television (22.4%). Health worker and others were the least mentioned (10.1% and 2.4% respectively) sources. This finding is more than the 94% awareness reported in Australia [9] and 98% awareness reported in Congo [14]. In Lagos, television is the dominant information source for respondents as regards the Ebola virus disease. Other main sources are radio and newspapers [15]. Among the Australian pilgrims, 89% of participants had been aware of the current Ebola outbreak before travelling [9].

This study found 51% good knowledge among those 40 years and above and 51.5% good knowledge among those 39 years and below which is comparable to 53% in Lagos [15] and contradicts 5% reported in India [16]. This finding may be attributed to their steady contact with the society while in search of daily bread and also due to attainment of formal education. There is gap in knowledge of EVD between those who had formal education and those who had non-formal education.

This study found 20% percent of respondents with negative attitude (run away) while 68.8% would inform health authority and 11% could practice other attitude. It is also comparable to studies in Lagos where 60% respondents showed willingness to refer to the health facility [17], 67% accepted to treat Ebola suspect whereas 80% would rather refer them to isolation facilities, while 89% of respondents reported that

if suspected to have Ebola signs, their first point of call would be health facility [18-20]. The study is also comparable to a study in Congo where 66.3% chose to call the health service and 33.7% could practice other attitudes [14].

The study found statistically significant relationship between knowledge about EVD and age, educational status of the respondents ( $p < 0.001$ ). Sixty two point five percent of respondents with non-formal education had poor knowledge of EVD. It also found statistically significant relationship between attitude towards EVD and age, educational status ( $p < 0.001$ ). Eighty one point two percent of respondents with non-formal education had negative attitude towards EVD.

## 5. CONCLUSION

The study found high awareness of EVD and statistically significant relationship between knowledge about EVD and respondent's age and educational status. It also found statistically significant relationship between negative attitude towards EVD and respondent's age and educational status. Therefore public health education should go beyond awareness creation on EVD to addressing some negative attitude towards EVD.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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