

**ASSESSMENT OF KNOWLEDGE AND ATTITUDES REGARDING EBOLA VIRUS DISEASE AMONG THE RESIDENTS OF HARAR, EASTERN ETHIOPIA**

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Corresponding author e-mail: viju.basker@gmail.comReceived on: 18-02-2016; Revised on: 29-03-2016; Accepted on: 03-04-2016***ABSTRACT**

Ebola virus disease (EVD) is a disease of humans and other primates, which is caused by an RNA virus of the family Filoviridae and genus Ebolavirus. The aim of this study was to determine the knowledge and attitudes regarding Ebola virus disease among the residents in Harar, Eastern Ethiopia. This study was carried out from March 4 to April 20, 2015. A descriptive cross sectional study design was used in this study. The respondents were interviewed on a pre-tested structured questionnaire after their verbal consent. The data was collected by direct face to face interview and the outcome variables were knowledge and attitudes regarding Ebola virus disease. The knowledge and attitudes score was classified as adequate if score was $\geq 70\%$, moderately adequate if score was 41-60% and inadequate if score was $< 40\%$. Of 269 respondents, only 67 (24.9%) had adequate knowledge, 121 (45%) had moderately adequate knowledge and 81 (30.1%) had inadequate knowledge regarding Ebola virus disease. Out of 269 respondents, 146 (54.3 %) had positive attitude and 123 (45.7 %) had negative attitude regarding Ebola virus disease. In the present study, it was found that residents in Harar, Eastern Ethiopia had unsatisfactory knowledge regarding Ebola Virus Disease. Also 123 (45.7 %) had negative attitudes regarding Ebola virus disease among the residents in kebele 18 were not satisfactory too. Hence findings of this study pinpoint the necessity of inculcation of health education programs, which will create the public to be aware against the EVD.

Key words: EVD, Knowledge, Attitudes and Harar**INTRODUCTION**

Wherever there is life, viruses are found and have probably existed since living cells first evolved.^[1] Ebola virus disease (EVD) is a disease of humans and other primates and also known as Ebola hemorrhagic fever (EHF).^[2] The causative agent of Ebola virus disease is an RNA virus of the family Filoviridae and genus Ebolavirus. There are five different identified Ebolavirus strains, namely Zaire Ebolavirus (EBOV), Sudan Ebolavirus (SUDV), Tai Forest Ebolavirus (TAFV), Bundibugyo Ebolavirus (BDBV) and Reston Ebolavirus (RESTV), with fruit bats considered as the most likely reservoir host.^[3] The most common earlier Ebola outbreaks in humans have been linked to three Ebola strains: EBOV, SUDV and BDBV.^[4]

The Ebola virus, EBOV is a deadliest of the five Ebola virus strains, was first identified in 1976 in Zaire (now the Democratic Republic of Congo) and its name was derived from the Ebola River located near the source of the first outbreak. The first known Ebola patient was a 44-year old man who had managed the construction of a school in northern Zaire. On August 26, 1976, the patient presented at a hospital with a high fever. He received an injection of chloroquine for presumptive malaria and had a clinical remission of his symptoms the next four days. On the sixth day, the patient had a fever of 39.2°C and began to haemorrhage. On September 8 (the 14th day), the patient died with severe haemorrhage. For the following months, until late-October, there was an outbreak of Ebola, with 280 of the 318 patients subsequently dying from the disease.

Unfortunately, in the hospital that treated the first case of Ebola, all 17 hospital employees were exposed to the patient, resulting in 13 being infected, and 11 dying. When the pathway of infection for this outbreak was examined, 85 of the 318 patients (26.7%) were found to have received an injection at their respective hospitals. There were no survivors among the patients who were infected through injections. At the time, syringes and needles were sometimes rinsed between patients in a pan of warm water. At the end of the day they were sometimes boiled.^[5] Since then, Ebola outbreaks have occurred from time to time in Africa over the past 38 years. In this time, there have been 19 additional outbreaks, primarily in central African countries including the DRC (1977, 1995, 2007, 2008, and 2012), Sudan (1976, 1979, and 2004), Gabon (1994, 1996, 2001, and 2002), Uganda (2000, 2007, and 2012), and the Congo (2001-2002, 2003, and two in 2005). There have been 2,403 patients affected during these 19 outbreaks, and 1,594 patients have died from Ebola (66.3%).^[6] Past Ebola outbreaks have been reported on average every 1.5 years,^[7] with a total of 7 prior outbreaks generating over 100 reported cases.^[8] The 2014 outbreak of EVD in West Africa, caused by Ebola virus (Zaire Ebolavirus species), is the largest outbreak of EVD in history.^[9] Human outbreaks of EVD are hypothesized to begin through direct contact with an infected animal or its body fluids, and human transmission chains are driven by direct contact with the blood or other body fluids of infected patients or persons who have died of EVD.^[10-17]

The EBOV genome is a single-stranded RNA approximately 19,000 nucleotides long. It encodes seven structural proteins: nucleoprotein (NP), polymerase cofactor (VP35), (VP40), GP, transcription activator (VP30), VP24, and RNA-dependent RNA polymerase (L).^[18] Because of its high mortality rate (up to 83-90%),^[19, 20] EBOV is also listed as a select agent, World Health Organization Risk Group 4 Pathogen (requiring Biosafety Level 4-equivalent containment), a U.S. National Institutes of Health/National Institute of Allergy and Infectious Diseases Category A Priority Pathogen, U.S. CDC Centers for Disease Control and Prevention Category A Bioterrorism Agent, and listed as a Biological Agent for Export Control by the Australia Group.

Signs and symptoms typically start between two days and three weeks after contracting the virus with a fever, sore throat, muscle pain, and headaches. Then, vomiting, diarrhea and rash usually follow, along with decreased function of the liver and kidneys. At this time some people begin

to bleed both internally and externally. Symptoms range from, firstly, fever and fatigue before descending into headaches, vomiting, violent diarrhea, then multiple organ failure and massive internal bleeding.^[21, 22] EBOV can be found in a number of human secretions during the acute phase of infection, such as saliva, faeces, semen, breast milk, tears, nasal blood, and skin.^[23]

The pathophysiology of Ebola is not yet fully understood, however, most studies report that the incubation period varies depending on the type of exposure (i.e., six days for percutaneous and ten days for contact exposure).^[24, 25] Patients with Ebola virus disease typically have an abrupt onset of symptoms 6 to 12 days after exposure (range 2 to 21 days).^[26, 27] After EBOV enters the human body, macrophages and dendritic cells are generally considered as the first cells to be infected.^[27] The virus then proliferates rapidly within these cells, releasing multiple new copies into the extracellular fluid.^[28, 29] Spread of the virus into the regional lymph nodes amplifies the viral load in the body, causing further viral dissemination to the lymphoid and vascular tissues.^[28] Subsequently, a systemic inflammatory response is initiated, resulting in cytokine and chemokine release from the infected macrophages and other cells. This constellation of innate host responses is considered to be responsible for the prodromal symptoms.^[28, 29] The coagulation defects are attributable to the synthesis of the cell surface tissue factor from viral infected macrophages.^[28] The ensuing hepatic injury also leads to decreased synthesis of coagulation factors from the liver.^[30] The appearance of haemorrhagic symptoms is associated with a worse prognosis. The disease has a high risk of death, killing between 25 percent and 90 percent of those infected with an average of about 50 percent. This is often due to low blood pressure from fluid loss, and typically follows six to sixteen days after symptoms appear.^[31]

According to a recent study conducted, 22 million people distributed in the areas of Central and West Africa to be at risk of Ebola.^[32] EVD is mainly endemic to the African continent, especially in West Africa so far. Other countries, such as the United States, Thailand, United Kingdom, Canada, and Spain had sporadic and possibly imported Ebola cases. The natural environment of the African continent provides a favourable condition for the survival of Ebola virus. First, the natural and alternate hosts of Ebola virus such as fruit bats, apes, and monkeys are widely distributed in Africa. Second, according to the historical data, EVD mainly distributes between 10° north and south of the

equator, with the temperature that benefits Ebola virus survival throughout the year. Ebola typically begins in remote places and can be distributed via hospitals/health care centers or within the community as it takes several infections before the disease is ascertained. The prevalence, morbidity and case fatality of chronological Ebola HF outbreaks showed the persistent resurgence in different regions in Sub-Saharan Africa.^[33] Being a highly contagious disease EVD can spread to other parts of the world because of continuous movement of people in different parts of the world. Also the Ebola virus can infect people at any age group. In some areas, about 80% of the EVD cases were in adults between 21 and 60 years old,^[34] possibly because most people at this age range are more likely to be physically active (i.e. hunting for food) and therefore have more opportunities of being exposed to the pathogen. The Ebola outbreak includes 24,282 cases and 9,976 deaths according to the WHO. Ethiopia has a large and very vulnerable population, with an estimated 15 percent of the population living below the poverty line. Most of the viral disease burdens in low-income countries find its roots in the consequences of poverty. Thus people in Ethiopia should have a sound knowledge and good attitudes regarding EVD which helps them to protect themselves and the country from EVD. Hence the main objective of this study is to assess the knowledge and attitudes concerning Ebola virus disease among the public in Ethiopia. This study is essential because no tangible research has been conducted in this area among the public in the town regarding EVD.

MATERIALS AND METHODS

A descriptive cross sectional study design was used in this study. Harar is one of the oldest and tourist site in Ethiopia, which is found in the eastern part of the country. It is the capital city of Harari Regional State. It is 525 km away from Addis Ababa, the capital city of Ethiopia. It has 6 districts (woredas) and 36 kebeles. Among 36 kebeles, the current research was conducted in kebele 18. In kebele 18, the total households were 1693 and have 4 ketenas. The study was conducted from March 4 to April 20, 2015. The study population were the residents of Kebele 18 region in Harar, Eastern Ethiopia. People who were residing in Kebele 18 region in Harar were only included for this study. The respondents were 18 years or above. People who were not willing to participate in the study was excluded. The sample size (n=384) determination was done by using single proportion population formula by taking $p_1 = 0.5$ and $q_1 = 0.5$ proportion with margin of error 5% and also 95% confidence interval. The exact number of households with in Werware ketena (N) is 600. Since

the population is less than 10,000, the investigators used the correction formula to get the final sample size. Hence the final sample size was $n=234$. By adding 15% non-respondent to the final sample found to be 269. First the Werware or Ketena 2 was selected by using lottery method among four ketenas from kebele 18. The sampling technique used was systematic random sampling with a sample interval of 2. Then, the first household sample is picked by a lottery method. After that every two household's data will be collected.

The respondents were interviewed on a pre-tested structured questionnaire after their verbal consent. The data was collected by direct face to face interview by disseminating the questionnaire to the people in Kebele 18, Harar, Eastern Ethiopia. A structured interview questionnaire based on the knowledge and attitudes assessment of Ebola Virus Disease was selected for the study. Articles, books, journals, published research studies and web-site links were reviewed and used to build up a good tool for the study.

A Performa developed by the investigators to collect the relevant sample characteristics. It contains 10 questions regarding socio-demographic variables such as age, sex, religion, ethnicity, marital status, educational status, occupation, level of income, food habit and type of family. Knowledge questionnaire consists of 10 knowledge related questions regarding EVD. Each "Right answer" scores one mark and "wrong answer" scores zero mark. Total score is 10. The score interpretation was Adequate 70-100% (7-10), Moderately adequate 40-69% (4 - 6) and Inadequate <40% (< 4). The attitudes questionnaire consists of 10 attitude related questions regarding EVD. There were 7 favorable (positive) and 3 unfavorable (negative) statements. The items were measured on Likert scale. Total score is 50 and interpreted as Strongly agree (SA) – 5, Agree (A) – 4, Uncertain (U) – 3, Disagree (D) – 2 and Strongly disagree (SD) – 1 for favorable statements. Also for unfavorable statements, Strongly agree (SA) – 1, Agree (A) – 2, Uncertain (U) – 3, Disagree (D) – 4 and Strongly disagree (SD) – 5.

All processes were started after secure the ethical clearance from ethical clearance committee. A signed written consent obtained from the heads of institutions/facilities and administration office of Kebele 18 following an explanation, purpose, risk and benefit of the study. Confidentiality of the data kept throughout the data collection and the entire study period. The study is limited to 269 residents of kebele 18, Harar, Eastern Ethiopia.

RESULTS

Socio-demographic variables of Respondents: Out of 269 respondents interviewed, 62.1 % were Female and 37.9% were Male, and 52.0% of them were between the age group of 26-35 years, 21.2% were between 36-45 years, 15-25 years were 16.4% and those 46 years and above were 10.4%. Among those 61.7% were Christians and, 36.8%, 1.5% were Muslim and Wakefata respectively. Majority of respondents (42.8%) were from Amhara ethnic group followed by Oromo (34.9%) and 13.8 %, 6.7% and 1.9% were Gurage, Adare and Tigre respectively. Majority of respondents were Married (48.3%) and 25.7% were Single followed by, 14.5% and 11.5% were widow and divorced or separated. About 32% of respondent's educational level were secondary level, followed by 31.6% who were illiterate, and 22.3%, 14.1% were primary and diploma and above respectively. The majority of respondents was day laborer (43.9%) and followed by 25.7%, 13.4%, 7.8%, 7.1% and 2.2% who were merchant, Government employee, NGOs, Farmer and students respectively. Half of monthly incomes of respondents were between 1001-5000ETB/month, and those who less than 1000ETB and more than 5000ETB were 24.2% and 21.9% respectively. About 90% of food habits of respondents were mixed and the left was vegetarian (10%), and their family type were Nuclear (59.1%) and joint (40.9%). Regarding their age groups, about 44 (16.4%) of the respondents were within age group of 15 – 25 years. Most of the respondents 140 (52%) were within age group of 26 – 35 years and the rest 57 (21.2%) and 28 (10.4%) were 36-45 years and 46 and above respectively. Regarding their educational status, about 86 (32%) of the respondents were attending their education in secondary school, 85 (31.6%) were illiterate and 60 (22.3%) were attended primary school and 38 (14.1%) were completed diploma and above.

Ebola Virus Disease knowledge assessment among the respondents: Out of 269 respondents, all respondents were heard about EVD. Majority of the respondents got information from media 233 (86.6%), and 101 (37.5%) had known about the mode of transmission of EVD. Among the respondents, 124 (46.1%) and 102 (37.9%) of the respondents had known about the incubation period and preventive measure of EVD respectively. Regarding the knowledge related to incubation period of Ebola among respondents, 46.1% have answered that incubation period of Ebola will be 2-21 days, followed by none (27.5%), 25-30days (19.3%) and 35-40 days (7.1%). Out of 269 respondents, 37.5% were answered that EVD may transfer through

blood/body fluids and almost similarly those said by mosquitoes was 33.5%, while 23.8% and 5.2% were believed that EVD may transfer through air and through contaminated drinking water, respectively. Out of 269 respondents, only 67 (24.9%) had adequate knowledge, 121 (45%) had moderately adequate knowledge and 81 (30.1%) had inadequate knowledge regarding Ebola virus disease.

Ebola Virus Disease attitudes assessment among the respondents: Concerning the attitude assessment questions towards Ebola virus disease, 96 (35.7%) have agreed on risk of Ebola transmission from raw bush meat, and 112 (41.6%) and 90 (33.5%) of respondents were uncertain on elimination of EVD by temperature and the transmission of EVD from a person recovered from Ebola. Out of 269 respondents, 49.4% of respondents have agreed on use of Personal protective clothing by Ebola care givers and followed by 43.9% who were strongly agreed on this statement, while 5.2% and 1.5% were uncertain and disagreed, respectively. None of the respondent stated that strongly disagree. Out of 269 respondents, 33.5% were disagreed to the statement that a person recovered from EVD can transmit it to other person, 26% were uncertain to this statement, followed by 17.5% and 16.4% were agreed and strongly disagreed respectively, while 6.7% were strongly agreed on risk of transmission of EVD from a person recovered from Ebola. Majority of respondents 41.6% and 34.9% were uncertain and disagree respectively regarding elimination of EVD by heat, followed by 14.9%, 6.3% and 2.2% agree, strongly disagree, and strongly agree, respectively. Out of 269 respondents, 146 (54.3 %) had positive attitude and 123 (45.7 %) had negative attitude regarding Ebola virus disease.

DISCUSSION

Current reports indicate the rapid spread of the Ebola epidemic. The high fatality rate, combined with the absence of treatment and vaccination options, makes Ebola virus an important public pathogen.^[35] Unlike previous outbreaks, which were centered on rural communication, infection has also been detected in large urban areas in 2014. Currently the Ebola outbreak represents a global EVD threat.

In the present study a 3-band distribution of respondent's knowledge was adopted (adequate (70 – 100%), moderately adequate (40 – 69%) and inadequate (<40%)) among the public. Also Likert scale was used to measure attitudes among the public. The study showed that total of 269 respondents was selected for the study. As can be seen from the table presented, 67 (24.9%) had adequate knowledge,

121 (45.0%) had moderately adequate knowledge and 81 (30.1%) had inadequate knowledge regarding Ebola virus disease, this level was unsatisfactory. Also 146 (54.3 %) had positive attitudes and 123 (45.7 %) had negative attitude regarding Ebola virus disease. The low level of knowledge among the residents of kebele 18 may be due to the fact educational status, about 85 (31.6%) were illiterate and 60 (22.3%) were attended just primary school.

A study conducted in Sierra Leone on survey sample comprised of 1413 individuals from 706 households from nine districts showed that Comprehensive knowledge on EVD prevention. 39% of respondents were able to identify three means of prevention.^[36] Consistent with this study the present study shows that regarding EVD prevention (Isolating the patient, Washing hands as needed, and by avoiding blood/body fluid contact) 102 (37.9%), the result almost similar the reason was due to urbanization of the study area.

The results of the present study was not similar with a study conducted in Lagos state,^[37] Nigeria in which 68.8% were got information from media and it is almost similar with study done among 150 Australian pilgrims returning home from Hajj were 78% (105/134) reported the mass media as their main source of information.^[38] Also there is difference in knowledge on EVD transfer which was 60% (80/134) stated that the virus transmits through contact with infected body fluids, 17% (n = 23) said it spreads through air, this difference was due to educational status of the person.

CONCLUSION & RECOMMENDATION

A basic knowledge and good attitudes among the public regarding Ebola virus disease is very essential. In the present study, it was found that residents in kebele 18, Harar, Eastern Ethiopia had unsatisfactory knowledge regarding Ebola Virus Disease. Also 123 (45.7 %) had negative attitudes regarding Ebola virus disease among the residents in kebele 18 were not satisfactory too.

To protect a nation from such a horrifying disease EVD, cooperation from the health care workers is very crucial because the findings of current study stated that only 7.8 % of respondents got information regarding EVD from Health care workers.

The deficiency of the knowledge and attitudes may be due to the disease was not prevalent in the country. Hence findings of this study pinpoint the necessity of inculcation of health education programs, which will create the public to be aware against the EVD.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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Table 1. Frequency and percentage distribution of socio demographic variables of respondents in Kebele 18, Harar, Eastern Ethiopia. N=269

Socio demographic variables		Frequency	Percentage (%)
Age in years	A. 15-25	44	16.4
	B. 26-35	140	52.0
	C. 36-45	57	21.2
	D. 46 and above	28	10.4
Sex	A. Male	102	37.9
	B. Female	167	62.1
Religion	A. Muslim	99	36.8
	B. Christian	166	61.7
	C. Others	4	1.5
Ethnicity	A. Oromo	94	34.9
	B. Amhara	115	42.8
	C. Gurage	37	13.8
	D. Adare	18	6.7
	E. Others	5	1.8

Marital Status	A. Married	130	48.3
	B. Single	69	25.7
	C. Widow	39	14.5
	D. Divorced/Separated	31	11.5
Educational Status	A. Illiterate	85	31.6
	B. Primary	60	22.3
	C. Secondary	86	32.0
	D. Diploma and above	38	14.1
Occupation	A. Farmer	19	7.1
	B. Day laborer	118	43.8
	C. Business	69	25.7
	D. Government employee	36	13.4
	E. NGO	21	7.8
	F. Others	6	2.2
Level of income per month	A. less than 1000 ETB/month	65	24.2
	B. 1001-5000 ETB/month	145	53.9
	C. More than 5000 ETB/month	59	21.9
Food habit	A. Mixed	27	10.0
	B. Vegetarian	242	90.0
Type of family	A. Nuclear	159	59.1
	B. Joint	110	40.9

Table 2: Frequency and Percentage distribution of Knowledge regarding Ebola virus disease among residents in Kebele 18, Harar, Eastern Ethiopia. N=269

S. No	Questions related to knowledge of EVD	Frequency	Percentage (%)	
1	Have you heard the disease Ebola?	A. Yes	269	100
		B. No	0	0
2	If your answer is yes, from where you get the information?	A. Media	233	86.6
		B. Health workers	21	7.8
		C. Neighbors	13	4.9
		D. Others	2	0.7
3	What is Ebola?	A. Virus	88	32.7
		B. Bacteria	115	42.8
		C. Plasmodium	49	18.2
		D. Fungus	17	6.3
4	How can EVD transfer?	A. Through air	64	23.8
		B. By mosquitoes	90	33.5
		C. Through blood/body fluid	101	37.5
		D. Through contaminated drinking	14	5.2

		water		
5	Which of the following is the initial symptom of Ebola?	A. Fever	95	35.3
		B. Diarrhea	43	16
		C. Vomiting	37	13.7
		D. Muscle ache	36	13.4
		E. All	58	21.6
6	What is the incubation period of Ebola?	A. 2 to 21 days	124	46.1
		B. 25-30 days	52	19.3
		C. 35-40 days	19	7.1
		D. None	74	27.5
7	Can Ebola transmit by touching the skin of someone who is symptomatic?	A. Yes	158	58.7
		B. No	111	41.3
8	Can Ebola transmit from someone without symptoms?	A. Yes	166	61.7
		B. No	103	38.3
9	Which of the following is the preventive measure for Ebola?	A. Isolating the patient	57	21.2
		B. Washing hands as needed	44	16.4
		C. By avoiding blood/body fluid contact	66	24.5
		D. All	102	37.9
10	Is there any treatment available for EVD?	A. Yes	38	14.1
		B. No	231	85.9

Table 3: Frequency and percentage distribution of level of knowledge score regarding Ebola virus disease among the residents of Kebele 18, Harar, Eastern Ethiopia.

N=269

S. No	Level of knowledge	Score	
		Frequency	Percentage
1	Adequate (7-10)	67	24.9 %
2	Moderately adequate (4-6)	121	45 %
3	Inadequate (0-3)	81	30.1 %

Maximumscore-10

Table 4: Frequency and percentage distribution of attitudes regarding EVD among the respondents in kebele 18, Harar, Eastern Ethiopia.

N=269

S. No	Statement related to attitude of EVD		Frequency	Percentage (%)
1	Ebola spreads through the air, water or food.	SA	30	11.2
		A	156	58.0
		U	41	15.2
		D	33	12.3
		SD	9	3.3
2	Do not touch the blood or body fluid of people who are affected from Ebola.	SA	39	14.5
		A	165	61.3
		U	43	16.0
		D	19	7.1
		SD	3	1.1
3	There is a risk of Ebola transmission raw bush meat.	SA	58	21.6
		A	96	35.7
		U	57	21.2
		D	48	17.8
		SD	10	3.7
4	Touching the body of someone has died of Ebola is not a problem.	SA	22	8.2
		A	71	26.4
		U	33	12.3
		D	98	36.4
		SD	45	16.7
5	A suspected person can reduce the chance of spreading the disease by immediately going to a health facility.	SA	125	46.5
		A	103	38.3
		U	26	9.6
		D	12	4.5
		SD	3	1.1
6	Ebola viruses can be eliminated with heat.	SA	6	2.2
		A	40	14.9
		U	112	41.6
		D	94	34.9
		SD	17	6.4
7	Although the victim has not developed initial symptoms, they can transmit EVD to those around them.	SA	23	8.6
		A	110	40.9
		U	63	23.4
		D	58	21.6
		SD	15	5.5
8	A person recovered from EVD can transmit it to other person.	SA	18	6.7
		A	47	17.4
		U	70	26.0
		D	90	33.5

		SD	44	16.4
9	Ebola care givers should wear Personal protective clothing.	SA	118	43.9
		A	133	49.4
		U	14	5.2
		D	4	1.5
		SD	0	0
10	Travelers who show initial symptoms of EVD should be isolated.	SA	145	53.9
		A	108	40.2
		U	9	3.3
		D	5	1.9
		SD	2	0.7

Table 5: Frequency and percentage distribution to assess the attitude of Ebola virus disease. N=269

S.No	Level of attitude	Score	
		Frequency	Percentage
1	Positive	146	54.3%
2	Negative	123	45.7%

Figure 1: Percentage of respondents according to age groups in kebele 18, Harar, Eastern Ethiopia.

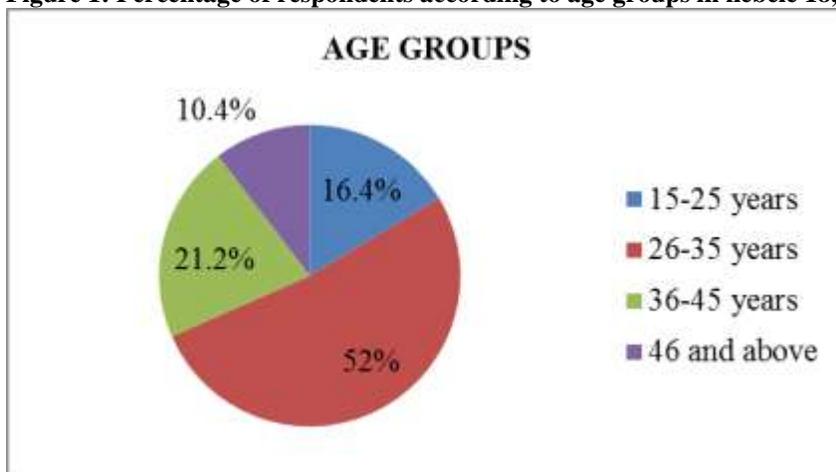


Figure 2: Percentage of educational status among respondents in kebele 18, Harar, Eastern Ethiopia.

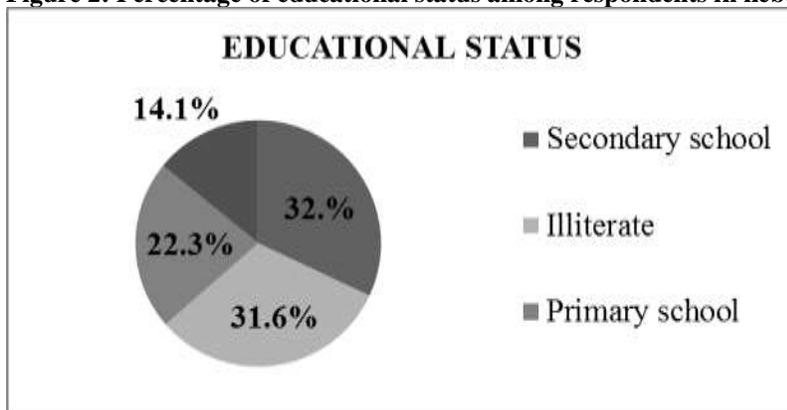


Figure 3: Percentage knowledge regarding Incubation period of Ebola virus disease among the respondents.

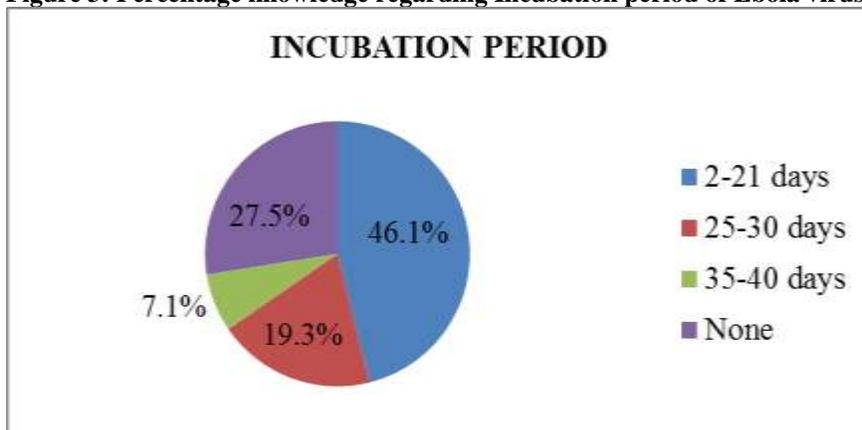


Figure 4: Percentage knowledge on EVD on mode of transmission among the respondents.

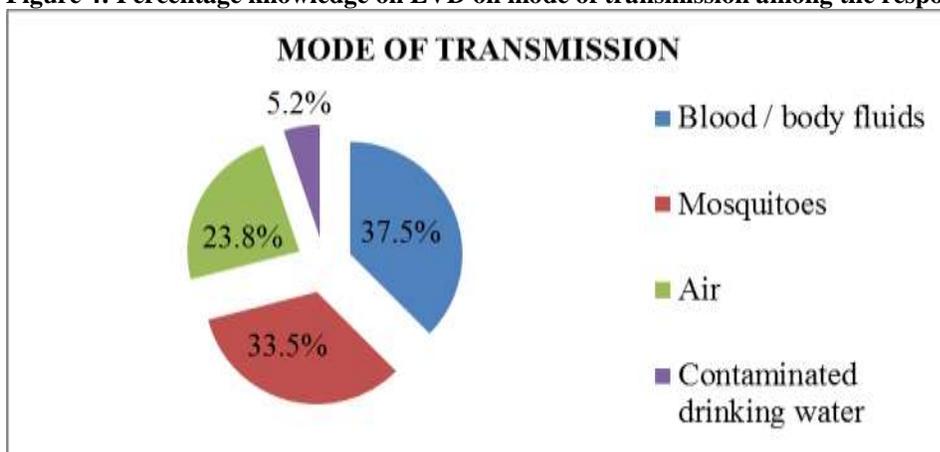


Figure 5: Percentage level of knowledge regarding EVD.

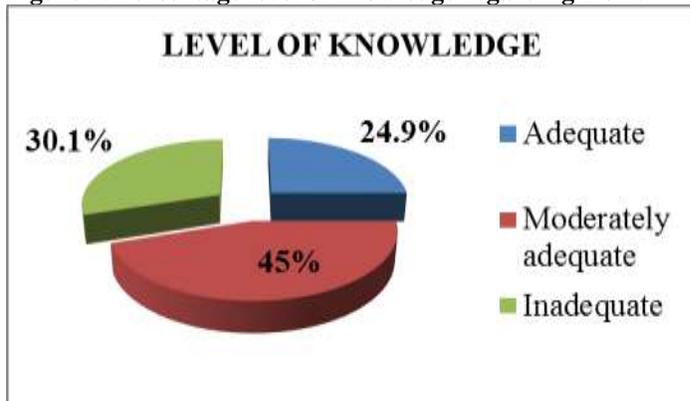


Figure 6: The attitude of respondents on use of Personal protective clothing by Ebola care givers.

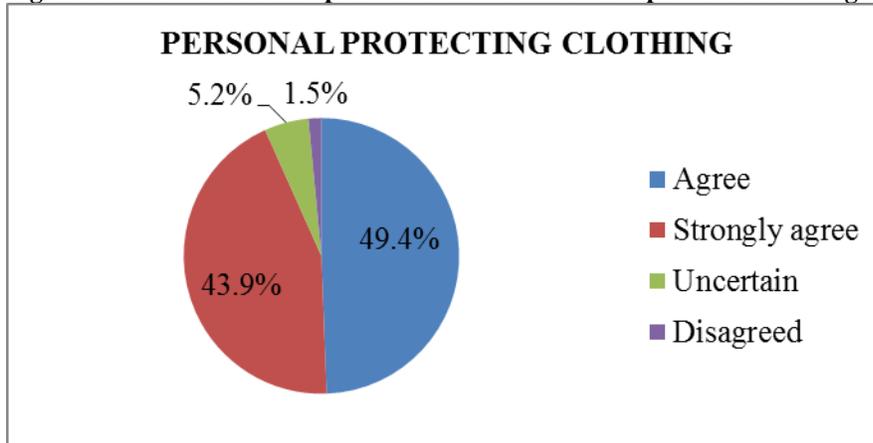


Figure 7: The attitude of respondents on risk of EVD transmitting from a person who recovered from Ebola.

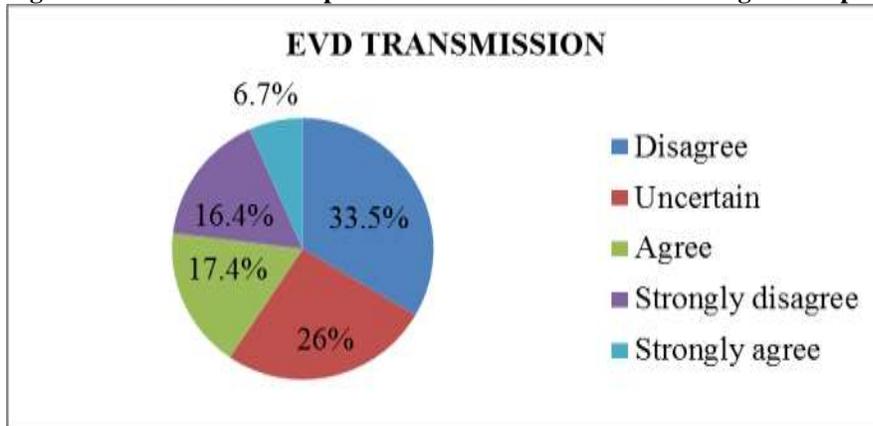


Figure 8: The attitude of respondents regarding EVD elimination with heat.

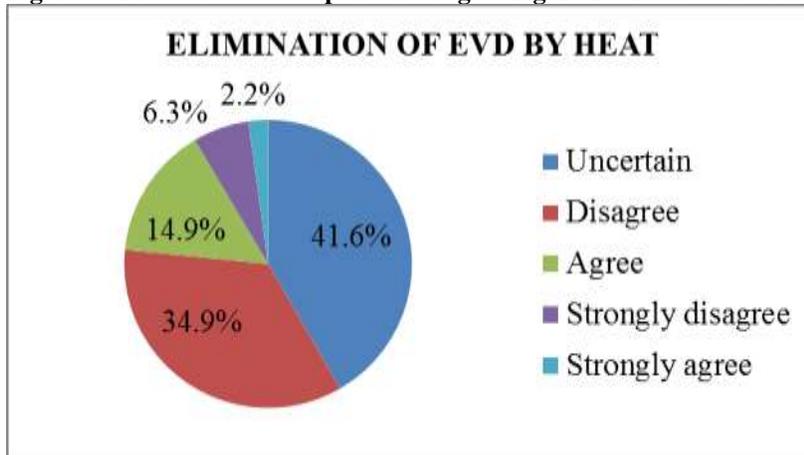
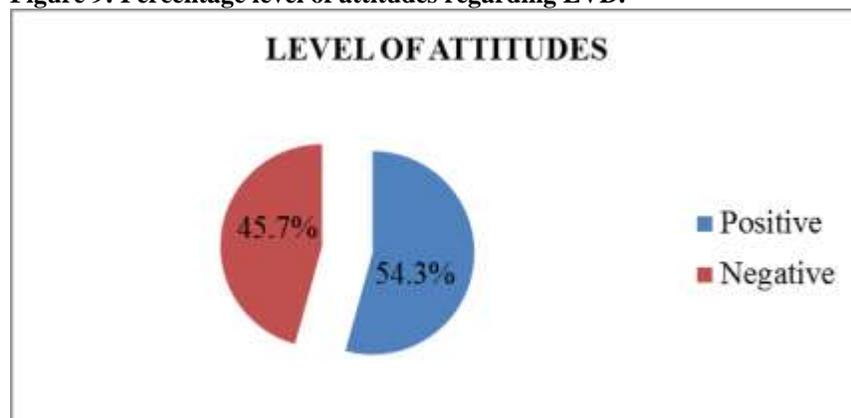


Figure 9: Percentage level of attitudes regarding EVD.**REFERENCES**

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