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Health Workers' Knowledge and Attitude about Ebola Virus Disease

Hassan Rezaeipandari[1], Vali Bahrevar[2], Alireza Babaei Mazreno[3], Zohreh Rahaei[*2], Saeedeh Zare Jamalabadi[4], Maryam Jedari Eghbali[5]

1. Department of Health Education and Promotion, Faculty of Health, Tabriz University of Medical Sciences, Tabriz , Iran
2. Department of Health Education and Promotion, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
3. Department of Sport Sciences, Islamic Azad University, Khorasgan Branch, Isfahan, Iran
4. Department of Radiology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
5. Deputy of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

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Corresponding Author:
Zohreh Rahaei
z.rahaei@ssu.ac.ir

ABSTRACT

Introduction: Ebola is a viral infection with a high mortality risk and health workers are considered as an at-risk group. The main aim of this study was to determine the knowledge and attitude of health workers about Ebola virus disease (EVD) in Yazd city, Iran.

Methods: This cross-sectional study was carried out on 110 health workers in health centres of Yazd city, Iran in 2015, who were selected by cluster random sampling method. The tool for data collection was a researcher-made questionnaire including demographic information as well as knowledge and attitude questions about EVD with confirmed validity and reliability. Data were analysed by statistical tests of Student's T-test, Chi-square, ANOVA, and Pearson correlation coefficient.

Results: The mean score of the participants' knowledge and attitude were 25.16± 3.58 (range 0-46) and 46.59±4.05 (range 13-65), respectively. More than half of the health workers did not know transmission routes of EVD. However, 59.6% of them were aware that the one way to prevent the disease was to avoid contact with an infected person. A significant correlation was also found between knowledge and attitude scores (P< 0.001, r= 0.384).

Conclusion: Since knowledge of the health workers was at the moderate level, training courses and interventional programs are recommended for health care workers especially about transmission routes and signs of EVD to increase the Knowledge and attitude of the participants.

Keywords: Ebolavirus, Knowledge, Attitude, Health Personnel

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Introduction

Ebola virus disease (EVD) is a viral infection created by Ebola virus. This virus is from the Filo virus family and creates a kind of fever and bleeding after entering the body of the hosts. This leads to death in 30% to 90% of the patients with symptoms (1). Ebola was first discovered in 1976 in Sudan and near Zaire, where the Democratic Republic of Congo is currently located (2). Later, it moved into other African countries and killed many people. As a matter of fact, it was not limited to Africa and spread into other continents (3). Ebola virus causes high fever and bleeding that weaken the patients and spreads very quickly. The researchers believe that the virus originated from African countries and spreads from animals to human beings (4).

The mortality rate of Ebola virus is from 25% to 90% and no treatment has ever been found for it (2). For the past few years, several researches conducted studies to identify the source and mode of Ebola; however, the precise spread route and mode of this disease have not been determined yet. Based on the existing evidences, the Ebola virus exists in the body fluids such as saliva and sex fluid during the acute period and convalescence of the disease. Therefore, EVD is probably transmitted to the healthy individuals by contacting with blood or other body fluids and discharges such as phlegm of the infected people (5-8).

Some of the physicians, nurses, and paramedics were infected with EVD while treating the patients. Repeated connection, lack of observance of the health issues, and lack of knowledge about the transmission mode in the initial years of the disease identification are among the main causes of this disease. In any case, this virus shows its symptoms after 2 to 21 days regardless of the way it enters the body (9). Patients with sudden onset of the fever, severe weakness, muscle pain, headache, and sore throat should consult a physician. Usually, after a short period of time, nausea, vomiting, diarrhoea, skin pustules, liver disorder, kidney disorder, and even in some cases the internal and external bleeding occur after the preliminary symptoms and the patients' condition severely moves towards critical (9). Patients suffering from EVD in the critical cases are similar to individuals with severe dehydration; so, they must receive special care.

So far, no specific treatment or vaccine has been discovered for EVD and all the proposed medicines and vaccines need several years of research to reach the clinical stage (9). Prevention from the bleeding fever of EVD in Africa has been encountered with difficulties. Since identification of the infected animals and their living places are unknown, only a few primitive measures have been proposed for prevention of this disease.

The main principle in prevention of the infection is avoiding direct contact with a patient. If a case of the disease is observed, the first people who should take great care about the danger are the health care centres' staff. These individuals should use complete coverage, mask, gloves, and glasses to prevent contact with blood and body of the infected person. Additionally, in the case that a patient dies, contacting the corpse should also be avoided (10).

A limited number of studies were conducted on the knowledge and attitude toward EVD. In a Nigerian study, the average percentage scores for knowledge, attitude, and practice were 79.4%, 95%, and 49.9%, respectively (11). In another study in Karnataka Hospital, the knowledge rate of physicians was 55.5%, of nurses as 45%, and of laboratory technicians was 40%. In general, knowledge, attitude, and practice scores of these participants were 73.6%, 83.1%, and 69.2%, respectively (4). In an interventional research in the United States, the participants' knowledge of EVD concerning its type, latency /incubation period, diagnosis, vaccination, treatment, and symptoms was adequate. Many individuals had a positive attitude towards the treatment of patients suffering from EVD and believed that the infected patients should be isolated and societies must actively participate in the prevention of the EVD (12). Thus, the health care personnel must follow strict observance and apply precise health principles to prevent spread of the disease and self-

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infection. Consequently, considering the importance of the role and position of healthcare centres' personnel and lack of a related study in Iran, the present study was conducted to determine the knowledge and attitude of the health care centres' staff about EVD in Yazd, Iran.

Methods

Participants

The participants of this cross-sectional study included 110 workers of healthcare centres in Yazd, Iran. The following parameters were used to estimate the sample size: (1) 95% confidence interval, (2) standard deviation of 2.5 (13), and (3) estimated error of 0.45. A clustered random sampling was used for selecting the participants. In this regard, 10 health care centers were randomly selected out of the urban health care centers and 11 individuals were selected from each center.

Procedures and Measures

A 3-part researcher-made questionnaire was used derived from the literature (14-16) to collect data. The first section of this questionnaire was used to collect the participants' demographic information including age, gender, educational status, and work experience. The second section consisted of 16 questions to assess EVD knowledge. The questions were designed in multiple choices while some of them had more than one correct answer. The items were scored so that each correct answer received one point. The total scores could range from zero to 46. The individuals' level of knowledge was categorized into three groups: 0-16 = weak, 17-31 = moderate and 32-46 = good.

The third section of the questionnaire dealt with the participants' attitudes towards EVD and included 13 attitudinal statements. A 5-point Likert-type scaling (1 = completely disagree, 5 = completely agree) was applied to answer the items. The total scores could range from 13 to 65, which was categorized as follows: (1) 13-30= weak, (2) 31-47 = moderate and 48-65 = good.

The content validity of the questionnaire was assessed and approved by a panel of experts in infectious disease and health education. The questionnaire was pilot-tested and the data were obtained to estimate the reliability of the scales; this process resulted in Cronbach's Alpha Coefficient of greater than 0.7 for each of the scales.

The research team members distributed the questionnaire among the staff members of the selected healthcare centres in Yazd.

Ethical consideration

Participation in this study was consciously and voluntarily. All participating healthcare workers signed an informed consent form. Additionally, all were ensured about the confidentiality of their information.

Statistics

The inferential statistics employed for the purpose of data analysis included Student's t-test, Chi-square, Analysis of Variance (ANOVA), and Pearson Product-Moment Correlation Coefficient (Pearson r).

Results

Demographic Variables

The mean age of the samples was 35.02±8.28 years and the mean years of work experience was 11.93±8.55. The majority of the participants were female (67.9%), married (83.5%) and had Bachelor of Science (BS) degrees (52.5%) (Table 1).

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Table 1. Demographic characteristics of the participants

Variable		N	Percent
Age	20-29	30	28.0
	30-39	39	36.4
	40-49	33	30.8
	>50	8	5
Gender	Male	35	32.1
	Female	75	67.9
Married status	Single	19	16.5
	Married	91	83.5
Educational level	Associate	30	28.7
	BS	56	52.5
	MS	14	10.9
	PhD/MD	10	7.9
Work experience	<10 years	57	52.0
	10-20 years	34	31.4
	>20 years	19	16.6

Knowledge

The knowledge test scores ranged from 0 to 46 with an average score of 25.16 (SD=3.58). The most frequently correct answers were related to the questions that asked about the causes of EVD (98.2%) and awareness about the fact that the disease leads to death (96.3%). The lowest percentage of the correct answer was attributed to the question about the people at risk of EVD (16.5%), followed by of the awareness about the most important transmission routes of this disease (35.5%) (Table 2).

Table 2. Frequency distribution of answers to Ebola knowledge items among participants

	N	Percent
The cause of Ebola disease	107	98.2
The most important transmission route of Ebola disease	51	46.8
The possibility of transmission of Ebola disease through animals	69	63.3
The possibility of transmission of Ebola disease to caregiver	102	93.6
Quarantine the person with Ebola diseases	83	76.1
Season outbreak of Ebola diseases	54	49.5
Death caused by Ebola diseases	105	96.3
Medication for treatment of Ebola diseases	39	35.8
Drug resistance	53	48.6
Protective measures	44	44.9
At risk individuals	18	16.5
Signs of Ebola diseases	39	35.6
Preventive ways	58	53.4
Vaccination	70	64.2
Countries involved with Ebola diseases	87	79.8
Information of Ebola diseases	13	11.90

Knowledge scores had no statistically significant difference with gender (p=0.13), marital status (p=0.15), age (p=0.18), and work experience (p=0.13). However, participants with higher levels of education had higher scores in knowledge area (p<0.01). Post-hoc analysis using Tukey test showed that the individuals with PhD level of education and physicians had a higher level of knowledge about Ebola rather than others (Table 3).

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Table 3. Frequency distribution of mean and standard deviation of knowledge and attitude based on the demographic variables

		Knowledge		p-value	Attitude		p-value
		M	SD		M	SD	
Gender	Male	25.91	3.79	0.13	54.88	5.06	0.32
	Female	24.81	3.45		53.95	4.35	
Mariage status	Single	24.05	2.68	0.15	54.11	3.75	0.88
	Married	25.38	3.71		54.28	4.75	
Educational level	Associate degree	24.86	3.39	0.013	52.86	4.11	0.029
	B.S	24.92	3.40		54.56	4.41	
	M.Sc.	25.36	3.29		55.09	4.72	
	M.D	29.12	3.39		58	4.53	
Field of study	Paramedic	27.5	6.36	0.012	57	4.24	0.098
	Family Health	23.93	3.25		53.5	2.92	
	Laboratory science	26.33	2.29		55.44	5.05	
	Public Health	25	3.59		53.76	5.22	
	Environmental Health	24.33	3.86		56.20	3.96	
	Physician	30.33	2.58		58	5.01	
	Nurse – midwifery	25	2.70		53.14	3.33	
	Others	24.73	3.23		52.33	4.01	
Age	20-29	24.83	3.07	0.81	53.96	3.89	0.35
	30-39	25.51	3.85		53.76	4.75	
	40-49	24.78	3.61		54.09	4.36	
	50-59	25.40	4.72		57.60	6.38	
Work history	Below 10 years	25.66	3.52	0.31	54.35	4.13	0.24
	10-19 years	24.71	3.50		53.25	4.78	
	20 years and above	24.35	4.01		55.52	5.61	

Attitude

The respondents' attitudinal scores toward EVD ranged from 13 to 65 **(**46.6±4.0). The majority (85.3%) of the participants did not have any opinion about the fact that no one is immune in the society from EVD infection. The most positive attitudes of the healthcare workers were respect for patients with Ebola (47.7%) and agreement about this idea that nobody in the community is immune from Ebola disease. Nearly 23% of the individuals agreed that healthcare workers were at a higher risk of developing the contagious disease (Table 4). Attitude scores had no statistically significant difference with gender (P<0.32), marital status (P<0.88), age (P<0.35), work experience (P<0.24), and field of study (P<0.09), but attitude had a statistically significant relationship with level of education (P<0.02). Tukey test showed that people with the PhD level of education had a higher attitude scores about Ebola rather than other educational levels (Table 4).

Attitude had no statistically significant difference with gender (p=0.32), marital status (p=0.88), age (p=0.35), and work experience (p=0.24). Similarly, knowledge scores were higher among the participants with higher levels of education (p < 0.05).

The EVD knowledge and attitude scores were significantly correlated (r=0.4, p<.01). Radio and television were the most important sources of providing information about EVD (62.2%).

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Table 4. Frequency distribution of answer to Ebola attitude items among participants

Items	Completely agree		agree		No comment		Disagree		Completely disagree	
	N	%	N	%	N	%	N	%	N	%
1. According to my viewpoint no one in the society from the viewpoint of getting infected with Ebola is not immune	42	38.5	51	46.8	6	5.5	4	3.7	6	5.5
2.I believe that getting infected to this disease surely leads to death	15	13.8	42	38.5	13	11.9	32	29.4	7	6.4
3. According to my viewpoint, respect to patients suffering from Ebola like other diseases is necessary	52	47.7	48	44	8	7.3	1	0.9	-	-
4.I believe that the Ebola disease is threatening our society	28	25.7	54	49.5	19	17.4	5	4.6	3	2.8
5. According to my viewpoint, companionship and talking to an infected individual causes transmission of this disease	20	18.3	51	46.8	16	14.7	19	17.4	3	2.8
6. According to my viewpoint, prevention from Ebola disease is easy.	3	2.8	45	41.3	15	13.8	38	34.9	8	7.3
7.As per my viewpoint, Ebola is specially for the deprived and poor classes of the society	5	4.6	20	18.3	18	16.5	47	43.1	19	17.4
8. According to my viewpoint, the individual infected by Ebola leads to his or her family destruction	6	5.5	18	16.5	24	22	50	45.9	11	10.1
9. According to my belief, the direct contact with blood and discharges of infected individual is effective in transmission of this disease	37	33.9	50	45.9	16	14.7	5	4.6	1	0.9
10. According to my belief, avoidance of contact with infected animal is useful in the transmission of this disease.	24	22	48	44	26	23.9	9	8.3	2	1.8
11. According to my belief, avoidance from presence in the crowded places is effective in prevention from getting infected to this disease.	18	16.5	55	50.5	21	19.3	14	12.8	1	0.9
12. According to my viewpoint, hygienic personnel more than others are exposed to danger.	25	22.9	60	55	10	9.2	11	10.1	3	2.8
13. According to my viewpoint, putting hand in front of the mouth and nose during cough or sneeze is effective in prevention of the transmission of this disease.	26	23.9	57	52.3	13	11.9	8	7.3	5	4.6

Discussion

Considering the aim of this study, the levels of knowledge and attitude about EVD were determined among the staff of healthcare centres in Yazd. The participants' mean scores of knowledge and attitude were 25.16 and 46.6, respectively. In other words, their knowledge and attitude measures were at a moderate level.

In a Nigerian study, 45.4%, 52.5%, and 24.35% of the participants had a good knowledge, attitude, and practice scores, respectively (11). In another study conducted in the Karnataka Hospital, the knowledge rate of the physicians, nurses, and laboratory technicians were 55.5%, 45%, and 40%, respectively. In the same study, the total scores of knowledge, attitude, and performance were 73.6%, 83.1%, and 69.2%,

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respectively (12). In an interventional study in the United States, Ebola knowledge showed a significant increase after instruction, attitudes towards the infected patients were found to be positive (10). Such dispersed information can be due to sudden and unexpected outbreak of Ebola disease in the world, especially in African countries. In addition, the sensitivity of the concerned health care officials in dealing with the disease can be another reason. In the setting of the present study, dissemination of information by radio, televisions, and educational posters may contributed to increased awareness about the disease. Thus, appropriate training courses should be planned to deal with this disease, which must include all healthcare personnel.

The above-mentioned results are in concurrence with the findings of the present study. However, in a study in Sierra Leone, the rate of public knowledge about the EVD was low, but the participants' attitude was positive towards the prevention strategies and caring behaviours (17).

In the present study, physicians and people with PhD degree had the highest knowledge scores. In a study by Holakuei et al. (18), PhD and MPH students had the highest knowledge scores about Ebola. It is not surprising that the level of education is a factor in attaining knowledge.

The majority of participants in the current study knew that infection with this disease led to death. In a study by Olowookere et al., the overwhelming majority of the participants (91.5%) were also aware of this fact (15). In the present study, 66% of the participants were unaware of the at-risk group, which is compared to 57.6% reported by Holakuei et al. (18). In our study, 59.6% of the participants knew that "avoiding contacts with an infected person" was a way to prevent from the disease. In Toure et al. study, 57.9% of the participants were aware of at least one way of protection against the disease (16). Mahwish et al. also reported that 88% of participants were aware of the fact that washing hands with water and soap was one of the preventive measures (19). The high prevalence and mortality rates of this disease in some countries caused participants to be aware of the outcome of the disease, that's mean death.

In the present study, 53.2% of the healthcare workers were not aware of the most important transmission route of EVD. In Jiang et al. (15) and Olowookere et al. (20) studies, more than 80% of the participants were aware of the transmission routes of this disease. In our study, the majority of participants were unaware of the expected signs of the disease, which was consistent with Holakuei et al.'s findings (18). In Olowookere et al.'s study, 27% of people believed that a vaccine existed for Ebola (15); in our study, 64% of the participants did not believe that a vaccine existed for Ebola. It seems that since the incidence of EVD has not been reported in Iran, participants were not aware of the transmission routs.

Ebola patients, similar to other patients, must be respected and receive the best available medical care. The healthcare professionals in our study felt that Ebola patients must be provided with high quality personnel, facilities, equipment, and intervention. Stigmas must be avoided and ethical considerations must be followed in treating Ebola patients.

The results of this study showed that general awareness existed about the role of direct contact with the blood and fluids of an infected person in the transmission of Ebola. Nearly 35.8% of the participants believed that getting infected by this disease did not lead to death, which is not correct, implying the need for additional training. Only 17.4% of the participants believed that this disease was threatening our society, which is very low. Due to the high worldwide prevalence of this disease and its incidents in the neighbouring countries as well as Islamic places, the possibility of the spread of the disease cannot be under-estimated. Therefore, it is necessary to educate the public on the potential consequences of Ebola. Knowledge and attitudes towards the Ebola disease had statistically significant relationships with the level of education; higher education was associated

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with higher knowledge and attitudes scores, which were expected.

The main sources of information for the participants of the current study were radio and television (62%). In a study conducted by Vailayaet al., the most important source of information was the electronic media (41.2%) and only 19.5% of the participants received information via television (4). In the study conducted in Sierra Leone, 85% of the information about Ebola was obtained through radio (17). In studies by Idris et al. and Jiang et al., the media such as radio and television were the most important source of information (20, 21). Interestingly, health workers also received information from radio and television, while they should be a source of information for people in the community.

A limitation of this study was its cross-sectional design, which does not show a powerful causal relationship. Another limitation was application of self-report instruments to collect the data.

Conclusion

The knowledge level of the health centres' workers was not desirable, whereas their attitude level was good; thus, developing and conducting continuous education courses and workshops are recommended. The education programs must take into account the potential participants' level of education and professional expertise in order to design effective programs in increasing the knowledge and changing the attitudes of them.

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Conflict of interest

Authors declare no conflict of interest.

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