Assessing the Knowledge, Attitudes, and Practices of Students Regarding Ebola Virus Disease Outbreak

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Abstract

Background: The emergence and spread of Ebola outbreak is a growing problem worldwide, which represents a significant threat to public health. Evidence has shown that the level of knowledge, attitude, and practice of people in the society play major roles in controlling the spread of Ebola virus disease. This study was designed to determine knowledge, attitude and practice of students at School of Public Health, Tehran University of Medical Sciences towards Ebola.

Methods: A cross-sectional survey was performed in Tehran, Iran in 2014 using a pretested self-administered questionnaire on a stratified sample of 400 students. Descriptive and multivariate analyses were used for statistical analysis.

Results: All-in-all, 385 students returned the completed questionnaires making a response rate of 96.3%., 239 (62.2%) were females and 145 (37.8%) were males. The mean age of female and males were 28.44 and 30.3 years respectively. Of the 385students, 83 (21.7%) were studying at PhD level, 210 (55.0%) at Masters Level (including MPH) and 89 (23.3%) at Bachelors level. knowledge of the students regarding EVD transmission was lowest among students of Department of Occupational Health (50.0%), followed by Health Education and Promotion Department (33.3%). Virology Department recorded the highest percentage of students who had selected correct answers regarding EVD prevention (100.0%)

Conclusion: These findings will aid in the assessment of the adequacy of current students' educational curriculum. Also, it will provide further insight in designing future multifaceted interventions to promote specific messages to change attitude and improve practice.

Keywords: Ebola, Outbreak, Tehran, Iran, Knowledge, Attitude, Practice, Students

Introduction

As stated by Center of Disease Control and Prevention (CDC – US), current Ebola epidemic is the largest epidemic since the first outbreak in Sudan and Zaire, 1976 (1). The Ebola virus (EBOV) belongs to RNA virus family of *Filoviridea* and is the most pathogenic strain. It was

first identified in 1976's outbreak in Zaire near Ebola River. Since then, multiple outbreaks have occurred of various magnitude (2), placing an estimated 22 million people at risk of getting Ebola virus disease (EVD) (3). Current Ebola epidemic came to surface from Southern Guinea, on March 23, 2014 at the time Ministry of Health (MoH) of Guinea reported to WHO a number of cases of Ebola virus disease (EVD). Out of 49 reported cases, 29 succumbed to death, giving case fatality rate of 59% for its initial epidemic wave. By the first week of April 2014, Ebola virus penetrated into Liberia and Sierra Leone to the extent that Nigeria and United States of America suffered 'travel – associated' cases of Ebola.

Initial clinical manifestations of EVD can be mistaken with any other viral disease. Patients present complaining of fever, headache, muscle aches, vomiting and diarrhea. Alarming symptoms develop in later stages of disease and are marked by a hemorrhagic rash and internal and external bleeding. With an incubation period of 3 – 12 days (4) the disease lasts approximately two weeks (5). EVD is characterized by high case fatality rate up to 90% (2). Until February 2015, out of 14,098 cases of EVD 5,160 patients have died (1).

Fruit bats are the only known natural reservoir of Ebola virus, which in some parts of West African region, are used by people as food. Although the current epidemic of Ebola virus is propagated by human to human transmission but it is hypothesized that transmission from reservoir to human has likely occurred by consuming "bush meat" or handling an infected animal (6). Transmission of Ebola virus from human to human is through direct contact with body fluids. People handling animals and giving care to patient with EVD are more vulnerable to getting infection. Therefore, WHO (7) and the US CDC (8) have developed stringent guidelines to adhere when taking care of suspected EVD cases.

Political situation of affected countries has brought considerable amount of mistrust among people, combined with the high level of misconceptions about Ebola which has caused widespread epidemics. Many people still deny the existence of EVD, as reported in Liberia. Therefore,

they care less about prevention messages such as frequent handwashing, avoiding direct contact with susceptible animals, eating uncooked or undercooked bush meat, or travelling to affected areas. Furthermore, because there is no known cure for the disease, families prefer to care for and let their loved ones die at home in comfort than to take them to isolated wards in hospitals. Unfortunately many of these care-givers end up infecting themselves as a result of limited knowledge about standard precautions. Also practices such as handshaking, handling dead bodies and mass gathering for funerals all pose potential risks for contracting the virus.

It is against the aforementioned issues that this proposal is developed to determine the knowledge, attitude and practice of students about Ebola Virus Disease. It is expected that the findings of the research and its recommendations will be useful for making public health decisions especially those relating to epidemic preparedness and disease control.

Specific objectives were to determine the level of knowledge regarding EVD among students of School of Public Health, the attitude of students of School of Public Health towards EVD, the practices of students of School of Public Health regarding EVD prevention and the level of knowledge regarding EVD among students of School of Public Health in relation to demographic variables.

Methods

Study design

A cross – sectional analytical study was conducted in Tehran, Iran in 2014 at School of Public Health - Tehran University of Medical Sciences main campus, among students of School of Public Health, present in their departments.

Setting

This survey was conducted at School of Public Health buildings within premises of Tehran University of Medical Sciences, Tehran. To avoid awareness of survey within School, data was collected as one – day activity in all departments.

Participants

Purposeful sampling technique was applied to collect data from 387 students. The respondents were given bilingual (English-Persian) questionnaires approved after pre-testing. Primary questionnaire was developed after comprehensive literature review and later translated to Persian language by a native speaker and back translated into English language. Permission for conducting this study was obtained from the Dean of School of Public Health, Tehran University of Medical Science.

Variables

The dependent variables were knowledge, attitudes and practices of EVD prevention. Independent variables included age, sex, department of study and educational level.

Data sources/ measurement

In addition to the demographic data, nine questions were asked to assess knowledge on prevention EVD, seven questions explored attitudes and six questions focused on practices towards prevention of EVD. Questionnaire consisted of both one best answer as well as multiple choice formats. Questions on attitudes towards prevention of EVD were measured using 4 points Likert scale.

Statistical methods

Data were initially entered into the Microsoft Excel and later transferred to the Statistical Package for Social Sciences (SPSS) v. 20 for analysis (Chicago, IL, USA). Description was done to demonstrate respondents' demographic characteristics. Categorical variables were measured as percentages while continuous variables were expressed as mean ± standard deviation. Inferential statistics (chi – square test) was used to measure difference in responses between groups. A p – value of less than 0.05 was considered as statistically significant.

Results

Demographics

Four hundred questionnaires were distributed among the students in 10 Departments of School of Public Health at Tehran University of Medical Sciences (TUMS). Of these questionnaires, 385 were filled and returned back making a response rate of 96.3%. Distribution of the students by level of study, sex, department and age is summarized in Table 1.

Table 1: Distribution of the students by level of study, sex, department and age

Variable		Number (%)	Totals
Level of Study	PhD	83 (21.7)	382 (100.0)
	Masters	183 (47.9)	
	MPH	27 (7.1)	
	Bachelors	89 (23.3)	
Sex	Female	239 (62.2)	384 (100.0)
	Male	145 (37.8)	
Department	Occupational Health	57 (14.8)	355 (92.2)
	Epidemiology & Biostatistics	50 (13.0)	
	Parasitology & Mycology	50 (13.0)	
	Environmental Health	47 (12.2)	
	Patho-Biology	27 (7.0)	
	Health Education & Promotion	24 (6.2)	
	Economics & Management	23 (6.0)	
	Entomology & Parasitology	19 (4.9)	
	Virology	15 (3.9)	
	Others	43 (11.2)	
		Mean (± S.E)	
Age	Female	28.44 (0.466)	
	Male	30.31 (0.622)	29.19 (0.377)

Knowledge of the Students towards EVD

Of the 384 students, 358 (93.2%) had ever heard of EVD (P = 0.044) and was slightly higher in males (96.6%) than in females (91.2%). All the Students from the Departments of Economics and Management (n=23), Entomology and Vector Control (n=19) and Patho-biology (n=27) have heard of EVD (P = 0.004). Similarly, the highest percentage of ever heard of EVD was observed among students studying MPH (100.0%), followed by PhD (98.8%), Masters (94.5%) and Bachelors (83.1%), assuming (P = 0.000). Conversely, Occupational Health Department had the highest percentage of students (17.5%) who had never heard of EVD, followed by Epidemiology and Biostatistics Department (10.0%).

Students knowledge of EVD Modes of Transmission (MOT), Signs and Symptoms, Most at Risk Areas and Populations

Out of 384 students, 358 (74.0%) knew how EVD could be transmitted. The highest and lowest percentages were seen among MPH 24(88.9%) and Bachelors 50(56.2%) students respectively. Similarly, knowledge of the students regarding EVD transmission was lowest among students of Department of Occupational Health (50.0%), followed by Health Education and Promotion Department (33.3%). On the other hand, female students appeared to have less knowledge about EVD transmission (26.2%) compared to their male counterparts (18.1%).

An analysis of knowledge regarding signs and symptoms of EVD indicated that 34.4% of the students (male= 38.9%, females= 31.6%) were not able to identify correct options relating to signs and symptoms. Furthermore, 22.3% of the students (male= 16.7%, females= 25.0%) did not have any idea about signs and symptoms of EVD. However, the percentage of students who selected the correct answers regarding signs and symptoms of EVD was highest among PhD students (63.9%), followed by MPH (55.6%) (P = 0.000).

Of the 145 male and 234 female students asked about the countries affected by EVD, 107 (73.8%) and 114 (48.7%) respectively selected the correct options (P = 0.000) and the highest percentage was seen among MPH students 12 (44.4%). Conversely, of the 378 students that responded to the question regarding populations most at risk of EVD, 44.2% (male= 37.1%, females= 25.7%) reported to have no idea about it; the highest percentage was seen among students 49 (57.6%) (Table 2).

Table 2: Knowledge of students regarding mode of transmission, symptoms, affected areas, at risk populations and preventive measures of EVD by sex

	Correct		Incorrect		No idea	
	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)
Modes of Transmission	164(69.20)	117(81.2)	11(4.6)	1(0.7)	62(26.10)	26(18.10)
Signs and symptoms of EVD	101(42.6)	64(44.4)	75(31.6)	56(38.9)	61(25.7)	24(16.7)
Populations most at risk of EVD	56(23.8)	52(36.4)	65(23.8)	38(26.6)	114(25.7)	53(37.1)
Countries affect by EVD	114(48.7)	107(73.8)	38(16.2)	12(8.3)	82(35)	26(17.9)

Attitude of the Students towards EVD

While on average, 2.78 (males =2.79, female = 2.77) of students believed that their field of study will prevent them from EVD infection, a similar number of them, 2.63 (Male = 2.61, female = 2.64) believed that their occupation would put them at risk of EVD infection. The highest percentage of student who believed that their field of study will prevent them from EVD infection was observed among students of Economics and Management Department (3.0, STD error 1.41). The mean of students who feel scare in the event of one member of loves ones become infected with EVD is 1.67(male = 1.79, female = 1.60) and the lowest

was observed among the students of Economics and Management Department (1.43, ± 0.11).

On average, 2.34 (male = 2.21, female = 2.41) considered putting on gloves during burial as a means of prevention EVD infection. Furthermore, 1.78 (male = 1.83, female = 1.75) believed that travelling to EVD affected regions will increase their risk of getting EVD while an average of 3.30

(male = 3.33, female = 3.29) preferred herbal treatment when they fall ill to EVD. The overall mean of students who believed that EVD was generated by the West to be tested in Africa was 2.48 (male = 2.56, female = 2.43) and the highest was recorded among students of Entomology and Vector Control Department (Table 3).

Table 3: Attitude of the students towards EVD by Gender

		Male Mean (±S.E)	Female Mean (±S.E)
1	My field of study will prevent me from EVD	2.79 (.074)	2.77 (.051)
2	My occupation makes me at risk of EVD	2.61 (.056)	2.64 (.045)
3	I feel scared when one of my family member or friend is affected with EVD	1.79 (.064)	1.60 (.046)
4	I think putting on hand gloves during burial practices can prevent me from EVD	2.21(.062)	2.41 (.050)
5	I believe travelling to affected area will make me an EVD patient	1.83 (.059)	1.75 (.044)
6	I prefer traditional remedy when ill of EVD	3.33 (.52)	3.29 (.043)
7	Ebola virus engineered by the Europe and America to be tested in Africa	2.56 (.072)	1.43 (.054)

Practices of the students towards EVD

Among the 380 students that responded to the question regarding EVD preventive practices, 214 (56.3%) of them chose correct answers and the percentage is higher in males (63.4%) than in females (51.9%) with (P = 0.013). Furthermore, Virology Department recorded the highest percentage of students who had selected correct answers regarding EVD prevention (100.0%), followed by Pathobiology Department (88.9%) and Epidemiology and Biostatistics Department (66.0%) (P = 0.000).

In contrast, the percentage of students who did not have any idea about measures to take to prevent EVD was the highest among students of Occupational Health Department (46.4%), followed by Entomology and Parasitology Department (42.1%) and Economics and Management Department (30.4%). Again, the percentage of students who selected correct options regarding measures to take to prevent EVD was highest among students pursuing MPH (88.5 %), followed by PhD (84.1%), Masters (73.7%) and Bachelors (47.1%) (Fig. 1).
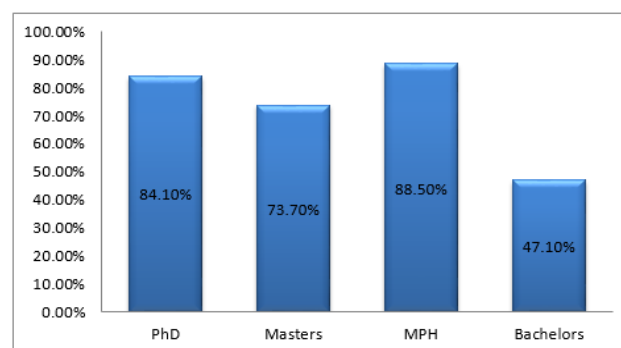

Fig. 1: Preventive practices of the student towards EVD by level of study

Discussion

To our knowledge, this is the first time that a study demonstrates knowledge, attitudes, and practice among students at School of Public Health, Tehran University of Medical Sciences, towards Ebola. The findings can be considered the first step in providing data on knowledge, attitudes and practice regarding Ebola outbreak and will aid in the assessment of present educational curricula, to provide insight in

designing future interventions to bridge the gaps as an effort against Ebola outbreak.

High levels of knowledge among MPH students were identified by the present study. These high levels could partly be explained by expertise and background of students who participate in the MPH program. Previous studies have shown that people's knowledge about Ebola might have been affected by education level of people (9-11). This underscores the need for policies of improving educational curricula for postgraduate and undergraduate levels. It is widely believed that inadequate knowledge has contributed to the emergence and spread of Ebola outbreak, which is a current problem in the world (10-12).

Expressing negative attitude towards Ebola was not uncommon among students. It has been reported that focus areas of students are factors that may lead to negative attitudes towards an infectious disease (13). Hence, a balance between professionalism and attitude needs to be addressed. Implementation of practical sessions about outbreaks within the School of Public Health can help to improve students' attitude towards Ebola. MPH students are the most accessible group to the decision-makers, and can be engaged in contributing to students' knowledge about Ebola.

Respondents' acceptable practice regarding Ebola can be explained positively with their levels of knowledge, which is consistent with other studies, where appropriate knowledge of Ebola was identified to be a predictor for positive practice towards Ebola (11, 14). The present findings identified groups of students who were prone to malpractice. Hence, efforts should be focused to reach these groups in future public educational campaigns to improve knowledge and change attitudes and practices towards Ebola outbreak.

Certain potential limitations in our study should be taken into account in interpretation of findings and conclusions. This type of study with a self-administered questionnaire depends very much upon information given by respondents' over-reporting of desirable knowledge, attitudes, or behaviors or under-reporting of undesirable ones. Anonymous completion of the questionnaires and confidentiality would minimize the over- and under-reporting (15). The cross-sectional nature of the data may not reflect any changes in respondents' knowledge, attitude and practice over time in relation to Ebola outbreak. Despite these limitations, the present findings provide important information for evaluating and improving knowledge, attitude and practice towards Ebola virus disease.

Conclusion

The present findings highlight important concerns regarding knowledge, attitude, and practice among students regarding Ebola virus disease outbreak. Our findings will help decision-makers at School of Public Health to plan future interventions to improve students' knowledge, attitude, and practice, with more effective curricula.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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