

Knowledge of Ebola virus disease: An evaluation of university students and staff regarding the current Ebola issue around the globe

Usman Abubakar, Syed Azhar Syed Sulaiman

Department of Clinical Pharmacy, Universiti Sains Malaysia, Penang, Malaysia

Address for correspondence:

Prof. Syed Azhar Syed Sulaiman,
Department of Clinical Pharmacy,
Universiti Sains Malaysia, Penang,
Malaysia.
E-mail: sazhar@usm.my

ABSTRACT

Background: Ebola virus disease (EVD) is at the moment a global pandemic disease. The importance of public awareness and alertness toward the disease cannot be underestimated since it is an important step to prevent unnecessary anxiety, fear, as well as an excessive reaction that accompany such anxiety. The main objective of this study is to assess the current level of knowledge and perception of students and staff at Universiti Sains Malaysia toward EVD.

Method: A cross sectional survey method was used, and a self-administered questionnaire was used as an instrument for data collection. The questionnaire consisted of three sections. Section A with 6 questions pertaining to demographic data of respondents', Section B had 20 questions pertaining to respondents knowledge of cause, symptoms, transmission, prevention, and current affairs about EVD. Section C had 12 questions pertaining to respondents' perception toward EVD. Respondents in this study included both students and staff.

Results: From the 520 questionnaire (400 among students and 120 among staff) distributed, only 458 were retrieved (380 from students and 78 from staff). Results showed that majority of the students were female (163; 66.0% for undergraduates, 71; 53.4% for postgraduate and 50; 64.1% for staff). The majority of the students first learned about EVD from the internet (193, 80.4%; 102, 81.0%; and 43, 58.9%, respectively, for undergraduate, postgraduate, and staff). This study found that the current level of knowledge about EVD among respondents is low (median knowledge score <50%). However, postgraduate students possess more knowledge than undergraduate and staff (median score 46.2%, $P = 0.002$). In addition, staff respondents from the university hospital (clinic) were found to possess more knowledge than other category of staff (median score = 61.5%, $P = 0.002$). Furthermore, sciences based students were found to have more knowledge than arts and social sciences based students (median score = 46.2%, $P < 0.0001$). Most of the respondents; 136 (56.7%), 52 (41.3%), and 30

Access this article online	
Quick Response Code:	Website:
	www.archivepp.com
	DOI:
	10.4103/2045-080X.166594

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Abubakar U, Sulaiman SA. Knowledge of Ebola virus disease: An evaluation of university students and staff regarding the current Ebola issue around the globe. Arch Pharma Pract 2015;6:85-92.

(41.1%), respectively, of undergraduates, postgraduates, and staff have a misconception that there are foods that can effectively cure or prevent EVD. The internet was found to be the most commonly acceptable method for provision of education about EVD among undergraduate, 64 (27.7%) and postgraduate students, 32 (26.2%). A combination of internet, TV shows and awareness campaign was found to be the most acceptable way to provide EVD education among staff (26, 41.9%).

Conclusion: It was concluded that the current level of knowledge among students and staff regarding EVD is low and there is a need to raise awareness about EVD among the university population.

Key words: Ebola virus disease, knowledge, perception, staff, students

INTRODUCTION

Ebola virus disease (EVD) previously called Ebola haemorrhagic fever is a viral disease caused by infection with a virus of the family Filoviridae, genus Ebola virus and causes serious or life threatening infections in human and primates which if left untreated could be very fatal.^[1-3] The first identified case of EVD was recorded in Democratic Republic of Congo (DR Congo) and Sudan in 1976.^[4,5] The virus was named after a small river, Ebola River, where the index patients was believed to have contracted the virus.^[5] Since these initial outbreaks, there have been 20 other outbreaks reported through to 2013, involving nearly 2500 cases in the Democratic Republic of Congo, Sudan, Gabon and Uganda.^[5]

The current Ebola outbreak is the longest, largest and most widespread in history and the first in West Africa and Europe.^[1] The current outbreak is believed to have started in Meliandou, a village in Guinea, in December 2013. As at January 18, 2015, there were a total of 21 724 cases of EVD with 8641 mortality recorded in six West African nations (Guinea, Liberia, Sierra Leone, Mali, Nigeria and Senegal), Spain, United States of America and Britain. EVD is widely spread in Guinea, Liberia and Sierra Leone where there are over 21,600 reported confirmed, probable, and suspected cases with recorded mortality in excess of 8,600 (see Table 2). Deaths outcome are thought to be under reported.^[6]

Ebola virus causes disease in both humans and non-human primates (monkeys, gorillas, and chimpanzees). The natural reservoir host of Ebola virus is still not yet known.^[7] However, fruit bats are considered the natural host of the virus,^[8,9] which is also thought to transmit the virus to primates.^[10] The contamination of index cases in human are thought to occur from contact with an infected animal.^[11] Subsequent human-to-human transmission occurs through direct contact with the

body fluids of an infected patient.^[10] Infection spread by direct contact (usually through broken skin or mucous membrane) with the blood, or other bodily fluids or secretions (stool, urine, saliva, semen) of infected people or through objects (like needles and syringes) that have been contaminated with infectious fluids.^[7,12] Infection can also occur when there is a direct contact between broken skin or mucous membranes of a healthy individual with clothing and bed linen.^[12]

Incubation time for humans ranges from 2 to 21 days. Symptoms manifest in most patients after 8 to 9 days, and once symptoms appear, the infection becomes contagious.^[13] EVD is characterized by abrupt onset of fever, fatigue, muscle pain, headache and sore throat.^[12,14] This is accompanied by gastrointestinal (anorexia, nausea, vomiting, abdominal pain, diarrhea), respiratory (chest pain, cough), vascular (conjunctival injection, postural hypotension, edema), and neurologic (headache, confusion, coma) manifestations.^[7,8]

The current EVD outbreak highlights the possibility of cases importation into unaffected countries. In an effort to ensure that unaffected countries rapidly and effectively contain case introduction, the World Health Organization (WHO) has advocated the use of a systematic framework called WHO country preparedness. The success of Nigeria and Senegal in containing the transmission of EVD demonstrates the importance of preparedness. The major factors that aided halting the spread of EVD in both countries included strong political leadership, early detection and response, public awareness campaigns, and strong support from partner organizations.^[15] Public awareness is one of the components of preparedness or readiness.^[16]

The aim of this study was to evaluate knowledge and perceptions of students and staff at USM towards EVD and to compare the knowledge among undergraduates, postgraduates and staff as well as based on respondents school.

MATERIALS AND METHODS

Study design and location

This is an observational study conducted among students and staff at the Main Campus of Universiti Sains Malaysia (USM) Penang, Malaysia.

Sample size determination

The sample size was determined using Raosoft sample size calculator. With an accepted margin of error of 5% and a 95% confidence interval, the sample size required for students was 376. This was however rounded off to 380 student respondents. To recruit staff respondents for the study, convenient sampling method was used.

Data collection

A self administered questionnaire was used as an instrument for data collection which assessed the knowledge and perception of respondents towards EVD. A 38 item questionnaire was designed after literature search consisting of section A which had six questions to extract participant's socio-demographic information. Section B had 20 questions; one on respondent prior knowledge of Ebola disease, one on the first knowledge source, one on cause of disease, three on transmission, two on symptoms, six on prevention and management, another six on current affairs and twelve on perception towards EVD. The questionnaire was thoroughly reviewed by Senior Lecturers from Clinical Pharmacy Department School of Pharmaceutical Sciences USM. Based on the recommendation of the reviewers, adjustments were made with regard to arrangement and structure of questions.

Statistical analysis

The collected data were processed using the Statistical Packages for Social Sciences (SPSS), version 16.0. A scoring system of 1 and 0 for each correct and wrong answer respectively was used to obtain knowledge score. This is with the exception of questions 5, 8, 11 and 17 where respondents were scored 1 if they indicate $\leq 50\%$ correct answers, 2 and 3 respectively for 50% - 69% and $\geq 70\%$ correct response. For quantitative analysis, a score greater than 70% of the possible maximum score was considered good, 50-69% was considered moderate and less than 50% was considered poor.^[17] Normality of data was tested using Kolmogorov-Smirnov test. The results were presented using descriptive and inferential statistics involving Mann-Whitney U test and Kruskal Wallis test. For both tests, a *P* value of less than 0.05 was considered statistically significant.

RESULTS

A total of 520 questionnaires were distributed (400 among students and 120 among staff) and 458 were retrieved (380 from students and 78 from staff). The response rate was found to be 88% (95% and 65% respectively among students and staff). Majority of respondents in this study were undergraduate students that constituted 247 (54%) of respondents. This was followed by postgraduate students that accounted for 133 (29%) and staff with 78 (17%) respondents.

The demographic profile of respondents which comprises the age, gender, ethnicity, nationality and school/department is presented in frequencies on Table 1. Over ninety percent respondents in each category indicated they have heard of EVD. Majority of the respondents, 80.4%, 81.0% and 58.9% respectively of undergraduate, postgraduate and staff, indicated the internet was their source of first knowledge of EVD [Table 2].

Table 1: Distribution of respondents' sociodemographic characteristics

Variable	Undergraduate N (%)	Postgraduate N (%)	Staff N (%)
Gender			
Male	84 (34.0)	62 (46.6)	27 (34.6)
Female	163 (66.0)	71 (53.4)	50 (64.1)
Not indicated	-	-	1 (1.3)
Age			
18-25	215 (87.0)	29 (21.8)	2 (2.6)
26-30	19 (7.7)	46 (34.6)	22 (28.2)
31-35	8 (3.2)	26 (19.5)	15 (19.2)
>35	4 (1.6)	31 (23.3)	37 (47.4)
Not indicated	1 (0.4)	1 (0.8)	2 (2.6)
Ethnicity			
Malay	146 (59.1)	63 (47.4)	67 (85.9)
Chinese	76 (30.8)	27 (20.3)	1 (1.3)
Indian	13 (5.3)	12 (9.0)	5 (6.4)
Others	12 (4.8)	28 (21.0)	1 (1.3)
Not indicated	-	3 (2.3)	4 (5.1)
Nationality			
Malaysian	231 (93.5)	88 (66.2)	73 (93.6)
Non Malaysian	16 (6.5)	44 (33.1)	3 (3.8)
Not indicated	-	1 (0.8)	2 (2.6)
School/department			
Arts based	19 (7.7)	18 (13.5)	17 (21.8)
Social sciences based	134 (54.2)	52 (39.0)	7 (9.0)
Sciences based	82 (33.2)	58 (43.6)	18 (23.1)
Library	-	-	9 (11.5)
Clinic	-	-	19 (24.3)
Security	-	-	7 (9.0)
Not indicated	12 (4.9)	5 (3.7)	1 (1.3)

Table 2: Respondents' prior knowledge of EVD and source of the first knowledge

	Undergraduate N (%)	Postgraduate N (%)	Staff N (%)
Have you ever heard of Ebola disease?			
Yes	240 (97.2)	126 (94.7)	73 (93.6)
No	7 (2.8)	7 (5.3)	5 (6.4)
If yes, where did you first learnt about Ebola disease?			
Home	19 (7.9)	2 (1.6)	6 (8.2)
School	3 (1.2)	8 (6.3)	4 (5.5)
Friends	11 (4.6)	8 (6.3)	5 (6.8)
Internet	193 (80.4)	102 (81.0)	43 (58.9)
Others	14 (5.8)	6 (4.8)	15 (20.6)

EVD=Ebola virus disease

The results shows that 188 (78%), 113 (89.7%) and 64 (87.7%) undergraduate, postgraduate and staff respondents respectively possess a knowledge of the cause of EVD. However, more postgraduate respondents were found to have knowledge of EVD cause than staff respondents. In contrast, only 35.8%, 50% and 43.8% respectively of undergraduate, postgraduate and staff participants knew that EVD is not airborne. Again more postgraduate respondents were observed to know EVD is not transmitted by air. Majority of respondents across all the categories, 73.3% (undergraduate), 69.8% (postgraduate) and 67.1% (staff), correctly answered that human to human transmission is the most common route of EVD transmission. However, it can be seen from the results that more undergraduate respondents answered correctly than postgraduate and staff respondents in this regard. Only 14.6%, 18.3% and 32.9% respectively of undergraduate, postgraduate and staff respondents correctly answered that the incubation time of EVD is 2-21 days. In contrast, majority of the respondents; 63.3% (undergraduate), 63.5% (postgraduate) and 57.5% (staff) answered correctly that people who die of EVD are still infectious after death. About 80.8% (undergraduate), 87.3% (postgraduate) and 75.3% (staff) respondents knew that EVD can be prevented. Majority of the participants, 68.3% ($n = 164$), 69.0% ($n = 87$) and 68.5% ($n = 50$) respectively for undergraduate, postgraduate and staff, also knew that there is no cure for EVD at the moment. In addition, 53.4% (undergraduate), 57.1% (postgraduate) and 64.7% (staff) respondents, who thought there is a cure for EVD indicated antibiotics can cure EVD. It was also found that most undergraduate (53.8%), postgraduate (61.1%) and staff (50.7%) respondents knew that there is no vaccine for EVD yet [Table 3].

In this study, it was found that respondents generally have low level of knowledge about EVD (median knowledge score less than 50). The results further shows that there is a significant difference in EVD knowledge among undergraduate, postgraduate and staff respondents ($X^2 = 12.34$, $P = 0.002$). There is also a significant difference between median knowledge score of arts (38.5%), social sciences (42.3%) and sciences (46.2%) based students respondents. In the staff category, it was observed that university clinic staff respondents (median score 61.5%) have significantly more knowledge about EVD than other staff respondents (P value = 0.002) [Table 4].

The results shows that most respondents, 93.3% (undergraduate), 92.1% (postgraduate) and 86.3% (staff), indicated they were afraid of EVD. EVD is highly contagious is the reason behind the fear of the infection in 30.8% and 35.3% of undergraduate and postgraduate respondents. In the staff group however, most of the respondents, 41.3% indicated they fear EVD because it has no cure. There exists a misunderstanding about the management of EVD among respondents. Almost half of the respondents in all groups, 56.7% among undergraduate, 41.3% among postgraduate and 41.1% among staff respondents believe there were food that can effectively cure or prevent EVD. In addition, 96.2% of undergraduates, 96.8% of postgraduates and 84.9% of staff believe educating students/staff about EVD is necessary [Table 5].

DISCUSSION

Tertiary educational institution has potential of becoming serious outbreak centres during a pandemic, therefore adequate knowledge and good perception of the university students and members of staff towards a pandemic is important to ensure compliance to the directives of public health agencies. This study aimed to assess the knowledge and perception of EVD among students and staff at USM Main Campus, Penang. Majority of the respondents are undergraduates, followed by postgraduates and staff.

EVD is currently a public health emergency of international concern. The current pandemic has affected nine (9) countries around the world and cause scare in some other countries. To the best of our knowledge there is no previous study that assessed the knowledge of EVD among students or any portion of the population. Therefore, in discussing our results, comparison will be made with studies conducted at

Table 3: Distribution of respondents' response to questions regarding knowledge of EVD

Item number	Response	Undergraduate N (%)	Postgraduate N (%)	Staff N (%)
3	Correct	188 (78.3)	113 (89.7)	64 (87.7)
	Incorrect	52 (21.7)	13 (10.3)	9 (12.3)
4	Correct	86 (35.8)	63 (50)	32 (43.8)
	Incorrect	154 (64.2)	63 (50)	41 (56.2)
5	Low	210 (87.5)	112 (88.9)	59 (80.8)
	Moderate	8 (3.3)	4 (3.2)	2 (2.7)
	Good	22 (9.2)	10 (7.9)	12 (16.4)
6	Correct	176 (73.3)	88 (69.8)	49 (67.1)
	Incorrect	64 (26.67)	38 (30.2)	24 (32.9)
7	Correct	35 (14.6)	23 (18.3)	24 (32.9)
	Incorrect	205 (85.4)	103 (81.7)	49 (67.1)
8	Low	197 (82.1)	98 (77.8)	48 (65.8)
	Moderate	25 (10.4)	13 (10.3)	13 (17.8)
	Good	18 (7.5)	15 (11.9)	12 (16.4)
9	Correct	152 (63.3)	80 (63.5)	42 (57.5)
	Incorrect	88 (36.7)	46 (36.5)	31 (42.5)
10	Correct	194 (80.8)	110 (87.3)	55 (75.3)
	Incorrect	46 (19.2)	16 (12.7)	18 (24.7)
11	Low	147 (75.8)	73 (66.4)	33 (60.0)
	Moderate	30 (15.5)	24 (21.8)	13 (23.6)
	Good	17 (8.8)	13 (11.8)	9 (16.4)
12	Correct	164 (68.3)	87 (69.0)	50 (68.5)
	Incorrect	76 (31.7)	39 (31.0)	23 (31.5)
13	Aspirin	7 (9.6)	2 (5.7)	1 (5.9)
	Antibiotic	39 (53.4)	20 (57.1)	11 (64.7)
	Oral Rehydration Therapy	12 (16.4)	11 (31.4)	4 (23.5)
	Vitamin supplements	2 (2.7)	1 (2.9)	-
	All of the above	2 (2.7)	-	-
	Aspirin and antibiotics	4 (5.5)	-	-
	Others	7 (9.5)	1 (2.9)	1 (5.9)
14	Correct	129 (53.8)	77 (61.1)	37 (50.7)
	Incorrect	111 (46.2)	49 (38.9)	26 (49.3)
15	Correct	30 (12.5)	34 (27.0)	14 (19.2)
	Incorrect	210 (87.5)	92 (73.0)	59 (80.8)
16	Correct	22 (9.2)	20 (15.9)	4 (5.5)
	Incorrect	218 (90.8)	106 (84.1)	69 (94.5)
17	Low	215 (89.6)	111 (88.1)	69 (94.5)
	Moderate	22 (9.2)	12 (9.5)	3 (4.1)
	Good	3 (1.2)	3 (2.4)	1 (1.4)
18	Correct	78 (32.5)	47 (37.3)	27 (37.0)
	Incorrect	162 (67.5)	79 (62.7)	46 (63.0)
19	Correct	32 (41.0)	17 (36.2)	13 (48.1)
	Incorrect	46 (52.0)	30 (68.8)	14 (51.9)
20	Correct	32 (13.3)	26 (20.6)	16 (22.0)
	Incorrect	208 (86.7)	100 (79.4)	57 (78.0)

EVD=Ebola virus disease

the beginning of some recent pandemic disease such as SARS and Avian flu.

In a study aimed at examining the knowledge, attitudes and risk perceptions towards influenza and infection control strategies amongst university students, Seale *et al.*, found that participants were generally

knowledgeable about influenza transmission.^[18] In another study conducted among university students in Turkey at the beginning of the influenza pandemic. The authors concluded that the participants had enough knowledge about influenza pandemic and vaccination and other preventive measures. However, they found that there were still gaps and confusions

Table 4: Comparison of knowledge scores using demographic factors

Category	Median score (%)	χ^2	P
Undergraduate	42.3	12.343	0.002
Postgraduate	46.2		
Staff	42.3		
Arts based	38.5	16.182	<0.0001
Social sciences based	42.3		
Sciences based	46.2		
Arts based	38.5	12.343	0.002
Social sciences based	42.3		
Sciences based	50.0		
Library	50.0		
Security	30.7		
Clinic	61.5		

Kruskal-Wallis and Mann-Whitney U-test

in some areas.^[19] In our study, it was found that respondents generally have low level of knowledge about EVD (median knowledge score less than 50). Postgraduate students were found to possess more knowledge of the disease than undergraduate and staff respondents (median score = 46.2, $P = 0.002$). In addition, sciences based students were found to be more knowledgeable than arts and social sciences based students (median score = 46.2, $P < 0.0001$). Furthermore, university hospital respondents were found to have more knowledge in the staff category (median score = 61.5, $P = 0.002$). This difference may relate to the level of information available to the medical personnel.

Table 5: Distribution of response about respondents' perception towards EVD

Item number	Statement	Undergraduate N (%)	Postgraduate N (%)	Staff N (%)
1	Yes	224 (93.3)	116 (92.1)	63 (86.3)
	No	15 (6.2)	7 (5.6)	6 (8.2)
	Did not answer	1 (0.4)	3 (2.4)	4 (5.5)
2	No cure	66 (29.5)	33 (28.4)	26 (41.3)
	Is highly contagious	69 (30.8)	41 (35.3)	19 (30.2)
	Is a new disease	34 (15.2)	12 (10.3)	4 (6.3)
	No preventive methods	25 (11.2)	13 (11.2)	6 (9.5)
	All of the above	3 (1.3)	-	1 (1.6)
	No cure + is highly contagious	11 (4.9)	10 (8.6)	-
	No cure + no preventive measures	5 (2.2)	1 (0.9)	2 (3.2)
	Others	11 (4.9)	6 (5.1)	5 (7.9)
3	Yes	102 (42.5)	51 (40.5)	16 (21.9)
	No	135 (56.2)	68 (54.0)	50 (68.5)
	Did not answer	3 (1.2)	7 (5.5)	7 (9.6)
4	Inadequate health personnel	72 (30)	29 (23.0)	25 (34.2)
	Lack of information	87 (36.2)	45 (35.7)	21 (28.8)
	Porous border	13 (5.4)	11 (8.7)	3 (4.1)
	Poverty	19 (7.9)	12 (9.5)	2 (2.7)
	All of the above	5 (2.1)	3 (2.4)	4 (5.5)
	Inadequate health personnel and Lack of information	12 (5.0)	11 (8.7)	2 (2.7)
	Lack of information and poverty	5 (2.1)	3 (2.4)	1 (1.4)
	Inadequate health personnel + poverty	5 (2.1)	1 (0.8)	-
	Did not answer	5 (2.1)	5 (4.0)	10 (13.7)
	Others	17 (7.0)	6 (4.7)	5 (6.8)
5	Yes	176 (73.3)	83 (65.9)	41 (56.2)
	No	62 (25.8)	39 (31.0)	19 (26.0)
	Did not answer	2 (0.8)	4 (3.2)	13 (17.8)
6	Yes	222 (92.5)	114 (90.5)	63 (86.3)
	No	17 (7.1)	7 (5.6)	4 (5.5)
	Did not answer	1 (0.4)	5 (4.0)	6 (8.2)
7	Yes	136 (56.7)	52 (41.3)	30 (41.1)
	No	103 (42.9)	69 (54.8)	35 (47.9)
	Did not answer	1 (0.4)	5 (4.0)	8 (11.0)
8	Yes	171 (71.2)	96 (76.2)	52 (71.2)
	No	68 (28.3)	25 (19.8)	13 (17.8)
	Did not answer	1 (0.4)	5 (4.0)	8 (11.0)

Contd...

Table 5: Contd...

Item number	Statement	Undergraduate N (%)	Postgraduate N (%)	Staff N (%)
9	Yes	45 (18.8)	23 (18.3)	14 (19.2)
	No	193 (80.4)	100 (79.4)	52 (71.2)
	Did not answer	2 (0.8)	3 (2.4)	7 (9.6)
10	Yes	194 (80.8)	100 (79.4)	48 (65.8)
	No	44 (18.3)	24 (19.0)	18 (24.7)
	Did not answer	2 (0.8)	2 (1.6)	7 (9.6)
11	Yes	231 (96.2)	122 (96.8)	62 (84.9)
	No	8 (3.3)	2 (1.6)	5 (6.8)
	Did not answer	1 (0.4)	2 (1.6)	6 (8.2)
12	Internet	64 (27.7)	32 (26.2)	8 (12.9)
	TV show	57 (24.7)	31 (25.4)	4 (6.5)
	Awareness campaign	21 (9.1)	9 (7.4)	17 (27.4)
	All of the above	30 (13.0)	27 (22.1)	26 (41.9)
	TV and internet	25 (10.8)	14 (11.5)	2 (3.2)
	Internet and awareness campaign	22 (9.5)	7 (5.7)	5 (8.1)
	Others	12 (5.2)	2 (1.6)	-

EVD=Ebola virus disease

This study is not free of limitation because it was not all the questionnaires administered that were retrieved. Also some of the participants didn't provide answers to some of the questions. Non probability sampling was used to recruit respondents which may be associated with selection bias. Kruskal – Wallis test and Mann whitney U test (parametric tests) were used to analyse the data. This study has low statistical power.

CONCLUSION

In conclusion, this study found that the current level of knowledge regarding EVD among the participants is low. Postgraduate students were found to be more knowledgeable than undergraduate and staff. Sciences based participants were found to possess more knowledge of EVD than arts and social sciences based students. More so, staff respondents of the university hospital were found to have more knowledge of EVD than other staff.

There is a misconception among participants that there are foods that can effectively cure or prevent EVD. Internet was found to be the best way acceptable by most of the student respondents to educate them about EVD. However, a multi dimensional approach consisting of a combination of Internet, TV shows and awareness campaign was the best way acceptable by most of the staff respondents to educate them about EVD.

Financial support and sponsorship

Nil.

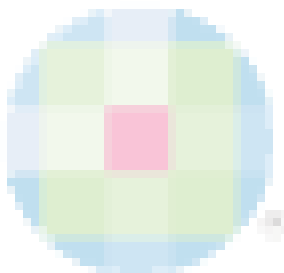
Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Wan Mohamed Noor WN, Sandhu SS, Ahmad Mahir HM, Kurup D, Rusli N, Saat Z, *et al.* Responding to the Potential of Ebola Virus Disease (EVD) Importation into Malaysia. *Malays J Med Sci* 2014;21:3-8.
2. Dallatomasina S, Crestani R, Sylvester Squire J, Declerk H, Caleo GM, Wolz A, *et al.* Ebola outbreak in rural West Africa: Epidemiology, clinical features and outcomes. *Trop Med Int Health* 2015;20:448-54.
3. Samaranayake L, Scully C, Nair RG, Petti S. Viral haemorrhagic fevers with emphasis on Ebola virus disease and oro-dental healthcare. *Oral Dis* 2015;21:1-6.
4. Tseng CP, Chan YJ. Overview of Ebola virus disease in 2014. *J Chin Med Assoc* 2015;78:51-5.
5. Harrod KS. Ebola: History, treatment and lessons from a new emerging pathogen. *Am J Physiol Lung Cell Mol Physiol* 2015;308:L307-13.
6. WHO. Ebola Situation Report; 2015. Available from: <http://www.who.int/csr/disease/ebola/situation-reports/en/?m=20150114>. [Last accessed on 2015 Sep 08].
7. Amdiouni H, Rhaffouli HE. Ebola virus and other Filoviruses: An overview. *Journal of Coastal Life Medicine*, 2015.
8. Kimura H, Tsukagoshi H, Ryo A, Oda Y, Kawabata T, Majima T, *et al.* Ebola virus disease: A literature review. *Journal of Coastal Life Medicine*. 2015.
9. Joshi M, Pandey R, Sodhi KS, Singh J. The Ebola menace: Epidemic, evidence and expectations. *Int J Curr Microbiol Appl Sci* 2015;4:731-47.
10. Ki M, What do we really fear? The epidemiological characteristics of Ebola and our preparedness. *Epidemiol Health*, 2014. 36: e2014014.
11. Chippaux JP. Outbreaks of Ebola virus disease in Africa: The

- beginnings of a tragic saga. *Journal of Venomous Animals and Toxins including Tropical Diseases*, 2014; 20:44.
12. WHO. Frequently asked questions on Ebola virus disease. 2014. Available from: <http://www.who.int/csr/disease/ebola/faq-ebola/en>. [Last accessed on 2014 Dec 15].
 13. Meyers L, Frawley T, Goss S, Kang C. Ebola virus outbreak 2014: Clinical review for emergency physicians. *Ann Emerg Med* 2015;65:101-8.
 14. Bah EI, Lamah MC, Fletcher T, Jacob ST, Brett-Major DM, Sall AA, *et al*. Clinical presentation of patients with Ebola virus disease in Conakry, Guinea. *N Engl J Med* 2015;372:40-7.
 15. WHO. Ebola Response Roadmap Situation Report; 2014. Available from: <http://www.who.int/csr/disease/ebola/situation-reports/en/?m=20141126>. [Last accessed on 2015 Sep 08].
 16. WHO. Ebola Situation Report; 2015. Available from: <http://www.who.int/csr/disease/ebola/situation-reports/en/?m=20150204>.
 17. Khan YH, Sarriff A, Khan AH, Mallhi TH. Knowledge, Attitude and Practice (KAP) Survey of Osteoporosis among Students of a Tertiary Institution in Malaysia. *Tropical Journal of Pharmaceutical Research*. 2014;13 (1):155.
 18. Seale H, Mak JP, Razee H, MacIntyre CR. Examining the knowledge, attitudes and practices of domestic and international university students towards seasonal and pandemic influenza. *BMC Public Health* 2012;12:307.
 19. Akan H, Gurol Y, Izbirak G, Ozdatli S, Yilmaz G, Vitrinel A, *et al*. Knowledge and attitudes of university students toward pandemic influenza: A cross-sectional study from Turkey. *BMC Public Health* 2010;10:413.



Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.