Assessment of the Level of Awareness and Knowledge of Ebola Virus Infections among Saudi Population

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Abstract: OBJECTIVE: This study aims to evaluate the level of awareness, perception, specific knowledge about Ebola virus infection among men and women in Riyadh and Al-Kharj regions, KSA (kingdom of Saudi Arabia). METHODS: This cross-sectional study applied a 10-item anonymous, closed-ended, dichotomous questionnaire to collect information about knowledge regarding Ebola virus infection, modes of transmission, risk factors, symptoms, fatality rates and its risk to KSA among Saudis of various ages in Riyadh and Al-Kharj. RESULTS: Four hundred respondents were recruited for the study by random selection. Fifty-eight percent of respondents did not have any knowledge about the mode of transmission, regions of the outbreak, seriousness of the infection, availability of treatment or vaccine or modes of prevention. Of the respondents, 164 (41%) reported having heard about EVI (Ebola virus infection), 271 (67.75%) considered EVI a serious risk during Hajj or Umrah and 239 (59.75%) responded that traveling to Africa is not safe. Social media was the main source of information among young adults while television and radio were more important sources among older participants. CONCLUSION: The findings suggest that the level of awareness about EVI in this study is low while the level of perception was just above average. An aggressive health education campaign is critical for increasing Ebola virus infection awareness.

Key words: Ebola virus, survey, pilgrimage, alhajj.

1. Introduction

The Ebola virus is regarded as the prototype pathogen of viral hemorrhagic fever, causing severe disease and high case-fatality rates [1] The Zaire species of Ebola virus is the causative agent of the 2014 outbreak in West Africa, in which the case fatality rate is estimated to be as high as 70% [2]. The Ebola virus is an enveloped, non-segmented, negative-stranded RNA with characteristic filamentous particles [3]. Ebola virus particles have a uniform diameter of 80 nm but can greatly vary in length, with lengths up to 14000 nm [4-6]. The genome consists of seven genes in the order 3’ leader, nucleoprotein, VP (virion protein) 35, VP40, glycoprotein, VP30, VP24, RNA-dependent RNA polymerase (L)—5’ trailer [5, 6].

A similar virus causing a fatal hemorrhagic infection was first recognized in 1967, when infected monkeys from Uganda resulted in explosive outbreaks of severe illness among laboratory workers in Marburg, Germany who were extracting the infected monkeys’ kidneys, or preparing primary cell cultures for polio vaccine production. The causative agent, designated Marburg virus, has caused a number of outbreaks in Africa [8].

The Ebola virus, was first recognized when two outbreaks that erupted in Sudan and Zaire in 1976 [9]. Most Ebola virus outbreaks were clustered in Sub-Saharan Africa. An epidemic caused by the Zaire species caused several hundred cases in 1995 in the Democratic Republic of the Congo, and the Sudan virus infected more than 400 people in Gulu, Uganda in 2000 [9]. The 2014 Ebola epidemic is not only the first to occur in West Africa, however, it is considered as the largest epidemic that has been reported [10-13].

Most previous Ebola outbreaks occurred in Central Africa, however, World Health Organization confirmed in March 2014 several cases discovered in Guinea [14-16]. The outbreak rapidly spread to Liberia, Sierra Leone, Nigeria, Senegal, and Mali [17-21]. Sequence analysis of viruses isolated from patients in
Sierra Leone indicated that the epidemic has resulted from sustained person-to-person transmission [22]. The magnitude of the outbreak has been initially underestimated particularly in Liberia and Sierra Leone. As of December 13, 2014, the cumulative number of cases was 18,498, the laboratory-confirmed cases reached 11,731 with total deaths of 6,856 infected persons [23]. Several healthcare workers caring for Ebola patients were infected and approximately 55% have died [24-26]. Senegal and Nigeria have not reported free from Ebola in August 29 and September 5, respectively [27-29].

The first travel-associated case of Ebola was reported on September 30, 2014 [28] where a traveler from Liberia to Dallas, Texas developed clinical manifestations consistent with Ebola virus disease five days after his arrival to the US. The infection was subsequently transmitted to two healthcare workers caring for him at the hospital [29]. On October 6, the first human-to-human transmission outside Africa was confirmed in Spain where a healthcare worker was considered free of Ebola as of October 21 and in the 42-day period since, there have been no additional Ebola cases in Spain [27].

Hajj (pilgrimage) to Mecca, KSA is the largest mass gathering in the world. Each year, KSA receives more than 2 million pilgrims and millions of Mu`tamirs from all over the world. This vast gathering might represent a health risk to the Kingdom. Work force from Ebola struck countries maybe another risk. The Kingdom health authorities have taken strict measures to prevent the risk of introduction of Ebola virus to Saudi Arabia through imposing travel restrictions and denying visas to travelers from countries afflicted by Ebola. Nevertheless, it is important to promote the general awareness and knowledge of the public about this serious disease and to implement strict health precautions.

Therefore, this cross-sectional study aim to assess the degree of awareness and the means of transmission and prevention of Ebola virus. This study aimed to assess the level of awareness, perception and behavior of a Saudi population from Riyadh and Al-Kharj towards Ebola virus infections, and to determine the extent to which their perception of the of disease may contribute to booster the efforts of the Saudi health authorities to combat this disease. Data from this study would serve as a baseline for future awareness campaigns.

2. Methodology

This was a cross-sectional and descriptive study utilizing a cross-sectional study applied a 10-item Arabic, anonymous, closed-ended, dichotomous questionnaire to collect information about to specific knowledge, awareness, perception of perceived seriousness of the disease and, modes of transmission, risk factors, symptoms, fatality rates and its risk to KSA among Saudis of various ages in Riyadh and Al-Kharj. The questionnaire was generated by the supervisor and students and distributed by the participant medical students. The following information was collected: to asses people awareness regarding modes of transmission of Ebola virus, its early warning symptoms, potential risks to KSA, geographic distribution, whether it is safe or not to travel to affected African countries or if there is a vaccine or treatment for Ebola. An additional question was added on the source of the information: social media, newspaper, TV or radio. For every question, the participant is given a choice of answering by yes or no or do not know. Table 1 summarizes the questions.

2.1 Target Population and Setting

The sample was derived from the general population with varying age groups and locations from Sept 5, 2014 to October 30 2014, including: (1) intermediate and high schools; (2) Mohammed Ibin Al Qasem Central park in Riyadh; (3) King Abdullah Road Walking Area in Riyadh; (4) Salman bin Abdul-Aziz university in Al kharj.

All participants in the study voluntarily gave their
Table 1  The questionnaire structure.

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Is there infected people with Ebola virus in the middle east?</td>
</tr>
<tr>
<td>Q2</td>
<td>Do you think Al-Haj season represents a danger to get infected with Ebola?</td>
</tr>
<tr>
<td>Q3</td>
<td>Is Ebola virus transmitted by air or droplets?</td>
</tr>
<tr>
<td>Q4</td>
<td>Is Ebola virus transmitted through food?</td>
</tr>
<tr>
<td>Q5</td>
<td>Is Ebola virus transmitted through touch?</td>
</tr>
<tr>
<td>Q6</td>
<td>Is it safe to travel to Africa in the current time?</td>
</tr>
<tr>
<td>Q7</td>
<td>Do you know the symptoms of Ebola virus?</td>
</tr>
<tr>
<td>Q8</td>
<td>Is there a vaccine for Ebola Virus?</td>
</tr>
<tr>
<td>Q9</td>
<td>Is there a treatment for Ebola virus?</td>
</tr>
<tr>
<td>Q10</td>
<td>Is it possible to be cured from Ebola virus?</td>
</tr>
</tbody>
</table>

Participants were selected randomly without age or gender criteria.

2.3 Sample Size

The sample size was calculated using a Raosoft sample size calculator available at http://www.raosoft.com/samplesize.html. The sample size estimated was 280 individuals. We added 20% to guard against invalid or incomplete responses. A total of 300 questionnaires have been distributed.

2.4 Date Collection and Analysis Procedure

Although the questionnaire was anonymous, verbal consent was obtained from all participants. Clear clarification and explanation was given by medical student for each statement and way of filling the questionnaire.

Data analysis was conducted using Statistical Package for Social Sciences version 22.0. Descriptive statistics such as frequency distributions and means were used to evaluate perception variables. The significance level was set at ($P \leq 0.05$) for all statistical procedures.

3. Results

The basic results of the study are presented here in the form of descriptive statistics and tables for the specific knowledge, and level of awareness. A total of 400 individual between 11-55 years were interviewed. About two-thirds of the respondents were males.

3.1 Demographic Characteristics of the Respondents

Three hundred participants completed the questionnaires. Mean age of participants in the survey was 34.15 $\pm$ 11.21 years. More than half of the respondents were married, 68.1% have secondary school education, 27% had high level of education.

As shown in Fig. 1, the responders didn’t know whether going to such a massive gathering like Al-haj is considered a risk factor. Participants have limited knowledge about the symptom’s and modes of transmission. The majority presumed that there is a vaccine and treatment for Ebola virus infection.

As shown in Table 2, younger participants have better awareness about EVI compared to older individuals. Participants with higher levels of education had more knowledge about Ebola virus infection.

The main source of information was social media particularly twitter among young participants while TV and radio was the main source among older individuals.

4. Discussion and Conclusions

This study assessed the knowledge and attitude of Saudis towards Ebola virus in Saudi Arabia and the risks that it poses to the Kingdom. The Ebola virus is
considered by the World Health Organization a major threat because the current outbreak far exceeds the previous ones in the number of injuries and deaths.

Saudi Arabia is free from the disease but this country should be always in alert because the risk of many infectious agents is imminent due to many reasons. First, millions of people come to the Kingdom for Hajj and Umrah. Those maybe infected or in an incubation period and thus introduce the infection. Furthermore, there is a huger labor force from the African community that may also pose a potential threat.

Therefore, 300 individuals of different age groups were invited to complete a questionnaire to assess the information and knowledge about the Ebola virus, and the sources of such information. The questionnaire is about where it was heard: on the news, radio or through the newspapers and social media or others; and what would be the best reaching method to increase their knowledge about this virus.

Overall, the knowledge was low particularly among older participants who derived most of the information from the TV or radio and few from newspapers. In contrast, younger individuals had more and better quality of awareness. This is attributed to their adequate access to social media. This suggests that the awareness health campaigns need to include various routes to address different population groups.

In conclusion, these findings suggest that the level of awareness about EVI in this study is low while the level of perception was just above average. An aggressive health education campaign is critical for increasing Ebola virus infection awareness.
References

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