RESEARCH ARTICLE

Effectiveness of basic training session regarding the awareness of Ebola virus disease among nurses of public tertiary care hospitals of Lahore

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Abstract

Objective: To evaluate the effectiveness of basic training session regarding the awareness of ebola virus disease among nurses of public tertiary care hospitals.

Method: The quasi-experimental study was conducted in Lahore, Pakistan, from November to December 2015, and comprised nurses working at three public tertiary care hospitals. Baseline and post-intervention data was collected through a questionnaire, and was compared using SPSS 20.

Results: The sample comprised 100 nurses. The mean baseline knowledge score was 3.93±2.519 which indicated poor knowledge. The post-intervention mean score was 13.18±1.192 and the difference was significant ($p<0.05$).

Conclusion: The basic training session regarding awareness of ebola virus disease was highly effective.

Keywords: Ebola virus disease, EVD, Epidemic, Knowledge, Training session. (JPMA 70: 477; 2020).
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Introduction

Ebola virus (EV), an aggressive pathogen causing highly contagious haemorrhagic disease, has become a major public health concern in the developing countries.[1] Since the first outbreak in 1976 near Ebola river in the Democratic Republic of Congo, formally known as Zaire, in Africa, several outbreaks have occurred in the ensuing years with mortality rate ranging from 50% to 90% in the African region,[2] with the last being the most devastating both in terms of its number of over 21,724 cases and 8,626 deaths.[3] It is expected to spread to various parts of the world and cases have already been reported.[4]

Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever, is a severe, often fatal, illness in humans caused by the virus. It belongs to the family filoviridae and has five identified species that include Zaire, Bundibugyo, Sudan, Reston and Tai Forest.[5] The Zaire strain is the most severe, with a case-fatality rate up to 90%. Fruit bats of the family pteropodidaeare thought to be the natural reservoir, and the humans are thought to acquire the disease through direct contact with non-human primates.[6]

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The mode of transmission is person-to-person via contact with bodily secretions, including but not limited to stool, saliva, sweat, urine, vomit, semen, tears etc., organs and blood of infected individuals after the incubation period of 2-21 days. Sexual transmission is possible after recovery till 7 weeks thereafter. Direct contact with the body of a deceased person infected with the virus can also cause transmission. Nosocomial transmission occurs frequently during outbreaks.[5] Contact with surfaces or objects contaminated by the virus, particularly needles and syringes, may also transmit the infection.[7] A high death rate has been noticed among children of the infected mothers that could be due to transmission during breastfeeding, either through the milk or close contact.[8]

The current model for the course of EV infection is that the virus enters the host through minute lesions in the skin and the mucosa.[9] Common clinical features include sudden onset of high-grade fever, severe headache, myalgia, severe diarrhoea, vomiting, hypotension, shock, impaired kidney and liver functions and in some cases internal and external bleeding.[10] The diagnosis can be established on the basis of clinical history and history of recent journey, along with the help of laboratory tests.[11]

So far, no specific anti-viral drug or vaccine is available for EVD, and symptomatic treatment is the mainstay of management.[4] If not diagnosed and treated, death usually

occurs in the second week after the symptoms surface, and is usually caused by massive blood loss.[12] World Health Organisation (WHO) has warned that EV might spread to Pakistan sooner or later, since it is spreading quickly across the world. As such, the government should take speedy precautionary measures and steps against the deadly disease.[13] The health ministry in Pakistan has warned that EV might travel to Pakistan due to the frequent movement of people to the African countries in connection with trade and transit, etc. More than two suspected cases of EVD have been resolved in Pakistan and there is no facility to test EV in Pakistan, while for the confirmation of the cases, the sample is sent to Germany or Cairo.[14]

EVD carries not only the potential to cause substantial mortality and morbidity at the community level, but also for nosocomial spread. Care-providers can play a critical role in preventing and controlling the disease. The only effective way of the management and prevention of the disease is to have a sound knowledge of the presentation and its occurrence pattern. Nurses along with doctors serve as the first-line healthcare providers for infection diagnosis, notification, and treatment. Adequate knowledge among care-providers regarding the disease not only improves the management and outcome, but also become helpful in patient education and mass awareness at the community level. It is thus imperative that health workers be knowledgeable about EVD along with the resources to identify, treat and manage cases in a way to prevent it from transmission to healthy public as well as in healthcare workers.[10]

Pakistan is already facing the challenge to control dengue fever and has paid a heavy price due to lack of proper preparation and training of healthcare workers. Highly variable mortality during various dengue outbreaks in Pakistan may also be attributed to co-morbid conditions, lack of proper management guidelines and training of healthcare professionals.[15] Knowledge and preparation in advance is a key to reacting properly during outbreaks. The knowledge and preparation level of nurses about EVD in Pakistan is not known. Measuring knowledge is essential to determine what nurses know and do not know. Lack of knowledge would render them vulnerable in times of crisis. Nurses can be better equipped with knowledge and skills by increasing their level of awareness by developing guideline/strategy in the form of a structured training programme /session.[16,17]

Annexure: Working sheet of sample size estimation.

Sample size is the number of participants that need to be studied in a research work. A sample of 100 nurses was selected based on inclusion and exclusion criteria in this study. Sample size was calculated with support of literature and following formula was applied.

$$N = \frac{\left(Z_{\alpha/2}\sqrt{2p(1-p)} + Z_{1-\beta}\sqrt{p_1(1-p_1)p_2(1-p_2)}\right)^2}{(p_1-p_2)^2}$$

Power of study	90%
Level of significance	05%
Anticipated proportion of knowledge level before training secession	55.8%1[18]
Anticipated proportion of improvement in knowledge level after training session	32.2%[18]
Sample size of the study	97≈100

The current study was planned to evaluate the effectiveness of basic training session regarding EVD awareness among nurses of public tertiary care hospitals in a Pakistani city.

Subjects and Methods

After Ethical approval from institutional review board (IRB), The quasi-experimental study was conducted in Lahore, Pakistan, from November to December 2015, and comprised nurses working at emergency, medical and paediatric units of Sheikh Zayed Hospital, Lahore General Hospital and Jinnah Hospital Lahore. The sample size was calculated on the basis of an earlier study[18] (Annexure), and the sample was raised using non-probability convenience sampling. A modified structured questionnaire10 was used for data collection before and after the training sessions. Multiple comparisons were made according to various variables.

A pilot study was carried out on a number of 10 participants that was 10% of the actual sample size. The internal consistency of 0.763 was calculated by applying Cronbach's α indicating that the instrument was reliable and consistent for data compilation.

In the absence of any specific guidelines for conducting the basic training session regarding EVD, the programme was tailored according to regional circumstances and material was selected from the most reliable websites, like that of the WHO,[19] Centre for Disease Control and Prevention(CDC)[20] and recent available literature about EVD.[1,4-7,10-13,21-23] The training session was of three-hour duration which was divided into lecture, video and question-answer components. Overall, the training session was interactive in nature. One session each was conducted at the three hospitals.

Data was analysed using Microsoft Excel and SPSS 20, and

Table-1: Indicator to evaluate the Knowledge level.[5]

Very good Knowledge	If the respondents give >80% correct answers from the structured questionnaire.
Good Knowledge	If the respondents give 60-80% correct answers from the structured questionnaire
Average Knowledge	If the respondents give 50% - 60% correct answers from the structured questionnaire.
Poor Knowledge	If the respondents give < 50% correct answers from the structured questionnaire.

Table-2: Effectiveness of the training session.

Knowledge Score	Sample Size	Mean±SD	*p*-value
Before training session	100	3.93±2.51964	<0.001*
After training session	100	13.18±1.19240	

Paired t-test (Paired samples statistics) was applied to see the Effectiveness of Basic training session*. The mean difference is significant at the 0.05 level. SD: Standard deviation.

Table-3: Comparison of education level with pre and post knowledge score.

Qualification	Mean±SD	SE	*p*-value
Pre- Knowledge Score			0.005*
Diploma	3.4545±2.11356	0.26016	
Generic B.Sc.N	5.7857±4.20949	1.12503	
Post RN.B.Sc.N	4.2000±1.50787	0.33717	
Total	3.9300±2.51964	0.25196	
Post- Knowledge score			0.132*
Diploma	13.0152±1.27089	15644	
Generic B.Sc.N	13.3571±1.15073	0.30755	
Post RN B.Sc.N	13.6000±0.82078	0.18353	
Total	13.1800±1.19240	0.11924	

One way ANOVA was applied to see comparison of Education Level with Pre and Post knowledge score.*. The mean difference is significant at the 0.05 level. SD: Standard deviation, SE: Standard error.

Table-4: Multiple comparisons of education level with pre-knowledge score.

Dependent Variable	Qualification	Mean Difference	SE	*p*-value
Pre-Score				
Diploma	Generic BScN	-2.33117*	0.70947	0.004
	Post RN BScN	-0.74545	0.61544	0.449
Generic BScN	Diploma	2.33117*	0.70947	0.004
	Post RN BScN	1.58571	0.84020	0.148
Post RN BScN	Diploma	0.74545	0.61544	0.449
	Generic BScN	-1.58571	0.84020	0.148

Post hoc tukey (Tukey HSD) test was applied to see significance differences within groups.*. The mean difference is significant at the 0.05 level. -SE: Standard error.

was presented as frequencies and percentages for qualitative variables, and mean with standard deviation (SD) for quantitative variables. Paired t-test was used to evaluate the effectiveness of the training session. One-way analysis of variance (ANOVA) and Post-hoc Tukey test were used to evaluate the association between pre- and post-intervention knowledge scores with qualification and experience. P≤0.05 was considered significant.

Table-5: Comparison ofworking experience with pre- and post-intervention knowledge score.

Dependent variable	Experience	Mean±SD	SE	P-value
Pre knowledge score				
	1-3 years	4.0962±2.55343	0.35410	
	4-6 years	4.0435±2.73825	0.57096	
	7-10years	2.9286±2.67364	0.71456	0.464*
	>10 years	4.1818±1.47093	0.44350	
	Total	3.9300±2.51964	0.25196	
Post knowledge score				
	1-3 years	13.1538±1.19451	0.16565	
	4-6 years	13.3478±1.22877	0.25622	
	7-10years	12.7857±1.36880	0.36583	0.132*
	>10 years	13.4545±.82020	0.24730	
	Total	13.1800±1.19240	0.11924	

One way ANOVA was applied to see comparison of working experience with Pre and Post knowledge score*. The mean difference is significant at the 0.05 level. SD: Standard deviation, SE: Standard error.

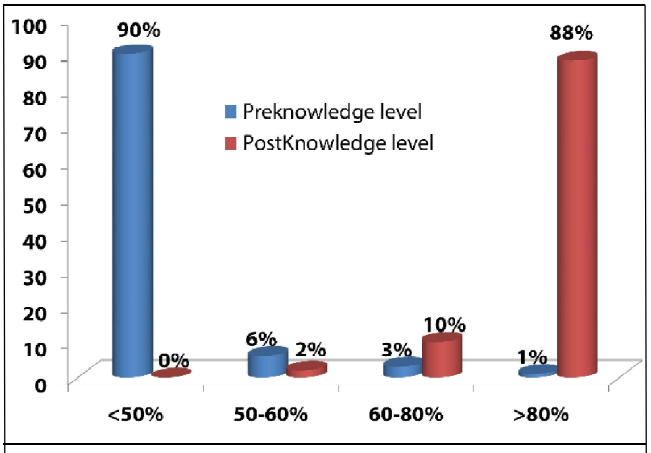

Figure : Knowledge level of nurses before and after the training session.

Results

Of the 100 subjects, 90(90%) had poor knowledge, 6(6%) had average knowledge, 3(3%) had good knowledge and 1(1%) had very good knowledge before the training session, according to the criterion used (Table 1). After the training session,88 (88%) subjects had very good knowledge, 10 (10%) showed good knowledge, and 2 (2%) had average knowledge (Figure).

Baseline mean score of correct responses was 3.93±2.51 which went up to 13.18±1.19 Post-intervention (p<0.001) (Table 2).

At baseline, there was a significant association between qualification and scores of the participants (p<0.05). However, post-intervention there was no significant

difference between the two (p>0.05) (Table 3-4).

There was no significant difference in baseline and post-intervention scores of the subjects (p>0.05) (Table 5).

Discussion

To best of our knowledge, the study is the first known awareness programme of its kind about EVD among nurses in tertiary care hospitals anywhere in Pakistan. The findings of training session revealed that the programme was highly effective and significantly contributed to the preparedness regarding EVD and knowledge of the nurses was significantly improved. This significant difference in knowledge resulted from the information provided during the training sessions and is abundantly evident by the improvement in post-intervention scores.

The findings of the study are consistent with outcomes reported after education-based approaches in the Philippines, Egypt and India.[18,21-22]

In the present study, the mean baseline score was very low regardless of professional qualifications. It could be because of several reasons, like lack of motivation of learning related to emerging health issues and epidemics, lack of awareness and knowledge regarding emerging health problems, lack of curriculum revision, absence of planning and preparation, insufficient resources and mismanagement of resources, unstable health policies, dearth of priorities, personal interests etc. All participants of this study were qualified registered nurses and most of them were aware that EVD is of viral origin and is highly communicable, but at baseline, most of them responded incorrectly regarding the host organism of EV and ways of transmission from one person to another. The overlapping of knowledge could also be attributed to large-scale prevalence of dengue and malaria in the region.

The results related to professional qualifications in the current study are supported by a study which concluded that the nurses whose qualification was diploma level executed lower level of knowledge and skill than baccalaureate, master and doctoral students in clinical administration system.[23]

In future epidemics, the strategy adopted by the present study may contribute to the level of preparedness in nurses and other healthcare workers to assist in controlling and preventing EVD spread. A significant limitation of the basic training session may be the retention of knowledge among the subjects and that is why periodic sessions regarding EVD as a part of continuous medical education (CME) programmes and should be incorporated in the curricula in all categories of healthcare providers, although a brief educational intervention for disaster preparedness was proven to be effective and to have a long-term impact on nurses' knowledge.[24]

The inadequate knowledge at the baseline represents a snapshot of our preparation and indicates a strong need to conduct basic and advance training sessions regarding EVD awareness among all levels of healthcare workers throughout Pakistan.

Conclusion

The basic training session regarding awareness of ebola virus disease was found to be highly effective.

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