Knowledge, Attitudes and Practices of Health Care Workers on Ebola in Hospital Towards Ebola Virus Disease, Conakry, Guinea, 2016

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Abstract: To cope with any further outbreak of Ebola Virus Disease (EVD) in Guinea, a cross-sectional study was carried out to assess the level of awareness, attitude and practice of health care workers about EVD in Conakry, Guinea. A cross-sectional study was conducted in the Institute of Nutrition and Child Health (INSE), at the national hospitals of Donka and Ignace Deen in 2016 and involved 14 clinical facilities. Scores were built up for knowledge, attitude and practice. These scores were classified into two groups: bad (score < 50%) and good (score ≥ 50%). A total of 267 participants from these health care systems responded to a structured questionnaire. The proportion of health care workers with good knowledge, attitudes and practices was respectively 71.9%, 94% and 50.2%. Factors associated with good knowledge of EVD were male [Adjusted Odds Ratio (AOR): 1.7: 95% CI 1.0 to 2.9] and received training in EVD (2.7: 1.6-4.8). Factors associated with good practice were membership in INSE (2.3: 1.1-4.7) and training on EVD (2.2: 1.3-3.8). There is lack of knowledge of EVD, as well as negative attitudes and practices, particularly in prevention. However, continuing education for health care workers could correct these deficiencies.

Keywords: Ebola Virus Disease, Knowledge, Health Care Workers, Guinea

1. Introduction

The EVD epidemic in West Africa in 2014 -2016 emerged in Guéckédou, Guinea [1, 2] and was characterized by its high lethality and rapid spread to urban areas and neighboring countries [3, 4]. A total of 28,616 confirmed, probable and suspect cases were reported in Guinea, Liberia and Sierra Leone, including 11,310 deaths [5]. In Guinea, this epidemic was unprecedented for both, health and socio-economic consequences [6, 7]. According to the World Health Organization, Guinea has recorded 3,811 cases including 2,543 deaths (case fatality rate of 67%), 211 health workers were affected with 115 deaths [8]. The weakness of the health system, particularly the prevention and control of infection (PCI) measures in health facilities, have meant that health care workers must pay a heavy toll during this epidemic [9, 10]. The isolation of the patients, the observation of hygiene measures and the use of personal

protective equipment, the use of chlorinated solutions during the management process helped to avoid any spreading of the EVD in the health structures [11]. A good level of knowledge and practice of health care workers is essential to protect staff and prevent possible outbreaks [9, 10, 12]. During the EVD outbreak, the Ministry of Health, in collaboration with its partners, organized ICH training for several health facilities with supplies of PPE materials. During the epidemic, Touré [13] had shown that 84% of health care workers surveyed in Guinea in 2014 estimated their level of knowledge on the EVD was insufficient and 97.1% sought training. Since this work, there has been a lack of publication on the level of health care staff that face with the epidemic of EVD that may occur in Guinea. It was therefore necessary to carry out this study whose objective was to evaluate the level of knowledge, the attitude and the practice of the nursing staff towards the EVD.

2. Materials and Methods

2.1. Study Setting

The Institute for Nutrition and Child Health (INSE), the national hospitals of Donka and Ignace Deen were the study sites. This study was conducted from 27 January to 26 April 2016 and involved 14 clinical facilities including 6 at Donka (Psychiatry, Internal Medicine, Emergencies, Dermatology, Infectious Diseases, Paediatrics), 7 at Ignace Deen (Pneumology, Rheumatology, Haematology, Emergencies, Maternity, General Surgery, Traumatology) and INSE.

2.2. Study Design and Population

A cross-sectional study was conducted regarding the health care workers staff of the selected services (doctors, nurses and trainee doctors). Health care workers who completed the questionnaire with more than 10% of the missing data were excluded. The sampling was non-random and consisted of a reasoned choice targeting services with a high number of health care workers or having a high risk of exposure to Ebola virus disease (EVD).

2.3. Data Collection and Study Instrument

The technique of self-administration of a standardized questionnaire made it possible to collect information from the health care workers. The data collected included sociodemographic characteristics (age, sex, number of years of practice, employment status and membership structure). The questionnaire also collected information related to the type of training on Ebola, the knowledge, attitudes and practice of the nursing staff on EVD. Issues related to knowledge of the epidemiological, pathogenesis and clinical aspects of EVD. The questions about attitude were focused on reaction to suspect Ebola. Practical issues included handwashing techniques, wearing personal protective barriers, vaccination against EVD.

2.4. Statistical Analysis

Data were entered the EPI DATA (version 3.1) and analyzed using SPSS 24. The results were presented as a proportion for the categorical variables, and as a mean ± standard deviation for the quantitative variables. A scale by assigning scores to the responses was constructed to assess the level of knowledge, attitude and practice of the health care workers. The answer to a question was rated 1 when it was right answer and 0 when it was wrong. A sum of scores was made for knowledge, attitude and practice. The level was classified into two groups: bad (score < 50%) and good (score ≥ 50%) [14]. A bivariate and multivariate logistic regression was performed to analyze the factors associated with a good level. Factors associated with $p \le 0.10$ in univariable analysis were entered a multivariable logistic regression models, and factors associated with good level retained from backward selections. The tests were considered significant at the 5% level.

2.5. Ethical Considerations

Respondents were intimated of the goals and objectives of the study before they were recruited. No names were filled on the questionnaires. The questionnaires were given numbers to facilitate their entry and analysis and to ensure anonymity of the respondents.

3. Results

3.1. Socio-Demographic Characteristics of Respondents

In total, 550 health care workers were counted and 267 were interviewed (participation rate of 49%). Table 1 shows the socio-demographic characteristics of the population studied. Most of health care workers surveyed were male (56.2%), doctors preparing their thesis (36%) with an average age of 29.8 ± 6.8 years and had received specific training on the Ebola virus disease (65.5%).

Table 1. *Characteristics according to the level of knowledges, practices and attitudes of health care workers at INSE, Donka and Ignace Deen in 2016.*

		Total		Level of knowledge				Attitude level				Practical level			
				Bad		Good		Bad		Good		Bad		Good	
		N=267	(%)	n=75	(%)	n=192	(%)	n=16	(%)	n=251	(%)	n=133	(%)	n=134	(%)
Hospital															
	Ignace Deen	131	(49.1)	12	(16.0)	29	(15.1)	3	(18.8)	38	(15.1)	16	(12.0)	25	(18.7)
	INSE	41	(15.4)	18	(24.0)	77	(40.1)	9	(56.3)	86	(34.3)	41	(30.8)	54	(40.3)
	Donka	95	(35.6)	45	(60.0)	86	(44.8)	4	(25.0)	127	(50.6)	76	(57.1)	55	(41.0)
Sex															
	Male	150	(56.2)	34	(45.3)	116	(60.4)	10	(62.5)	140	(55.8)	78	(58.6)	72	(53.7)

		Total		Level of knowledge				Attitude level				Practical level			
				Bad		Good		Bad		Good		Bad		Good	
		N=267	(%)	n=75	(%)	n=192	(%)	n=16	(%)	n=251	(%)	n=133	(%)	n=134	(%)
	Female	117	(43.8)	41	(54.7)	76	(39.6)	6	(37.5)	111	(44.2)	55	(41.4)	62	(46.3)
Age range															
	≤28 years	111	(41.6)	36	(48.0)	75	(39.1)	3	(18.8)	108	(43.0)	61	(45.9)	50	(37.3)
	>28 years	156	(58.4)	39	(52.0)	117	(60.9)	13	(81.3)	143	(57.0)	72	(54.1)	84	(62.7)
Professional status															
	Doctor	78	(29.2)	16	(21.3)	62	(32.3)	6	(37.5)	72	(28.7)	36	(27.1)	42	(31.3)
	Nurse	93	(34.8)	30	(40.0)	63	(32.8)	7	(43.8)	86	(34.3)	47	(35.3)	46	(34.3)
	Trainee doctor	96	(36.0)	29	(38.7)	67	(34.9)	3	(18.8)	93	(37.1)	50	(37.6)	46	(34.3)
Ebola training															
	Yes	175	(65.5)	36	(48.0)	139	(72.4)	13	(81.3)	162	(64.5)	75	(56.4)	100	(74.6)
	No	92	(34.5)	39	(52.0)	53	(27.6)	3	(18.8)	89	(35.5)	58	(43.6)	34	(25.4)

The training received was related to dressing techniques (43.4%), patient sorting (42.3%), management at the Ebola treatment center (15%) and training of trainers (7,1%).
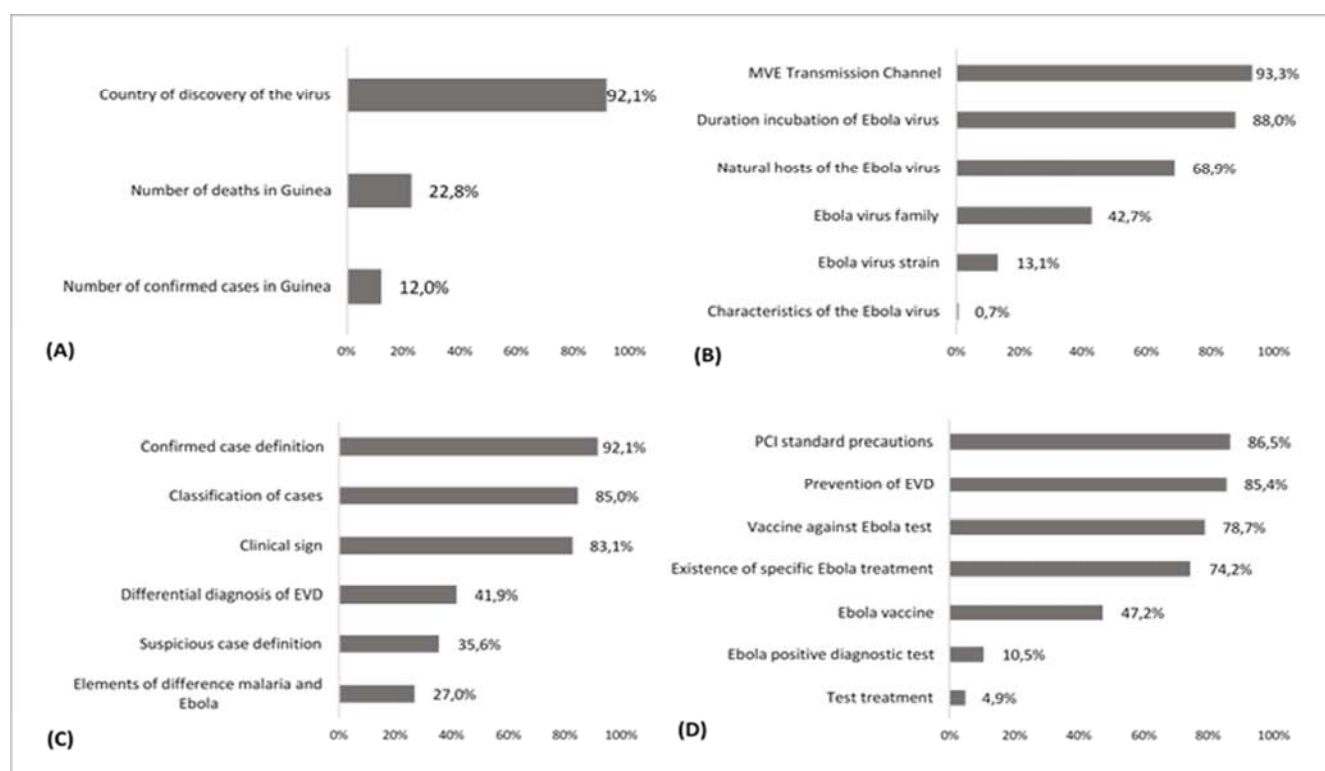

Figure 1. *Percentage of knowledge questions in Epidemiology (A), Pathogenesis (B), Clinic (C), Prevention and Treatment (D) that were answered correctly by health care workers of INSE, Donka and Ignace Deen in 2016.*

3.2. Respondents Level of Knowledges, Attitudes and Practices of EVD

The level of knowledge of the medical staff was considered good (score ≥ 50%) for 71.9% of health care workers (Table 1). In terms of the knowledge assessed, the level was good for 28.1% on Ebola virus disease's epidemiology, 73% in pathogenesis, 81.6% in clinic aspect and for 64.4% in prevention and treatment. Figure 1 shows that knowledge was less good for questions regarding confirmed EVD cases (12%), Ebola virus structure (0.7%), differential diagnosis components of EVD and malaria (27%) and trials (4.7%). Table 1 shows that the level of attitude was good for 94% of health care workers. However, 14% of participants reported expelling the suspect case because they did not go through a sorting center. This constitutes a deficiency. The caregiver's practices were considered as good for 50.2%. The acceptance to take part in the vaccine trial (14.6%), the duration of hand washing (16.5%) and the principle of using gloves (18.5%) were the practices with worst frequencies (Figure 2).
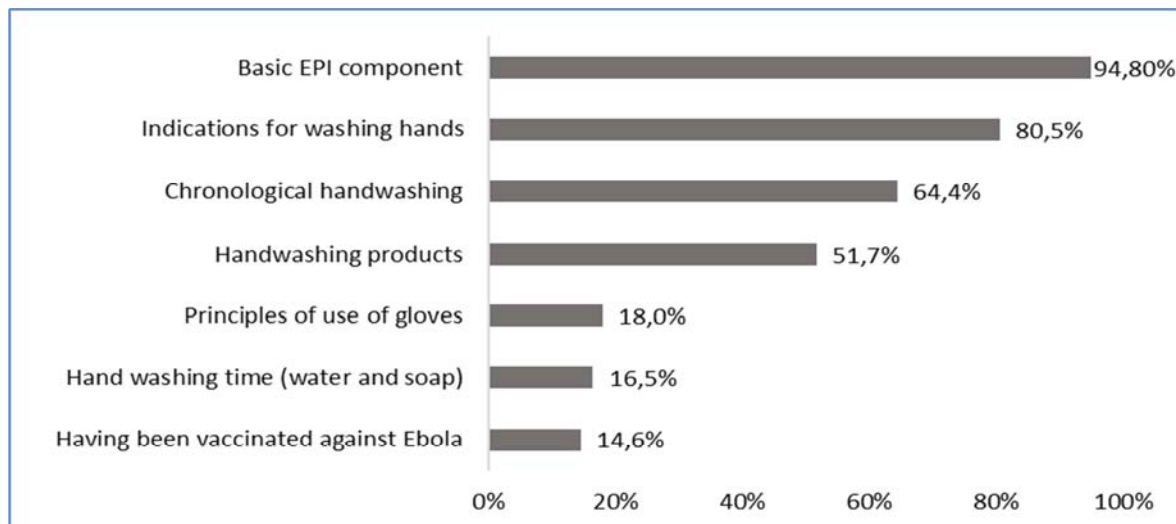
Figure 2. Percentage of practice questions answered correctly by health care workers of INSE, Donka and Ignace Deen in 2016.

3.3. Factors Associated at Knowledges, Attitudes and Practices Level (CAP) of EVD

The table 2 shows logistic regression outcome for the identification of factors associated with a good knowledge, attitude and practice regarding EVD. The multivariate analysis found that the factors associated with a good knowledge of EVD among male health care workers [Adjusted Odds Ratio (AOR): 1.7; 95% CI: 1.0-2.9] and received training on EVD (AOR: 2.7, 95% CI 1.6-4.8). The factors that remained independently associated with good practice among health care workers were membership of INSE (AOR: 2,3, 95% CI: 1,1-4,7) and training on EVD (AOR: 2.2, 95% CI 1.3 -3.8).

In this study, none of the factors tested were associated to the good attitude level of health care workers.

Table 2. *Factors associated with the good levels of knowledge, practice and attitude of carers from INSE, Donka and Ignace Deen in bivariate and multivariate analysis in 2016.*

	Good level of knowledge				Good level of practice				Good attitude level		
	n	(%)	OR (95% CI)	AOR (95% CI)	n	(%)	OR (95% CI)	AOR (95% CI)	n	(%)	AOR (95% CI)
Hospital											
Ignace Deen	86	(65.6)	1 -		55	(42.0)	1 -		127	(96.9)	1
INSE	29	(70.7)	1.3 (0.6-2.7)		25	(61.0)	2.1* (1.1-4.4)	2.3** (1.1-4.7)	38	(92.7)	0.4 (0.1-1.9)
Donka	77	(81.1)	2.2 (1.2-4.2)		54	(56.8)	1.8 *(1.1-3.1)	1.6 (0.9-2.7)	86	(90.5)	0.3 (0.9-1.0)
Sex											
Male	76	(65.0)	1 -	1 -	62	(53.0)	1 -		111	(94.9)	1 -
Female	116	(77.3)	1.8** (1.1-3.1)	1.7** (1.0-2.9)	72	(48.0)	0.8 (0.5-1.3)		140	(93.3)	0.8* (0.3-2.1)
Age range											
≤ 28 years	75	(67.6)	1 -		50	(45.0)	1 -		108	(97.3)	1 -
>28 years	117	(75.0)	1.4 (0.8-2.5)		84	(53.8)	1.4 (0.9-2.3)		143	(91.7)	0.3 (0.1-1.1)
Professional status											
Nurse	63	(67.7)	1 -		46	(49.5)	1 -		86	(92.5)	1 -
Trainee doctor	67	(69.8)	1.1 (0.6-2.0)		46	(47.9)	0.9 (0.5-1.6)		93	(96.9)	2.5 (0.6-10.1)
Doctor	62	(79.5)	1.8 (0.9-3.7)		42	(53.8)	1.2 (0.7-2.2)		72	(92.3)	1.0 (0.3-3.0)
Ebola training											
No	53	(57.6)	1 -	1 -	34	(37.0)	1 -	1 -	89	(96.7)	1 -
Yes	139	(79.4)	2.8*** (1.6-4.9)	2.7*** (1.6-4.8)	100	(57.1)	2.3** (1.4-3.8)	2.2** (1.3-3.8)	162	(92.6)	0.4 (0.1-1.5)

OR: Odd ratio; AOR: Adjusted Odd ratio; *: p<.1; **: p<.05; ***: p<.001.

4. Discussion

It is important for health care workers to understand the main aspects of Ebola Virus Disease (EVD) to recognize rapidly a case, to provide appropriate medical care and to prevent transmission. Nearly three out of four health care workers in this study (71.9%) had a good understanding of key aspects of Ebola transmission and prevention. However, a significant percentage of carers had poor knowledge of the number of confirmed EVD cases (12%), Ebola characteristics (0.7%), EVD differential diagnosis and Malaria (27%) and treatments of EVD under test (4.7%). Jalloh [15] showed in a study that a substantial number of health care workers in Guinea had misconceptions about the transmission of the

Ebola virus or expressed reluctance about the proximity of Ebola survivors. These data show the level of health promotion efforts needed to prevent or quickly control future outbreaks. In this study, as in the one conducted in Nigeria [16], having received training in EVD was associated with a good knowledge of EVD. Carlos [17] showed that although training improves knowledge about EVD, those on transmission remained suboptimal. Health authorities will have the challenge of maintaining a continuing level of training for health care workers during the epidemic-free period to allow new and old acquaintances to update their knowledge of EVD. Special emphasis should be given to female health care workers for these trainings. Without or in association with the training, self-documentation would be among the best channels of knowledge acquisition. A majority (94%) of health care workers had a good attitude. A positive attitude level was found in 76.7% of medical staff in Ethiopia in 2016 [18]. However, the fear of contracting the disease and the lack of information on the procedures to follow in the face of a suspected Ebola case produce negative attitudes. Messages aimed at changing misconceptions about the transmission and prevention of the Ebola virus should rigorously promote the health. In this study, factors associated with a good attitude were not identified.

One in two health care workers (50.2%) had good practice in this study. Similar trends of 45.7% and 64.7% were observed in Nigeria [19] and Ethiopia [20], respectively. The low percentage of health care workers who agreed to take part in the vaccine trial, correctly practiced hand washing for a while and adhering to the principle of using gloves, contributed to this level of practice. The results of the vaccine trial [20, 21] may be of interest to health care staff in response to outbreaks of Ebola virus disease. Organizing training for health care workers will provide better practice. A better organization of the INSE has certainly allowed this service to have a better practice for the EVD.

This study has some limitations. Indeed, it is not excluded that some participants were able to provide satisfactory answers to the recommendations rather than their real opinions. Also, the sample of health care workers was not representative of the staff of many private structures in Conakry. Despite these limitations, the results obtained provide important information to guide health communication efforts that can help control a future outbreak of the EVD epidemic.

5. Conclusion

The occurrence of the EVD epidemic in Guinea was a turning point for health care workers to acquire knowledge, new attitudes and practices through the training received. However, this study showed lack of knowledge, attitude and practice among health care workers. For this reason, it is relevant to further strengthen training to strengthen the capacity of health care providers and strengthen infections control measures.

Authors' Contribution

CA: conceptualized the study and design, did the entire data analysis

TMS and DIS: Did the interpretation of the result

TA, DA, and SS: Wrote the discussion and conclusion aspect of the article

GT, DAT and KMK: Wrote the introduction and abstract

MB: Coordinated field data collection and entry into computer statistical software

Conflict of Interest

No conflict of interest was reported by the authors.

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