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ORIGINAL RESEARCH ARTICLE

ASSESSMENT OF THE LEVEL OF KNOWLEDGE OF HEALTHCARE PROVIDERS ON EBOLA VIRUS DISEASE: A SURVEY AT A PUBLIC DISTRICT HOSPITAL IN GHANA

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Abstract

Background: Ebola virus disease (EVD) is a highly contagious, often fatal illness that poses significant occupational risks to healthcare workers (HCWs). Compliance with universal precaution practices is essential to curtail its transmission.

Objective: To ascertain the level of knowledge, attitudes, and practices regarding EVD among healthcare providers at a district hospital in Ghana, and to assess institutional preparedness against potential outbreaks.

Methods: A cross-sectional survey of 30 healthcare workers was conducted using structured questionnaires. Data were analyzed with SPSS v16, with Chi-square tests used to evaluate associations. A p-value <0.05 was considered statistically significant.

Results: Physicians demonstrated significantly higher compliance with universal precautions compared to nurses and other staff (p=0.017). Overall, 80% reported difficulties complying with precautionary measures, citing PPE shortages. Institutional preparedness for an EVD outbreak was poor according to 73.3% of participants.

Conclusion: Despite high awareness, actual compliance with EVD precautionary practices remains insufficient. There is an urgent need for strengthened training, resource allocation, and health system reforms.

Key words: Ebola, universal precautions, healthcare workers, epidemic preparedness, infection control

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INTRODUCTION

Ebola virus disease (EVD), also known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans. EVD belongs to a family of viruses that includes three genera: *Cuevavirus*, *Marburgvirus*, and *Ebolavirus*[1]. Five species of *Ebolavirus* have been identified: Zaire ebolavirus, Bundibugyo ebolavirus, Sudan ebolavirus, Reston ebolavirus, and Tai Forest ebolavirus. However, the first three species are primarily responsible for large outbreaks in Africa[1].

The first recorded EVD outbreaks occurred in 1976, simultaneously in Yambuku (Democratic Republic of Congo) and Nzara (Sudan)[2]. Transmission begins through direct contact with infected wild animals, such as fruit bats (the presumed natural host), and intermediate hosts like monkeys, chimpanzees, antelopes, and porcupines. Human-to-human transmission follows through direct contact with infected bodily fluids[3].

The average case fatality rate of EVD is approximately 50%, but it can vary between 25% and 90% depending on the outbreak context[3]. The 2014 outbreak that originated in Guinea and spread to Liberia, Sierra Leone, Nigeria, and Senegal marked the deadliest epidemic, with global health ramifications[4]. This outbreak prompted the World Health Organization (WHO) to declare EVD a Public Health Emergency of International Concern[4].

Despite global research efforts, no fully licensed cure exists; treatments remain experimental, and vaccine deployment began only in recent years[5]. The incubation period ranges from 2 to 21 days, with early symptoms including fever, fatigue, muscle pain, headache, and sore throat. These progress to vomiting, diarrhea, kidney and liver impairment, and both internal and external hemorrhaging[3].

1.1 Universal Precaution and Personal Protective Equipment

Universal precautions (UP) refer to medical practices designed to minimize exposure to pathogens through the use of protective barriers such as gloves, gowns, goggles, and face shields[6]. Originally introduced between 1985 and 1988 in response to the HIV/AIDS epidemic, the guidelines evolved into standard precautions by 1996, integrating the concept of body substance isolation[6].

Universal precautions apply to all patients, irrespective of known infection status, recognizing that bloodborne pathogens can be present in any patient[6]. Protective measures recommended include hand hygiene, safe needle handling, use of PPE, and proper disposal of sharps. Special emphasis is placed on the use of hospital gowns, latex gloves, and protective eyewear during exposure-prone procedures[7].

1.2 Healthcare Workers at Risk

Healthcare workers (HCWs) are at heightened risk for EVD and other bloodborne infections due to occupational exposure[8]. Each year, approximately three million HCWs suffer percutaneous exposure to bloodborne pathogens, resulting in an estimated 70,000 HBV, 15,000 HCV, and 1,000 HIV infections globally, with over 90% occurring in developing countries[8].

The primary routes of occupational exposure include needle-stick injuries, mucocutaneous exposure, and contact of blood with non-intact skin. Prevention strategies focus on adherence to UP, hepatitis B immunization, safe waste disposal, use of engineered safety devices, and strengthening infection control policies[9].

1.3 Ebola Virus Disease in Sierra Leone

During the 2014 EVD outbreak, HCWs in Sierra Leone experienced disproportionately high infection rates. Surveillance data from the national Viral Hemorrhagic Fever database indicated an approximately 100-fold higher incidence among HCWs compared to the general adult population[10].

The Kenema District recorded the highest number of HCW infections, linked to systemic failures in infection prevention, inadequate triage, and insufficient administrative controls[10]. Although training initiatives

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and PPE distribution began mid-outbreak, breaches in protocols and limited resources continued to expose HCWs to risk. These findings highlight the vital role of institutional infection control measures in curbing EVD spread among frontline workers[10].

1.4 Ebola Virus Disease in Liberia

Similarly, Liberia witnessed alarming rates of EVD among HCWs. By August 2014, 97 HCWs were infected, constituting 12% of total EVD cases reported in the country[11]. Clusters were primarily linked to non-Ebola treatment units (non-ETUs), where recognition of EVD cases was delayed, PPE was insufficient, and overcrowding compromised infection control practices[11].

Investigations by the Centers for Disease Control and Prevention (CDC) revealed that basic infection prevention tools such as gloves, soap, and isolation spaces were lacking in many facilities[11]. To address the crisis, national guidelines for infection control were established, alongside mass training programs aimed at fostering a culture of prevention and embedding infection control specialists in healthcare settings[12].

Problem Statement

Ebola virus disease (EVD) is an increasingly dangerous and fatal illness that has impacted several West African countries. Due to international travel, citizens from affected regions can easily enter Ghana, raising the risk of potential EVD cases. The study setting, a district hospital operating under the National Health Insurance Scheme, serves almost the entire Akuapem North community. Health workers in this region are at particularly high risk because of their frequent exposure to bodily fluids such as blood, saliva, and sweat during clinical practice.

Given the proximity to affected areas and the vulnerability of healthcare workers (HCWs), it is critical to assess their knowledge and practice of universal precautions to prevent disease transmission. Adequate education, provision of protective equipment (sterile gowns, gloves, masks, and sanitizers), establishment of emergency helplines, and creation of dedicated quarantine facilities managed by specially trained personnel are necessary interventions to mitigate risks.

2.2 Objective

The objective of this study was to assess the level of knowledge and practice of universal precautions regarding Ebola virus disease among healthcare providers at a public district hospital in Ghana.

2.3 Ethical Considerations

Ethical clearance was obtained from the Physician Assistantship Department and the Central University College Institutional Review Board. Permission was also granted by hospital management. Verbal informed consent was obtained from all participants, who were assured of confidentiality and anonymity. Participants were informed that their involvement was voluntary and that they could withdraw at any point during the study.

2.4 Study Design

A descriptive cross-sectional study design was employed, utilizing a structured questionnaire to collect data from healthcare workers.

2.5 Sample Size

The study involved 30 healthcare workers, purposively sampled from a total hospital staff population of approximately 100. Participants included doctors, physician assistants, nurses, pharmacists, anesthetists, laboratory personnel, paramedics, and orderlies who voluntarily agreed to participate after being educated on the importance of the study.

2.6 Study Setting

The research was conducted at a public district hospital located in the Akuapem North District, Eastern Region, Ghana, approximately 35 km northeast of Accra. The hospital is situated on the Akuapem-Togo mountain range at elevations between 381 and 487.7 meters above sea level.

The district's population is linguistically and ethnically diverse: Akuapem Twi speakers constitute 51.6%,

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Kyerepong and Guan groups make up 42.3%, and 6.1% comprises Ewes, Northerners, and Krobos. The 123-bed hospital serves over 120,000 residents spanning semi-urban and rural communities. It is the only government hospital within a 30 km radius, the nearest alternative being the Regional Hospital at Koforidua, 35 km away.

Clinical services provided include obstetrics and gynecology, pediatrics, surgery, internal medicine, ophthalmology, ENT, psychiatry, and dentistry. The hospital addresses common health challenges such as malaria, respiratory diseases, hernias, fractures, pregnancy-related complications, pediatric illnesses, and gynecological conditions.

2.7 Data Collection

Data collection was conducted through a structured questionnaire administered to the 30 selected healthcare workers. The questionnaire was designed to gather information on knowledge of EVD, practices concerning universal precautions, and perceptions of institutional readiness. Respondents typically returned completed questionnaires within 30 minutes to 72 hours. Additionally, unstructured verbal interviews were conducted, with responses transcribed and coded for qualitative analysis.

2.8 Data Analysis

Completed questionnaires were entered into the Statistical Package for the Social Sciences (SPSS) version 16 for analysis. Descriptive statistics, including frequencies and percentages, were used to summarize the data. Associations between professional categories and compliance levels were assessed using Chi-square (χ^2) tests. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Socio-demographic Characteristics

Characteristic	Category	n (%)
Age Group	20–30 years	14 (46.7%)
	31–40 years	13 (43.3%)
	41–50 years	3 (10.0%)
Sex	Male	14 (46.7%)
	Female	16 (53.3%)
Marital Status	Single	15 (50.0%)
	Married	14 (46.7%)
	Divorced	1 (3.3%)
Profession	Physician	5 (16.7%)
	Nurse	16 (53.3%)
	Lab Technicians/Orderlies	9 (30.0%)
Years in Service	<5 years	10 (33.3%)
	5–10 years	14 (46.7%)
	>10 years	6 (20.0%)

Compliance with Universal Precautions

Compliance Level	n (%)
Extremely cautious	10 (33.3%)
Almost always	5 (16.7%)
Just enough to feel safe	12 (40.0%)
Sometimes	3 (10.0%)

Statistical significance: Compliance was significantly associated with profession ($\chi^2 = 8.41$, df = 2, **p = 0.017**).

Perceived Challenges

Ease of Compliance	n (%)
Difficult	24 (80.0%)
Easy	6 (20.0%)

Knowledge of EVD Transmission

Mode of Transmission	n (%)
Contact with infected body	21 (70.0%)
Contact with bodily fluids	5 (16.7%)
Contaminated equipment	4 (13.3%)

Institutional Preparedness

Preparedness Level	n (%)
Poor	22 (73.3%)

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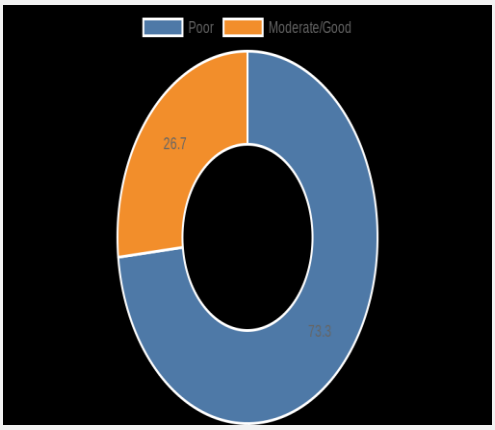
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Moderate/Good	8 (26.7%)

Fear Levels toward EVD

Fear Rating	n (%)
Quite afraid	2 (6.7%)
Afraid but will cope	6 (20.0%)
Terrified, can't function	2 (6.7%)
Absolutely terrified, will run	20 (66.7%)

3. Institutional Preparedness



DISCUSSION

The results demonstrate a significant gap between knowledge of EVD and compliance with universal precautionary measures, corroborating findings from previous studies in Sierra Leone and Liberia[6–8]. Although physicians were more compliant, other healthcare workers, notably nurses, occasionally practiced UP, revealing vulnerabilities.

Resource limitations, including inadequate PPE supply, were the main barriers to effective infection control. This echoes findings by Kilmarx et al.[6] and WHO guidelines emphasizing the necessity for continuous supply chains for PPE[9].

Fear of contracting EVD was profound, with two-thirds of respondents stating they would flee in case of an outbreak. Such fear has historically contributed to HCW shortages during epidemics[10]. Therefore, psychological preparedness must complement logistical readiness.

CONCLUSION

Despite a high level of knowledge regarding EVD among healthcare workers, compliance with infection prevention practices was suboptimal. Inadequate supplies of PPE and institutional unpreparedness were identified as critical challenges. Strengthening infection control measures, consistent training, and psychological support for HCWs are essential to enhance outbreak response capacity.

RECOMMENDATIONS

- Nationwide standardization and enforcement of universal precautions.
- Periodic training workshops on infection control and EVD management.
- Investment in PPE logistics and supply chains.
- Psychological support initiatives to address fear and burnout among HCWs.
- Creation of rapid-response isolation units and helplines for epidemic management

REFERENCES

1. WHO 2014 Ebola Virus disease, Factsheet 136(6):842-7 www.who.com/factsheet/ebola [Medline]
2. CDC 2014. Signs and symptoms of Ebola Virus disease Factsheet 103(7):475-9. www.cdc.gov/vhf/ebola/hcp. [Medline]
3. Gilbert Burnham. Response to the outbreak .JHBSPH. 2014. www.jhbsph.com/ebola. Oct 2014:101 (9) [Medline].
4. William Brieger. Nigeria's containment of Ebola.JHBSPH.2014. www.jhbsph.com/ebola Oct 2014[online]
5. David Quammen: the Natural and Human History of a Deadly Virus; www.jhbsph.com/ebola/davidquammen 2014(6):682-7. [Medline]

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E- ISSN: 2720 – 765X

ORIGINAL RESEARCH ARTICLE

6. Medscape. Ebola Virus Disease. www.medscape.com/ebolavirusdisease ; 2007.47(3):545-50 [Medline].

7. John B, Sean MK. The Ebola Virus: what EMS providers need to know www.emsworld.com/article Oct.2014(1200)62500

8. The Ebola Outbreak, Fragile Health Systems, and Quality as a cure Andrew S. Boozary; Paul E. Farmer, MD, PhD2; Ashish K. Jha, MD, MPH32014;312(18):1859-1860. doi:10.1001/jama.2014.14387.

9. World Health Organization. UN Mission for Ebola Emergency Response in Accra. http://www.who.int/csr/disease/ebola/en/. Accessed October 2, 2014.Rid A, Emanuel EJ. Why should high-income countries help combat Ebola? JAMA. 2014; 312(13):12971298.

10. World Health Organization. Fact sheet no. 103: Ebola virus disease. Geneva, Switzerland: World Health Organization; 2014.http://www.who.int/mediacentre/factsheets/fs103/en.

11. Incident Management System Ebola Epidemiology Team, CDC; Ministries of Health of Guinea, Sierra Leone, Liberia, Nigeria, and Senegal; Viral Special Pathogens Branch, National Center for Emerging and Zoonotic Infectious Diseases, CDC. Ebola virus disease outbreak—West Africa, September 2014. MMWR Morb Mortal Wkly Rep 2014; 63:865–6

12. World Health Organization. Infection prevention and control guidance for care of patients in health-care settings, with focus on Ebola. Geneva, Switzerland: World Health Organization; 2014. Available at http://www.who.int/csr/resources/publications/ebola/filovirus_infection_control/en.

13. Lamontagne F, Clément C, Fletcher T. Doing today's work superbly well: treating Ebola with current tools [published online September 24, 2014] N Engl J Med.doi:10.1056/NEJMp1411310.

14. World Health Organization. Marburg Hemorrhagic Fever Fact Sheet. http://www.who.int/mediacentre/factsheets/fs_marburg/en/. November 2012. Accessed August 23, 2014.

15. Epidemic Intelligence Service, CDC; 2International Rescue Committee; 3Kenema District Health Management Team, Sierra Leone Ministry of Health and Sanitation; 4Center for Global Health, CDC (Corresponding author: Michelle M. Dynes, mdynes@cdc.gov, 404263-7881)

16. World Health Organization. UN Mission for Ebola Emergency Response in Accra. http://www.who.int/csr/disease/ebola/en/. Accessed October 2, 2014.

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