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Principles of Midwifery Care during Virulent Outbreaks

Erhuvwukorotu S. Kollie

Abstract

In recent past virulent disease outbreaks have ravaged different parts of the world. The impact have been felt worldwide. During these outbreaks health workers are usually at high risk for contracting the infections. Rendering maternal ante-natal, intrapartum, and postnatal care can be challenging during these outbreaks. Some of these disease that have debuted fearsome outbreaks in the recent past are described briefly in terms of their characteristics, pathology, and treatments. The struggles involved in containing one of the outbreaks are highlighted. The dilemma that ensued as a result of seeking for balance between obligation, heroic midwifery interventions, and sense of calling have been explored. Special emphasis is accorded to highlighting the experiences of midwives during the recent 2014–2015 Ebola outbreak in West Africa. Recommended principles to guide midwifery practices suitable for sustaining the safety of families needing midwifery care and health care providers rendering midwifery care are described.

Keywords: Outbreaks, Midwifery care, Virulence, Ebola virus disease, midwifery interventions, safety

1. Introduction

During disease outbreaks health care workers (HCWs) are play important role which is primary to the control of further debilitating conditions and the maintenance the overall health of the public; this condition cuts across all populations worldwide [1]. As part of the solution several studies have identified principles for training and preparing health care workers (HCWs) to equip them for the competent handling of these difficult situations. There is evidence that the education of HCWs, including midwives, which involves training and preparation activities is very important to ensure that populations experiencing disease outbreak survive the event and recover meaningfully to optimum community health conditions. This involve equipping HCWs with skills vital for the conduction of competent surveillance, communication, reporting, and containment of outbreaks [2, 3]. It should be noted here that midwives operate under the domain of normal pregnancies, childbirth, and peuperium however, their clinical interventions during a virulent outbreak can become complicated with the high risk for contracting deadly diseases or transmitting the diseases to their patients. Several factors influence the availability and positive response of HCWs including midwives to contribute to the containment of the disease during disease outbreaks. Some of these factors include their willingness in spite of the risks involved such as uncertainty and insecurity. Other factors are their perceptions and attitudes towards their roles during disease

outbreaks [1, 4]. Scholars have identified that HCWs were somewhat willing to render care to victims during influenza virus epidemics [5–7]. Other studies have indicated differences in the rate of willingness of health workers to care for patients who are victims of virulent and life threatening epidemics, pandemics, and infectious diseases [8]. The study in [7] provided descriptions of the determinants of HCWs higher willingness to render care during epidemics; These include the type of disease outbreak (for example; it was shown that less virulent outbreaks were related with higher willingness of HCWs to continue to care for patients), also shown by studies that lower threat perceptions of health care workers are related with higher efficacy assertion (meaning higher assertion to being competent to handle the situation). It can be summarized then, that when disease outbreaks are less virulent, the threat perception of the outbreak are lower, while the self-determined ability to handle the situation becomes higher among HCWs. This results in a higher level of willingness by health care workers to continue to care for patients in the event of disease outbreaks. When outbreak of diseases were at its peak, the health care workers in close contact with victims, thereby putting them in a frontline position to salvage the situation, where recorded to express high rate of unwillingness to respond [1, 7]. One of such deadly disease outbreaks that have hit the world in recent past is the Ebola Virus disease that occurred in West Africa from 2014 to 2015. Studies to understand and describing the experiences of nurses and midwives and their willingness to care for patients during the Ebola disease outbreak have identified those factors that influenced midwives to care for patients during the fearsome outbreak [9]. It is important to note that during the Ebola outbreak in Liberia and West Africa as a whole, there was the great need to care for patients who had contracted the Ebola virus, but there was need also to pay attention to other patient populations who needed other health care services. Pregnant women, women in labor for child birth, and women who had just delivered their babies, newborn babies, and children with diverse conditions not related to Ebola were constantly in need of health care services [8].

Coping with the new disease with a recorded high mortality rate within the region, including development of treatment protocols, was a serious concern in the region. The situation was complicated further because the needed resources were not available in countries in the region (one of which was Liberia). These resource constraints included experienced experts in treatment and care for patients with Ebola. This inadequacy was caused by conditions created by the emergence from civil war in which lead to limited availability of health resources and a dysfunctional health care system in [8]. In addition, Ebola virus disease symptoms are not easily differentiated from other endemic diseases like malaria, gastroenteritis, or cholera [10]. The Ebola virus disease manifest symptoms that could be similar to other infectious diseases, meanwhile these symptoms are fatal. This caused high tension and anxiety among the health care workers and their attitude towards every patient who sought care changed in such a way that all patients were treated as suspected cases [11]. In appreciating the complexity of the new epidemic, in a statement about the Ebola outbreak in Liberia made by the World Health Organization (WHO) [12] it was reported that the highest number of deaths ocured in Liberia. This was also recorded as the most devastating outbreak of Ebola since it first emerged in 1976 in the Democratic Republic of Congo. When the epidemic reached its peak between August and September 2014, it was estimated that 300 to 400 new cases every week were reported. The situation in the country was very tragic; the treatment centers were overflowing with patients (which included women in labour, some of which delivered their babies in front of health care facilities). Horrific scenes were recorded were patients died on the hospital premises unattended to and bodies abandoned there for days. Local and International flights were

cancelled, and domestic supplies of food, gas, fuel ran low. Public places such as schools, businesses offices, border control, open markets, and most health institutions were closed down. Fear and uncertainty about the future—for families, for communities, and for the country and its economy was the common feeling in the country. The health care workers continued to play their roles in the management of patients, though supplies of personal protective equipment, training and preparation for safety procedures were inadequate. This led to the report of 375 health care workers who became infected and loss of the lives of 189 HCWs [12].

The enigma of the Ebola outbreak was associated to the challenges that were then posed to HCWs within the West African Region by the International Council of Nurses (ICN) [13]. Ebola infections according to the ICN [13] were contracted by health care workers which resulted in the debilitating effects on the health system; that included the closing down of hospitals, the reduction in the health care workforce, and a distrusted health system. It was reported also that health care workers were 21–32 times more likely to be infected with Ebola than were other adults in the general population [13]. In the three countries that were affected; Liberia, Guinea, and Serra Leone, 50% of all health care workers infected were nurses, 12% were physicians and medical students, and 7% were laboratory workers. These numbers of deaths of health care workers reflected the need to improve and strengthen safety policies, supply of adequate protective equipment, and the appropriate preparation and training for all HCWs. The International Council of Nurses recommended to governments to ensure the creation of safe working environments for health care workers as a prerequisite to providing care to Ebola patients. The ICN also recommended that nurses and midwives require proper training and education, prompt provision of protective equipment, and to take up an active, frontline role in the development of policies pertaining to the prevention of infection transmission and patient care [13].

The understanding of the high risks associated with giving care to infected patients during virulent outbreaks for midwives, attention should be increased and placed on the safety issues, social processes, and the needed to develop a more realistic policy that will meet the needs of midwives. There is also the need to describe what midwives went through during the epidemic while caring for Ebola and non-Ebola patients, which involved midwives' decision making about rendering or not rendering care to patients during the Ebola outbreak. This will serve as eye opener for other midwives to appreciate and understand the principles that they would need to internalize and utilize whenever necessary to render care to women and their families who in need of midwifery care during virulent outbreaks.

2. Disease that have caused virulent outbreaks in recent past

Some of the disease that have debuted fearsome outbreaks in the recent past are described very briefly in terms of their characteristics, pathology, and treatments. These diseases include Ebola virus disease, Avian influenza, Cholera, Yellow fever, Middle East Respiratory Syndrome Coronavirus, Marburg virus disease, and Zika virus infection. The COVID-19 disease debuted in 2019 and is currently ravaging the world (**Table 1**).

2.1 Ebola virus disease

According to WHO [10] Ebola viral disease (EVD) can cause fatal complications among humans up to about 90%. Wild animals transmit the virus to humans and then human to human transmission occurs through physical interactions between

Disease outbreak	Country	Year
COVID-19	220 Countries globally	2019
Ebola Virus	Uganda, Serra Leone, Liberia, Guinea, Nigeria	2010; 2014
Avian Influenza	Egypt, Indonesia, China	2010; 2011; 2013
Cholera	Haiti, Democratic Republic of Congo	2010; 2015
Yellow Fever	Senegal, Nigeria	2011; 2017
Middle East Respiratory Syndrome Coronavirus	Middle Eastern Countries; US, Saudi	2013; 2017
Marburg Virus Disease	Uganda	2014
Zika Virus infection	Panama, Honduras, Cape Verde, Paraguay, Mexico, Guatamala	2015

Table 1.
Disease outbreaks occurrence in the past ten years.

them. The clinical manifestations of Ebola infection starts to show between 2 to 10 days after a humans contract the virus. People can only transmit the virus during the period that they are. Survival critically depends on the provision of early supportive care which include rehydration and symptomatic treatment because there is currently no standard pharmacologic treatment to destroy the virus [10]. Ebola virus disease or EVD occurred first in 1976 in two concurrent outbreaks in Eastern Africa: one in Nzara, Sudan, and the other in Yambuku, Democratic Republic of Congo [10]. EVD is caused by a virus called Filoviridae, one of the viruses included in the family of hemorrhagic fever viruses that cause uncontrolled bleeding complications accompanied with fevers. The natural host for the Ebola virus are fruit bats [14]. When humans come in close contact with the fluids such as blood, body secretions, other bodily fluids of animals such as chimpanzees, gorillas, fruit bats, monkeys, forest antelope, and porcupines that are infected by the Ebola virus and/or are found ill or dead or in the rain forest, the humans contract the virus [14]. Transmission of Ebola virus among humans occurs when humans come in direct contact with fluids and body parts of other humans. For example when broken skin or mucous membranes of one human come into contact with the blood, secretions, or body fluids of other humans who are infected by the virus, even when they come in contact with materials (such as, bed clothing) contaminated with body fluids of other infected people. Once a person is infected with the virus they remain infectious throughout, as long as they virus remains in them and after death occurs due to the disease [10]. People infected with the Ebola Virus are not infectious until the symptoms begin to show, these symptoms begin to manifest between 2 to 21 days after infection. The Symptoms include headaches, fever that occurs suddenly, sore throat, muscle pain, fatigue, vomiting and diarrhea, skin rashes, clinical signs of renal and hepatic dysfunction, and internal and external bleeding (Symptoms of Ebola virus disease, para.1) [10]. The diagnosis of EVD can be difficult due to the indistinct clinical signs and symptoms compared to other infectious diseases however, laboratory tests can be used to confirm that a person is infected with the Ebola Virus. Examples of the laboratory tests that can be used to confirm EVD include antibody-capture enzyme-linked immunosorbent assay, antigen-capture detection tests, serum neutralization test, reverse transcriptase polymerase chain reaction assay, electron microscopy, and virus isolation by cell culture. EVD has no developed treatment yet. However, there is a range of potential treatments including blood products administration, immune therapies, drug

therapies, and vaccines which are currently being developed. Survival depends the provision of early supportive care which include rehydration and symptomatic treatment because there is currently no standard pharmacologic treatment to destroy the virus [10]. The skills and protocols involved in nursing care for patients with EVD are undergoing development. Some scholars have suggest the following as nursing interventions emanating from the experiences of nurses who were directly involved in the care of EVD patients:

The improvements made in the treatment techniques makes it now possible to render adequate care for EVD challenged patients with much better clinical results.

1. The safety and protection of health care providers is essential therefore, there should be adequate and timely provision of personal protective gear and equipment.
2. The management of patients with EVD is multifaceted and entails the utilization of isolation technique and the use of full protective gear. This require intensive training and practice.
3. There is need to engage in elaborated communication to everyone in and around the treatment facilities which involves detailed and repeated communications. This will distill the fear related to, and the inaccuracies and exaggerated reports by media on matters concerning personal and community risk.
4. The response to the crisis created by Ebola outbreak require the encouragement of volunteerism among nurses and midwives [15].

Midwifery interventions require touch; which is the main medium that people connect with each other. Touch is an important part of the midwife-patient relationship and may be the unavoidable aspects of the caring relationship between midwives and their patients [16]. Nurses and midwives use touch to promote healing and provide comfort and care to their patients. Touching patients is done in different kind of ways during every interaction; for instance, when measuring vital signs, bathing their patients, changing positions of patients in bed, assisting patients to leave their bed to walk or sit in a chair [16]. When midwives touch their patients, especially during the Ebola outbreak, it speaks volumes in terms of reassures them that the midwife is not afraid to be near them and that they are not alone. Though direct skin-to-skin contact is not wise nor acceptable, it is recommended that when midwives treat EVD patients, despite the layers of protective equipment, they need to seek for avenues to intentionally touch their patients in a deliberate and meaningful way that will provide care, comfort and connection between the midwife and the patient [16].

Curriculum development is crucial and important so that student midwives would be given a robust understanding of the knowledge, skills, and attitudes necessary to care for patients in the event of public health emergencies like the Ebola outbreak. For instance, Teachers at Emory's Nell Hodgson Woodruff School of Nursing worked in collaboration with their colleagues at the Centers for Disease Control and Prevention (CDC) to create and deliver a course that they titled, "Introduction to Complex Humanitarian Emergencies for Nurses." This course utilized presentations and active learning exercises that examined the methods needed to provide and manage public health emergency situations that require prompt care and opportunities for leadership. This could be applied and contextualized to midwifery and nursing schools in West Africa and globally as a continuous education program to update and improve midwifery care during disease outbreaks [17].

2.2 Avian influenza

The avian influenza viruses are zoonotic influenza viruses are resident in birds and cause Avian influenza commonly called bird flu. These animal influenza viruses are distinct from human seasonal influenza viruses and they do not easily become contagious and transmit from human to human. Occasionally through direct or indirect contact they infect humans and cause diseases that could lead to death. Avian influenza A (H5N1) first outbreak was in 1997 in a poultry in Hong Kong. It became widespread in 2003 from Asia to Europe to Africa. A (H5N1) occurs naturally in wild waterfowl, but it can spread easily to domestic poultry. The disease is transmitted to humans through contact with infected bird feces, nasal secretions, or secretions from the mouth or eyes. Also it is suspected that bird flu could be contacted by consuming improperly cooked poultry or eggs from infected birds, eggs should never be served runny. Bird meat when not properly cooked to an internal temperature of 165°F (73.9°C) could pose a risk. Symptoms of bird flu include cough, diarrhea, respiratory difficulties, fever (over 100.4°F or 38°C), headache, muscle aches, malaise, runny nose, and sore throat. Treatments may vary because different types of avian influenza can cause different symptoms. Most times antiviral medication such as oseltamivir (Tamiflu) or zanamivir (Relenza) can help alleviate the severity of the disease, especially when the medication is taken within 48 hours after symptoms first appear. Further management would be to place those infected in isolation to avoid spreading the virus to others [18].

2.3 Cholera

Cholera is an acute form of diarrhoeal disease, if not treated it can kill within hours. Several studies have identified approximately that every year there are 1.3 million to 4.0 million cases of cholera, and 21 000 to 143 000 deaths worldwide due to cholera. Most cases presents no or mild symptoms. Treatment with oral rehydration solution would be effective in such cases. More severe cases will require quick and immediate treatment with intravenous fluids and antibiotics. Control measures involve the provision of safe water and sanitation, safe oral cholera vaccines, improvements in water and sanitation [19].

2.4 Yellow fever

Yellow fever is caused by a virus found in parts of Africa and South America. The virus is spread to people by the bite of a mosquito. Symptoms of the illness ranges from fever with aches and pains to severe liver disease with bleeding and yellow colored skin (known as jaundice). Yellow fever presents first set of symptoms which include sudden onset of fever, chills, severe headache, back pain, general body aches, nausea, vomiting, fatigue, and weakness. Most persons improve after the initial presentation. After a brief remission ranging from hours to a day, about 15% of infection cases progress to develop severe symptoms which include high fever, jaundice, bleeding, and eventually shock and failure of multiple organs. Treatment is symptomatic and includes provision of rest, fluids, and use of pain relievers and medication to reduce fever to relieve symptoms of aching and fever. Yellow fever patients should be hospitalized for supportive care and close observation, they should be provided with material to protect them from more mosquito bites (by encouraging that they stay indoors and stay under a mosquito net). This should be adhered to for up to 5 days after the symptoms like fever begins. This will allow the yellow fever virus in their bloodstream to be unavailable to uninfected mosquitoes, thereby putting a halt to the further transmission of the virus and containing the risks posed

to other people around the patients. There is no medicine to treat the infection yet. Prevention is advisory which include use insect repellent, wear long-sleeved shirts and long pants outdoors, and get vaccinated. The incubation period (time from infection until illness) when people get infected is typically 3–6 days [20].

2.5 Middle East Respiratory Syndrome Coronavirus

This is a respiratory disease caused by a group of viruses known as coronaviruses discovered first in the Middle East region, specifically Saudi Arabia in 2012. These coronaviruses constitute a large family of viruses that can cause different kinds of diseases such as the common cold and Severe Acute Respiratory Syndrome (SARS). The clinical manifestations of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) include cough, fever, and shortness of breath. Other symptoms include pneumonia, and some gastrointestinal complications such as diarrhea. There are cases when infected people go on asymptomatic, meaning that they do not present any clinical signs nor symptoms, but they test positive for MERS-CoV after a laboratory test is conducted. In order to track down these asymptomatic cases rigorous contact tracing of a laboratory-confirmed case should be done. It is reported that so far about 35% of confirmed MERS-CoV infected patients have died. Transmission is mainly through human-to-human infections especially in health care settings; when providing unprotected care to a patient. Health care associated outbreaks have debuted in several countries, with the largest outbreaks seen in Saudi Arabia, United Arab Emirates, and the Republic of Korea. Scientific evidence have suggested that dromedary camels are a major reservoir host for MERS-CoV and have transmitted MERS infection to humans [21].

2.6 Marburg virus disease

Marburg virus disease (MVD) was formerly known as Marburg hemorrhagic fever. This is a severe fatal illness in humans transmitted to humans by *Rousettus aegyptiacus*, a fruit bat of the Pteropodidae family. It spreads among humans through human-to-human transmission. The average MVD case fatality rate is recored at around 50%. Community engagement is critical to successfully controlling outbreaks. To achieve good outbreak control several sets of interventions should be considered which include case management, infection prevention and control practices, surveillance and contact tracing, a good laboratory service, safe burials, and social mobilization. Early supportive care with rehydration, symptomatic treatment improves survival. No treatment has yet been developed [22].

2.7 Zika virus infection

Zika virus infectious disease is caused by a virus transmitted mainly by *Aedes* mosquitoes. Infected people present symptoms which include mild fever, skin rash, conjunctivitis, muscle and joint pain, malaise or headache. The symptoms usually last for 2–7 days. Zika can be transmitted from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects such as microcephaly and Guillain-Barré syndrome. There is no vaccine or medicine for Zika virus infection [23, 24].

2.8 COVID-19 Disease

COVID-19 disease also known as Coronavirus disease is an infectious disease caused by a newly discovered virus called coronavirus. It is spread by droplet

transmission from one human to another who are in close physical interaction. The COVID-19 virus is spread primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. It's important that people practice respiratory etiquette (for example, by coughing into a flexed elbow). People who get infected with the COVID-19 virus experience mild to moderate respiratory illness and recover without requiring special treatment. Special populations of humans are affected differently; ie older people, and those with underlying medical problems like diabetes, chronic respiratory disease, cardiovascular disease, and cancer are more likely to develop serious physiological responses. Prevention of transmission is best achieved by slowing down transmission by ensuring that the population is informed about the COVID-19 virus, the disease it causes and how it spreads. Other protective measures include washing hands or using an alcohol based rub frequently using facial mask, and not touching the face. The most common symptoms include fever, dry cough, tiredness. There are less common symptoms such as aches and pains, sore throat, diarrhoea, conjunctivitis, headache, loss of taste or smell and a rash on skin, or discoloration of fingers or toes. More serious symptoms also showcase such; difficulty breathing or shortness of breath, chest pain or pressure, loss of speech or movement. It takes an average of 5–6 days from when an individual is infected with the virus for symptoms to show, however it can take up to 14 days. Treatment mostly is by symptoms An approved drug, remdesivir (Veklury) is used to treat COVID-19. Any treatments that are used for COVID-19 should be taken under the care of a healthcare provider [25].

3. The experiences of midwives during a disease outbreak

Before elaborating on the principles that will guide midwifery care during virulent outbreaks. Let us appreciate the experiences of midwives during the 2-14-2015 Ebola virus disease outbreak in Liberia, West Africa. It is from this backdrop that the principles of midwifery care during virulent outbreaks are proposed. A study described the experiences of midwives during the EVD outbreak in Liberia; the midwives were living and working in fear and terror; their lives and those of their families were endangered [9]. The key concern of the midwives were concern for their family's safety, psychological, emotional, and social support. The midwives mostly felt obligated by virtue of their profession to continue caring for patients during the Ebola outbreak [9]. The midwives experienced stigmatization by the public during the outbreak due to fear of many that the midwives stood a greater risk to transmit the disease to their families and the public in general. However after engaging in the education of their families and patients, together with institutional influences, and government efforts eased the effect of stigmatization [9]. There is need for governments to improve their efforts to develop policies, provide safe working conditions, and fund training and educational programs in Ebola care [26].

Midwives experienced changes in the dynamics of the midwife-patient relationship and working in teams during the period of the outbreak. The training and education of the midwives, also the provision of protective equipment assisted the midwives to regain their confidence and self-efficacy. The midwives found ways to touch all patients despite the high risk involved, while using the personal protective equipment provided. They conducted midwifery procedures fully, improved the relationship between themselves and their patients. The spiritual dimension of health care was identified in a study as crucial to enhancing midwives' well-being [9]. Other authors have also reported that faith-based health care institutions and services are the vehicle used to drive spiritual health care [27]. The decision process involved in the midwives' choices either to render care or not to render

care for patients were made on the basis of emotional connections between them and other midwives and nurses, their families, and society. The decision process also was based on their value system, including professionalism and spirituality. The findings of the Kollie, Winslow, Porthier, and Geade study indicated the spiritual resources of midwives had influence on their decision to work. The study identified a conceptual map which described the work decision process to include that the midwives were in a state of fear and terror. Their situation was associated with emotional and psychological dimensions of the fear and terror condition [9]. Several factors were shown to influence their decision to work; key among them the family. Midwives made decisions to either work or not during the Ebola outbreak based on family responsibilities and demands. The midwives decided to work as a result of their sense of professionalism and their realization that they needed to depend on God for safety. There were institutional influences and also government roles which was shown to have both positive and negative influences on whether the midwives decided to work or not. The midwives decision to work was influenced by stigmatization issues which caused sadness and frustration. Stigmatization however did not stand out as a reason for the midwives to decide to stop working during the Ebola outbreak. Those midwives who continued to work during the outbreak encountered changes in the relationship between the patients and themselves as well as, midwives. Further description of the factors that influenced the midwives to continue to render care to their patients during the fearsome and dreadful 2014–2015 Ebola virus disease outbreak [9] are as follows:

3.1 Living in fear and terror

The midwives felt afraid and terrorized by the possibility of contracting the disease through interaction with patients and colleagues, and transmitting it to family members.

3.2 Family

The fear for their family's safety made the situation difficult for the midwives. In order to alleviate their fears and prevent the possible transmission of the virus to their family members, midwives bathed upon their return home and before they began to interact with members of their family. This phenomenon created what was described as physical distancing between their spouses and children, this was very difficult for them to endure, especially when they considered great risk the situation posed to their family. The results of the study identified that the midwives considered the physical distancing as the responsible thing to do; to ensure their family's safety irrespective of their desire for affection and closeness from their family members. The primary reason for a midwife to stop working during the outbreak was identified as family. The discouragement from family members or the sense of family responsibility was identified as the key factor that influenced those who did not work or stopped after a period of working.

3.3 Professionalism

The midwives were passionate for their profession, love for people, and sympathy or empathy for sick people. Financial benefits were not the motivation. The Midwives' logic for continuing to work was that their refusal to work would eventually lead to genocide, that neither they nor their relatives would be spared; that would be the retribution. The situation provided the opportunity for the midwife to gain additional clinical experience, competence, and confidence.

3.4 God and safety

The midwives depended on God for safety. This was the primary resource for safety, despite the availability of protective equipment. They believed that the surety of protection was only possible through dependence on God.

3.5 Stigmatization

People in society realized that the midwives were at risk of contracting infection and could in turn spread the virus to the public. This led to the stigmatization of the midwives and resulted in feelings of fear, frustration, and sadness.

3.6 Institutional influences

When hospitals closed because of fear, unpreparedness, and possible high risk of transmission to staff, the midwives felt the opportunity to continue serving was closed.

3.7 Government efforts

The government came through with their responsibility to provide Personal protective equipment. The government failed to deliver on its promise to compensate the workers with hazard allowance.

4. Principles that guide midwifery care during virulent outbreaks

The principles that guide midwifery care during virulent outbreaks will be discussed generally for all virulent disease outbreaks. These general principles will offer basic safety and educational guidelines that cut across all virulent outbreaks. During virulent outbreaks health workers are usually at high risk for contracting the infections. This poses a great risk to their patients, family members, and themselves. Rendering maternal antenatal, intrapartum, and postnatal care and immediate newborn care would be challenging during these outbreaks. The struggles involved in containing the outbreaks involves the dilemma of seeking for balance between obligation, heroic midwifery interventions, and the sense of professional calling. The solution would be to guide midwifery practice with fundamental principles to serve as frameworks for contextual evidence based midwifery interventions during deadly disease outbreaks.

These principles are discussed under domains of midwifery care; antenatal, intrapartum, postnatal, and immediate newborn care. General safety and education issues will also be explained.

4.1 Antenatal care

The care for pregnant women and their growing fetus is needful to ensure the desired outcome of a healthy pregnancy and fetus. The management of pregnancy during antenatal care during virulent outbreaks should be guided by the following principles:

1. Initial mandatory sensitivity screening test for all virulent infections such as Cholera, COVID-19, Ebola virus infection, and so on should be conducted to rule

out cases of infective patients. This involves the history taking and temperature screening for all women.

2. Health education should no longer be conducted in physical group classes, the option of virtual group classes, or sharing of screen casts of health education classes could be explored. This is because more recent virulent outbreaks have been of diseases that are easily transmitted via air and fluid droplets (COVID-19 and Ebola). Moreover, the transmission of such recent outbreaks have been aided by interpersonal physical contact. Social distancing has been prescribed by the WHO recently [25]. Individual appointments for educational activities should be conducted. Where the condition permits educational activities could adopt other forms including phone conversations, use of the internet through the hospital website or email services to the clients, and distribution of video clips on salient health topics to mothers.
3. Physical assessment procedures such as general head-to-toe examination, abdominal examination, and laboratory tests should be conducted under strict protective conditions. The use of the basic personal protective gears, and continuous sterilization of the examination rooms should be practiced. Blood and body fluid samples should be handled with great care.
4. The examination of fetal wellbeing should be conducted under protective conditions.

4.2 Intrapartum (delivery) care

As soon as labour is established, the woman is advised to report to the hospital. The midwife is responsible to assess, plan, and implement care to address physical, emotional, and support needs of the woman in labour. In the first stage of labour the assessment procedures should include history taking, general examination, abdominal examination, vaginal examination, and fetal assessment. At admission history is taken first on behavioral patterns that might have put the mother at risk of contracting a virulent infection. Other history on details from previous births and babies, characteristics of uterine contractions (frequency, duration, and perception of strength), ruptured membrane/color and amount of amniotic fluid, vaginal discharge, fetal movement, medical history can follow.

Support from the relatives of the woman in labor should be encouraged so as to boost the woman's confidence and help her in decision making. However it is advised that all relatives stay out of the delivery room to reduce the risk of transmitting diseases or infections.

Procedures should be conducted under a clean field. Personal protective gears should be worn by the midwife always. All materials used should be clean. Mother can be encouraged to take a bath and clean the perineal area. Mothers and relatives should be required to wear protective masks at all times. This is predicated on the novel COVID-19 infections. Regular hand-washing and hand-sanitization should be ensured for mothers and relatives to prevent transmission of all types of diseases and virulent infections.

Vaginal examination should be conducted under aseptic measures. A full explanation of the procedure is given to the woman and her consent obtained. Take note of discharges or bleeding from the vaginal orifice, note the amount, excessive amount may indicate suspicion of symptoms of hemorrhagic fevers (EVD).

In the second stage of labor as long as the mother and baby are well, and there is good progress in labour, then the outcome will be good. The management of the second stage of labour consist of positioning, delivery of the head, and delivery of the shoulders and the rest of the body.

The management of the third stage of labour involves two main protocols: the use of uterotonics for the prevention of postpartum hemorrhage (PPH) during the third stage of labour is recommended for all births. Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug for the prevention of PPH. In the situation where excessive bleeding does not respond to interventions and other physiologic indicators for bleeding are ruled out, caution should be applied to suspected EVD symptoms.

The second protocol is controlled cord traction (CCT) is recommended for vaginal births to achieve a small reduction in blood loss and a small reduction in the duration of the third stage of labour.

4.3 Postnatal care

The continuous screening and preventive measures for virulent diseases and infections continues in addition to typical postnatal care protocols; postnatal visitation appointment, infant feeding, reproductive and contraceptive plan, pregnancy complications follow-up care, postpartum complications detection and management, and mental health care. During postnatal care visitations the following should be observed by the midwives, mothers, and their relatives to prevent transmission of virulent infections; regular hand-washing or hand-sanitization, temperature checks, use of protective nose masks, social distancing, and barrier midwifery care (which involves the use of gloves, googles, boots, and masks).

4.4 Immediate newborn care

This could be summarized to include wiping, drying, warming (ideally skin-to-skin contact) and wrapping. Providing skin-to-skin contact is indicated only for mothers and babies who test negative to any virulent infection. Evaluating breathing and resuscitation if necessary as usual in the management of the newborn infant. Use a sterile method to cut the cord and evaluate bleeding from the cord area as suggestive of possible EVD symptoms. The management of the newborn infant also include initiating exclusive breastfeeding in the first hour for infants whose mothers have been confirmed negative to virulent infection screening.

4.5 General safety and education

The safety and education of midwives, health care workers, mothers and their relatives should be assured by conducting several general safety and education activities. Some of these activites include;

- initial screening for all virulent infections to serve as baseline data for all health care workers and midwifery clients of the health care facility
- daily temperature screening for all health care workers and midwifery clients of the health care facility
- compulsory regular hand-washing or hand-sanitization for all health workers and midwifery clients (immediately after every activity in the health care facility)

- use of nose mask by all midwifery clients at all times in the health care facility
- use of protective gears such as goggles, nose masks, gloves, boots, at all times in the health care facility
- use of basic personal protective gears by all midwives and health care workers during procedures
- Posting of easy-to-read information posters about all virulent diseases that have caused outbreaks recently in all spaces and locations within the health care facility
- Preparation and distribution of educational materials about virulent infections and diseases such as screen casts, fliers, SMS to all registered midwifery clients of the health care facility

The unique clinical skills which emerged from the perspective of the midwives working during the Ebola outbreak in Liberia [9] could be incorporated in the training of students midwives. This includes the training of hand washing techniques, and wearing and use of both basic and enhanced personal protective gears. There is need for nursing and midwifery professional boards and regulatory bodies to continue to assure continuous education on virulent infections preventive care and safety measures for midwives. Curricula in the schools of midwifery should include preventive care and safety measures. This could involve the training on the management of midwife-patient relationships, empowering midwife-midwife relationships, the proper use of the both basic and enhanced personal protective equipment and protective measures, and adjustment techniques. The training for virulent infections preventive care and safety measures should also involve ethical considerations and mental or psychological indications. Community health education on recent virulent disease outbreaks could be conducted by midwives to help communities understand the diseases and improve behavior towards health care workers. The role that faith plays in the decisions made by midwives should also be recognized when developing and implementing curricula.

5. Conclusion

Virulent disease outbreaks result in dreadful risks for contracting contagious diseases or infections to health workers including midwives. This poses a great risk to their patients, family members, and themselves. The struggles involved in containing the outbreaks involves the dilemma of seeking for balance between obligation, heroic midwifery interventions, and the sense of professional calling. Rendering maternal antenatal, intrapartum, and postnatal care and immediate newborn care would be challenging during these outbreaks. The solution would be to guide midwifery practice with fundamental principles to serve as frameworks for contextual evidence based midwifery interventions during deadly disease outbreaks.

Conflict of interest

The author declares on conflict of interest.

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Author details

Erhuvwukorotu S. Kollie

Adventist University of West Africa, Schiefflin Township, Margibi, Liberia

*Address all correspondence to: kolliee@auwa.edu.lr

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