



‘Even when you are afraid, you stay’: Provision of maternity care during the Ebola virus epidemic: A qualitative study

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ABSTRACT

Objective: to explore nurse-midwives understanding of their role in and ability to continue to provide routine and emergency maternity services during the time of the Ebola virus disease epidemic in Sierra Leone.

Design: a hermeneutic phenomenological approach was used to discover the lived experiences of nurse-midwives through 66 face to face interviews. Following verbatim transcription, an iterative approach to data analysis was adopted using framework analysis to discover the essence of the lived experience.

Setting: health facilities designated to provide maternity care across all 14 districts of Sierra Leone.

Participants: nurses, midwives, medical staff and managers providing maternal and newborn care during the Ebola epidemic in facilities designated to provide basic or emergency obstetric care.

Findings: the healthcare system in Sierra Leone was ill prepared to cope with the epidemic. Fear of Ebola and mistrust kept women from accessing care at a health facility. Healthcare providers continued to provide maternity care because of professional duty, responsibility to the community and religious beliefs.

Key conclusions: nurse-midwives faced increased risks of catching Ebola compared to other health workers but continued to provide essential maternity care.

Implications for practice: future preparedness plans must take into account the impact that epidemics have on the ability of the health system to continue to provide vital routine and emergency maternal and newborn health care. Healthcare providers need to have a stronger voice in health system rebuilding and planning and management to ensure that health service can continue to provide vital maternal and newborn care during epidemics.

Introduction

Ebola is a highly contagious, zoonotic, filovirus thought to be transmitted to humans through hunting and eating of bush meat from an unknown animal reservoir (Feldmann and Geisbert, 2011). Ebola is passed from human to human through transmission of infected body fluids and mucosal contact. Incubation for the disease is 21 days, but

nonspecific early symptoms similar to those for malaria or typhoid for example, mean that the disease may be misdiagnosed. Treatment of the disease is supportive with no cure or vaccinations currently available. Mortality in Sierra Leone during the 2014/2015 epidemic was between 50–70% (World Health Organisation, 2015).

Prior to the Ebola outbreak Sierra Leone already had a weak health system and one of the highest maternal mortality ratios in the world at

Abbreviations: BEmONC, Basic Emergency Obstetric and Newborn Care; CEmONC, Comprehensive Obstetric and Newborn Care; EVD, Ebola Virus Disease; IPC, Infection Prevention and Control; MOU, Memorandum of Understanding; NERC, National Ebola Response Centre; NGO, International Non-Governmental Organisations; VSO, Voluntary Services Overseas

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1100/100,000 (World Health Organization, 2014). Health care, including emergency obstetric care, is delivered through a system of both private and public healthcare facilities. A shortage of skilled birth attendants means that many women seek care from traditional birth attendants with 50% of deliveries taking place outside of any type of health facility (UNICEF, 2015).

The first confirmed case of Ebola Virus Disease (EVD) occurred in Sierra Leone in May 2014 in the Kailahun district of the Eastern province which borders with Guinea (World Health Organization, 2015). On the 7th November 2015, WHO declared Sierra Leone free from Ebola following 42 days without any new cases (National Ebola Response Centre (NERC), 2015). At the end of the epidemic, there were 8704 confirmed EVD cases and 3589 deaths; of these 307 healthcare workers were infected and 221 died (World Health Organization, 2015). In February 2016, two new cases of Ebola were reported in one district and the country was again declared Ebola free by WHO on 17th March 2016 (World Health Organization, 2016).

It is now widely accepted that there was a slow response from the international community as well as national governments to the EVD epidemic and missed opportunities to contain the outbreak in the early stages (Moon et al., 2015; Walker and Whitty, 2015). The reasons for this slow response are multifactorial with socio-political, geographical and cultural issues all playing a part. Understanding the nature of the epidemic, how the virus is transmitted and what can be done in future to ensure better emergency preparedness for EVD is important. There are also lessons to be learned from healthcare workers, in particular nurse-midwives, providing routine and emergency maternity services, on their perception and experience of the epidemic including preparedness and response. Nurse-midwives were particularly vulnerable to EVD because of the nature of their work and the lack of personal protective equipment and infection prevention and control procedures in the early stages of the epidemic (Kilmarx et al., 2014).

The community response to EVD was as important as that of the Government and international agencies in helping to control and eventually end the epidemic. Significant reduction in the number of women attending for maternity care during the EVD outbreak in Sierra Leone was documented in studies by Elston et al. (2016) and Jones et al. (2016). A lack of understanding as to how the disease spread and unsafe burial practices increased individual exposure. At the start of the epidemic UNFPA predicted that 800,000 women were due to give birth across Guinea, Sierra Leone and Liberia (the three countries with the highest number of Ebola cases) (UNFPA, 2014). Of these 800,000 more than 120,000 would be at risk from obstetric complications, demonstrating the importance of continued availability of routine and emergency maternal and newborn health services. Previous papers have documented the impact of Ebola on uptake and quality of maternity care in Liberia and Guinea and on the numbers of maternal deaths and still births (Barden-O'Fallon et al., 2015; Dynes et al., 2015; Iyengar et al., 2015). Prior to the Ebola epidemic Sierra Leone had a maternal mortality ratio of 1100 and could ill afford to lose the gains it had made in maternal and newborn health care (World Health Organization, 2014).

The aim of this study was to explore the factors which influenced on the ability of nurse-midwives to continue to provide routine and emergency maternity services during the time of the EVD epidemic. Previous quantitative studies have looked at the availability and uptake of maternity services during the epidemic (Jones et al., 2016). This study aimed to explore the perceptions of healthcare workers on the factors which allowed or hindered them to continue to provide maternity care and their reasons for continuing to provide care despite risks to their own health.

Methods

The research sought to discern nurse-midwives' understanding of their ability to continue to provide patient care during a humanitarian

crisis. Therefore, a Hermeneutic descriptive phenomenological approach was used to discover the lived experiences of healthcare workers (Willis et al., 2016). This approach allows the researcher to explore the lived experiences of individuals by allowing them to make sense of their own world in response to a particular phenomenon, in this case the humanitarian crisis caused by the Ebola epidemic (Blaaka and Eri 2008; Blaaka and Eri, 2008). It is particularly relevant when looking at the experiences of healthcare providers in a clinical setting.

A total of 66 face-to-face interviews were conducted. Purposive sampling was used to select informants from district health management teams and healthcare facilities involved in provision of maternity care (nurse-midwives) both prior to and during the epidemic across all 14 districts in Sierra Leone. Those providing direct maternity care (nurses, midwives, community health officers, matrons, traditional birth attendants, medical staff) and those in managerial positions (district health sister, district medical officer, medical superintendent) were interviewed.

All interviews took place within each of the 14 districts of Sierra Leone during July 2015. Participants were contacted through the appropriate District Health Management Team, District Health Sister and District Medical Officer and were provided with both written and verbal explanations of the study. Healthcare workers who consented were interviewed in July 2015 by trained researchers based in Sierra Leone using a topic guide, in the language of their choice and in a private room within the health facility.

Interviews were tape recorded and translated into English when necessary and transcribed verbatim. An iterative approach to data analysis was conducted using Framework analysis (Blaaka and Eri, 2008). Researchers read all transcripts to become immersed in the data and to identify commonalities, shared experiences and differences in the data to find the essence of the experiences of the nurse-midwives. Emerging themes were assigned a code and then grouped together into related themes. Initial open coding of a third of all transcripts was completed by four members of the research team (Gale et al., 2013). Following comparison of these initial codes, agreement was reached on the codes to apply to all subsequent transcripts. Microsoft Excel was used to group codes together under thematic headings which formed a working analytical framework.

Ethical considerations

Ethical approval for the study was obtained from the Liverpool School of Tropical Medicine and the Sierra Leone Ethics and Scientific Review Committee based at the College of Medicine and Allied Health Services in Freetown. Participants were provided with both verbal and written explanations of the study and signed a consent form if they agreed to participate. Participants may have been concerned that if they expressed negative opinions this may be detrimental to their positions and careers. Confidentiality was maintained at all stages of the research process and data stored securely in password protected computers or a locked cupboard. The researchers also recognised that participants may become distressed if recalling stressful situations. If this occurred interviews were stopped and only continued if the participant agreed. Researchers were also able to provide details of support services available within Sierra Leone for participants if they wished to use these.

Findings

A total of 66 key informant interviews were conducted across the 14 districts of Sierra Leone with a median of seven interviews per district (range 2–12) (Table 1). Midwives and various cadres of nursing make up the majority of those providing maternity care in Sierra Leone and this was reflected in the interviews, with the majority of MNH care being provided by non-midwives. A total of 50 out of 66 (76%) participants were classified as either midwives or nurses and the

Table 1
Number of interviews and cadre of participants.

Participant type	Number
Medical Superintendent	3
Matron*	5
District Medical Officer	5
District Health Sister*	5
Community Health Officer	8
Midwives*	18
State Enrolled Community Health Nurse*	10
Maternal and Child Health Aide*	8
Traditional Birth Attendant*	4
Total	66

* Classified as either nurses or midwives by the Ministry of Health and Sanitation in Sierra Leone.

remainder medical staff. However, due to the ongoing shortage of midwives in Sierra Leone only 18 of those interviewed were midwives. Interviews lasted no more than one hour with a range of between 40 and 60 minutes. We did not collect demographic information such as age. Seven main themes emerged from the data and these are described in more details below (Table 2).

Inadequate service provision prior to the epidemic

Participants discussed the provision of maternity care within the facility prior to the Ebola epidemic (with regard to infrastructure, drugs, supplies, ambulance services, staffing levels, etc.). Nurse-midwives reported that even before the EVD epidemic, healthcare facilities faced challenges with inadequate infrastructure and supplies such as gloves, stock-outs of drugs and lack of basic equipment such as fetoscopes. When they did have equipment it was often not in sufficient amounts. Ambulances were available for referral but not always in working order and poor road conditions presented challenges if women needed to be referred.

‘Often, pregnant women do give birth on the floor and obstetric examination is done in another room. And even after delivery, there have to be two lactating mothers per bed which is overcrowding.’ Maternal and Child Health Aide

‘Before the outbreak of the EVD we had some stock out especially with the iron folate and albendazole. The important drugs for delivery such as oxytocin, vitamin K was also stock out.’ Midwife.

However, in Sierra Leone all women are expected to give birth at a healthcare facility, but even before the EVD epidemic, there were challenges with regard to promoting facility based deliveries:

‘We have challenges with the traditional doctors. They always convince the patients to use traditional medicines and to deliver at home [rather than in a healthcare facility]. Women will only rush

to the hospital when complications occur.’ Registered Midwife
‘I am a native of this community. I would normally visit and sensitise the people to come to the facility. As a native they would listen to you when you talk to them.’ Traditional birth attendant

The majority of senior staff working at the healthcare facilities reported having had to work hard to encourage all staff to remain and provide care during the epidemic. In addition, they had difficulty ensuring that staff had the correct equipment to protect themselves from Ebola. Facility staff had been transferred by the DHMTs to the EVD holding or treatment centres to support the Ebola response and increase the numbers of healthcare workers at these centres (i.e. transferred out of routine service provision). Managers reported that once this occurred, it was difficult to get these staff to return to their normal postings once their time at the EVD treatment centre was completed as they no longer received financial incentives that had been given to them for working at the treatment centres.

‘Some of them (midwives) joined the treatment and holding centres. It is difficult to bring them back to come and continue normal work.’ District Medical Officer

The weak health system prior to the epidemic meant that the limited resources available had to be diverted to help fight the Ebola epidemic, with a negative impact on routine health services:

‘During the Ebola [epidemic], two ambulances were sent to [another] district to fight Ebola and one other was repositioned at [a third] district. So now, we are in dire need of ambulances to carry out normal referrals.’ Maternal and Child Health Aide

Sierra Leone had a lack of basic equipment such as gloves and protective clothing prior to the epidemic which meant that even though staff were willing to provide care without these prior to the epidemic, the increased risk to themselves because of Ebola limited the care they provided:

‘The care that we could offer was reduced with the advent of the EVD epidemic because we were in fear and we did not have enough personal protective equipment (PPE) to work with. So we were afraid to provide most of the services.’ Midwife

Despite some services being available, as the epidemic increased it was reported that fear of catching Ebola and mistrust in nurse-midwives was keeping women away from facilities:

‘During that time initially the community people feared to come to the health facility thinking that sometimes if they come they will be infected with Ebola.’ Community Health Officer

‘They [women] had this belief that it was the staff who were injecting the patients [with Ebola], so they were afraid to come.’

Table 2
Framework analysis of transcribed data - Major and sub themes emerging.

Major theme	Sub theme
Inadequate service provision prior to the epidemic	Staff support, available resources and infrastructure Impact on care provision, impact on staffing levels, uptake of services Reduced staffing levels, infrastructure improvements, planning for the future
Professional and personal conflicts in providing care	Loss of colleagues, fear and safety concerns
Team work, support and professional responsibility	Professional responsibility, staff refusing to attend work, societal support
Healthcare workers response to and perception of the risks of Ebola	Resilience, fear of Ebola, putting family members at risk, fear of healthcare workers, feelings of isolation, grief and stress, denial, protective factors, healthcare workers are the source of Ebola, changes in care provision, understanding of the causes of Ebola, reduced patient attendance, community sensitisation
How the epidemic exposed the inadequacies of the health system	Training in infection prevention and control, country preparedness, provision of resources, response from health facilities, knowledge of Ebola
The importance and limitations of the NGO response to the epidemic	The role of INGOs in the Ebola response, coordination of effort, lack of tangible results
Perceptions on health sector recovery after the epidemic	Public sensitisation and engagement, loss of equipment, poor staffing levels, healthcare worker training, healthcare financing

Midwife

In July 2015 when these interviews took place and with the decrease in Ebola cases in each district, nurse-midwives tried to resume normal services. Challenges to this were the continued loss of nurse-midwives and doctors to the EVD holding and treatment centres and persistent public mistrust, which meant women accessed services very late or only when complications occurred.

'Now we are fighting to persuade and move the large number of nurse-midwives working at the holding facilities to come back into routine service. We ask them to go back to their normal health service delivery station.' District Medical Officer

'We need more sensitization. Because some people are very stubborn. Even though they have heard the message [that it is safe to access maternity services] but it needs to be repeated. Because some are still following the traditional practice; when someone is sick instead of taking the person to the hospital they take them to the herbalist.' State Enrolled Community Health Nurse

Professional and personal conflicts in providing care

The overwhelming healthcare provider response was one of fear and sadness. Some healthcare workers became emotional and began crying during the interviews. Fear was related to the possibility of becoming infected with the Ebola virus when working as a healthcare provider and fear for their family and community. At the same time, there was also a feeling amongst nurse-midwives that they had a moral duty to continue to work despite these fears.

'Thankfully, I survived. When you come to work, you are not sure how you are going back to the house. You have concern for your relatives, you don't know what you are taking to the house (Sobbing).' Midwife

Support was important for healthcare workers as they continued to provide care, but it was not always available:

'It [Ebola] ceased my interactions with family and friends because I am a family person. It also makes me feel discriminated by other people because they think we the nurses are the main carriers of the Ebola virus.' State Enrolled Community Health Nurse

The conflict between the need for emotional support from their families, the desire to protect loved ones from the disease and professional responsibility was faced by midwives and nurses on a daily basis:

'I have not seen my family for a very long time now because we are asked to stay where we are [in the district], even when doing my job, there is fear in me and I am worried I will get in contact with the Ebola virus. This usually affects the way I do my job.' Maternal and Child Health Aide

'Even at home my husband kept a distance during this EVD epidemic. He told me to stop working. I was hiding to come to work..... My husband totally avoided me, even my children, even with all that I was still coming to render services. As I am in charge of the maternity ward, if I don't come to work the others too will stay at home.' Midwife

'I was traumatized, I was really, really, traumatized, because you can imagine, I am a doctor, I have a family, I have children, I have a wife. During this Ebola epidemic, I still have to give care.' Doctor

Team work, professional responsibility and community support

Team work and support for colleagues was also seen as important in helping healthcare workers to continue to provide care. Despite fears for themselves and their family, nurse-midwives were committed to

supporting each other and providing good patient care. There was a clear sense of duty amongst healthcare workers to continue in their roles despite the risks

'I had to be strong, I have to be there for them [colleagues].' District Health Sister

'This is Ebola, let's say this is a fight, we are fighting. You are the soldiers fighting a common enemy, an enemy which you don't know. You have your junior colleagues in the field and you, as the head, when you hear a gunshot you start to run, what would happen? Everybody will run away, even when you are afraid you stay, you have to face it, because if you start running everybody will run away.' District Health Sister

'We are nurse-midwives, we have always sacrificed to serve the nation, our duty is to go ahead to support work in the health system, we are health professionals, we cannot go to carpentry.' District Medical Officer

At the initial outbreak, fear of contamination, mistrust of nurse-midwives and misinformation about Ebola amongst the community meant that attendance at facilities declined. Patients who did attend, either because of symptoms suggestive of Ebola or for maternity care, often came late and only when they were already seriously ill.

'Then the patients were like not coming to the hospital because they were afraid. They said if they came we'll tell them they have Ebola.' Midwife

'Most of those who were admitted during Ebola, they eventually died because they were coming in very, very, very late. A lot of other people [in the community] were interfering. By the time they found out what was needed there was no way out. They came but extremely late.' Medical Superintendent

'They prefer it when you meet them out of the [healthcare] facility they greeted you well. When you asked them why they are not coming to the clinic for ANC or immunization they told us that they are afraid to go because at that time the EVD was at its peak in this community. There were many EVD cases in the healthcare facility so the community was afraid to come.' Community Health Nurse

It was only as the outbreak progressed that initiatives were put in place by the Government, District Health Management Teams and NGOs to inform the community about the EVD epidemic and the need to access care for any illness. Nurse-midwives made every effort to engage with the community, although a persistent lack of supplies meant that they could not always provide optimum care.

Nurse-midwives knew that women who were pregnant or needed care at the time of birth talked with each other and relied on peer-advice. Positive experiences at the healthcare facility meant women decided to re-access care.

'Yes, we are about to begin outreach programs to encourage people to attend clinic. We are also working with the paramount chiefs to help sensitise people.' Community Health Nurse

Healthcare workers response to and perception of the risks of Ebola

Prior to the outbreak of the epidemic there was little to no understanding amongst healthcare workers about Ebola, how it was spread or the impact it could have:

'We didn't know how dreadful it was. We only heard that there was an existing disease by the name of Ebola but we never knew that it was so dreadful until we had it in Sierra Leone.' Midwife

All healthcare workers were offered incentives to work in the Ebola treatment centres and though many moved to the centres financial reward was not the biggest motivator for them. Many healthcare workers cited their religious faith as being the main motivator for

continuing to provide care:

'But really when I was infected I was not scared because I know God Almighty has power over my life. God has control of myself, if God says I'm going to die I have nothing to do, so you know I had that strong feeling that God has the final decision, so I was not worried.' Community Health Officer

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How the epidemic exposed the inadequacies of the health system

Lack of preparedness for and knowledge about the EVD epidemic were major themes that emerged. Staff reported not being prepared. The majority reported hearing about the onset and spread of the EVD epidemic from non-official sources rather than via the Ministry of Health. In the initial stages, nurse-midwives began developing their own methods of coping. Training in infection prevention and control (IPC) was conducted by the Government and non-governmental organisations (NGO). Some nurse-midwives reported receiving training late and experiencing a lack of IPC or personal protective equipment. Others reported receiving frequent, multiple IPC trainings from several different NGOs via what appeared to be an uncoordinated response.

'Sierra Leone was never prepared for this outbreak. Sierra Leone is never prepared, we were not expecting it and we never prepared. The issue of emergency preparedness is always a big problem in this country.' District Medical Officer
'We were not prepared, by that time, we had no training and were not knowledgeable. The message that was around was that when you eat bats and mango you will be infected. We had the belief that we would get infected through that. It is only during the intense phase [of the epidemic] that we came to know it was transmitted through body contact, sweat saliva and things like that.' Maternal and Child Health Aide

The importance and limitations of the NGO response to the epidemic

All interviewees reported having had some contact with an NGO during the EVD epidemic. In some cases, this was a continuation of previous partnerships, in others, new partnerships were established as a result of working together during the epidemic. Though nurse-midwives did appreciate the effort of NGOs, they also voiced many frustrations. Healthcare workers felt it is important to address these during the recovery phase after the epidemic in order to build a better, resilient health service. The expectations of NGOs and healthcare facility staff were not always the same and this resulted in frustration amongst nurse-midwives.

'They [NGO] are not tying themselves to any area. But we told them to give us an MOU (memorandum of understanding). We have been telling them since they entered the hospital. But they are not doing anything, they just said that they are doing surveillance

and Ebola patient care. They say they want to help with the recovery but they are not organised so we don't depend on them too much.' Midwife

'Many people have been here. They usually collect data and leave.' Community Health Assistant

'They [NGO] came for Ebola activity and then since the holding centre was here they said they wanted to support the hospital because they saw our problems. They are saying they want to help but I am not seeing that it is effective.' Matron

'The NGO came during the EVD epidemic to know the demarcation of our land to build living quarters for the nurses. Since they came we have not heard from them.' Community Health Officer

Perceptions on health sector recovery after the epidemic

Interviewees were asked what they thought was needed for the healthcare system to recover after the EVD epidemic. Nurse-midwives shared ideas on where services should be targeted and how this could be achieved. Many senior staff were aware of the Government's proposed recovery plan and long-term strategy and had been involved in this in some way. Hospital staff felt that secondary level care was neglected compared to primary health care especially with regard to supplies and training. Support from outside Sierra Leone for the recovery phase was also mentioned, but again there was some scepticism on how effective this would be.

'I know primary health care is paramount to prevent diseases but whatever preventive measure you take if this fails... like in case of the EVD epidemic, it started in the community and is going to end in the hospital. Whatever you, say the last case will end in the hospital. If the hospitals are not ready, are not equipped, then lives are lost...' Midwife

The importance of continuing community sensitisation to reduce fear were seen as important along with improvements in supplies and resources if a more resilient health service was to be developed. Those with a managerial role in the district health system emphasised the need for a coordinated approach post EVD which included the community and district health teams.

'To continue funding and support to sensitise the patients at the community level and alleviate the fear; Ebola district health response; improve resources- more delivery beds and stocking essential drugs.' District Medical Officer

The importance of motivating health staff was also raised. Both financial incentives and the adequate resources were seen as important, to encourage staff and also patients.

'I would like to add is for them to look into the maternity wing and motivate staff working there even with the performance based financing that we used to have, we are the ones doing the bulk of the work but when it comes to the reward we don't have much.'
'Firstly the nurses should be encouraged. They should be supplied with all the necessary equipment and drugs that they should use. Because you can tell patient to use the service, when they come like ANC we do not have drugs.' Midwife

Discussion

Main findings

The fragile state of the Sierra Leone healthcare system prior to the Ebola epidemic meant that the country was ill-prepared to manage both this emergency and continue to provide routine patient care. However, improvements were being seen in maternal and newborn health care. In the first half of 2014, prior to the epidemic, Sierra Leone was showing a positive trend regarding access to maternity care which was halted with the onset of the epidemic (Brolin Ribacke et al., 2016).

Estimations of the impact of the epidemic on routine health services such as malaria control showed that morbidity and mortality increased due to the health system becoming overwhelmed in caring for patients with EVD (Walker and Whitty, 2015). As early as December 2014 there were concerns that the reduced numbers of healthcare workers in already understaffed facilities would negatively impact on maternal and newborn care (Delamou et al., 2014). The numbers of women choosing to access facility care also fell due to fears of contracting Ebola (Dynes et al., 2015). There was a 20% reduction during the epidemic in the number of facility based deliveries and C-sections as women stayed away from health facilities (Brolin Ribacke et al., 2016). In an effort to reduce risks to healthcare workers and encourage pregnant women to attend for facility care the Government of Sierra Leone and NGOs developed care protocols and set up specialist Ebola treatment centres for pregnant women (Ministry of Health and Sanitation, 2014; Centers for Disease Control and Prevention, 2015). Outreach services were not developed as the Government aimed to encourage safe births in healthcare facilities. However, this study also shows that nurses and midwives attempted to increase the confidence of women to attend at facilities by meeting them in their community to discuss and allay their fears.

The boundaries in practice between different cadres and across facility types in Sierra Leone is often very fluid because of the scarcity of healthcare workers, this can contribute to a shared experience of the impact of the Ebola epidemic. The diversion of scarce existing resources including human resources, equipment and consumables to the Ebola holding and treatment centres adversely affected the ability to continue to provide routine and emergency maternity care.

A number of reasons for healthcare workers continuing to provide care despite the risks to themselves, their family and sometimes a lack of community support emerged. The first of these relates to a feeling of professional responsibility and the need to continue to provide care even if this was sometimes limited to reduce risks to themselves. Those in senior/line management positions felt a commitment to show leadership and to act as a role model for junior members of staff. The final reason related to religion and a belief in God and that they would be protected in their work, or if not then this was something they would have to accept as part of Gods plan for them.

Studies on the motivation of healthcare workers in Sierra Leone prior to the epidemic showed that religion was a motivating factor for providing care despite inadequate resources (Wurie et al., 2016). Financial incentives (salaries and wages) have also previously been reported as being important, however serving the community and being effective in their job were placed higher than monetary concerns (Wurie et al., 2016). Non-financial rewards have also been proven to work when combined with monitoring and evaluation initiatives (Pieterse and Lodge, 2015). Financial incentives have been shown to be motivational during previous Ebola outbreaks in other countries but further study is needed to determine how much influence this had in Sierra Leone (Quaglio et al., 2016). Our findings show that motivation is a multifactorial issue with no one element holding sway over the others within healthcare workers.

This study showed that respondents suffered extreme emotional stress during the epidemic but continued to work. Similar studies carried out during previous Ebola outbreaks in Africa have also shown severe emotional stress in healthcare workers, concerns about the risks to their families, a lack of community support and tensions between national and international healthcare teams (Quaglio et al., 2016).

The community response to the epidemic was as important as the health system response for control to be achieved. Fear of catching Ebola and lack of trust in healthcare workers to keep them safe meant many pregnant women stayed away from facilities or presented very late. As confirmed in other studies misconceptions about Ebola and lack of trust in the response system led people to delay seeking help (Yamanis et al., 2016). The eventual realisation by government and NGOs that full public involvement would help combat the epidemic

came only once the disease had spread countrywide (Bortel et al., 2016).

This study shows that a lack of coordination and commitment by NGOs meant that healthcare workers did not always feel supported by the international community response. However, the ability of NGOs and the international community to respond to such a large scale epidemic was not necessarily there. A lack of easily deployable specialists, too many short term volunteers and administrative and immigration issues all contributed to a slow response (Cancedda et al., 2016).

The ongoing failure shown in this and other studies to ensure adequate routine provision of healthcare workers, supplies and infrastructure meant that control of the spread of Ebola did not happen early or quickly enough to prevent the epidemic (Boozary et al., 2014). This study confirms that both nurse-midwives and managers were already aware of and concerned about the lack of drugs, supplies and poor infrastructure of the health system, in particular the ability to provide infection prevention and control without vital equipment such as gloves. This study and others have shown that developing a resilient health system which has high standards of basic care such as infection control is the best defence against future epidemics such as Ebola, without this it was all too easy for the disease to spread (Cancedda et al., 2016). Prior to the epidemic there was a perceived lack of trust between the public and health workers related to issues of corruption around the governments free healthcare initiative and the this was exacerbated during the Ebola epidemic (Pieterse and Lodge, 2015). This study also shows the importance of trust between healthcare workers and communities, to reduce public fears and encourage women to continue to use health facilities.

Recovery, transition and building a resilient health system have been the main themes in the post Ebola period for both governments and NGOs. The Governments' National Recovery Strategy (2015) provides a two-year plan to recover from the epidemic and to build a more resilient health system for the future (Government of Sierra Leone, 2015). Findings from this study show that a major concern of healthcare workers was the poor condition of the health system prior to the epidemic. When asked about lessons learnt from the epidemic and priorities for rebuilding post EVD, healthcare workers wanted greater investment to increase availability of resources, improved infrastructure (particularly water and electricity supplies), and to continue with public sensitisation on health care.

Improvements in infrastructure and resources were also seen as important to help motivate staff to work with government to develop a resilient health system. Financial incentives were also mentioned as a way of motivating healthcare workers with reference to previous programmes in maternal and newborn care.

Coordination, planning and agreement between Government, NGOs, district health management teams and the community will be vital if a more resilient health system is to be developed in Sierra Leone. It is equally important that during this phase, maternity care providers are fully informed and involved in planning the way ahead since they understand fully the limitations of the services that they provide.

Involving nurse-midwives in the rebuilding of the health system, addressing human resource shortages, lack of capacity and stress or demotivation following the epidemic will be crucial. Systems put in place for the Ebola response may provide an opportunity to build more resilient healthcare systems but additional resources will also be needed including continued community sensitisation and involvement in health (Edelstein et al., 2015).

In the post Ebola recovery period, maternal mortality in Sierra Leone has increased to 1360/100,000 (World Health Organization, 2015). Maternal and newborn health is at the centre of the governments' recovery plan and will require reinvigorating and refocusing on the availability of skilled birth attendance at both primary and secondary level to ensure that Sierra Leone gets back on track to

improve maternal and newborn health outcomes. Such change will also require massive improvements in infrastructure, supplies, availability of clean water, electricity, emergency services and the many other aspects that contribute to providing an enabling environment for routine and emergency obstetric care.

Conclusions

Understanding the lessons that can be learnt from those providing maternal and newborn care at the front line of the fight against Ebola, building on the leadership, teamwork and professionalism shown by nurse-midwives across Sierra Leone is essential if a more resilient healthcare system is to be developed. Community sensitisation and involvement is vital to develop trust between service users and service providers and ensure women receive the maternity care that they need.

This study shows that both governments and NGOs need to consider their response not just to emergency situations such as the EVD epidemic but also how they are tackling the ongoing problems of weak health systems and inadequate care. The EVD epidemic occurred not just because of the virulence of the disease but because of an inherently weak health system, lack of resources and poor infrastructure. Further research is needed not just on the response to the epidemic but also on the impact of development aid in fragile states.

For nurses and midwives, the implications of the epidemic were devastating with the loss of colleagues, rejection by the community and families and increased stress. Nurses and midwives need systematic and sustainable support to deliver care and protect themselves and should play a central role in the rebuilding of the healthcare system.

Strengths and limitations

The study provides important information from healthcare workers about the challenges faced by those caring for patients within a high risk environment during the Ebola epidemic. We analysed data from 66 interviews which provided a valuable insight into the lived experiences of the healthcare workers. It would have been useful to explore some of the themes that emerged further, through follow up interviews and or focus groups to better inform the post Ebola recovery further.

The researchers had envisaged being able to conduct interviews with service users but it soon became apparent that this would not be possible given that communities were still recovering from the epidemic and there was still mistrust between communities and health workers. This is a limitation when looking at how a more resilient health system can be developed.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.midw.2017.05.009](https://doi.org/10.1016/j.midw.2017.05.009).

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