Why a disaster is not just normal business ramped up: findings from a study about disaster response in the emergency department

What is already known

We know that nurses working in the emergency department (ED) are at the front line of disaster response by virtue of the fact that following a disaster people will present, or be transported to the ED for treatment. Existing literature suggests that emergency nurses are unprepared for disaster response. Publications that describe the ED response to a disaster focus mostly on execution of the disaster plan, staff experiences, response times, types of injuries people sustained and how they were managed. There is an implication though, that little else other than the context of the situation is different from the every day experience of working in the ED and participating in a disaster response in the ED.

What this paper adds

This paper demonstrates that a disaster response is different from the everyday experience of working in the ED. A number of changes in the ED and in nursing behaviour and practice occur as a result of a disaster that don't occur on a normal day. Several recommendations could be drawn from this research which could enhance preparedness of emergency nurses for disaster response.

Introduction

The ED is a familiar, ever present construct of an emergency nurses' work life. Every day the emergency nurse enters the ED and largely within the confines of that environment they conduct their daily nursing practice. Within this space are the resources that support the diagnosis and treatment of patients. Also housed in the ED are vital medical gasses such as oxygen that is piped through the walls, beds for the patients and a vast array of other physical tools necessary to manage and treat a variety of patient presentations. Through this familiarity the nurse knows where to find things and how to use the space. Through the ED people present with a wide range of illnesses and injuries. While names and faces change, presenting complaints remain relatively the same providing nurses with constant exposure to similar complaints.

The ED and the things that nurses do inside it every day are familiar, but this changes when a disaster occurs. When a disaster is declared it sets off a chain reaction of changes that differentiate the everyday experience of working in the ED from participation in disaster response. The nurses' attention is consumed by the event. Additional human and material resources begin to materialise to support the response and extra beds and more space is identified. Although these changes are described in the literature which discusses the ED response to a disaster they have not been explicitly discussed (Frank 2001, add more).

Depending on what region of the world you live in, disaster response can be a relatively infrequent event. Staff working in the ED are already stretched to their limits and have limited time for additional things. As a result very little time is often prescribed to preparing for disaster response. In reality though, these events have very high consequences for the affected community and for the health professionals that respond in the aftermath caring for people affected by the event. Because

of this, nurses who work in ED need to be adequately prepared for the realities of disaster response. This paper describes the findings of a research study that indicate a number of changes occur in the ED as a result of the declaration of a disaster. This provides a focus for future preparedness and training considerations for emergency nurses.

Method

This research used a qualitative approach underpinned by Hermeneutic Phenomenology. Thirteen nurses from 8 different countries across the world participated in interviews about their experience of working as a nurse in the ED during a disaster response. Interviews were conducted either via Skype or face to face. Data collected from the interviews were read multiple times and analysed using thematic analysis and guided reflection on five existential constructs of our lived world; *lived relation* how self and others are experienced, *lived body* how the body is experienced, *lived space* how space is experienced, *lived time* how time is experienced and *lived things* how things are experienced (van Manen 2014, p. 303).

This paper reports the findings of a research study that adhered to the National Statement on the Conduct of Human Research by the Australian National Health and Medical Research Council, and has been approved by the Flinders University Social and Behavioural Research Ethics Committee, project number 5701.

Results

Nurses who participated in this research were involved in a range of natural and man-made events. Naturally occurring events that participants were involved in included bushfire, heatwave, tsunami, earthquake, volcanic eruption and flood, while man-made events included transport incidents, chemical spill and terror attacks. Terror attacks were bomb blasts, ED evacuation due to bomb threat, mass stabbings and mass shootings. The results of this study demonstrate the changes that transpire in the ED when a disaster occurs.

In the first instance, when nurses are notified of a disaster event the normal flow and business of the ED is disrupted as staff pause to consider their next actions. Nurses are shocked and disbelieving:

> *It's just disbelief…you think, "Geez, that can't happen, not where we live. These things don't happen" (Participant 9 – terror attack).*

Nurses' attention is bought to the impending response as they consider their ability to cope and speculate on whether they have acquired the appropriate skills, knowledge and experience to cope effectively:

> *There was the initial fear if we could actually handle this and then my first time to really handle a big, big, big incident like that. It was this picture of blood all over, people screaming, lives needing to be saved immediately. You feel or you don't know how the hour would come or if they – we weren't sure how many lives we could actually save (Participant 10 – terror attack).*

The declaration of a disaster initiates a chain reaction whereby things materialise or are put into place so as to manage the response. For example, nurses begin to ready the ED space to accommodate an influx of patients.

> *In that hour, what we were doing is clearing the emergency department. Most of the people who had come to be seen with minor, minor illnesses, we made the announcement that they should go to our satellite clinics…Those who were waiting for their results, we also told them that they can either come on another day or they could go into other clinics where they could also access their results online from our facility. So we were clearing the department and waiting now for them [patients to arrive]. We were also preparing the packs, the mass casualty packs. We were getting supplies for the ED, now pooling all the resources from the hospital to one bunch in the area and then there was allocation of duties to each and everyone where you would be… (Participant 10 – terror attack).*

External measures come in to play and the ED is flooded with resources, such as extra staff. Space is made available by moving patients out of the ED or by creating extra areas in the hospital to manage patients and extra material resources are sent to the ED such as blood packs, intravenous fluids and bandages.

> *Once you call a disaster, it sets off a whole motion and a whole chain reaction of different things. Suddenly more people are notified and different things happen to make way for the disaster…And that may mean that all your admitted patients go to the ward without being seen and written up, that means that minimal things get done. It means people get pulled off their office jobs onto the floor and help in a certain roles that need to be filled. And having the walk-in wounded leave or go somewhere else and having clearance to wards enables to freeing up a staff too. So, calling a disaster certainly kicks thing different phases of plans… there's a chain of events that happens (Participant 4 - flooding).*

In catastrophic disasters or where there is a perceived lack of preparedness, material resources may not initially be readily available due to the scale of the event.

> *What should I do? No equipment, limited doctor, no medication and also medical record. We never think that we will have a disaster like that. And we didn't prepare for the resources. We don't have a system. That's the big problem. We don't have a back-up planning for the human resources. We just come and did what we can and because we are limited resources and limited anything, we get frantic and finally, our hospital called the closest hospital and then called the doctor who are not on shift, the nurses. But it took time because we're not prepared for that (Participant 5 – terror attack).*

As the response gets underway the space may become crowded and busy as the ED floods with people affected by the event, their friends and family, emergency services personnel, health professionals and media:

> *The unit is very small and the injured people, when they arrive the unit begin crowded and we can't move or help anyone, as an example when I help anyone many of the patient stay on the ground… It's very noisy, you can say like imagine the most, most high noisy, just like that…Very busy, sometimes visitors, sometimes volunteers try to help us, sometimes inured, everyone…there is chaos without a system (Participant 12 – terror attack).*

The crowded ED space makes it challenging for nurses to move around and work unimpeded. The chaos and busyness of the situation adds another dimension to the challenge of managing a large influx of critically ill or injured patients. The exception to this was more insidious events such as flooding and bushfire. In these instances the ED was cleared in anticipation of receiving patients that never came, or never came in the volumes that were expected:

> *It was dead quiet and I think we couldn't pin it down into any particular reason. It wasn't 'til the next day that we found out the devastation of everything (Participant 1 – bushfire).*

In the current climate where ED are consistently functioning over capacity this situation is equally as disconcerting for nurses who are not familiar with an empty department.

Usually within an ED different patients are seen in different areas. There is a specially designated room set up with the necessary equipment to manage the treatment of different patients. A disaster situation creates more critically unwell patients than the ED can manage and so nurses may be forced to care for patients in areas where they wouldn't normally.

> *It was within ED, it was a room that was kind of like a plaster room in a way…it didn't have all of the emergency kind of equipment that we would have liked in a resus room. It still had oxygen and suction, and we were able to move some stuff there. We had drawers that had your medications and things in – your resus meds that were attached to poles and things like that…we didn't have a trolley you could take with you to another room. We'd have to take just a normal resus trolley. So it was just less than ideal (Participant 4 – ED evacuation).*

Because an existing ED space cannot accommodate a large influx of patients at once, other areas are often set up to manage patients. Examples of this would be a reception area for the walking wounded, a decontamination area or an outside triage area. The concept of working in a different environment also related to the need to wear high level personal protective equipment (PPE):

> *One thing is that you can't hear anything. So you're kind of in your own little space. And the only sound that you can hear is the motor running on the powered air respirator and this little shield of air that blows over your face. So you feel isolated and you feel alone. And you feel as though if something happens to you…how quickly can someone get me out of this thing… And I also knew that if anything happened to me that they have to decon me first before they can take you out of the suit…So it is very, very claustrophobic and fear inducing and lonely. It's very lonely in there. Even though you're busy, you don't feel – like when you're standing next to somebody and you're working, there's stimulation. In a suit, there's none. Your peripheral vision is gone. You can only see out the front of the visor. You have no manual dexterity at all. And all you hear is this hum of the air and that's it. (Participant 8 – chemical spill).*

The hospital may be rendered unviable, or nurses might volunteer to work or be deployed to a completely different ED. In the examples above nurses stay in a familiar setting but the setting is altered because they are working in a different area or with PPE on. In this example requires a nurse to work in a completely different space to the one that they are used to working in.

> *It was confusing, it was frustrating, and it took a little while to develop who was the boss…They had a different computer system to us. So we didn't know their computer system; they didn't know what we wanted. Nothing was compatible…and like where is all the stuff? Where is your toilet? Didn't know where anything was. It was difficult. (Participant 4 – bomb threat).*

This new environment adds another layer of complexity to the challenge of care for disaster affected patients.

During a disaster response nurses report a single minded focus on helping their patients.

> *When disaster occurs, mostly I'd be silent. I don't allow myself to feel during the disaster. During the event, I'm very calm and very strict to what I have to do. If I move during that time to what I call "automatic pilot" and leave my emotion out of there, this is not a disaster. The situation might be very difficult to handle. But as long as I do not involve my private emotions, I can handle the situation (Participant 2 – terror attack).*

Nurses are so focused on caring for patients and dealing with the tasks at hand that they overlook their own needs.

> *From the time the first casualty arrived, I think it was around 11 in the morning, from that point to around eight at night, we didn't go for any break for those hours from 11 to around eight, nine. There wasn't any break (Participant 10 – terror attack).*

In this situation nurses' report working long hours and only stopping when specifically asked to. This extreme causes them to overlook any potential legal consequences of their behaviour in favour for a more ethical outcome.

> *In normal situation, we can practice our protocol and when we can assess that patient. We can treat the patient properly because we have enough resources…But in disaster, we can't use our policy. For example, like policy – If we want to give medication, is about the doctor. We want to do resuscitation, just wait for the doctor. But in disaster, we just do by myself. Put IV, for example, The nurse put it, but it's under doctors' orders, but in this case, in a disaster, we just – We don't need the doctor. Yeah just put it. Yeah. I should do it, but I feel – what call? It's not my job. Is it wrong or too wrong, is good or right? (Participant 5 – terror attack).*

Following the response nurses are provoked to reflect on their experience. They focus their attention to what things supported them to feel more confident or prepared during the response, and what things didn't.

> *I have a very sad experience, yes, but that I could say where experience was very precious for me…But I think the experience made me think what is my life, what my life is…why I'm living like this, why not like that…Twenty thousand people died at once. Why? Why didn't I? Somehow they were making efforts to build their life, to make new families, yes. So the one it is studying hard to reach to that effort. But why does disaster happen? But - so, I can't find the answer for that. I can't find answer, but because we got there, there's some things, many things that we can't control and I – that's why I think I reached to the last point, last day of my life, I want to do something. I want to keep doing something…So in my daily life, I think that on my own, you have to do, you have to keep living, keep walking, keep studying over, keep in time - yeah, may until the last day. 'Cause you don't know the last day, when your last day comes. In that disaster, I strongly felt we don't know anything about the - in your future (Participant 6 – earthquake/tsunami).*

Discussion

When a disaster is declared as such a chain reaction is initiated whereby the ED is flooded with additional resources – human, material and space. This has also been reported widely in the literature as more staff are called in or sent to the ED, space is made available by moving patients out of the ED or by creating extra areas in the hospital to manage patients and extra material resources are sent to the ED such as blood packs, intravenous fluids and bandages. The effect of providing assistance in this manner begins to resolve an overwhelming situation. The implication being that a disaster response is different to every day practice and extra resources are required to effectively manage the response. A disaster therefore necessitates change. The behaviours and reactions of nurses and the changes that occur as a result of a disaster that are described above demonstrate that a disaster is not just normal business ramped up. Changes occur in response to the event and as a way to manage the event. The implications of these changes are discussed further below under the headings; nursing reactions, nursing behaviours and changes to space.

Nursing reactions

The reactions from nurses' pre and post-response indicate that a disaster response is something different from the everyday experience of working in the ED. This is indicated in the pre-response phase as nurses describe feelings and shock and disbelief. Also in the pre-response phase of this

research nurses are provoked to consider their level of preparedness and ability to cope with the impending response. Similar reactions are also evident in the existing literature that describes the experiences of nurses working in the ED during a disaster response. In the initial stages of the response to 9/11 nurses describe disbelief and shock and fear associated with not being able to manage all of the patients who might present to the ED (Frank 2001). Similarly fear and anxiety related to not being able to function properly is described by Israeli nurses as they wait for patients to arrive to the ED following a terror attack (Riba & Reches 2002). Nurses were also reported questioning their capabilities and describing feelings of fear, anxiety, apprehension and disbelief on receiving notification of the Bali bombing in 2002 and the Boson bombing in 2013 (Taylor *et al*. 2003; Nadworny e*t al.* 2014). An initial shock and overwhelming feeling is also reportedly experienced by nurses as patients began to present to the ED following the Oklahoma bombing in 1994 and the Omagh bombing in 1999 (Amundson & Burkle 1995; Collins 2001).

These reactions from nurses indicate a general complacency and lack of awareness among emergency nurses with regards to the likelihood of a disaster occurring and the expectations of the individual nurses in the ED response to a disaster. That nurses are driven to consider their level of preparedness suggests that nurses' believe a different sub set of skills or knowledge to what they already possess or need for work on a daily basis is required in order to respond effectively.

In the post-disaster phase nurses are provoked to reflect on their experience and consider aspects of the response that were effective and those that were not. This has also been discussed in the literature more in terms of how grateful nurses are for the community support and how proud they are of their role in the response (references). There are some reports also of how emotionally draining and challenging the response was (Amundson & Burkle 1995; Taylor et al. 2003). That nurses are provoked to reflect on their experience implies that they are trying to make sense of the experience. It is unlikely that they would be prompted to do this if the experience was familiar to them.

These reactions from nurses indicate that a disaster response is an uncommon occurrence and something different from the norm. Nurses working in the ED are among the first healthcare workers to care for people who have presented to the hospital seeking treatment and refuge after a disaster. When this is considered in relation to what is known about disasters; that they occur with reasonable frequency and no continent is immune, it becomes evident that emergency nurses should anticipate the likelihood of disaster response at some point in their working life. Nurses should consider this likelihood in relation to the geopolitical causes of disasters such as political instability, geographical location in the world (for example along the ring of fire) or other community specific risk factors, which heighten the likelihood of a disaster event occurring in their community.

Nursing behaviour

During a disaster response nurses reported working long hours without taking breaks. There is an all-consuming focus on caring for people affected by the disaster. A central irony in nursing is that the majority of nurses perceive themselves as giving, caring people but find it hard to nurture themselves (Boyle 2011). This is demonstrated during disaster response as nurses either forget or refuse to take breaks and continue to work for long hours.

The concept of emergency nurses working long hours during disaster response has not been explicitly discussed in the literature however there is some evidence that it does happen and has

been discussed in relation to the Bali bombings and the World Trade Centre attacks (Frank 2001; Taylor et al. 2003). Anecdotally though, there is evidence on online forums (Graban 2014; The Commuter 2015; Reddit 2016) that emergency nurses are regularly skipping work breaks in their everyday practice suggesting that this behavour is ingrained in our nursing culture. The implications of this behaviour ordinarily are that ignoring work breaks may create fatigue and could be associated with poor patient outcomes. According to Rogers *et al.* (2004b, p. 210) the likelihood of making an error increased with longer work hours and was three times higher when nurses worked shifts lasting 12.5 hours or more. In relation to a disaster response though, although fatigue may be a factor, particularly in prolonged events, there is the possibility that there will not be enough nurses available for subsequent shifts. This highlights the need for a change in mindset that not only supports emergency nurses to take breaks but also recognises the importance of taking breaks during peak times.

Nurses who participated in this research also reported working outside their scope of practice during a disaster response. A lack of human resource forces nurses to undertake skills and tasks they wouldn't usually do in every day practice. Nurses do this because there is not enough staff and they believe that what they are doing is either life-saving or life enhancing. Nurses make it clear that they wouldn't do this a non-disaster day unless they had appropriate supervision or training. This implies a belief of nurses that there is a different set of rules for disaster response where anything goes as long as it is in the best interest of the patient.

The concept of nurses working beyond their usual scope of practice has been discussed in relation to nurses from Australia, China and USA who have worked outside of the hospital setting during a disaster (Cox & Briggs 2004; Arbon *et al.* 2006; Slepski 2007; Yin *et al.* 2011). However, there is no evidence in existing literature that nurses are working beyond their scope of practice during an ED response to disaster and there remains no specific evidence that nurses are undertaking tasks they are not trained or legally allowed to undertake (Hammad *et al.* 2012; Cusack & Gebbie 2015). Most of the discussion in this field relates to reallocation of scarce resources and reducing existing standards of care as opposed to taking on additional roles that have potential for poor outcomes (Koenig *et al.* 2006; Hick *et al.* 2012; Schultz & Annas 2012).

That there has been limited discussion about this practice in existing literature doesn't mean that it is not happening, it could mean that this behaviour hasn't yet been uncovered. This emphasises the need for further research to explore the frequency of this behaviour and the potential ramifications of it if nurses are working beyond of their usual scope of practice. Furthermore, that nurses are conscious of the fact that they would not do this on a non-disaster day and report that their colleagues turn a blind eye to this behaviour also signifies that in nurses' minds a disaster is different and some sort of leniency is prescribed to their behaviour that they wouldn't ordinarily allow.

Changes to space

Disaster response forces the nurse to view the ED space differently. Where before the space was taken for granted and familiar, suddenly a nurse becomes aware of the space they are working in by virtue of the fact that it has changed and things that were usually readily at hand are now absent thus the familiarity of the everyday is altered. While still working within a familiar environment their experience of the space is altered by an influx of people, structural changes resulting from the disaster, or having to care for critically ill patients in different treatment areas. An extra strain is placed on nurses who now need to re-negotiate the previously familiar space. While still in a familiar

environment this places nurses in an unfamiliar situation where lifesaving equipment and support from colleagues is not as readily available. In some instances nurses were required to work in a completely different space such as a decontamination tent, outside triage or another hospital. Because disaster response is an uncommon occurrence this places nurses in an environment that they may have limited experience with or may be completely unfamiliar with. This experience places nurses outside of their comfort zone requiring them to simultaneously manage the disaster response alongside familiarising themselves with a new environment, new equipment and in some cases, staff that were previously unknown to them in a relatively short space of time.

Alterations and changes to the ED space has also been reported in existing literature. An alteration to the space occurs when the ED is directly impacted by the event causing infrastructure damage as well through continued aftershocks, power outages and phone line disruption (Dolan *et al*. 2011; Richardson *et al*. 2013; Frank 2001). During their response to the Bali bombing Taylor e*t al.* (2003, p.5) writes; *'This small room was now expected to accommodate more than 25 nurses and doctors and 5 patients, so running across the room to get equipment in a hurry was nearly impossible'*. Additionally, there is evidence in the litertaure that nurses work outside the ED during a disaster response such as an outside triage area or decontamination unit (Amundson & Burkle 1995; Anteau & Williams 1998; Chavez & Binder 1995; Dolan *et al*. 2011; Frank 2001; Leslie *et al.* 2001; Richardson *et al*. 2013; Tham 2004; Timm & Reeves 2007). Furthermore, during a disaster nurses might be required to work in other spaces outside of the ED, due to damage to the hospital or as part of a strategy to manage a large influx of patients (Amundson & Burkle 1995; Chavez & Binder 1995; Anteau & Williams 1998; Mickelson *et al.* 1999; Roccaforte 2001; Palmer *et al*. 2003; Taylor *et al*. 2003; Tham 2004; Behney *et al.* 2006; Dolan *et al*. 2011; Ardagh *et al*. 2012; Little *et al*. 2012).

Nurses' experience of space during disaster response is unique and this is a significant factor that sets disaster response apart from the everyday experience of working in the ED. The impact, if any, caused to emergency nurses as a result of an altered or changed ED space is unclear. However, it can be assumed that as the existing ED space is one that is familiar to nurses who work within it every day, the changes that occur as a result of the disaster response transform the space into something unfamiliar. Additionally, nurses may be moved to an area they are not familiar with. The unfamiliarity that is created as a result is what separates disaster response from the everyday.

Conclusion

This paper demonstrates that a disaster response is not just normal business ramped up. The reactions and behaviours of nurses and the series of activities that unfold when a disaster is announced in itself highlights that a disaster is something different from the everyday experience of working as a nurse in the ED. This research identifies a number of changes that occur as a result of a disaster that cause disaster response stand apart from the everyday experience of working in the ED. Several recommendations could be drawn from this research, which could enhance preparedness of emergency nurses for disaster response. It can be assumed that an emergency nurse going in to a disaster response is adequately prepared for the things that they are used to doing every day in the ED. Therefore, preparedness and training activities should be focussed on aspects of disaster response that are different from the everyday. It is necessary to raise awareness among emergency nurses of the likelihood of their involvement in disaster response at some point in their career.

While these are low frequency events they have high impacts so it is important that nurses are prepared.

Training activities should be focussed on recreating realistic scenarios that orientate nurses to the realities of disaster response. Not only to their anticipated roles and behaviours, but to the likelihood of working in a different environment or different conditions. An understanding of the realities of disaster response may also dampen the emotional impact that is reported by nurses in the post-response phase. Further research should focus on exploring factors that would support emergency nurses to feel more prepared and confident for disaster response as well as what their actual preparedness needs are. Additionally, the prevalence of nurses working outside their usual scope of practice and the legal implications of this should be explored further.