12-2015

“You Came to Not Normal Land”: Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

Stasia Elizabeth Ruskie
University of Tennessee - Knoxville, sruskie@vols.utk.edu

To the Graduate Council:

I am submitting herewith a dissertation written by Stasia Elizabeth Ruskie entitled ""“You Came to Not Normal Land”: Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

Sandra P. Thomas, Major Professor

We have read this dissertation and recommend its acceptance:

Mary Gunther, Reba Umberger, John McRae

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

"*You Came to Not Normal Land*": Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

A Dissertation Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Stasia Elizabeth Ruskie
December 2015

Dedication

To my father, the first Dr. Ruskie, from whom I received my intelligence and love of learning…

To my friends who have unfailingly supported me…

To the nurses who only want ‘to be of use’…

Acknowledgements

A sincere thank you to the nurses who participated in this research, who repeatedly told me they saw the need for this research.

Thank you to Dr. Susan Speraw for creating the Global Disaster Nursing program, and for convincing me to pursue it first.

Thank you to Dr. Kenneth Phillips for your unflinching support of graduate students.

Thank you to Dr. Sandra Thomas, Dr. Mary Gunther, Dr. Reba Umberger, and Professor John McRae for being members of my dissertation committee.

Additional thank you's to:

Dr. Jan Welsh, who has fostered and encouraged my success since high school.

Dr. Pat Farrell, my dear friend, for her stalwart and unfailing belief in me.

Dr. Susan Shapiro for mentorship and guidance and support from before the start of this journey to this finish.

Drs. Deb Chyka and Tami Bland for unparalleled support, friendship, and laughter.

Dr. Ethel Nicdao, first for her generous offer to be an operational mentor, and now because of the friend she is.

All my many other friends who have, in one way or another, helped me along on this journey. It takes a village to raise a PhD.

Abstract

Previous research suggests US nurses are unprepared for disaster, and suffer from adverse psychosocial outcomes following their disaster response. Current disaster preparedness focuses on providing hospital-centric trauma and acute care in fully resourced Western conditions, and does not include the environmental realities of the disaster setting. This study utilized an existential phenomenological approach to explore the meaning of the nurse's experience of the disaster environment. Eleven nurses with broad disaster expertise and training levels participated in this research. The essence of their disaster experiences can be summed up by the central theme of "*You came to not normal land*." Four global themes that describe this "not normal land" were "*All the resources was gone"*; "*You prepare, you prepare, and you are unprepared"*; "*It can be done; it's just different"*; and "*Stuff that sticks with you."*

The environment of disaster was both "not normal" and challenging owing to the many simultaneous breakdowns in healthcare supportive systems. Nurses were surprised and unprepared for the environmental conditions surrounding them. Reductions in systems (i.e. water, power), structures, staff, and supplies were coupled with lack of familiarity with alternative care sites, unaccustomed patient populations, the prevailing need for public health and fundamental nursing, and the isolated nature of disaster environments. Policies and regulations that "normally" guide nurses' actions were disregarded in the immediacy of providing care when the usual social framework no longer existed. Nurses continue to relive the disaster setting's sights, sounds, smells, and

stories of the people they encountered. A strong sense of pride, duty, and willingness to respond again prevailed in these nurses.

Nurses can be prepared for the likely conditions of reduced resources and damaged infrastructure following disaster by including the contextual setting of disaster nursing in disaster education, practice, training, and policy. Suggestions for further research include determining the relevance of current disaster training to the nurses' actual disaster experience; determining what non-clinical knowledge or skills or training disaster nurses think would be useful; and identifying and measuring the contribution of environmental factors to disaster nurses' stress.

Table of Contents

List of Tables

List of Figures

Abbreviations

ARC	American Red Cross
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosive
CDC	Centers for Disease Control and Prevention
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DMAT	Disaster Medical Assistance Team
FEMA	Federal Emergency Management Agency
HCW	Healthcare worker
HSDL	Homeland Security Digital Library
NDMS	National Disaster Medical System
NRF	National Response Framework
PTSD	Post-traumatic stress disorder
US	United States
USPHS	US Public Health Service
WADEM	World Association for Disaster & Emergency Medicine

Prologue

To be of use

The people I love the best
jump into work head first
without dallying in the shallows
and swim off with sure strokes almost out of sight.
They seem to become natives of that element,
the black sleek heads of seals
bouncing like half-submerged balls.

I love people who harness themselves, an ox to a heavy cart,
who pull like water buffalo, with massive patience,
who strain in the mud and muck to move things forward,
who do what has to be done, again and again.

I want to be with people who submerge
in the task, who go into the fields to harvest
and work in a row and pass the bags along,
who stand in the line and haul in their places,
who are not parlor generals and field deserters
but move in a common rhythm
when the food must come in or the fire be put out.

The work of the world is common as mud.
Botched, it smears the hands, crumbles into dust.
But the thing worth doing well done
has a shape that satisfies, clean and evident.
Greek amphoras for wine or oil,
Hopi vases that held corn, are put in museums
But you know they were made to be used.
The pitcher cries for water to carry
and a person for work that is real.
--Marge Piercy (1973)

Chapter 1: Introduction

Imagine you are a nurse working on a medical/surgical unit in your local hospital when an F5 tornado suddenly strikes full-on. With no time to evacuate patients to safety in the basement, you leave them alone in their rooms while you huddle with colleagues in an internal, windowless room. After the all-clear sounds, you return to find your patients covered with debris and electrical wires, attached to non-functional IV infusion pumps and heart monitors. Shattered window glass covers the rain-soaked floor and your terrified patients.

Or imagine volunteering to assist with a hurricane response in a neighboring state. You are assigned to a shelter with 5,000 or even 50,000 survivors. You work a 16+ hour shift while trying to sleep head-to-foot with 99 others on military cots in the heat.

- Could you provide your usual and accustomed level of clinical care during these disaster events?
- Could you live and work in these extreme environmental conditions?
- Could you communicate effectively with patients from a geographic and demographically different population?

Nurses repeatedly have reported being unprepared for the difficulties of these conditions and the unexpectedly austere working environment of disaster (for example, see Bless, 2005; Leiby, 2008; Nasrabadi, Naji, Mirzabeigi, & Dadbakhs, 2007). Their general nursing training left them unprepared. A post-mortem by the American Nurses Association (ANA) deemed "the conditions for rendering nursing care immediately after Hurricane Katrina were horrendous" (ANA, 2006, para. 2). "The environment evoked fear and contributed immensely to the negativity of the experience. Safety and security and basic physiological needs were not met. The buildings were coming apart while the

nurses watched. The heat and humidity were oppressive. Conditions were so extreme that they seemed almost too horrible to be true" (Jordan-Welch, 2007, p.62). "As a nurse, that prepares you for nothing. I mean . . . I have all my certifications, I have all this . . . I'm *qualified*, but you're not prepared for anything like that . . . I mean nothing really prepares you, you just gotta adapt once you get there" (Sloand, Ho, & Kub, 2013, p. 199). "I quickly realized that living and working in a disaster shelter, everything I had done for years under hospital regulations was history" (Bless, 2005, para. 5).

Even explicit disaster plans failed to account for all possibilities: "None of our prior planning entailed a disaster in another state that would impact our city" (Marshall, 2007, p. 16). Because so many nurses report being unprepared for the extreme conditions of disaster, and because the environmental conditions of disaster nursing have not been systematically examined, this dissertation examines nurses' experiences of the environment of disaster.

In this chapter, the reader is introduced to the environmental conditions faced by nurses responding to a disaster event, whether local or distant. The key terms 'disaster' and 'environment' are defined. An explanation of the structural components of society that make up our everyday environment follows, along with their relationship to nursing care during a disaster. The significance of this study to nursing, including a brief review of the extant literature regarding disaster nursing, is described. After a brief review to describe my personal interest in the subject, I conclude the chapter by summarizing the philosophical basis and the research design of this study. The following chapters review pertinent literature, detail the philosophical and methodological approach used, report the

study findings, and discuss implications and study conclusions; conclusions that may open a new door leading to improvement in nurses' preparedness for disaster and their disaster nursing care.

What is Disaster?

A disaster is a complex physical, social, economic, and political (World Health Organization [WHO], 2007) natural or man-made event that causes harm to life or property and substantially overwhelms the community's resources, thus requiring outside assistance (Guerisse, 2005; Veenema, 2013). Disaster also has been described as a serious disruption of the functioning of a community or society, causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using only its own resources (Inter-Agency Standing Committee [IASC], 2009, p. 9). Both definitions include the defining criteria of disaster: an event that overwhelms the community's resources and requires outside assistance for response and recovery from the event. The first definition emphasizes the nature and the complexity of the event, while IASC includes the breadth of the harm, and includes additional types of harm besides human injury that impact the functioning of society. Disasters may be time-limited or prolonged natural events, human systems failures, or acts of war and conflict (Burkle & Greenough, 2008). Disasters are also classified as public health emergencies affecting population health because of damage to the public health system or its supportive infrastructure, such as food, water, sanitation, transportation, etc.

Worldwide, disasters are occurring more frequently and are affecting greater numbers of people (Guha-Sapir, 2014). For the decade 2003-2012, there was an average of 388 natural disasters, resulting in 106,654 deaths and impacting an additional 216 million people in each of those years (Guha-Sapir, 2014). The United States ranked among the top five nations experiencing the most disasters during this decade (Guha-Sapir, 2014).

Individuals and nations with fewer available resources and less developed social infrastructures are disproportionately harmed when disasters occur. In developing countries, the built environment and healthcare infrastructure may have only marginally existed before the devastation occurred (Farmer, 2005; Partners in Health [PIH], 2010). In 2013, 88% of all disaster mortalities occurred in low or low-middle income countries (Guha-Sapir, 2014).

Environment

The environment is everything that surrounds us, and can be divided into the natural and built worlds (Bechtel, 1997; Centers for Disease Control and Prevention [CDC], 2013). The environment includes the familiar weather (such as rain, tornadoes, and floods), plants, and people, but also includes polluted water, damaged housing, overcrowding, dangerous roads, temperature extremes, toxic chemicals, sewage, airplane exhaust and noise, people intent on doing harm, the workplace environment, and food. Additional components of the overall environment include issues of the built environment such as crime, communicable diseases, traffic accidents, pollution, and “all the other benefits of modern civilization” (Bechtel, 1997, p. 37). The built environment is

"the human-made space in which people live, work, and recreate on a day-to-day basis" (Roof & Oleru, 2008), and refers to the buildings, space, and infrastructure necessary for society to function.

Infrastructure and Built Environment

Modern United States (US) healthcare is inextricably woven with and inseparable from the essential structural components of society, which includes logistics, architecture, transportation, sanitation, electricity, and water along with many other necessary and interdependent municipal and commercial systems. Imagine providing nursing care without access to power or water, or obtaining critical supplies without logistics or transportation support. The built environment is so vital to the nation's well-being that US Homeland Security Presidential Directive 7 (HSPD-7), Critical Infrastructure Identification, Prioritization, and Protection (DHS, 2013a) authorized the creation of a National Infrastructure Protection Plan (NIPP) to identify and protect 18 critical infrastructure and key resources (CIKR) of the United States from harm (see Table 1.1). The World Association of Disaster and Emergency Medicine (WADEM) classifies 14 basic societal functions, any or all of which can be affected either directly or indirectly by a disaster (see Table 1.1) (WADEM, 2002, p. 145). The US National Response Framework (NRF) has a differing, yet similar list of 15 emergency support functions (ESFs) (see Table 1.2) deemed necessary for an integrated disaster response (Department of Homeland Security [DHS], 2013b); nurses may be familiar with ESF-6 (mass care, emergency assistance, housing, and human services) and ESF-8 (public health and

Table 1.1 Organization-specific critical societal components

National Infrastructure Protection Plan critical infrastructure and key resources *(DHS, 2013a)*	World Association of Disaster and Emergency Medicine basic societal functions *(WADEM, 2002)*
Agriculture and food	Medical
Defense	Public health
Energy	Sanitation and water supplies
Healthcare and public health	Shelter and clothing
National monuments and icons	Food
Banking and finance	Energy supplies
Water	Search and rescue
Chemical	Public works and engineering
Commercial facilities	Environment
Critical manufacturing	Logistics and transport
Dams	Security
Emergency services	Communications
Nuclear reactors, materials, and waste	Economy
Information technology	Education
Communication	
Postal and shipping	
Transportation systems	
Government facilities	

Table 1.2 US National Response Framework

Emergency Support Function	***System***
ESF-1	Transportation
ESF-2	Communication
ESF-3	Public works and engineering
ESF-4	Firefighting
ESF-5	Emergency management
ESF-6	Mass care
ESF-7	Emergency assistance
ESF-8	Housing, and human services
ESF-9	Search and rescue
ESF-10	Oil and hazardous materials response
ESF-11	Agriculture and natural resources
ESF-12	Energy
ESF-13	Public safety and security
ESF-14	Superseded by National Disaster Recovery
ESF-15	Framework
	External affairs

Department of Homeland Security [DHS], 2013b.

medical services). In reaction to the ineffective humanitarian aid response following the 2004 Indonesian tsunami, the United Nations (UN) created a cluster approach with designated agencies responsible for specific sectors of support necessary for a coordinated and efficacious response of disaster and humanitarian relief efforts (see Table 1.3) (IASC, 2012, 2013). These national and international frameworks demonstrate the dependence upon the comprehensive environmental context for the provisioning of healthcare during disaster situations. Whether in developed or developing world, the natural, physical, social, and built environments are critical and integrated components for the healthcare response.

Damage to non-healthcare specific sectors of a community's infrastructure by a disaster affects both survivors and the humanitarian response in numerous ways. Flooding disrupts local agriculture and impacts food supplies acutely and long term (Bayer et al., 2014). To reduce these impacts, emergency planners have proposed the standardization of modular shipping containers, which can easily be transferred between trucks and ships, along with aerial methods of transportation in order to flexibly respond to supply chains disrupted by flooding, impassable roads, or incompatibility between modes of transport (Donahue, Cunnion, & Godwin, 2013). The 2011 Haiti earthquake response was hindered by a lack of coordination and failures of logistics to transport supplies to where they were most needed (Zoraster, 2010).

Functioning communication systems are vital, and enable an effective disaster response. Land-based communications system, both public telephones and emergency response systems, failed egregiously during Katrina (Darsey, Carlton, & Wilson, 2013).

Table 1.3 United Nations Cluster Approach

Lead Organization	***System***
WHO	Health
IFRC/ UNHCR	Emergency shelter
UNICEF	Water, sanitation, and hygiene
WFP	Logistics
IOM/UNHCR	Camp coordination and management
UNHCR	Protection
UNICEF	Nutrition
WFP & FAO	Food security
WFP	Emergency telecommunications
UNICEF & STC	Education
UNDP	Early recovery

Abbreviations: WHO-World Health Organization, IFRC - International Federation of Red Cross and Red Crescent Societies, UNHCR - United Nations High Commissioner for Refugees, UNICEF - United Nations Children's Fund, WFP - World Food Programme, IOM - International Organization for Migration, FAO - Food and Agriculture Organization, STC - Save The Children, UNDP - United Nations Development Programme (IASC, 2012).

Breakdowns of the communication systems continue to be the most common failure occurring during hospital disaster drills (Evans, Carlson, Barr, Kutscher, & Zigmond, 2012; Klima et al., 2012), and despite previous lessons and warnings, continues to fail in more recent disasters (Kudo et al., 2014). The ease of disrupting these crucial systems was demonstrated very recently when a vandal cut a single cable in Phoenix, silencing all voice communications and much of the internet in northern Arizona (Jarvis & MacDonald-Evoy, 2015).

The legal environment also must not be discounted. Failing to plan for the functional needs of all people in a community during a disaster, and not understanding the impact of disrupted power, transportation, and communications on the ability to shelter-in-place or evacuate, can result in unnecessary death and suffering of people with disabilities and hinder government-assisted rescue. This failure to plan increases the potential of civil rights litigation against the municipality as evidenced by the Brooklyn Center for Independence of the Disabled v. Bloomberg decision (2013). In this decision, the city of New York was found guilty of violating the civil rights of people with disabilities during Hurricanes Irene and Sandy via 'benign neglect' by "failing to accommodate for their needs during emergencies" (Santora & Weiser, 2013, para. 1). Additionally, during disaster, the unique needs of children and the legal authority of nurses to care for children without parents must also be recognized (Courtney, Priest, & Root, 2012).

Survivor access to medical care can be blocked due to non-functional healthcare facilities, an inability to travel to functional facilities over damaged roads, or just the lack

of transportation. During Katrina, cars were rendered inoperable from flooding, the ocean storm surge along the Gulf Coast, and the levee failure in New Orleans. Responding healthcare organizations adapted to the conditions by bringing healthcare to impacted communities via mobile medical clinics (Krol, Redlener, Shapiro, & Wajnberg, 2007).

Social environments as well may be disrupted before or after a disaster event. Large numbers of people worldwide live in conditions of poverty, substandard housing, and limited economic resources including food, energy, and heat (Hernandez, 2013). People existing in these conditions are more susceptible to the effects of disaster (Davis, Hansen, Kushma, Peek, & Phillips, 2013; Woodhouse, 2007).

Existing social policies that separated and segregated people in New Orleans and Mississippi (Weber & Hilfinger Messias, 2012), led to excessively higher death rates among poor people, the elderly, and African-Americans than these groups were represented in the pre-Hurricane population of New Orleans (Sharkey, 2007). Individuals, groups, and populations all have specific needs and norms; they recover from disaster events within the context of their culture and belief systems. It is important for nurses to respond in a culturally attuned manner consistent with these social contexts, coupled with the disaster context, in order to provide appropriate and effective services and care (Danna, Pierce, Schaubhut, Billingsley, & Bennett, 2015). Previous experiences with vulnerable populations in resource-poor social and economic environments were deemed an asset to clinicians providing care (Krol et al., 2007).

Safety in a disaster setting goes beyond personal responsibility and is a function of the political, social, and physical environments where one is located. The contribution

of the spatial dimension of the built environment for the protection of aid workers continues to be examined in conflict and disaster settings (Boano, 2011). For example, nurses working in disaster zones may be exposed to toxic elements in the air and water as a result of damaged refineries, ruptured supply lines, sewage dispersion, and recovery efforts (Kim et al., 2013; Ravikrishna, Lee, Mbuligwe, Valsaraj, & Pardue, 2010; Santella, Steinberg, & Sengul, 2010).

The total system-wide failure of the infrastructure is a common occurrence following a disaster especially, but not exclusively, in less developed countries with fewer resources. Disaster nurses responding to Haiti found a healthcare and social system that only marginally existed prior to the earthquake (Zanotti, 2010). Even in the US, damaged infrastructure has caught emergency planners and citizens off guard, such as during Hurricane Katrina in 2005 or Superstorm Sandy in 2012. While the usual focus of nursing is the healthcare domain, the unexpected environmental conditions and damaged structural systems during disaster comprise the larger narrative of the experiences of nurses responding to disasters.

Environment and Nursing

The environment is a central concept of nursing. The nursing metaparadigm of person, environment, health, and nursing (Fawcett, 1984) acknowledges the importance of the environment as a factor in the patient's health. A holistic conceptualization of a patient integral with his/her environment, as evident in several prominent nursing theories, separates nursing from medicine, and is similar to the public health social, ecologic, and social determinants of health models utilized in public health (Fielding,

Teutsch, & Breslow, 2010; Woolf & Braveman, 2011). These locate the patient in the center of their surrounding environment. Western medical philosophy has largely moved away from these contextual understandings, but public health and nursing remain premised on these environmental influences on health (Fielding et al., 2010). As nursing slips ever closer to the medical model, nursing scholars have called for a return to the contexts of our patients' lives, and the need to examine the environmental conditions that constrain health (Chopoorian, 1986; Meleis, 2012; Stevens, 1989). The environmental conditions where disaster nurses function differ from their usual healthcare setting. In this study, I am essentially considering nurses as the patients, and the focus of the research is the altered and damaged environment where disaster nurses live and work during the disaster response.

Statement of the Problem

Nurses' anecdotal accounts of their disaster experiences have consistently described their difficult living and working conditions, along with their lack of preparedness for living and providing care in an altered care setting of disaster (see Table 1.4). The limited research regarding nurse disaster preparedness has centered on the fully-resourced hospital setting but not the comprehensive disaster setting itself. The problem this study addresses is the lack of focus on the environmental context of nurse disaster care, and the dearth of empirical evidence regarding the nursing disaster environment.

Purpose of the study

The purpose of this study is to gain an understanding of nurses' experience of the disaster environment. Findings of the study may lead to improved nurse disaster response

Table 1.4 Environmental conditions faced by nurses during disaster

Environmental sector	*Examples of conditions experienced by nurses*
Climatological	Temperature extremes, humidity, wet/muddy conditions
Clinical	Lack of equipment, supplies, technology, usual support (RTs, CNAs, housekeeping, transfer team), definitive care, follow-up care, local healthcare infrastructure, weeks of 16+ hour shifts, unfamiliar patient populations and needs
Clinical decision-making	Western standards of care versus disaster triage, mandates, care available, care needed
Security	Armed military presence, political instability
Cultural	Unfamiliar cultures, religions, and languages. Gender oppression, unfamiliar clothing norms; family provision of personal care in hospital
Economic	Extreme poverty; inability to pay required upfront healthcare costs
Living	Field tents, camp cots, porta-potties, dry rations, limited hygiene capability, sleep deprivation
Social	Loss of contact with social support, family, accustomed culture; community versus individual focus
Built environment	Damaged and destroyed buildings, power, water, sanitation, transportation, agriculture, economy, non-Western standards even before the disaster occurred

expectations and preparedness. This study adds to the limited body of disaster nursing research, and specifically the lack of empirical research regarding nurses' experiences of the disaster environment. This study builds on existing anecdotal accounts and descriptive research that maintains the disaster environment as background, and explicitly raises it into the foreground as a research topic in its own right.

Significance of the Problem

Nurses and Disasters

All nurses have the potential to experience a disaster, whether by circumstance or inclination. Nurses may experience disaster directly when an event, such as a tornado or hurricane, occurs in and disrupts their community and place of employment, in which case they may be considered both a survivor and responder. Nurses may also volunteer in domestic or international disaster and humanitarian events as part of disaster relief non-governmental organizations (NGOs) or governmental response groups. These responding nurses also experience the disaster by their proximity to and witnessing of environmental destruction, living in austere conditions, and attending to the masses of humanity needing care.

It has been suggested that every nurse should be considered a disaster nurse because "the skills required in disaster are the same as those required on a regular shift, although the setting is different and the resources are stretched or absent" (Gebbie, Hutton, & Plummer, 2012, p. 171). While the healthcare needs may be the same, the context of that care is not, and the required supporting infrastructure may be damaged or rudimentary even before the event occurs. Zinsli and Smythe (2009) cite an experienced

disaster nurse who described the disaster experience as “the culture of the bizarre and horrific … laid on top of an already culturally different experience” (p. 236).

Nurses Unprepared for Disaster

When Hurricane Katrina made landfall along the US Gulf Coast, nurses on duty in New Orleans hospitals were stranded by the flooding, and endured days of excessive heat, distress, and overwhelming numbers of patients. Sheltering patient and staff family members, along with community refugees requiring food and water due to impassable roads and lack of transportation, added to the stress of the situation. Furious winds shattered hospital windows, allowing in torrents of rain. Nurses wore the same clothes for days. Outside communication, personal safety, ability to sleep, and assurance of their own rescue and evacuation from the hospital were non-existent (Danna, Bernard, Schaubhut, & Mathews, 2010; Fink, 2013; Geisz-Everson, Dodd-McCue, & Bennett, 2012).

Nurses deployed during the aftermath of Katrina were similarly unprepared for rudimentary field living conditions, being housed in an empty hospital, or the emotional health needs of patients and local nurses who experienced the hurricane (Leiby, 2008). Healthcare workers deploying with federal disaster medical assistance teams (DMAT) experienced overwhelming numbers of highly acute patients; wholly inadequate amounts of medical supplies; lack of functional power, water, communications and sanitation; and had no evacuation plan for patients (Klein & Nagel, 2007). Nurses were unprepared for the high levels of mental health needs of survivors (Marshall, 2007), and their cultural unawareness led to interpersonal difficulties (Fink, 2013) .

The context of disaster nursing is also altered in other countries. English-speaking nurses responding to Haiti were unable to communicate with survivors; food and water were difficult to obtain, and nurses slept on mattresses on the floor. Nurses reported a scarcity of medical supplies, an inability to understand medication labelling in non-English languages, using the same pair of gloves all day, and exhaustion from heat, humidity, long hours, and endless patients (Tomer, 2010).

Following the 2008 Wenchuan earthquake, nurses responding to the devastated region felt unprepared and afraid for their own safety:

> The road was totally destroyed and we had to walk more than 9 hours to Yinxiu, carrying a 30 kg backpack. We had to give up equipment we'd prepared, including the mobile operating theatre. It is quite physically demanding . . . On the way to Yinxiu, we witnessed tragic life losses and brutal damages. I had a strong feeling that I was incompetent for this task . . . Be honest, when rocks fell during the aftershocks, I had a fear of dying in the scene (Yang, Xiao, Cheng, Zhu, & Arbon, 2010, p. 219).

The support they were expecting in order to provide nursing care was unavailable:

> Our rescue team was the earliest arrival and we found Yinxiu town totally destroyed. There was no running water, no electricity and no local medical services. We were soon surrounded by a large crowd who were desperately seeking medical assistance. Although we knew our first priority was triage, we recognized that the method we used in the hospital did not work there when confronting the large numbers of casualties (Yang et al., 2010, p. 219).

Another nurse was unprepared for the widespread death she encountered, and has suffered long-term effects:

> We saw and smelt corpses every day and witnessed large numbers of victims dying on arrival or soon after operations. I watched a girl die half-way through digging her out from the building. Her small hand was in my hand and she talked to me . . . These horrible deaths always came to me at night and I could not sleep for a quite a long period after I returned from the rescue (Yang et al., 2010, pp. 219-220).

US nurses are also unprepared to encounter disaster conditions. Nurses in New Orleans during Hurricane Katrina experienced fear, chaos, danger, and terror:

> The conditions were deplorable…you've got hunger, heat, fear, anger…none of the toilets work…going into those bathrooms…I thought I was going to throw up…we were in hell (Urrabazo, 2012, p. 57).

These US nurses reported that nothing had prepared them for this experience:

> Nurses had to complete assessments by flashlight or by using their senses in the dark after the batteries ran out. They had to start IV's on patients whose skin was so wet that the tape did not hold allowing IV's to slide out. They had to make determinations of death in patients who still had body temperatures of 101º F hours after death (Urrabazo, 2012, p. 97).

Little is known about nurses' experiences in the environment of a disaster. Research that dances around the periphery of the topic includes preparedness; adverse workforce outcomes of psychosocial distress and lack of intention to report for work during a disaster; and disaster competencies for nurses.

Nursing and Disaster Preparedness

The seminal Future of Nursing report (Institute of Medicine [IOM], 2011) urges nurses to assume roles in disaster preparedness efforts and to be ready for the unexpected. Nurses, the largest group of healthcare workers globally (Veenema, 2013; World Health Organization and International Council for Nurses [WHO/ICN], 2009), are situated to provide the greatest amount of assistance during a disaster, and fill a vital role by providing humanitarian aid and disaster response (Powers & Daly, 2010; Yang et al., 2010).

The World Health Organization and International Council of Nurses (WHO/ICN) (2009) state that "disaster education for all nurses is vital" (p. 5), and preparedness is

expected of all nurses. Nurses are frequently the first healthcare workers on site. They also note that "the sporadic nature of disaster nursing education has resulted in a workforce with limited capability to respond in the event of a disaster, develop policy, educate or accept leadership roles. . .the risk is further increased by hesitancy to respond as a result of a lack of knowledge" (p. 28). Nurses and midwives are essential in disaster response, but their lack of disaster training remains a major weakness in disaster and emergency response, and they need to be properly prepared with "an enabling environment" to be fully effective (WHO, 2006, p. 5).

Psychosocial Impact

It is well established through empiric research that disaster responders suffer from higher rates of psychosocial outcomes such as distress and post-traumatic stress disorder (PTSD) (see, for example, Fullerton, Ursano, & Wang, 2004; Park, 2011; Urrabazo, 2012). The reasons for these adverse outcomes have not yet been elucidated. While individual characteristics, such as coping skills and the high baseline levels of physical and mental health of responders have been examined (Palm, Polusny, & Follette, 2004), factors of the contextual setting have not. The social ecologic models of public health "assumes that health and well-being are affected by interaction among the multiple determinants of health" (IOM, 2003, p. 1). These determinants of health, the surrounding circumstances of the person's environment that are generally beyond one's ability to control (CDC, 2015), also affect nurses' well-being. Disaster research should thus consider the inseparable interaction of the extreme surroundings upon the disaster nurse.

Environmental distress, including solastalgia - a sense of distress "when one's physical environment is transformed and damaged by forces that undermine identity, well-being, and control" (Albrecht et al., 2007; Higginbotham, Connor, Albrecht, Freeman, & Agho, 2006, p. 246) - has been observed in survivors who experienced the devastation of a volcanic eruption (Warsini, Buettner, Mills, West, & Usher, 2014a). Nurses who respond to disaster also live and function in devastated and damaged environments. The contribution of environmental distress to disaster nurses' psychosocial stress has not yet been explored.

Stress may be reduced through preparedness for the expected condition (perceived control), in a recursive feedback interaction (Glass & Singer, 1972; Langer, 1983 as cited in Bechtel, 1997). It is possible that preparation for the likely environment conditions of disaster - temperature extremes, military presence, low resources, and rudimentary living conditions - may reduce the stress of disaster response due to knowledge and appropriate expectations of the context of providing disaster care to survivors.

Lack of Intention to Report to Work

Adverse outcomes at the organizational level are reflected in the growing worldwide body of research demonstrating a large percentage (20-80%) of nurses who have acknowledged a lack of intention to report to work in the event of a disaster, in part due to the work environment (Paul Arbon et al., 2013; Connor, 2014; Melnikov, Itzhaki, & Kagan, 2014; O'Boyle, Robertson, & Secor-Turner, 2006; Qureshi et al., 2005). Nurses are concerned with being abandoned by hospital administration, prolonged confinement within the hospitals, and with not having their basic needs of water, food, rest, shelter,

and safety met during disaster (Good, 2007). Nurses felt that "coming to work meant putting their lives in danger," with little hope of evacuation (French, Sole, & Byers, 2002, p. 116).

These situations suggest that the context of disaster healthcare is problematic for nurses. An understanding of the experience of the environment by disaster nurses may enlarge the subset of contributors to stress for researchers to consider.

Disaster Competencies

Some hospital administrators have adapted to past preparedness failures by hardening their infrastructure capabilities through a philosophy of self-sufficiency and strategy of redundancy for vital systems such as communications, building safety, power, security, climate control, and water system (Brands et al., 2013). Nurse preparedness does not yet address this larger environment of disaster. There are numerous disaster competencies proposed for nurses and healthcare workers (Anderson, 2012; Bahrami, Aliakbari, & Aein, 2014; Gebbie & Merrill, 2002; Gebbie & Qureshi, 2002; Hsu et al., 2006; Silenas, Akins, Parrish, & Edwards, 2008; WHO/ICN, 2009) but no standardization nor empirical evidence exists that these standards are appropriate or complete (Gebbie, Hutton, & Plummer, 2012; Hein, 2010). The WHO/ICN *Framework of Disaster Nurse Competencies* focuses on nurses' roles in risk reduction, health promotion, policy development, legal and ethical practice, and familiarity with care of communities, individuals and families, psychological care, and vulnerable populations (WHO/ICN, 2009). Numerous other proposed competencies for nurses and healthcare workers also fail to address the expected global conditions of disaster, and focus on

clinical care and knowledge of the incident command system (ICS) (see, for instance, Daily, Padjen, & Birnbaum, 2010; Hsu et al., 2006; Nursing Emergency Preparedness Education Coalition, 2003; Polivka et al., 2008).

Significance Summary

This research is significant to nursing and disaster response for several reasons. While growing, there is limited systemic and empirical research on disaster nursing in general. Much is still unknown about disaster nursing, necessary competencies, and health outcomes of nurses following disaster response. The extreme conditions and reduced resources of a disaster setting have not been a focus of training or research in nursing. Secondly, much of the research is outcomes research, focusing on personal qualities of the nurse, healthcare-centric training, and intent to report to work. This study examines antecedents of two well-documented outcomes of disaster, PTSD and the unwillingness to report to work, by examining the contextual setting of disaster that have not yet been explored and that are frequently described in disturbing detail in post-response accounts by nurses. Thirdly, the reduced resources of the disaster environment has not been a focus of nursing training, of research, or addressed by nursing disaster competencies.

This study introduces the environmental context of disaster to nursing and disaster research. This qualitative study gives voice to nurses' experiences of the environment of disaster. Knowledge gained from these nurses regarding the contextual conditions of providing healthcare during a disaster has the potential to:

- impact nurse preparedness by enhancing the comprehensiveness of training curriculums;
- better prepare nurses for the shift in disaster roles and reduction of resources;
- broaden disaster competencies to include the conditions of providing disaster healthcare;
- lessen the detrimental effects of disaster deployments on nurses;
- improve nurses' ability to provide appropriate and competent disaster nursing care to survivors;
- increase nurses' intention to report to work during a disaster;
- provide guidance for improving disaster preparedness of hospitals; and
- increase the retention of disaster-experienced nurses in the ranks of nursing.

Perspective of the Researcher

Although I did not realize it at the time, my nursing journey began when I was deployed as part of an all-hazards wildland fire crew from my home in Minnesota to where the eye of Hurricane Katrina made landfall 30 miles east of New Orleans in Waveland, Mississippi (MS) in August 2005. We entered the destruction zone fully self-supported, with three days' supply of food, water, tents, sleeping bags, work gear, and radios. We had no cell phone coverage, we were unsure where or if we would find fuel for our vehicles, and we were completely unsure of what we would find. We pitched our tents on the asphalt of Stennis Space Center, battled fire ants, poisonous snakes, and

intense heat and humidity during physically demanding 16-hour work days, and assisted in restoring Stennis International Airport back to operational status. Without air control or radio communications, we landed, loaded, and launched a steady stream of incoming military and NGO-owned helicopters with ice, water, and food for delivery to communities still cut-off from assistance by impassable roads.

During this deployment I met disaster survivors, and I was able to listen to stories that they needed to tell. One man, helping salvage food for the community from the high school kitchen, told me he hadn't seen or heard from his wife in days. She had gone to check on the horses by the coast before the storm hit. The sheriff in Bay St. Louis told me he had been on duty for five days and nights straight since the storm made landfall, half that time in a boat checking on people in their flooded homes. His aunt had drowned in the upstairs of her house. Both their voices cracked as if holding back tears as they shared their stories. They both wanted to tell their stories to anyone who would listen. I did.

Following Katrina, I moved to Arizona (AZ) and continued firefighting near the Grand Canyon. One winter I deployed to support the extremely remote National Science Foundation research base at the South Pole, Antarctica, two miles above sea level. I provided physical labor to plumbers, electricians, and generally shoveled snow (in temperatures from -20 to -50 F degrees Fahrenheit (F)) from everywhere it had accumulated during the previous nine months of Antarctic winter.

I experienced high altitude pulmonary edema (HAPE), which required an immediate National Guard medivac back to McMurdo Station and sea level on the coast of Antarctica. Upon my return to South Pole Station, and despite not having any medical

training beyond Wilderness First Aid, I was invited to join the trauma team to support the lone physician and his physician assistant. I learned to take vitals, hang IVs, and assist with the intubation of mannequins in preparation for potential mass casualty incidents (MCI). In these remote and medically limited conditions, credentials were immaterial, and everyone on station filled an emergency role, whether firefighter, medical, communications technician, or foodservice worker.

It took a minimum of six hours to launch a plane from the NSF base and medivac a patient back to the larger medical, but still limited, facilities of McMurdo station. It would take another ten hours to launch a plane from New Zealand and transport a patient to definitive care at Christchurch Hospital; with both aerial legs of the trip exceptionally weather dependent.

When pipes in the heating plant exploded under pressure, we rescued several injured workers and emergency responders, transported them to sick bay by snowmobile, cobbled together a temporary solution to get one of the generators functioning on minimal power, and brought workers living in outbuildings (most of the summer staff) into the main building because it was the only one left with heat in the subzero climate.

Returning that summer to my firefighting position in AZ, I became licensed as an emergency medical technician (EMT), which led to nursing school where I focused on emergency care. I have since participated in providing primary care at Phoenix and Appalachian free clinics, emergency care at Gallup (New Mexico) Indian Medical Center, and primary and community nursing in low income Jamaican health clinics.

All these experiences (and more) are variations of remote and austere disaster situations, whether sudden and acute (South Pole), long-term and chronic (Gallup, Jamaica), or acute-on-chronic (Hurricane Katrina), and led me to the University of Tennessee Global Disaster Nursing PhD program, where my professional focus is the improvement of nurse preparedness for the environmental conditions of the disaster response.

Philosophical Basis

Given the scarcity of systematic research regarding the environment and disaster nursing, an exploratory, qualitative approach was used to describe the subjective experience of these nurses. Specifically, an existential phenomenological approach allows for understanding the essence of the nurses' lived experiences of the environment during disaster response and privileges the expertise and words of the informant to describe the findings of the study. Merleau-Ponty (1964) believed one cannot separate one's self from the world around one, there is a 'circular causation' between an individual and one's environment, and an individual's perception of an experience is framed against a background context of body, time, world, and others (Moran, 2000). This inclusion of the environment as co-creating one's experience provides a coherent philosophy and methodology appropriate for examining the disaster nurse's experience and raises the traditionally background context to the foreground. This philosophy and method of research will be elaborated upon in chapter three.

The Research Question

The research question being asked in this study is: What is the meaning of the nurse's experience of the environment during disaster response?

Definition of Terms

Disaster –A serious disruption of the functioning of a community or society, causing widespread human, material, economic, or environmental losses which exceed the ability of the affected community or society to cope using only its own resources (IASC, 2009, p. 9). For this study, disaster will include any major disaster, man-made or natural, including complex humanitarian emergencies.

Disaster response-The phase in a disaster event when relief, recovery, and rehabilitation occur; it includes the delivery of services, and the management of activities and programs to address the immediate and short-term effects of an emergency or disaster (Veenema, 2013, p. 732).

Environment- The total infrastructure of the affected society including the existence and condition of the natural world as well as social factors such as population densities, topography, culture, existing social and governmental structures, as well as living conditions and known hazards and the risks associated with each hazard (WADEM, 2002). In this study, it will encompass the comprehensive context of the natural and built environment.

Preparedness-All measures and policies taken before an event occurs that allows for prevention, mitigation, and readiness, including education, training, and disaster drills and exercises (Veenema, 2013, p. 731).

Response- Working or volunteering as a nurse during a disaster or during the disaster response phase, regardless of role filled while on deployment (administrative, dog-walker, food server).

Study Assumptions

Assumptions of this study are grounded in Kantian and social constructivist philosophy:

1) The environment impacts the nurses' experiences, and it is a subjective as well as objective experience.
2) The environment of a disaster cannot be separated from the healthcare provided in that setting.
3) Nurses' unique experiences during a disaster have inherent value and can contribute to improving nurses' preparedness and patient care.
4) Information about nurses' environmental experiences of disaster response can be inductively discovered.
5) Based on their nursing ethos, nurses will want to share their experiences of disaster response.

Delimitations

This study is being delimited to English-speaking US-licensed registered nurses, who were deployed as a non-military nurse, regardless of actual role filled, in a major disaster since 2004, and were willing to discuss their experiences and be recorded during their interview. This cut-off date was chosen because Hurricane Katrina in 2005 was a televised disaster response debacle that demonstrated the United States' complete failure to understand the complexity of disaster preparedness and emergency response required for an intertwined man-made and natural disaster. Katrina brought to light the previously hidden and broader context of disaster to the US, thus the literature review will be

primarily since Katrina. Military nurses at the time of response were excluded from this study, as were nurses who self-disclosed with PTSD.

Summary

Nurses have not been prepared for the "unfamiliar and unusual conditions" of disaster (Leiby, 2008). Much of nurses' disaster training is hospital-centric, yet the surrounding infrastructure and environment of a disaster impacts and cannot be separated from the nurses' response of providing disaster healthcare. Anecdotally, there is a litany of reports from nurses describing the altered contexts of disaster care from what they normally encounter in their everyday work and personal life. Without scientific inquiry, nurses' expert knowledge of environmental barriers and facilitators cannot be used to improve the preparation of disaster nurses, and likely all healthcare workers, for deployment to disasters.

Nurses who are not adequately prepared for the conditions may in fact add to the problem in an already catastrophic situation (Van Hoving, Wallis, Docrat, & De Vries, 2010). PTSD and stress are known negative health outcomes in nurses who have responded to disaster, but factors in the disaster environment that might be contributing to that stress are not known. This study expands the boundaries of existing knowledge regarding nurses' experiences during disaster by specifically examining the contribution of the altered disaster environment to the lived experiences of nurses who respond to these situations. In the next chapter, I review the current literature regarding nurses and the disaster environment.

Chapter 2: Literature Review

In this chapter, I review the extant literature related to nurses' experiences of their environment during disasters. To begin, the search strategy used to locate relevant articles is explained, followed by an analysis of the types of research currently being conducted in the field of disaster nursing. A critique of the literature related to the nurses' experience of environment during a disaster follows. Relevant literature regarding nurses' preparedness for the disaster environment is included. Finally, gaps in the disaster nursing literature are identified, and I explain how the current study research addresses these areas.

Literature Search

In my search for literature I began with a general search of material related to nursing experiences in the disaster environment. As the complexity of the disaster environment is not exclusive to any singular discipline, I used a variety of databases which may seem disparate, however, they are interconnected by the multidisciplinary nature of the study topic. The databases employed were: Homeland Security Digital Library, PubMed, Web of Science, Communication & Mass Media Complete, Cochrane Reviews, Academic Search Premier, ProQuest Dissertations and Theses Global, and CINAHL Complete. In looking at these various databases I used the following search terms, both alone and in various combinations: *nurse, nursing, humanitarian, volunteer, experience, disaster, training, environment, built environment, communications,* and *engineering* in multiple permutations.

Abstracts and titles identified by the prompts were then scrutinized for relevance with those identified and selected for further review. PubMed Medical Subject Headings (PubMed MeSH) headings of relevant articles were examined to determine additional key words to augment the original search criteria and locate additional articles of substance. Articles included for this review were nursing reports or research articles published in English that addressed or mentioned aspects of the larger disaster environment.

While I have found a small body of research relating to specific areas of nursing and the environment, my search did not result in the location of any literature or research that *specifically* addressed nurses and the disaster environment.

Next, those articles pertaining to nursing and disaster in general where nurses, generally anecdotally, described the environment they encountered when relating their overall disaster experience were selected. By scrutinizing the reference lists of these articles and utilizing the 'related articles' feature provided by the databases themselves, additional relevant research articles were located.

Because of the nation's awakening to the complexity of the disaster setting that occurred following Hurricane Katrina (2005), I selected those articles published since 2005, unless seminal articles were found from earlier dates. Articles selected were then categorized based on their main area of focus. These categories and number of articles in each are: (a) experience of disaster nursing (31), (b) preparedness (15), (c) stress in disaster nurses (26), (d) intent to report to work during disaster (19), and (e) nurse disaster competencies (19).

Stress, intent to report during disaster, and competencies, all well-established in the literature, were presented as background material in Chapter One, and are not be reviewed further. Rather, articles pertaining to the experience of disaster nursing and perceptions of preparedness are presented, along with findings specific to matters of the environment. A final 26 articles were selected for this specific literature review.

Nurses' Experiences of Disaster

In their anecdotal accounts, nurses returning from disaster responses consistently report (a) surprise and discomfort at the reduced medical resources, (b) difficult living and arduous work environments, (c) unfamiliar cultural and/or social conditions, (d) unfamiliar professional roles, (e) exceptionally heavy patient workload, (f) unexpected patient care, (g) military presence, and (h) prevalence of mental health needs of both survivors and nurses. There is little systematic research on nurses' experience of the disaster environment, although descriptive qualitative and quantitative research studies of specific circumstances of disaster are emerging.

Hurricane Katrina brought the physical, social, economic, and political environments of disaster, as well as the chronic medical conditions of survivors, to the nation's consciousness during the seemingly continuous television broadcasts of the sights and sounds of desperate evacuees and trapped New Orleanians in late August and early September, 2005. Stories of the experiences and ordeals of nurses emerged later, primarily through personal accounts describing severe alterations from the usual clinical environment and the difficult working conditions they encountered.

In the Pulitzer Prize-winning book *Five Days at Memorial* (Fink, 2013), experiences of nurses at New Orleans' Memorial Hospital during Hurricane Katrina were explicitly detailed as the author investigated conditions (a flooded and isolated hospital) that resulted in a high number of patient deaths; specifically euthanasia by the staff. According to Fink, healthcare staff appeared to have a complete disconnect from the political, cultural, racial, and social environments of the largely minority city in which they worked and lived.

A physician at the hospital, whose administrators had long resisted integration, recalled thinking "what would they do, these crazy black people who think they've been oppressed for all these years by white people?…God knows what these crazy people outside are going to do to these poor patients who are dying. They can dismember them, they can rape them, they can torture them" (p. 8). This physician "was white, his colleagues too, and those around them were nearly all 'Afro American.' And, he feared, desperate" (p. 288). The hospital staff felt trapped in their hospital, working in an environment of intense, and it seems, irrational, fear, with no way to defend themselves. "The enemy was near" (p. 290), they felt, yet, "most of the worst crimes reported at the time never happened" (p. 347), as the *New Orleans Times-Picayune* later reported in its own Pulitzer Prize-winning investigative account (Thevenot & Russell, 2005). Nurses' fear of and lack of understanding of the community inside and outside the hospital contributed to the stress nurses were experiencing from the actual physical conditions inside the hospital.

Nurses experienced abhorrent physical conditions inside of the hospital. The city-wide failed infrastructure could no longer supply clean water; electricity to enable lighting, air-conditioning, and medical equipment; internal or external communications; operational sanitation facilities; or transportation and necessary logistics to restock exhausted medical supplies or evacuate staff. Patients, even more vulnerable, suffered these hardships and indignities as well.

Coupled with the aforementioned conditions, plus the excessive heat and humidity of the New Orleans summer, Memorial became a refuge to an unexpected excess of patients, staff, families of patients and staff, and survivors from the community seeking shelter. Food, water, and healthcare supplies were rationed, with nurses limiting their own hydration and food intake due to the horrid stench and squalor of accumulating feces and urine throughout the building.

So ingrained was her dependence upon technology and electricity to accomplish basic nursing tasks, one nurse finally realized her patients were dying from dehydration. In the overheated, steamy, hermetically-sealed building, she forgot she could hang life-saving intravenous fluid using gravity instead of the accustomed mechanical pump (Fink, 2013).

However, not all reactions were as disheartening as those at Memorial. Across town, the response by nurses to their disaster environment was different. The equally marooned staff at Charity Hospital was "populated by crusty characters accustomed to the relatively Spartan, chaotic, and occasionally threatening conditions of an inner-city government hospital" (p. 380)…. and were experienced "with getting creative with all-

too-common resource limitations" (p. 380). Morale at Charity was maintained by frequent staff meetings, pulling together, and holding "talent shows by flashlight" (Fink, 2013, p. 380). Nurses' responses to the flooding at these two hospitals less than 2.5 miles apart appeared to be dependent on their previous experiences with problem-solving under low-resource settings and familiarity with the surrounding culture and community.

Three disaster medical assistance teams (DMATs), federally authorized teams each consisting of 35 physicians, nurses, and support staff designed to be fully self-sufficient and provide medical care for 250 people for three days, were deployed to New Orleans' Armstrong International Airport three days after Katrina made landfall. Their charge was to provide care during the mass medical evacuation of city residents (Klein & Nagel, 2007). They were told to expect 2000-2500 people per day via helicopters and ambulances, clearly too many for their supplies and staff. Like Memorial and Charity hospitals, they encountered a physical environment of excessive heat and humidity, failed electrical and water systems, lack of external communication with supporting governmental authorities, limited medical and sanitation supplies (such as hand washing capability and toilets), unclear plans for resupply, and lack of an evacuation plan to transport the endless stream of arriving patients to a definitive care setting. Along with this unforeseen non-functional infrastructure, the DMATs unexpectedly received patients with chronic health issues from hospitals and nursing homes, whose medical conditions went untreated while they awaited evacuation, instead of the expected and trained-for trauma patients. In spite of recognizing that patient needs outstripped available resources in the given conditions, the DMAT teams failed to switch from standard hospital triage,

which provides all possible care to the sickest patient (Veenema, 2013), to disaster triage, which provides the greatest good to the greatest number of people who are most likely to survive (Romig, 2013). Within a day, the majority of the medical supplies were exhausted. The DMATs were unprepared for the "hostile and austere environment" (Klein & Nagel, 2007, p. 60) and a clinical environment of patients with chronic conditions, who needed more nursing care than medical care.

Nurses who volunteered and deployed to Katrina from unaffected regions throughout the US described unrealistic expectations of the working environments. A cardiology nurse anecdotally reporting her expectation of working at a hospital with a patient/nurse ratio of 5:1, was instead sent to a special needs shelter with a patient/nurse ratio of ratio of 40:1 (Bless, 2005). "What do I know about special needs? I'm a cardiology nurse" (para. 5). She realized her hospital training "was history" (para. 6), because her clinical environment lacked water, sinks, electronic charts, and medication carts.

Nurses were also appalled by their living conditions. This same nurse found her living environment left her "alone and frightened" (para. 6). After two weeks of sleeping on cots in a tent with 40 others, using portable bathrooms and showers, and "eating less than appetizing food" (para. 9), she couldn't wait to get back to a familiar environment consisting of "comforts of home and family" after an emotionally and physically exhausting two weeks (Bless, 2005, para. 10).

In distinct contrast, Leiby (2008), in another personal account, recounted being deployed with nurses who were disillusioned to find themselves performing work that

"could be done at home" when they were assigned to one of the few hospitals in the region unaffected by Hurricane Katrina (Leiby, 2008). Sent to provide relief for local nurse/survivors who were grappling with personal trauma and issues of devastated homes, insurance, and family care following the hurricane (Leiby, 2008), the author and her fellow federal volunteers expected to be "roaming New Orleans streets to help the sick and hurt" (p. 86). She acknowledged the ''disconnect between the aspirations of the army of volunteers and the actual needs of the victims of Hurricane Katrina" (p. 86). As did the cardiology nurse, the author focused on the living environment: sleeping on cots in a co-ed field tent, the portable shower facility, and using one of the 102 portable toilets, significant enough to her that she counted them. Her living conditions improved vastly yet were "surreal" when she was later moved to a non-functioning hospital, slept in inpatient beds, and was guarded by military personnel carrying rifles. She reported that she worked eight 12-hour shifts in nine days.

In retrospect, Leiby (2008) recognized the need for flexibility to adjust to non-materializing preconceptions of what they had anticipated, better communication and leadership, advanced organizational and personal preparedness, and disaster training that prepared nurses for the "unfamiliar and unusual conditions" of disaster (p. 89). She also recognized the need for mental healthcare for the nurse survivor/responder.

The military environment was also mentioned anecdotally by a nurse who reported feeling like a "prisoner," "confined and controlled" by armed military guards "like refugees in their tent city" (Miller & Dowd, 2008, p. 57). Her camp consisted of 15 large tents, each sleeping one hundred volunteers. Transportation issues and the ongoing

communication difficulties led to the lack of a defined mission for several days and volunteers were not allowed to leave camp. After three days of inactivity, healthcare personnel were glad to perform tasks outside their professional roles, such as dog walking, administration, phone-interviewing to locate unaccounted for residents, emptying trash, locating supplies, working in unaccustomed medical specialties, and helping survivors sort through mud-soaked homes.

These three preceding accounts relate tales of nurses' inaccurate expectations of the physical needs and living conditions of disaster, the discomfort with the heavy and armed military presence, and the lack of preparedness for likely patient populations requiring care during a disaster response.

A United States Public Health Service (USPHS) nurse provided an opposing perspective of the environmental conditions of disaster (Kawano, 2006). While "the nation was completely unprepared because we had never had to deal with a disaster this monstrous before Katrina" ("Into the Flood Zone", para. 3), she felt prepared for the conditions. She described the physical destruction, the "stench of garbage and decay," streets "void of the living," and likened her Katrina environment to "a bombed-out war zone" ("Into the Flood Zone", para. 2). Similar to the above account of nurses at Charity Hospital, she believed her prior experiences of being raised on the Navajo Reservation and working as an U.S. Air Force flight nurse in Saudi Arabia prepared her for the difficult, austere disaster environment. Even with her prior Air Force survival training and basic field nurse training, she felt USPHS nurses need disaster-specific training.

Above, Leiby (2008) described caring for nurses who were also survivors of the disaster. Despite not being in the path of Hurricane Katrina, a psychiatric nurse described her realization that her hometown of San Antonio also experienced the distant disaster environment when local nurses were asked to provide for the psychosocial needs of the thousands of Katrina survivors evacuated to a shelter at the Astrodome (Marshall, 2007). This translocation of the disaster environment was then compounded by the impending arrival of Hurricane Rita heading directly at them. Their preparedness planning had not considered this possibility. Volunteer healthcare providers became casualties themselves from the lengthy work shifts in difficult conditions and enormous numbers of patients. Nurses were unprepared for the high rate of mental health needs, the large populations of the young and elderly, people in wheelchairs, people with mental or physical impairment, the many unaccompanied children, and others simply needing extra assistance. Similar to the previously mentioned anecdotal reports, these nurses were unprepared for their patient populations.

Systematic research of nurses' experience of disaster is beginning to appear in the literature. A qualitative, existential phenomenological study of the experiences of nine nurses who were on duty in New Orleans' hospitals during Hurricane Katrina revealed six themes (Jordan-Welch, 2007): (a) nurses were fearful of their surroundings inside and outside the hospital, of criminals, animals, darkness, and their own death; (b) nurses experienced ethical conflicts when faced with only bad choices; (c) job boundaries became blurred, as physicians performed non-physician work, lay persons were trained to assist the nurses, and nurses did whatever needed to be done; (d) nurses felt isolated from

the rest of the world, but also felt connected to those they were working and suffering with; (e) nurses described a sense of powerlessness because they were only able to provide "primitive, basic, or archaic" (p. 76) nursing care, or conversely felt empowered as they improvised with any available materials in order to meet patients' needs; and (f) nurses alternately lost all hope for survival or regained hope from colleagues, radio broadcasts, or relying on their faith. Nurses became patients themselves, some dehydrated or psychotic from the distress and fear caused by the conditions inside their hospitals.

Nurses reported that they suffered from numerous negative psychosocial outcomes following their ordeals. The centrality of the altered hospital environments - limited resources, excessive heat and humidity, unmet personal and physiologic needs, physical exhaustion - is evident in all of their stories, and was likened to "nursing in hell" (Jordan-Welch, 2007). The nurses in this phenomenological study agreed that "nothing had prepared them for this experience" (Jordan-Welch, 2007, p.92). This research supports the above anecdotal findings and suggests the need to understand the disaster environment of nurses. The focus on the experience of nurses during a singular disaster event is a limitation of this study. The importance of the disaster environment was apparent, but the environment was not the objective of the research focus.

In another existential phenomenological study, Rivers (2009) examined the experiences of military nurses during a disaster deployment Despite their advanced training, military nurses were unprepared for the low resource living conditions and "unknown" environment of disaster healthcare. "The lack of preparation for the disaster and scarcity of information prior to deployment was illuminated in their stories" (Rivers,

2009, p. 125). Five mostly contrasting themes were revealed: (a) nature of war versus nature of disaster; (b) structured versus chaos; (c) prepared versus making do; (d) being strong versus emotionality; and (e) existential growth. Military nurses emphasized “how different war and disaster actually are" (p. 23). While military nursing is highly structured and predictable, nurses described “not knowing what to expect" (p. 125) in the chaotic disaster environment, being unprepared for the difficulty of working long hours in an austere environment, and not having their usual logistic support which is provided during wartime. Like the civilian nurses in the previous study, military nurses utilized their basic nursing skills instead of accustomed technology because of the lack of electricity, and relied upon adaption and innovation. “Things that you were used to being able to do on a daily basis now all of a sudden… it’s just not available to you anymore” (p. 132). Their nursing roles changed often, and they worked outside their scope of practice, including clean-up details, construction, morgue duty, and search and rescue.

These military nurses felt the conditions of their disaster living environments were worse than those in combat. The quickness of response demanded by a disaster deployment allowed very little time for preparation. The timeline of providing care during a disaster “is just so much more concentrated [than war]. In disaster, every waking minute you are doing something that is valuable” (p. 136). Familiar with applying disaster triage during war conditions, military nurses reported that their civilian counterparts found it inconceivable to bypass patients who were actively dying in order to save their resources for those who could be saved (disaster triage). The psychosocial

distress from the disaster experience is not limited to civilian nurses. “I knew I was in the United States but it was … it was very surreal” (p. 134).

The pre-existing environment of the survivors was unfamiliar to these nurses. "One participant related how mind-boggling the effect of third world poverty was to him, while for another, the complete shutdown of society was foremost in his mind” (p. 131). Another nurse ethnocentrically had difficulty understanding why residents “didn’t just leave” (p. 138) ahead of Hurricane Katrina’s arrival, failing to appreciate the political, historical, economic, or physical environments of the patients and never considered that individuals who stayed behind may not have had a choice about leaving the area. Even for war-prepared military nurses, the disaster experience and environment "was much more than they had anticipated" (Rivers, 2009, p. 138). While pertinent to the field of disaster nursing, this research was limited to military nurses, who function and are trained in very different circumstances than civilian nurses.

Lack of nurse preparedness for disaster conditions extends beyond Hurricane Katrina and the United States. In January 2010, a 7.0 earthquake centered in the capitol city of Port-au-Prince rocked Haiti, reduced low-quality housing to rubble, and killed 316,000 people, injured 300,000, and displaced 1.3 million people in the poorest country in the Western hemisphere (United States Geological Survey, 2011). Along with their strong desire to help, some US volunteer nurses left for Haiti with no plans and limited language capabilities, according to an anecdotal report (Tomer, 2010). “There were a lot of things I didn't expect to see.” “You cannot put the destruction into words" (Tomer, 2010, para. 18). Generators provided electricity only intermittently. Food and water were

limited and hard to find. Patients lay on the ground for days without pain medications or fresh dressings. One nurse assisted in a Cesarean section performed on the ground without surgical supplies or anesthesia. “It's not America. It's not how we run medicine” (Tomer, 2010, para. 8). “Everything we take for granted [in the United States] was nonexistent…We're so spoiled” (Tomer, 2010, para. 5). “We had to make our own makeshift everything” (para. 19). Many of these experiences - fear, the need to improvise care, the inability to provide expected levels of care with sufficient resources - echoed the findings of the nurses working in New Orleans’ hospitals five years previously, demonstrating that few lessons had been learned by nurses about disaster environmental conditions in the five years since Hurricane Katrina.

In a qualitative, descriptive study, Sloand, Ho, Klimmek, Pho, and Kub (2012) utilized in-depth, semi-structured interviews to query ten nurses regarding their experience of caring for children in Haiti following the earthquake. Four themes were identified: (a) hope amid devastation; (b) professional compromises; (c) universality of children; and (d) emotional impact on nurses. The devastated natural and built environments along with the extreme social, political, and economic environments of Haiti were incomprehensible. “The destruction was mind-boggling. The poverty, there’s just no words for the poverty” (p.244). Nurses were severely limited by lack of medical supplies, medications, personnel, referral to definitive care, and other resources. Like previously cited accounts, they experienced emotional distress due to the inability to provide their accustomed Western, fully-resourced nursing care, and the ethical challenges of providing care under severe circumstances. These nurses shared their sense

of hopelessness and described work that was heartbreaking, frustrating, and "mind-boggling difficult" (p. 250).

The larger parent study, designed with a goal to help with the preparedness needs of future nurse responders, used the same interview guide to describe the lived experience of 12 volunteer US nurses deployed to Haiti (Sloand et al., 2013). Themes of initial shock, relentless work, substituting and making do, questioning, systems building, and transitioning were discovered. Echoing the results of many of the previous studies, they described being "physically, mentally, and emotionally overwhelmed" (p. 199) by the "eye-opening" (p. 199) destruction and an unimaginable volume of patients. Nurses were forced to make do with anything available, ignoring the stress and difficult realities of healthcare in an austere environment, and watching colleagues collapse due to heat and dehydration. Despite the devastated infrastructure, ever-present dead bodies, language barriers, and lack of familiarity with providing nursing care with extremely limited medical resources, one nurse, contradicting herself, stated that her nursing training "prepares you for nothing" and "I'm qualified, but you're not prepared for anything like that" (p. 199). When asked about training that might have been helpful, another nurse replied "there really isn't anything that you would need to read or know to go and work" in Haiti (p. 201). These statements suggest a complete lack of awareness by nurses of the need for and the likely benefit to both nurse and survivor in being better prepared for the unique and challenging cultural, physical, and clinical environments of disaster nursing.

There are several limitations in these two related studies. The interviews for the first study regarding nurses' experience with children were selected from a larger, overall

study of nurse volunteer experiences in Haiti. The development of the interview guide used in these studies was not described. No specific theory or philosophy was explicitly mentioned as a guide for these studies, although the authors indicated the use of Strauss and Corbin's coding methods to analyze their textual data.

Similar to US nurses, nurses from other countries described similar altered conditions and their lack of preparedness for disaster. In contrast to the devastating destruction, death, and injury following the Haiti earthquake, Christchurch, New Zealand, experienced an 6.3 earthquake a year later, with only 185 deaths (Manatū Taonga Ministry for Culture and Heritage, n.d.), in part because of a more robust and regulated infrastructure. Nurses working in or enroute to the Christchurch hospital at the time of the earthquake reported experiencing ground liquefaction, damage to transportation, power, and communications systems, interruptions to supply chains, and an inability to access electronic documentation (Richardson, Ardagh, Grainger, & Robinson, 2013). Nurses performed functions outside their designated roles, and reported being unfamiliar with hospital disaster plans. As with US nurses, these New Zealand nurses were overwhelmed by the severity of injuries and numbers of patients, and they also experienced acute and persistent physical and psychosocial symptoms. Their post-earthquake disaster analyses recognized the need for personal and professional disaster plans, psychosocial support after the event (but did not mention support during the disaster), and more robust communications and electronic patient record systems. They did not address hospital backup plans for infrastructure redundancies of power, water, and external communications. The authors did not specify if a theoretical perspective was used to

guide this report, which was based on interviews with an unstated number of nurses. It does not specify a methodology beyond ‘conducting interviews’ (Richardson et al., 2013).

In a qualitative narrative analysis, twelve nurses who participated in the Wenchuan (2008) and Yushu (2010) earthquake disaster response in China were asked about their experiences, preparation, and advice about preparation for future disaster nurses (Wenji, Turale, Stone, & Petrini, 2014). Themes that emerged from this study included: (a) unbeatable challenges; (b) qualities of a disaster nurse; (c) mental health and trauma; (d) poor disaster planning and co-ordination; and (e) urgently needed disaster education. These Chinese nurses experienced heavily damaged buildings, transportation, communications, and healthcare systems, a lack of medical resources along with massive numbers of casualties, and poor living conditions and lack of shelter during their disaster response.

Their climatological and geographical environment was one of aftershocks, mud, landslides, heavy rain, extreme elevation, excessive heat by day and cold by night, humidity, and noise. Psychosocially, cultural differences and language barriers resulted in ineffective communication with patients. Nurses lacked the mental health skills to offer adequate assistance to survivors and each other.

They had not considered the reality of disaster conditions beforehand, and thus experienced unforeseen ethical challenges. They felt underprepared for the total disaster environment, and recognized that their clinical training had not sufficiently prepared them for the disaster response.

These findings support the previously identified environment of overwhelming circumstances, mental health needs of survivors and responders, cultural differences, and ethical challenges. Differing from the Sloand (2012, 2013) studies above, these Chinese nurses recognized their need for further education and training regarding disaster conditions. This research builds on previous research by demonstrating that Chinese nurses experienced similar conditions as US and New Zealand nurses, suggesting disaster conditions, experiences, and lack of preparedness for disaster deployments are similar for nurses worldwide. These international perspectives are also relevant because US nurses, as volunteers and members of disaster relief agencies and organizations, have the potential to be deployed worldwide. The unclear application of sociocultural theory used to guide this study limits this report. Beyond mentioning Riessman's narrative methodology, the authors did not describe their analytic methods.

Nurses participating in a grounded theory study of disaster nursing characterized the nurse experience following the Wenchuan earthquake as “working in that terrible environment” (Li, Turale, Stone, & Petrini, 2015). Following the grounded theory methodology of Glaser, and developed from interviews with 15 Chinese nurses, the disaster nurse responder “turned into a strong nurse” by traversing the stages of “going to the disaster,” “immersing in the disaster,” and “trying to let disaster experiences fade away” (p.1). This research is limited by its narrow focus on a single disaster event, and recruitment from a single specific Chinese province. The authors state that disaster training for Chinese nurses is “almost non-existent” (p. 2), so this theory may not be applicable to nurses from other countries. However, its recommendations of additional

disaster education, training, and mental health support for (Chinese) nurses agrees with findings from numerous other reports and studies reviewed above.

Even the shift of the working environment from one hospital to another in New York City has led to distress in US nurses. Researchers used a mixed methods format to explore nurses' experience of evacuating three New York hospitals during Hurricane Sandy in 2013 (VanDevanter, Kovner, Raveis, McCollum, & Keller, 2014). Using an interview guide informed by experienced disaster nurses and the extant literature, sixteen of these nurses were qualitatively interviewed regarding their experiences of disaster prior to evacuation, during evacuation, and during the recovery phase. Findings from these interviews guided the development of the subsequent online quantitative instrument, which queried 528 nurse's sociodemographic factors, disaster preparedness, perceptions of their disaster experience, personal impact of the storm, and their deployment experience to other area hospitals.

Only 30% of these nurses felt they had sufficient orientation after deployment to their new hospitals. Other nurses were exhausted and traumatized from their own personal evacuation experience, thus the burden of adjusting to their new working environments became more challenging. Less than half (49%) felt they had support from the staff at the host hospital, and they also had legal concerns about their clinical assignments. Nurses did not have the comfort of "familiarity with your surroundings, the equipment, the technology, the medications" (p. 608). Several nurses were assigned more patients than they felt they could safely care for. It is important to emphasize that these nurses remained in the same environment of their own city. Yet, the change of context

from their own workplace to a new hospital resulted in stress and discomfort due to the new environment.

There was no mention of a theoretical framework that guided this study. The qualitative philosophy was unstated although they described the sequential process of open coding, focused coding and identification of major themes in their interview analyses. Sixteen of 20 purposively-contacted nurses at the original hospital agreed to participate in the qualitative interviews. The quantitative study had a 32% participation rate from the entire hospital nurse staff population employed at the time of the evacuation and deployment (N=1,668), and analysis was limited to descriptive statistics.

Most recently, Hobfoll's Conservation of Resources (COR) theory was utilized in a mixed methods study, examining the relationship of perceived adequacy of object, condition, personal, and energy resources with disaster healthcare workers' psychological stress (Boswell, 2014). This quantitative analysis of 109 nurses, physicians, EMTs, paramedics, and mental health providers was followed by ten interviews to identify additional resources not included by the quantitative instruments used in the study. Moral congruence, disaster self-efficacy, readiness to deploy, and educational level were predictors of psychological distress. Other disaster response components not addressed by COR theory and subsequently identified via the existential phenomenological qualitative analysis included personal qualities along with influence of media and the political environment (Boswell, 2014). Surprisingly, perceptions of basic needs, sleep, safety, and security did not correlate with responder stress levels. They did however

correlate with disaster self-efficacy, the responder's "level of confidence in their ability to function efficiently and successfully in a disaster scenario" (Nypaver, 2011, p. 62).

This study was not specific to nurses, and included respondents from six continents. The majority of respondents were recruited from disaster-specific organizations, and thus may not reflect the experiences of non-disaster identified nurses. The majority (> 70%) of participants had disaster training both inside and outside their affiliated organization. Disaster self-efficacy and readiness to deploy scales are measures of self-perception, and as described in the following section, do not correlate well with actual knowledge. While this study supported the association of personal and external resources with disaster responder stress, the comprehensive spectrum of supportive resources required by responders in the disaster environment remain unidentified and quantitative instruments are constrained by their incomplete subset of identified resources. Hobfoll's theory is based on the belief that people are highly motivated to gain, and protect resources, and implies the individual is in control of obtaining these resources. The major limitation, however, is that during a disaster situation, control of the majority of object, energy, and condition resources are beyond the control of nurses.

While the environment of disaster was not the focus of any of the above studies, nurses and healthcare staff repeatedly reported being surprised by the unexpected physical, social/societal, political/cultural, built, and psychosocial environments of disaster, including unexpected conditions relating to the healthcare, patient populations, and living conditions. Personal accounts and anecdotal reports still comprise the bulk of nurses' disaster experience literature. The limited extant research is largely qualitative,

describing nurse disaster experiences. The majority of qualitative studies utilized semi-structured interview guides developed by the investigators for their particular study. The Haiti study notwithstanding, military and civilian nurses, US and worldwide, recognize they are unprepared for the extreme and varied conditions of the environment of disaster and the need for additional training to effectively prepare them for the conditions they will face during a deployment. Other studies were not specific to nurses. These consistent findings suggest that the environment experienced by nurses deploying to a disaster setting should be further examined. Recommendations from the majority of the works cited above suggests a need for further qualitative studies of disaster experiences with civilian nurses. None of the reports and studies specifically examined nurses' experience of the disaster environment; it arose as part of the context. The broader environment of the disaster setting was not examined explicitly nor brought to the forefront as a subject of further research.

A recently conducted existential phenomenological study specifically examined the experience of eight Australian Medical Assistance Team (AusMAT) nurses in the disaster environment (Ruskie, 2015). AusMAT team members attend mandatory training that address survival in austere environments, with topics including security, military and militia presence, trip planning, cultural awareness, ethics of clinical decision- making, humanitarian operations, crowd management and concludes with a field-camp exercise.

Even with this preparation for the difficult environment and their high levels of nursing experience, nurses in this study had an overall experience of being "stripped bare," which was supported by global themes of (1) "it's full on," (2) "let's get on with

it," and (3) "you're flogged in that environment." Nurses felt stripped of their usual living conditions, accustomed supporting infrastructure, standard clinical resources and capabilities, familiar mechanisms of injury, frames of reference, and personal resilience.

Nurses required 24-48 hours upon arrival to "reprogram [their] brain" to the limitations and capabilities of the disaster setting, and to the confronting situations they were faced with while providing care. After the initial disorientation, they progressed to developing ways to provide care despite limited resources, of coping with the devastation and shock, and resorting to their basic nursing training and physiological understanding to provide nursing care. "That's all we've really got here. We don't have any bells and whistle. I'm not asking you to do positive pressure ventilation on these patients; I'm not even asking you to do any basic monitoring. I need you to use your clinical skills." "It's hard core stuff." Nurses were "depleted" and "just shattered" by their experiences. "You can be dog-tired and, um, just, um, quite – quite exhausted, you know, physically, emotionally , um, mentally [laughing], spiritually. You can be absolutely – oh, what do I tell you? It's flogged, you know?" Additionally, modifiable factors of the environment that enhanced or hindered nurses' ability to provide care were identified (Ruskie, 2015).

US disaster preparedness training focuses on hospital response and individual characteristics of nurses and does not generally consider the context of altered infrastructure of disaster. Thus AusMAT disaster nurse experiences of disaster deployment may differ from both US disaster-identified and non-disaster identified nurses.

In the following section, I review the literature on nurse perceptions of disaster preparedness. I begin by discussing US preparedness policies, and expectations and meaning of nurse preparedness.

US Policy on Preparedness

Preparedness is a continuous process of activities and measures taken in advance, that ensure effective response to the impact of a disaster, thus requiring periodic review and revision based on changes in the environment, staff changes, new information and technology (WHO/ICN, 2009). Preparedness includes planning, training, equipping, education, exercising and evaluating (Veenema, 2013; WADEM, 2002).

US Presidential Policy Directive (PPD-8) calls for measures to build and sustain national preparedness, including preparedness, response, and recovery from disaster (Obama, 2011). President Obama has asked all nurses to sign up with national volunteer registries as part of improving national preparedness (Rhode Island State Nurses Association, 2009). US national policy, as specified by the Pandemic and All-Hazards Preparedness Act (PAHPA) ("Pandemic and All-Hazards Preparedness Act," 2006) requires “a national strategy for establishing an effective and prepared public health workforce, including defining the functions, capabilities, and gaps in such” (Section 304, sub-section 4, p. 3). To assume the U.S. has an existing corps of hospital healthcare workers (HCWs) adequately prepared for disaster situations is fallacy (Agency for Healthcare Research and Quality [AHRQ], 2005). Training specified by AHRQ focuses on incident management, healthcare, signs and symptoms of specific hazards, signs of stress in patients and workforce, and altered standards of care. It does not address the

potential for altered environmental conditions surrounding the healthcare venue (AHRQ, 2005). The Department of Health and Human Services utilizes a strategic national stockpile (SNS) to facilitate rapid and timely response to public health crises anywhere in the US. The SNS supplies a federal medical station (FMS), with equipment (e.g. cots) and medical supplies through state health departments; however set-up of a FMS requires the state to provide an operational infrastructure, specifically a warehouse-style facility capable of housing 250 patients, with functioning power, water, waste and bio-hazard removal, meals and showers (CDC, 2014). During the public health emergency of Hurricane Katrina, most of these infrastructural components failed, leaving nurses in an unfamiliar environment and providing care reminiscent of 100 years ago.

The Joint Commission, which accredits healthcare organizations and programs in the US, requires that all hospital-based nursing staff have knowledge and skills in disaster preparedness (Veenema, 2003). This requirement leaves out non-hospital-based nurses, and American Red Cross and other NGO nurses. Yet these nurses need to be prepared as well (Gebbie, Hutton, & Plummer, 2012). Nurses "must receive disaster training that includes culturally sensitive care of survivors and patients," along with "training in ethical, moral, legal, medical, and group decision-making" (Leiby, 2008, p. 89).

Nurse Disaster Preparedness

In its document *Nurses and Disaster Preparedness*, the ICN (2006) states "disaster preparedness, including risk assessment and multi-disciplinary management strategies at all system levels, is critical to the delivery of effective responses to the short, medium, and long-term needs of a disaster-stricken population. It is also important for

sustainable and continued development" (p. 1). Unfortunately, current healthcare preparedness standards and training rarely incorporate ancillary systems and aspects of the environment, focusing on the clinical segment almost singularly. The ICN itself neglects the larger context of environment in their discussions of preparedness. "Nurses with their technical skills and knowledge of epidemiology, physiology, pharmacology, cultural-familial structures, and psychological issues can assist in disaster preparedness programmes, as well as during disasters" (p. 13). Many studies have examined nurse disaster preparedness, nurse perceptions of preparedness and disaster knowledge, and nurse perceptions of hospital preparedness, i.e. the working environment of nurses during a disaster in their own communities. Perceptions of personal and hospital preparedness, along with the actual disaster knowledge of nurses will be reviewed next.

In summary, nurses and hospitals are expected to be prepared for disaster but readiness for the all-encompassing environment of disaster has not been included in national standards and guidelines for healthcare disaster preparedness.

Personal Perceptions and Actual Knowledge of Disaster

Despite their perceptions otherwise, research shows that nurses have a low level of actual disaster knowledge. Using both interview and survey methods, researchers found that medical/surgical, critical care, and community health nurses' in Hong Kong failed to recognize the majority of the WHO/ICN disaster competencies (Loke & Fung, 2014).

In Adelaide, Australia, most of the 192 emergency departments (ED) nurses from eight public hospitals who participated in a mixed methods study reported having

completed prior disaster education and training. Nevertheless, 85% failed the knowledge test, which only required an achievement score greater than 50% (Hammad, Arbon, & Gebbie, 2011). The self-designed questionnaire utilized both quantitative and open-ended qualitative questions to assess nurses' disaster experience, education, and perceptions of preparedness. Detailed descriptions of the nature of disaster education and training was not obtained in this study, and the authors suggested the need for future research to actually determine what is appropriate and relevant disaster education and training for health professionals. No specific qualitative philosophy or methodology was specified, the thematic analysis was not described, and no theory was named as guiding the quantitative aspect. The authors achieved a 32.9% response rate from nurses, while only descriptive statistics were used in the analysis. This research was limited to emergency and intensive care unit (ICU) nurses employed in Australian public hospitals in a single city.

In reality, nurses are less knowledgeable about disaster preparedness than they really are. Winston (2011) sought to determine disaster knowledge scores among 933 nurses employed at three East Coast teaching hospitals. Nurses' perception of their level of disaster knowledge was moderate (2.49) on a self-reported 1-5 scale; however their actual knowledge scores were 50.7%. While these results support the above studies, this master's thesis study has several limitations. It had no stated theoretical guidance, and it reduced a validated, eight-dimension, 44-question perception instrument into single item questions pertaining to ten disaster knowledge domains (terms and activity, the ICS system, ethical issues in triage, epidemiology and surveillance, isolation and quarantine,

communication/connectivity, psychological issues, special populations, and accessing critical resources), none of which address the infrastructure or environment surrounding the healthcare setting. The low response rate (6.7%) further limits the generalizability of the results.

Disaster preparedness training for nurses is not yet universal. Exploring the relationships between anxiety, coping, and post-traumatic stress disorder (PTSD) among nurses (n=91) who provided care in New Orleans during Hurricane Katrina, Urrabazo (2012) conducted a retrospective cross-sectional study. The authors reported that only 61.5% of nurses reported receiving disaster training prior to the storm, with only 31% having ongoing disaster education. This study, conducted three years post-Katrina, is subject to recall bias. The study had a low response rate (17%) of nurses recruited from the New Orleans area, and many nurses may have already permanently left the area. The author cites Lazarus' and Folkman's Cognitive Theory of Psychological Stress and Coping as the theoretical framework, along with the use of numerous well-validated instruments.

Conversely, 11 ambulance-based nurses in Australia considered themselves educationally prepared and clinically experienced for their response to the Victorian bushfires in 2009 (Ranse & Lenson, 2012). In findings from this qualitative study using semi-structured telephone interviews, nurses allowed they had little need for their supplies and training because they provided minimal clinical care and instead became psychosocial supporters, coordinators of care and resources, and problem-solvers. Like the previously discussed report by Miller and Dowd (2008), nurses filled roles as needed,

many non-clinical. Owing to the mismatch between their training and the exigencies of their roles, they expressed a desire for more primary, community, public health, and mental health nurses to complement the emergency, ICU, and peri-operative nurses that traditionally staff ambulances. This study focused on a single Australian organization specially trained for out-of-hospital care during a single bushfire (wildfire) event (Ranse & Lenson, 2012).

Preparedness is directly related to nurses' disaster experience because many nurses have stated they were unprepared for the conditions experienced during a disaster. Feeling unprepared and having higher perceived than actual disaster knowledge may play a role in nurses' difficult experiences of the actual disaster environment. Nurses in the pre-hospital setting felt prepared, but did not rely on their clinical skills as much as their administrative and psychosocial skills. Taken together, whatever the level of preparedness nurses may think they have, it appears to be an overestimation. None of these studies measured aspects of the environmental context of disaster; rather, the queries used healthcare-specific disaster knowledge and hospital-delivered care as the standard of measure of their individual preparedness. So, one must ask, what of nurses' perceptions of hospital preparedness, the environment where so many nurses are employed?

Perceptions of Hospital Preparedness

Nurse perceptions of hospitals preparedness is relevant to this discussion because this is the environment in which nurses will likely be working if a disaster occurs in their community. If a hospital is not prepared for a disaster, its nurses working will not be

prepared for disaster. Nurses are not convinced their workplace environments are prepared, Joint Committee requirements notwithstanding. In a descriptive study utilizing a Health Belief Model (HBM) framework, 39% of 177 emergency department (ED) nurses attending a New Jersey Emergency Nurses Association (ENA) conference felt their healthcare facility was unprepared for disaster, while 60% had completed some emergency preparedness education in the prior year (Whetzel, Walker-Cillo, Chan, & Trivett, 2013). Half of the 177 nurses did not have a personal disaster kit, while virtually all nurses (98.9%) felt their community had the potential to experience a disaster event. Study data were obtained via a self-designed 56-question unvalidated survey. The highly specific population of ENA-affiliated ED nurses may limit generalizability. Conversely, one may suppose emergency nurses might be the most prepared of nurses, hence it might be surmised that other nursing specialties (i.e. neo-natal) may have even less knowledge of and preparation for disaster. HBM theory examines an individual's perceptions of a threat and relation to his/her behavior (Hochbaum, Rosenstock, & Kegels, 1952), but not one's actual knowledge level. As demonstrated above, perception of actual knowledge is frequently overestimated.

Critical care and emergency nurses in Canada also reported a lack of preparedness, both personally and institutionally (O'Sullivan et al., 2008). In this descriptive study utilizing a self-developed online survey, personal perceptions of preparedness for chemical, biologic, radiologic, nuclear, and explosive (CBRNE) events were rated on a 1 (low) to 4 (high) scale. Scores for the 1,543 nurses ranged from 1.32 for a radiological attack to 2.35 for natural disaster or infectious disease outbreak. In

agreement with the Chinese study mentioned earlier (Wenji et al., 2014), these nurses expressed a need for additional disaster training. No theoretical guide was reported for this research, which used a self-developed, unvalidated online survey. Measures of preparedness were hospital-centric, and did not include preparedness of interdependent systems such as water, power, or communications systems. Of nine hospital resources queried for adequate levels of commodities available for disaster, eight consisted of medical supplies, with the last being food and water. While 72% of nurses felt their hospital workplace had enough gloves, only 11% thought their hospital had enough food and water.

In Singapore, 75% of 1,534 hospital HCWs felt their institution was prepared for disaster, while only 28% felt they were individually prepared (Lim, Lim, & Vasu, 2013). This descriptive, cross-sectional study supports previous findings of nurses' feelings of unpreparedness and low actual disaster knowledge. It differs strikingly from previous findings in their perception of institutional preparedness. This study was conducted at a single hospital in Singapore, which may have social and healthcare cultures differing from those in the West. There was a 90% survey response rate to their self-designed survey. Limited to the categories provided, this survey is unlikely to have captured all the relevant factors affecting preparedness perception. Perception, as seen in previous studies, does not correlate well with actual disaster knowledge of nurses.

Researchers have also found that hospitals are unprepared for disaster, and have identified common infrastructural weaknesses: communications failures, power outages, and disruption of transportation.

After Hurricane Katrina pounded Mississippi and the University of Mississippi Medical Center (UMMC) (Darsey et al., 2013), administrators realized their errors of assuming the stability of the surrounding built environment. Disaster planners had expected the rapid restoration of interrupted utilities systems, robust communications systems, and a limited patient surge. When these vital systems failed regionally and power-dependent patients seeking sanctuary at hospitals soared, the "stark devastation affected not only the medical infrastructure and utility support but also healthcare providers working in extremely difficult circumstances" (Darsey et al., 2013, p. 112).

In response to these lessons learned, planners increased hospital self-sufficiency and lessened the impact of outside infrastructure failures by building self-contained fueling stations and water towers, improving employees' sheltering and safety, hardening their communications systems, and obtaining utility supply agreements with out-of-state suppliers.

Following Hurricane Rita in 2005, administrators at five of seven evacuating hospitals reported significant critical resource shortages resulting from the hurricane: electrical power, water resources, staffing, equipment, and supplies, including oxygen and medications (Downey, Andress, & Schultz, 2013a, 2013b). In this observational, retrospective study, the hospitals were without power for an average of 4.8 days, which resulted in a cascading loss of resources: shortages of generator-fuel-reduced electrical capabilities which resulted in reduced water pressure. Emergency generator power met minimal hospital requirements, but did not support the air conditioning units, placing heat stress on the staff and patients. Staffing fell to 40%-60% of normal personnel levels.

Patient evacuations were complicated by oversubscribed transportation services and difficulties navigating the heavy flow of traffic heading away from town. This quantitative study utilized a standardized survey instrument and lengthy interview process, along with descriptive statistics. No explicit theoretical framework was used to guide this study.

Hospital disaster preparedness affects the experiences of nurses working in that hospital environment during a disaster, as was previously described so vividly by the New Orleans nurses during Katrina (Fink, 2013; Jordan-Welch, 2007; Urrabazo, 2012). If nurses believe their employing hospitals are unprepared for disaster, it follows that the nurses dependent on the hospital context are also unprepared to meet the demands of disaster.

Training Needs

Disaster literature includes only the barest mention of the disaster training needs of nurses. Using a self-developed descriptive survey, designed to determine the knowledge, skills and abilities of clinical staff who provided care during Hurricanes Katrina and Rita, Slepski (2007) identified a need for additional social, personal, and environmental training, but not further clinical training for disasters. Like other reports in this literature review, healthcare providers were least prepared for the high volume and low acuity level of patients, lengthy work shifts, high patient-provider ratios, provision of care outside their normal practice area, the high demand for mental health services, and the inability to transport people to definitive care. Healthcare workers were also unprepared for externalities to the usual care processes: the level of devastation, politics and red tape,

speaking with the media, functioning in an austere environment, the absence of communication, inadequate supplies, and lack of re-supply mechanisms. This was an atheoretical study. Descriptive statistics were used for the quantitative analysis, and a 10-step hermeneutic approach was used but not described in the analysis of the three open-ended questions used in the study. Nurses comprised 34% of the sample population of 200 healthcare workers attending two federal (National Disaster Medical System or USPHS) disaster conferences post Hurricanes Katrina and Rita.

Other HCWs are also beginning to examine the non-clinical aspects of disaster care. In a literature review, 'non-technical skills' for surgeons in disaster response, included communications, teamwork and leadership; flexibility, adaptability, innovation, improvisation and creativity; and physical and psychological self-care, were also deemed necessary to enable surgeons to better function during disaster conditions (Willems, Waxman, Bacon, Smith, & Kitto, 2013). While the focus of non-technical skills by surgeons was on individual attributes, the perspective enlarges the arena of training required beyond one of strictly clinical skills to adapt to a disaster environment of chaos and reduced resources.

Strengths, Weaknesses, and Gaps in the Literature

This literature review provides ample material demonstrating that nurses are impacted greatly by the circumstances of providing nursing care in a disaster environment. It is well documented that nurses incur adverse psychosocial effects from the disaster experience. Nurse disaster competencies, disaster knowledge, and perceptions of preparedness are also dominant areas of research. Nurses returning from disaster

experiences, as well as nurses evaluating their preparedness for future hospital-based disasters have stated that they were unprepared, and that their employing institutions were also not prepared for disasters. It has been clearly demonstrated that nurses worldwide are hesitant to report to work during a disaster.

There are limitations in many of the studies presented in this review. Most importantly, disaster preparedness itself has not been well defined. Disaster training and competencies required to achieve preparedness have not been standardized nor validated. The appropriateness of what constitutes disaster knowledge is unclear, and disaster knowledge content remains focused on the provision of healthcare and knowledge of incident command systems.

Methodologies were frequently not well described. Many studies utilized self-designed, unvalidated instruments in their data collection. Existing quantitative studies regarding preparedness are of a basic descriptive and atheoretical design.

There are also many gaps in the disaster nurse literature. According to experienced disaster nurse/researchers, the area of greatest need for further research is psychosocial stress (Ranse, Hutton, Jeeawody, & Wilson, 2014; Ranse, Hutton, Wilson, & Usher, 2015), followed by education, training, and curriculum. Currently, research regarding the causes or prevention of stress during disaster deployment is limited and tends to focus on personal qualities of the nurse. The contribution of the living and working conditions have not been examined as a cause of stress, despite the numerous anecdotal accounts and descriptive research that describe distress regarding these extreme conditions. In light of the findings of environmental stress in Indonesian volcano eruption

survivors (Warsini, Buettner, Mills, West, & Usher, 2014b), further examination of environmental stress in other survivor populations is warranted, including disaster nurses.

Disaster preparedness for nurses is not yet universal, and nurses have low levels of disaster knowledge. Nurses returning from disaster deployments have espoused the belief that "nothing prepares you" for the devastation and altered clinical and living conditions of disaster work. Nurses have stated they are 'qualified' yet 'everything they learned' in nursing school or at the hospital was useless under these conditions (Jordan-Welch, 2007; Sloand et al., 2013).

US disaster training focusses on hospital-based healthcare, and not necessarily healthcare provided in low resource settings. US nurses with actual disaster experiences have not been asked for their meanings of preparedness, or to identify disaster conditions they were unprepared or untrained for, either clinical or situational. Although there is a hint in the literature that nurses already familiar with low-resource settings may fare better in disaster settings (Fink, 2013; Kawano, 2006), no researcher has followed this lead. These aspects of disaster preparedness need additional research.

Health outcomes of survivors are also partly dependent on the nursing care provided. Studies of healthcare quality in disaster and emergency shelters are very limited. Further research could inform us if nurses prepared for limited healthcare resources and rudimentary living conditions suffer less stress and provide better care to patients in these settings.

Much of the extant research has utilized healthcare workers who are disaster oriented, or in emergency specialties. Many of the anecdotal accounts of nurse

experiences are from hospital-based floor nurses who volunteered when the need arose. The preparedness and training needs of these non-disaster identified nurses are not known.

Overall, disaster nursing research has not addressed the environmental conditions in which nurses are being asked to live and work while providing healthcare during a disaster, and over which they have no control. Systematic research of nurse disaster experiences are increasing, but only one preliminary study has explicitly examined the experience of the altered environmental setting of disaster: the natural, cultural, political, structural, economic, and built environments surrounding the nurse during provision of clinical care during a disaster response. Further research will help nursing and preparedness managers to understand the relationship between nurses and the interrelated, complex, frequently damaged, systems-dependent, and reduced resource conditions of the disaster environment.

By bringing the contextual setting of disaster to the foreground of nursing, researchers can foster the explicit examination of a topic that has starred in the background of many nurses' descriptions of their disaster experience. Thus, this phenomenological study on nurses' experience in the comprehensive disaster environment is warranted and needed. Understanding the interaction of the disaster environment with nurses' corresponding experience should ultimately help improve disaster policy, preparedness, and training, and potentially influence disaster nurses' stress, nurses' intent to report to work, and patient care.

The methodology for this study is described in Chapter Three.

Chapter 3: Methodology

The purpose of this study was to gain an understanding of nurses' experience of the larger environment during a disaster response, using an existential phenomenological approach of inquiry. In this chapter, I discuss the research strategy and methodology, provide a review of philosophical development of phenomenology, and explain the rationale for the chosen approach. The methodological approach is then detailed, including recruitment, data collection, data analysis procedures, ethical issues, and methods for ensuring rigor in this study.

Research Strategy and Methodology

Given the dearth of research regarding the nurses' contextual surroundings during disaster, a qualitative research approach was used in order to gain a richer, contextualized understanding of their disaster experience *in situ*. Qualitative research was introduced to nursing in the 1970s, and has become more utilized and accepted as a research strategy in the heavily quantitative medical fields since 1999 (Borreani, Miccinesi, Brunelli, & Lina, 2004). Qualitative research is suitable for initial discovery when little is known about a phenomenon (Brink & Wood, 1998; Morse, 2012). It is frequently the most efficient method to identify concepts and dimensions of phenomena to enable further quantitative investigation in healthcare situations (Glaser & Strauss, 1966). Qualitative research provides systematic and rigorous methodologies to inductively generate knowledge, using the naturalistic, non-artificial setting to illuminate and explore the individual meanings of a phenomenon (Creswell, 2009; Lincoln & Guba, 1985).

The naturalistic setting, or observing the phenomenon in its native setting, provides for a holistic framework to understand a person's experience. Utilizing inductive methods to generate knowledge, qualitative research privileges the participant's emic (from within) perspective and expertise. Qualitative research permits participants to both provide detailed descriptions of a phenomenon through its use of broad, open-ended questions that ask participants, and to reflect upon the most significant aspects of their experience. The meaning of an experience reflects an individual's past experiences and contextual setting (Creswell, 2009; Lincoln & Guba, 1985). Qualitative researchers acknowledge these multiple and complex views of reality, and embrace the inherent subjectivity.

Qualitative research methods are fluid. The researcher participates as a co-creator of the research, with the participants' words at a given point in time and space interpreted through the inseparable and particular lens and history of the researcher's own experiences (Creswell, 2013). However, the researcher's subjective interpretation remains close to the data (Sandelowski, 2010; Thomas & Pollio, 2002), with the participant's quotes and words being used as evidence to support study conclusions.

There are numerous methods of conducting qualitative research, including narrative analysis, phenomenology, grounded theory, ethnography, and case study. These strategies are selectively chosen depending on how much is known about the phenomenon, and the nature of the research question (Creswell, 2009). To understand the meaning of the environment for disaster nurses, I chose a phenomenological philosophy and methodology.

The philosophical basis of phenomenology is social constructivism (Creswell, 2013). Social constructivists believe individuals seek to understand the world they live in, thus they develop subjective meanings of their experiences. These unique meanings are based on an individual's social, cultural, and historical contextual setting (Creswell, 2009; Lincoln & Guba, 1985).

Thomas and Pollio (2002) created a methodology suitable for nursing studies, based on Merleau-Ponty's existential phenomenological philosophy, which was utilized for this research. Their approach focuses on the process of discovering, through one-on-one dialog, the direct unobscured human experience from the expert perspective of the one who lives it. The application of their methodology is described following a brief review of its philosophical origin, existential phenomenology.

The Existential Phenomenology Approach

The turn away from philosophical empiricism - the belief that science, and thus knowledge, consists solely of what can be observed and measured - to the acceptance of subjective knowledge began with Hume and Kant (Rodgers, 2005). David Hume (1711-1776) believed all mental content was perception, the subjective interpretation of sensory information. He believed an individual's perceptions of one's experiences preceded and was thus separate from one's thoughts and ideas of the experience (Morris & Brown, 2014). Hume explained this as the experience of a thing, and then the thoughts about the experience of the thing. This distinction is known as Hume's Fork, and it separated ideas (synthetic knowledge) from matters of fact (analytic knowledge). His ideas allowed for

the separation of the objective experience from the subjective perception of that experience (Rodgers, 2005).

Immanuel Kant (1724-1804) furthered expanded the idea of subjective knowledge with his belief that the mind is not a passive receptacle of experience, but plays an active role in constructing knowledge (Rodgers, 2005). He believed that knowledge can exist before an actual experience of it. We know what rocks are without having personally examined each and every rock on the face of the earth. According to Kant, this transcendental knowledge of a thing was a synthetic construct created within the mind from a pre-existing framework. This framework allows the mind to organize a person's experiences using its *a priori* understanding of quantity, quality, relation, and modality (Rohlf, 2014). He termed this *phenomenon*, or the appearance of reality. *Noumenon*, the objective reality, was the thing itself (Rodgers, 2005). Hume and Kant expanded upon the prevailing limited dogma of objective, empirical science by providing reasoned arguments that subjective knowledge of a thing is possible, and is individualized according to the thoughts and perspective of each unique person.

A phenomenological approach to science, encompassing subjective knowledge, began in the early 1900s when the German philosopher Edmund Husserl (1859-1938) became dissatisfied with positivist reductions of the world to unrecognizable universal truths, and the continued belief that only empirical data counted as knowledge (Moran, 2000). Credited as the father of phenomenology, Husserl believed that "science as an idea lies undisclosed beyond its objectively documented theoretical structures" (Husserl, 1933/1960, p. 9). He felt that scientific laws and objectivity obscured how we saw

objects. Husserl wanted to return to a ‘pre-reflective’ state of consciousness and examine the things themselves as they really are before being objectified in our mind by science, measured and reduced to a ‘mere shadow’ of the actual object. Husserl’s phenomenology was not concerned with matters of fact (empiracy) but with transcendental essences of ‘the things themselves,’ or its universal essence of *Being* (Delacampagne, 1999; Husserl, 1933/1960; Russell, 2006).

Introduced half a century before Husserl, existentialism is an analysis of ourselves as entities in our own existence, our Being (Ree, 1999). The Danish philosopher and social critic Søren Kierkegaard (1813-1855), regarded as the father of existentialism, believed individuals, not society or religion, are solely responsible for giving meaning to their life by living it "authentically" (McDonald, 2012).

A younger contemporary of Husserl (and another German), Martin Heidegger (1917-1976) combined Kierkegaard’s individual existentialism with phenomenology to examine “the meaning of *Being,*” “that most universal of concepts” (Ree, 1999, p. 4) common in all of us yet also something “vague and undefinable” (p. 4), because of that ubiquity. In Husserl’s phenomenology, objects can be known entirely through one’s consciousness, or one’s thoughts and perceptions of a universal object. Heidegger believed objects are known instead by one’s actual experience of the object in its context, of Being-in-the-world. Heidegger points out that “we need some general sense of our environment and where we are in it before we can understand anything else” (Ree, 1999, p. 16).

Heidegger demonstrated the complexity of Being in his book *Sein und Zeit* (Being and Time). Through the use of German sentence structure he demonstrated how multiple realities of Being arise from a singular inquiry about a thing. As soon as we ask 'What is Being?' it becomes a new state of Being in itself:

> There is the inquirer's preliminary question about a vague notion about Being, the sought-after, the Fragen; the item asked-about Being, Gefragte; a Being that is interrogated-out, a specific instance of the thing being inquired about, Befragte; and a Being that is the asked-for, the Being we are finding out about, the "meaning of Being itself," the Erfragte. (Ree, 1999, p. 7)

Ree, in his translation and interpretation of the German language original, then introduced a fifth factor that should be accounted for, "What is the essence of the asker?" (Ree, 1999, p. 8). The asker frames the intent of the question, and has a perspective and a subjective interpretation of the asked-for answer as well. A singular inquiry about Being thus recursively becomes expanded into multiple location-specific realities of Being (Schmitt, 1969). As such, Being is inseparable from Being-in-the-world. Being-in-the-world implies the world is always 'already there,' and a person is always located somewhere, with a unique set of experiences and perspective.

Heidegger also distinguishes between ontologic and ontic states of Being (Wheeler, 2014). Ontic refers to entities, specific instances of a Being, having a unique set of attributes and properties that vary from the subsuming category of a more universal ontologic essence of a Being (*Dasein*). Dasein is explained by Heidegger as the authentic essence of 'simply us,' the pure existence of Being-in-the-world, and prior to our knowing of the unique ontic versions.

Maurice Merleau-Ponty (1908-1961) was not interested in Heidegger's universal meaning of Being-in-the-world, but rather the meaning for the individual *human* being, (Merleau-Ponty, 1964). This meaning is constructed in a world that is inseparable from the individual (Merleau-Ponty, 1962). "The phenomenological world is not pure Being, but the sense that is revealed where the paths of my various experiences intersect, and also where my own and other people's intersect and engage each other like gears" (Merleau-Ponty, 1962, p. xx). Whatever figural experiences stand out, they are co-created upon the existential (back) grounds of body, world, others, and time that give reference to one's perception (Merleau-Ponty, 1962; Moran, 2000; Thomas & Pollio, 2002).

For Merleau-Ponty, what we know of the world we learn through perception (Merleau-Ponty, 1962). Perception is one's direct and uncluttered experience of the world around oneself, before it becomes clouded by thought and analysis, and before objective knowing obscures its true reality. Perception is enabled through embodiment, our ability to interface with the world through our sensory body. Perception is separate from truth, or the objective measurement of the object. "Perception does not give me truth like geometry but presences" (Merleau-Ponty, 1964, p. 14). Perception is instead real. Differing perceptions of reality occur because perception is always created from a singular perspective, and different and separate from another's (Merleau-Ponty, 1948/2004; Merleau-Ponty, 1964).

The sensory, perceiving, Being-in-the-world body does not simply and unconsciously stand outside the world and observe it, but interacts with the world with intentionality. A person's consciousness and actions are always directed at the world

surrounding them (Merleau-Ponty, 1962), and a person acts upon, and is acted upon by, their surroundings.

It is one's experience of the world which leads to objective understanding, (Merleau-Ponty, 1962), and phenomenology "allow[s] us to rediscover the world in which we live, yet we are always prone to forget. This discovery requires a careful description of things as they appear to the consciousness (Moran, 2000). Merleau-Ponty's existential philosophy thus provides a useful lens to examine nurse perceptions of disaster along with the inseparable disaster environments co-creating those experiences, and was used to guide this study.

Existential Phenomenology Method Applied

Institutional review board (IRB) approval for this research was obtained from the University of Tennessee's Office of Research and Engagement. Participant criteria for this study were persons who: 1) held a US registered nurse (RN) license at time of disaster response, 2) had participated in a major disaster as a nurse, 3) were non-military at the time of response, 4) have the ability to read, speak, and write in English, and 5) were willing to be interviewed and digitally recorded. Excluded from the study were 1) non-US nurses, 2) military nurses, or 3) persons under care for PTSD.

Participants were recruited through the distribution of informational flyers (see Appendix A) circulated to both disaster- and non-disaster specific nursing organizations, including international, national, and state-level associations, especially in states that have recently experienced major disasters. Both basic study information and investigator contact information were provided on the recruitment flyer, as well as a link to a study-

specific web page with further details (see Appendix J for a complete list of contacted organizations).

After e-mailing the appropriate contact person of each organization for permission to recruit participants and obtain their policies concerning nurses' participation, study announcements were also purposively distributed to minority nursing organizations (Minority Nurse, Black Nurses Association, Hispanic Nurses Association, and Native American Nurses Association), as these groups are still underrepresented in nursing (Health Resources and Services Administration [HRSA], 2013) and likely underrepresented as well in non-minority-targeted research on nurses.

My intent was to reach nurses who have participated in disasters, and not nurses who specifically identify or specialize as disaster nurses, potentially reaching a broader spectrum of nurses with disaster experience. The goal of this broad recruitment strategy was to reach and include as varied and diverse a group of study participants across age, sex, race/ethnicity, specialty, types of disasters, number of deployments, and roles filled during the disaster, and to identify across these varied situations, the common meanings of the experience, the intent of phenomenological research. Volunteers who met the eligibility criteria and were willing to be interviewed comprised the study sample. In phenomenological studies, 10 -15 participants generally provides an adequate sample size, as determined by achievement of data saturation, the point in data collection when no new data is being discovered from additional interviews (Creswell, 2009, 2013; Guest, Bunce, & Johnson, 2006). In this study, I conducted nine initial interviews, and an additional two interviews were then conducted to confirm data saturation.

Data Collection. Data collection began with an experienced qualitative researcher conducting a bracketing interview of my own thoughts, feelings, and experiences of disaster. Commonly misunderstood as a setting-aside of the researcher's experiences and knowledge, the bracketing interview instead clearly acknowledges the researcher's perspective by explicitly stating their presumptions and positions (Thomas & Pollio, 2002). The bracketing process also helps maintain objectivity by helping prevent interjections of the researcher's perspective into the analysis of the participant's data. The bracketing interview was digitally recorded, and transcribed verbatim. The long-established University of Tennessee Phenomenology Research Group (PRG) analyzed my bracketing interview on March 24, 2015. They discovered that I have presuppositions that nurses are generally not aware of their own surroundings because of the invisibleness of what is 'normal' and 'expected.' I also have expectations that nurses are generally not aware of the environs or conditions of anything outside their own world (including inner-city, cultural communities in the US, as well as outside the US). During my data analysis, I needed to remember that I have an assumption of less awareness by others, and that I need to be observant, but not judgmental. The group, in summary, suggested that I should be careful that I do not disregard other nurses' 'lesser' experiences (compared to my experience during Hurricane Katrina). It was apparent that I am judgmental about 'stupid rules' that prevent helpful action, and thus need to be careful of over-identifying with people who have similar experiences or attitudes about interfering 'stupid rules,' bureaucracy, politics, or 'unhelpful' help. I was also cautioned to be aware that some

nurses may be processing the event for the first time as they speak with me, and to be prepared for that.

Potential participants contacted me via email inquiry, and I responded by both email and phone. I then further described the purpose of the study, along with its benefits and risks. Volunteers were screened to ensure they met study criteria, at which time I then scheduled an interview at a mutually agreeable time and place. Eight interviews occurred in person, while three had to be conducted via Skype for differing reasons (airline delay, one participant was in Mongolia, and logistical difficulties). Interviews occurred in a private, quiet location to eliminate disturbances. The participant consent form (see Appendix B) was summarized, explained to, and then signed by all participants. During the consent process, participant rights to not participate or to stop the interview at any time were emphasized. Personal and background information about their training, experience, and disaster deployments, were obtained via a demographic survey (see Appendix C).

Phenomenological interviews are conducted using an open-ended question designed to focus the participant on the experience to be explored (Thomas & Pollio, 2002). The research question was: *"When you think about your disaster environment, what stands out about your experience?"* My recently conducted pilot study (Ruskie, 2015) had confirmed the suitability and participant's understanding of the research question. After putting forth this query, my role as researcher was to listen as the interviewees shared what was meaningful to them about their disaster experience. Follow up queries asked for examples, additional details, or expansion on the ideas presented by

the participants (see Appendix D). Each interview continued until the participants had completed their narration of experience, or otherwise stated that the interview was concluded.

Each interview was recorded using a digital recorder as well as an iPad or Android backup device. Field observations were recorded following each interview to capture the setting, participant non-verbal behavior, interview interruptions, and my own feelings and thoughts. These observations were then incorporated into the research as data.

Data Storage. Following the completion of each interview, all recordings were immediately transferred to my password-protected personal computer and a backup of the interview file was transferred to a password-protected external hard drive. Recordings were also transferred to a password-protected Dropbox account so a professional transcriptionist, experienced with phenomenological research, could transcribe the interviews. (See Appendix E for the letter of confidentiality signed by the transcriptionist.) Interviews were transcribed word for word. I verified each transcript for accuracy by reading it while listening to its audio recording and making any necessary corrections. At that time I replaced all subject names, locations of events, and other potentially identifying information with pseudonyms. Only pseudonyms or aggregate data will be used when this research is discussed in professional meetings or publications.

Data Analysis. Following Thomas and Pollio's (2002) methodology based on Merleau-Ponty's existential philosophy, individual transcripts were first read in their entirety for a general sense of the meaning of the whole experience. Next, individual paragraphs and

sections of each transcript were scrutinized for significant phrases, metaphors, and meaning units, or what stood out for the participant in relation to the contextual background of the experience. Lastly, at this basic level of analysis, I identified themes occurring in each interview, or the "patterns of description that repetitively recur as important aspects of a participant's description of his/her experience" (Thomas & Pollio, 2002, p. 37). At two points during this stage of data analysis, the PRG, after signing confidentiality agreements (see Appendix F), analyzed two of the interviews, as a means of establishing reliability in the data analysis. As I had already analyzed each interview prior to their assessment, their comments provided confirmation of my initial findings, and also added new interpretations to consider.

Next, attention was given to the overall meaning of the experience across all the interviews, and the determination of what was figural - what specifically the consciousness of the participants as a group was being directed toward. These more abstract levels of conceptual meaning were refined into global and nomothetic themes, or the "experiential patterns exhibited in diverse situations" (Thomas & Pollio, 2002, p. 37). The contextual background of body, time, world, and others upon which these figural experiences stood was also identified. These global themes were substantiated in the data of the individual interviews, an overall thematic structure created, and then both were presented to the PRG, to assess the merit of my findings, and refined further.

As a final check of the veracity of the data analysis, participants were offered the opportunity to review a summary of all data, and to comment on the accuracy of the

description derived. This feedback assured that the results reflected the true essences of these nurses' disaster experiences.

Ethical Considerations

Human subject protection is paramount to this research. I have completed Collaborative Institutional Training Initiative (CITI) human subjects training. University of Tennessee IRB approval was obtained prior to any study recruitment. The informed consent document was provided to participants electronically several weeks prior to each interview (scheduled for several weeks hence) for their leisurely review prior to their scheduled interviews. The document was explained verbally to all participants at the time of the interview. Signatures were then obtained, either in person or via email. Participants were given their own copy of the signed informed consent agreement.

The nature of the study was described to all volunteers at the time of the interview, along with the explicit reminder that participation was voluntary, and that they may withdraw or stop at any time with no consequences whatsoever. None withdrew during the scheduling phase or actual interview.

Risks to the participants were primarily emotional. Participants were observed for signs of emotional distress, and provided time to recover. Although several participants teared up while relating their experiences, none wanted to stop or discontinue the interview. Participants were made aware of and provided the phone number for the national Substance Abuse and Mental Health Services Administration (SAMHSA) Disaster Distress Helpline in the informed consent agreement in case they might require additional support, or counseling services (see Appendix G).

Pseudonyms were used on all documents to ensure participant anonymity. Confidentiality was ensured by securely locking up all documents in my home office and maintaining password protection on my personal computer. Prior to gaining access to interviews, the transcriptionist and PRG members signed agreements to maintain confidentiality. Data safety was enhanced by redundancy of files, and those copies were also electronically protected.

Methodological Rigor in Qualitative Research

Rigor in qualitative research is similar yet different than quantitative research. In qualitative research, rigor is achieved via specificity of topic, appropriate research questions for the qualitative method chosen, and detailed explanation of methods so others can replicate, but not duplicate, the research (Creswell, 2007). This is due to the nature of qualitative research. The investigator is the instrument, located in a particular point in time and space. The participants also are located in a particular point in time and space. Neither of these situations can be recreated, so while a replication of the method with similar participants should produce similar data, the results will not be identical (Lincoln & Guba, 1985), nor should they. According to Sandelowski (2010), every application of qualitative methods is a reinvention of the method. Methodological rigor has also been enhanced by my training and experience in the method, attention to the method, and by staying true to the data (Pyett, 2003).

There are numerous frameworks to help establish methodological rigor. I will use Creswell's terminology of validity and reliability (Creswell, 2013) to enumerate the strategies incorporated to achieve rigor in this study.

Validity. Validity refers to procedures utilized by the researcher to ensure the accuracy of the findings, and was achieved through a compilation of techniques (Creswell, 2009, 2013). Foremost, validity in my study was established by an understanding of the philosophical basis of the phenomenological research method and by being trained and knowledgeable in the method. Credibility of the researcher results in being trusted by participants to convey their experience faithfully (Creswell, 2009). Conversely, each study participant had inherent face validity and credibility as a result of having experienced the event (Groleau, Zelkowitz, & Cabral, 2009). Validity was strengthened by use of a pilot study, which demonstrated participant's adequate understanding and response to the research question. My credibility has been previously supported by statements made by participants in my initial pilot study. By bracketing my own beliefs, I accentuated my biases, and gained an awareness and understanding of the researcher's own experiences, preconceived opinions, and biases (Thomas & Pollio, 2002). This awareness of my own subjectivity was further maintained throughout the analysis process via "continuous reflexivity and self-scrutiny" (Pyett, 2003, p. 1171), through the use of memos, ongoing notes, and reflections on my thoughts and emotions during the coding and analysis phases.

Internal validity, or the credibility of the data itself (Creswell, 2013) was achieved through the use of asking open-ended questions, through prolonged engagement with the participants, and by allowing them to speak freely about their disaster experience (Creswell, 2009). Observation of the informant also added to the validity by paying attention to the subject's words, actions, and non-verbal communication.

Further methods of assuring rigor during analysis included triangulation - the agreement in findings between my analysis, the analysis by the PRG, and the interviewees, and by the use of thick, rich descriptions to provide well-described and abundant details of the experience (Creswell, 2009; Lincoln & Guba, 1985). Validity of the findings was also further established via member checking - the presentation of the findings back to the participants for their comments regarding the accuracy of my distillation of their interviews into an essence of their experience (Lincoln & Guba, 1985).

Reliability. Reliability, the consistency of the data and findings, was demonstrated by achieving data saturation, the point when further interviews fail to provide any new data (Creswell, 2013). Reliability was also provided through a detailed audit trail with well-documented field notes, good quality audiotape, transcriptions that were verified to be accurate, intercoder agreement of meanings and themes (by bringing to the PRG), and the scrutiny of my dissertation committee.

A final test of rigor was the ability of the researcher to remain close to the words of the participants, and supporting all conclusions with the words of the participants themselves (Creswell, 2013, p. 247).

Summary

The purpose of this study was to more fully describe and bring to the foreground the disaster environment as experienced by nurses. Phenomenological research methods, specifically the philosophical perspective of Merleau-Ponty centered on the meaning of an individual's experience framed by its co-constituting existential grounds of body,

world, others, and time, are particularly relevant and useful for examining nurses' experience of the disaster environment. Much as the social determinants of health model relates the influence of the surrounding social structures to an individual's health, the altered natural and built systems of disaster, influence the health and capability of the nurse working in that environment. Improved knowledge regarding these environments has implications for nurse disaster preparedness, stressing improved training, improved competencies, by enlarging the spotlight on disaster environment factors, and by bringing to light the often incorrect assumptions of expected resources. In the next chapter the findings of this study are presented.

Chapter 4: Findings

The purpose of this study was to identify the universal essence of the phenomenon of the disaster environment as described by nurses who had responded across a broad array of disaster events. This chapter presents the thematic structure discovered within the participants' portrayal of their experiences. Participant demographics and a description of their interviews precede the presentation of the thematic structure. The existential grounds of the disaster environment will be described, followed by transcendent themes with exemplars. The chapter concludes with a summary of the thematic analysis.

Participants

Eleven participants were interviewed over a two-month span from June 1 through July 30, 2015. Participants had been informed about this study via my initial strategy for flyer distribution (3), via word of mouth from other research participants (2), via Facebook postings made by unknown others (1), and via organizations which were contacted by organizations I had contacted (5). Interviews lasted from 50 to 94 minutes, an average of 71 minutes. Eight interviews occurred face to face in the participant's hometown, and three interviews were conducted via Skype.

At the time of the interview, ten of the participants were currently practicing US registered nurses, with one nurse working in Mongolia. One nurse was recently retired, although still active in nursing leadership activities. Ten white nurses and one Hispanic nurse were interviewed; ten nurses were female and one male. They had an average age of 57, with a range of 45-65. Participating nurses resided in seven states (Arizona, Minnesota, Mississippi, Missouri, Oklahoma, Ohio, West Virginia), and one foreign

country (Mongolia). Included in the study were ADN (1), BSN (1), MSN or MS (6), DNP (2), and PhD (1) prepared nurses. They had a mean of 25.9 years nursing experience, with a range of 9-42 years. Nurses had specializations in forensics, medical-surgical, public health, family health, geriatric/dementia, pediatrics, and emergency/trauma nursing.

Nurses had disaster experience ranging from one to more than 25 events, with an estimated average of 5.8 deployments. However two respondents accounted for 57% of all disasters responses, so excluding them, the remaining nine study participants had an average of 3.1 disaster experiences. These nurses had experienced and/or responded to hurricanes, derechos, flooding, tornados, bombings, earthquakes, train derailments, water contamination, and communicable disease outbreaks. Measured in days, disaster experiences ranged from a single-day disaster experience, to upwards of 180 days of deployment. Two nurses had only experienced one disaster (18%).

Study participants had extremely variable levels of disaster training. Asked to self-identify any disaster-training courses they had taken, two nurses reported having no disaster training prior to their disaster experience. One had attended only general hospital preparedness training. Five had completed FEMA Incident Command System (ICS) online courses. Two nurses had master's degrees in disaster preparedness or homeland defense. Two described state disaster or public health training they had received. Three had participated in numerous Red Cross trainings. One participant had received Basic Disaster Life Support (BDLS) and Advanced Disaster Life Support (ADLS) certifications. Two reported having attended hazardous materials (hazmat) training. Two

had attended a Trauma Nursing Core Course (TNCC). One had attended preparedness training at a national center of emergency preparedness training.

Ten nurses responded to their disaster as part of an organization. One self-deployed. Five nurses relayed accounts of being primarily involved in a local disaster response, while the other six spoke primarily of deployments to distant disasters. Two nurses specifically mentioned both local and distant disaster experiences.

I began each interview with a very brief introduction of myself and my experiences with disaster (as my previous interview experience demonstrated that this helped develop trust with the interviewees). Nurses displayed an enthusiasm for the interviews, and seemed grateful and happy to share their stories. While one nurse could not fathom what I meant even after explaining the global definition of *environment*, the majority jumped in with an opening statement listing multiple environmental components that stood out. Several were eager to show pictures and refer to maps to make my understanding of spatial relationships and locations clearer.

Nurses generally began their accounts in a very matter-of-fact manner as they relayed their experiences. They told compelling stories of their experiences and spoke passionately at times. Laughter was quite common when they shared a particularly 'different' event, an 'out of the ordinary' solution to a problem, or simply because the situation seemed so ridiculous. Others remained very analytic and objective, becoming demonstrative and emphatic while opining about needed changes or sharing their own analysis of the general disaster response of the US. Some nurses spoke politely and almost formally, but several were refreshingly uncensored, stating clearly what they felt,

describing ‘pompous asses’ or expressing distaste for governmental solutions: “Um, the Katrina cottages, ugh. The FEMA trailers, ugh.” This comfort in sharing made the interviews seem more honest, flow smoother, and established rapport more easily between us.

Several nurses choked up while telling particularly moving stories about their experience, although no one ever cried or needed to pause the interview more than momentarily. One teared up while telling of her own hurricane experience and her husband’s five-hour, eight-mile walk home from work over downed trees and debris. None ended their participation in this study during the interview or later.

Some nurses became physically tired of speaking, and appeared to end the interview before they ran out of things to say. Frequently, after the conclusion of the interview, nurses remembered yet another experience they wanted to share, or just wanted to talk about mutual experiences with me.

What Stood Out

In this study, nurses were specifically asked about what stood out regarding the phenomenon of the environment during their disaster experience. Many immediately spouted a litany of events or circumstances. Others named a single element, perhaps naming “oh, another thing” later in the interview. These individual experiences that stood out were generally not universal themes across the experiences of all the nurses. ‘What stood out’ can be centered on two broad areas: self and systems. Nurses mentioned the sensorial aspects of smell, sound, and sight, as well as climatological sensations: heat, cold, humidity, oppressiveness. Another facet of their personal environment that they

shared in common was their internal feelings of guilt, duty, satisfaction, and pride in their own response and that of their fellow responders and the community. Six nurses immediately mentioned sectors of society: politics, security, climate, demographics, community, and healthcare. In the healthcare sector, they mentioned patient load, lack of skill or experience of colleagues, and limited supplies. The universal essences of these nurses' experiences of the phenomenon of the disaster environment will now be described.

Existential Grounds

In the philosophy of Merleau-Ponty, figural aspects of human experience must be understood as contextualized by the existential grounds of *body*, *world*, *time*, and *others*. According to Merleau-Ponty, "one's own *body* is in the *world* just as the heart is in the organism" (2012/1962, p. 209). In other words, the environment surrounding one's experience is always, inseparably, "already there," and interacts with the other contextual grounds of *time* and *others*. This ever-present context of the *world* cannot be dissected from one's lived experience, because it co-creates the experience. In the following paragraphs, I will discuss the existential grounds of *body*, *time*, *world*, and *others* against which nurses' individual experiences of the disaster environment stood out.

For nurses in this study, the disaster environment was "hands on," with direct and intimate bodily contact with their structural and human surroundings. From their physical location during the disaster, nurses experienced their disaster environments either as victims/survivors or responders. Some nurses lived in the locale where the disaster occurred and experienced the physical event directly and/or were immediate responders to the scene of the incident. Other nurses in this study were responders to geographically

distant areas after a disaster event occurred. Some nurses deployed as responders and then subsequently experienced threatening weather during their deployment. “I actually became almost a shelteree” (RN6). Nurses also became patients in the aftermath due to the difficult working conditions of the disaster response. “You gotta take care of the staff … just as much, ’cause the staff ends up to be … your client too” (RN5). All were visually exposed to extensive human injury, system disruption, and community destruction, and to the extended recovery processes.

The primal sensory experiences of sights, smells, and sounds of the disaster setting were vivid for many of the individuals. Nurses immediately recalled smelling “burning …gasoline, that diesel fuel,” “… all of the toilets and stuff.” Some remembered the smell of “fresh dirt” and “pine sap” from snapped off and uprooted trees, and the “gangrene” smell of missing pets and human body parts.

One nurse experienced a hubbub of unfamiliar background noise. “Haitians have this incessant need to honk the horn every time they drive a vehicle, like, constantly” (RN10). Other times, despite the busy noise of recovery activities, there was an unfamiliar silence, a simultaneous “sea of quiet because even though there was all these people working and we were doing these things, at any moment you could stop and you could hear a pin drop. It was just eerie silence for being in the middle of all that” (RN6). That background of “eerie quiet” heightened and “made” the smells stand out.

While one experienced disaster nurse in a leadership position stated “the [evacuation] shelters are many, many miles away from the hot zone…So you don’t often see disaster at all” (RN2), the remaining nurses vividly described unusual, previously

unimagined sights of the disaster environment that stood out to them: “fabulous old buildings that have been there for hundreds of years just smashed and crushed or just completely washed away” (RN1), or the sight of entire buildings that were relocated by the storm: “Yeah, see that, that house? It’s now over here …” (RN5). Other sights caused emotional responses, such as seeing “the most worst, dirtiest, tattered-up [US] flag hanging” amongst a sea of devastated buildings, or the sight of “the husband trying to find his dead wife’s wedding ring” (RN6). “Every direction you’d look there was debris, and sometimes you could tell what the debris was from and sometimes it was so torn up and damaged you couldn’t tell what the debris was from” (RN7).

The physical perception of climate was usually unpleasant for nurses in this study. It was “humid” or “cold when it rained.” “The heat was oppressive, besides the strain of all of the loss.” “It was miserable.” “It was August and it was a hundred degree – a hundred and ten degrees heat index and people were sweaty and gross and they were wearing the clothes that they were wearing before the storm. [Sighs]” (RN1). Physically, one nurse recalled a bodily sensation that “felt like a gas line had exploded and, you know, kind of, you know, the bed shook and everything. That – that woke us up” (RN8).

Nurses frequently coupled their sensorial remembrances in tandem: “the heat, the smells.” Nurses were “overwhelmed…, because of what they were hearing and seeing.” “Those smells work on me, the heat works on me.”

Whether the disaster was experienced as local destruction or distant devastation, nurses endured severe physical and emotional stress. Extended work shifts, heat, noise, and a lack of privacy all contributed to a “lack of sleep,” being “sleep-deprived,” “pretty

fatigued," and "exhausted." Nurses also elaborated on their extreme emotions in their extreme circumstances.

The enormity of the human devastation and the stories shared by survivors combined to overwhelm and emotionally challenge the nurse/responders. Nurses experienced a constant state of "shock" and "disbelief" at the "intense" surroundings, the weight of seeing "so much need all around," and "especially the kids." Nurses spoke of working with colleagues who were "psychologically fried," "nonfunctional," or having a "meltdown." Survivors they were caring for were stressed: "tempers were short, nerves were short, there was just fighting everywhere, arguing everywhere." Nurses shed "a lot of tears," "lost it," and were "overwhelmed" with the "stress," the "tension," and the enormity of the suffering.

> It was stressful and it was hard, but you just tried to make it through. (RN10)

> It was such a high stress, uh, period, that when it's over with, it's kind of like you – you're totally wrung out by that time. (RN8)

Some nurses experienced "a little grief" at "the loss of … the elegant Southern coastline that we had" (RN1). Another, hearing of the [incorrect] loss of physicians' colleagues "want[ed] to take time to grieve over that but you couldn't" (RN11).

Several nurses experienced feelings of guilt because of their privilege or personal morals. As a public health nurse responding during the Hurricane Katrina response in her home state, she had priority for "going to the front of the line in the grocery store" and "in the gas line," and felt "guilt that I had things that other people didn't have" (RN1). A nurse who manages evacuation shelters felt that "when I go to a disaster, I shouldn't be living better – I don't figure-- better than . . . my clients" (RN6).

Nursing care provided by these nurses to patients was described as body-centered:

> What I love…it's hands on: sensory, self-reliant, not technology, but personal again. (RN4)

The care of nurses was also body-centered. After a tornado destroyed their hospital, nurses were given tasks that engaged their mind and body as a way to cope with the loss and devastation:

> They had set up a little bitty tent. And we – they – she said, "Write down everything you think you need. Write down scissors, write down Band-Aids, write down lidocaine; you know, write down every supply you can think of." Like, oh my gosh, I don't know if they even used that list, but it kept us busy and we felt useful and so it was good for us to do that. (RN11)

From a distance, the most apparent context of *time* regarding the disaster was as a dichotomous referent. For those directly experiencing the precipitating disaster event, life was viewed as "before or after" the event. Nurses from outside the region who deployed to assist with response and recovery, arrived "after" to "pick up the pieces and make it better from there." Nurses who experienced their first deployment, also demarcated their lives as before and after the event. "After" has endured a long time, for some nurses:

> Afterwards, you kind of fall apart. (RN8)

> Even, you know, ten, fifteen, twenty years after this has happened, it still brings up emotions. (RN8)

When nurses were immersed in the immediate aftermath of a destructive event, their sense of time was continuous, centered in the now, focused in the moment. "No, I don't know when I'll be home. No, I don't know where I'll sleep. No, I don't know when I'll eat…We didn't know when we left when we'd get to come back home" (RN7).

Clinics, care facilities, and shelters were commonly run 24 hours a day. The days "run together," time no longer regulated by calendar or clock.

The immediacy of time was also manifested by the creation of time-efficacious healthcare structures in a shelter, as pharmacists dispensing medications were co-located in shelters:

> That was a different concept, you know, the pharmacy's right here on the floor and, you know, you run over with your little prescription. (RN4)

A question of "time" contributed to another problem. In contrast to the known future of volunteers, constantly rotating through their shelter, the inescapable, unknown fate of survivors loomed, daunting survivors. The nurses learned that survivors resented the nurses, because these responders would be returning to their normal, undamaged lives, while survivors felt stuck in the present with no future:

> *Yeah, you get to – we're* [survivors] *still gonna be here dealing with this long after you're gone.* (RN6)

Time was also systematically measured by the nurse's daily work shift length or by "interesting events," "nights," "days," "twenty-four hours," "six-hour shifts."

> You know, pretty much every fifteen minutes for three weeks something very interesting happened in that shelter and in that … environment. (RN2)

The primary experience of time for these nurses, however, was as an even scarcer resource than in their normal time-constrained work lives. Whether from acuity of condition or sheer volume of patients, nurses in the disaster setting had to make a "million" "split-second decisions," and "process [their knowledge] very quickly."

> In a normal situation you might get a patient in there, uh, take C-spine precautions, uh, uh, lab that you want, draw a rainbow, send all that off.

> And – and it might be a two-, two-and-a-half-, three-hour process, uh, making a decision on what you feel like is wrong with this patient. Um, in a disaster situation you don't have that time. That time is working against you. So I think you have to do your critical thinking very quickly, uh, assessing that patient and deciding what you feel like is going on, without a lot of data to back it up [laughing]. (RN8)

Time was "used up" or "wasted." Nurses didn't "have a lot of time for idle chitchat … and futzing around." Utilizing familiar hospital triage protocols and spending the usual ten minutes to assess each patient, physicians who "didn't know how to [perform disaster] triage" quickly became "overwhelmed" by the patient load. One-week volunteers requiring cholera-care training used up the scant time of the long-term nurses. Just as they got up to speed after their training by the long-term nurses, they returned home.

Nurses noticed that the *relevance* of elapsed time for patients became altered from the normal atmosphere of waiting rooms across the US:

> You're used to people complaining all the time. *I had to wait three hours!* Here, people were gracious, basically. You know, they would tell me, you know, *that person needs you more than me,* you know, even though they hadn't eaten probably in two days. (RN4)

Relationships with patients, colleagues, community members, and organizations distinguish the existential ground of *others* during a disaster response. Nurses spoke of the need for "having those relationships in place" with "people….suppliers… your other agencies" before the disaster in order to know how to effectively plug in to the response effort or procure needed resources. Plugging in necessitated "developing relationships" and "joining up and listening to local responders and the people who know that community" (RN3) during the disaster response, respecting the local expertise.

In the immediate aftermath of a destructive event, relationships were centered at the local level and on previously established relationships in the community.

> When I needed something I didn't call [national store]; I called [Mary at the national store]. It was a person, not a store. And, you know, it got to the point, "[Sighs] [Mary], I need gloves."
> "A pallet or do you want a couple of cases?"
> "Well, pallet!" [Laughs] So we'd get stuff that way. (RN6)

Affected community members extemporaneously responded to help: "people just showed up to help transport" patients, "farmers got together" to clear roads, "churches" and "restaurants donated all kinds of food." For nurses responding in their own communities, the established relationships with families and neighbors motivated them "to make sure everybody was taken care of" but also made it "harder" because of a "bigger weight on my shoulders to save the day and save the town" (RN6).

The well-intentioned community response could also add to responder stress and work load, but the desire to maintain and foster the relationship prevailed:

> This outpouring of people wanting to give you stuff, and it's like you so appreciate it but it's like, *I have no place to put that right now, can you bring* – and you wanna say, *Can you bring it back in about six months?* …But, I mean, you don't do that. You take it and then just pile it up. (RN11)

As the disaster response lengthened (and outside volunteers and agencies arrived), new relationships were formed with patients, colleagues, and agencies. The long-term and close quarters' nature of the shelter environment allowed nurses to "bond with people so much closer" and "socialize, um, a little bit" as they became

> …so involved trying to help … every aspect of their life. Um, so that – that's the hard part, 'cause you kind of start feeling their pain. (RN6)

Oftentimes working with other responders previously unknown to them, nurses described positive working relationships and colleagues who were viewed as being "on my team," "professional," "amazing," and those who were there who focused on helping survivors or their coworkers.

> I had young nurses, had a nurse who was eighty-four years old. I mean, it was just a great team. We had a great team. (RN2)

> If I need help [from other county health department staff], all I gotta do is call. (RN5)

> What's your – your need right now? And she goes, "Mostly nights." So we were used to nights and so we said, "Okay, we'll come – we'll come during the nightshift." (RN9)

Nurses formed friendships and became "close with" their new colleagues:

> He and this other little nurse and I, we got to be big buddies 'cause we worked that same weekend shift twelve hours a day, sitting at that table waiting. (RN1)

> My wife and I are really good friends with her now, but she ended up my partner for like three weeks in Louisiana. (RN6)

A supportive relationship with the employer at the disaster site was mentioned as important and helpful by nurses who had lost their pre-disaster jobs and place of work:

> All across [hospital system name], they were so helpful to us. People did fundraisers, they prayed for us, they provided scrubs, they did all kinds of things that were nice. (RN11)

Not all relationships were positive at the outset or helped ease the enormity of the situation. Deployment to assist communities afar oftentimes initially resulted in a lack of trust or resentment by survivors, who thought volunteers were there for the money, or

otherwise not legitimately invested in the community's welfare but in their own. Nurses recognized the need to establish

> this rapport and trust right off the bat with people, because you are this stranger coming in and people are, *Oh, yeah, you get to go back to your house and you get to, you know, make money off our* – and it's like, "No, I've left my kids, my wife, my jobs to be here, and I'm not – I don't get paid, I'm doing this because I truly want to be here and help." (RN6)

Local agencies and organizations also distrusted deployed volunteers as "outsiders" and "strangers" who were coming in to "take over." One nurse acted as a "liaison" specifically "to help facilitate [a response team] being accepted" because "the South is very hospitable until we have Northerners or someone…unknown to us people come in to take over" (RN1). Other deployed nurses recognized the need to "reach out" to the local agencies and "partner" to maximize the capabilities of both agencies and "get things done."

Poor working relationships with fellow HCWs also existed, as a result of poor work ethic, or a focus on self-gains. Some nurses [in the opinion of the interviewees] came to the disaster to get the [aren't-I-a-splendid-person] "trophy," go "shopping," obtain per diem cash, or just did not appear to be dedicated to the work at hand.

Another major aspect of the ground of *others* was the unfamiliar patient populations nurses were interacting with. The "mixing of cultural norms" was how one nurse described the population within these disaster environments. Nurses who deployed to assist in distant regions were unwelcome outsiders, and had to demonstrate or otherwise convince survivors of their intention to help. This included north/south divisions as well as adjacent state animosity within the United States. Racial prejudices were encountered:

> I – I was a [northern state] white boy going into some of these [Southern state] areas that, you know, they didn't want you there. Or, then … when I was in [Midwest state] … where [they saw] my partner was a black nurse and they wanted no part of that. So it was having to deal with some of my naïve ideas, coming from [northern state], that this stuff is still out there. (RN6)

In the mass shelter setting, nurses encountered unfamiliar, unexpected populations: the "homeless and the drug addicts," "whole population of people on methadone," "a whole bunch of group-home schizophrenics who were untethered," "persons who are pregnant," and the

> craziest thing I ever saw…we were getting a women's group for battered women and we were getting the bus from the halfway house [laughs] from the corrections, which … most of 'em knew each other! (RN6)

Other unexpected and unfamiliar cultural groups specifically mentioned by participant nurses included gangs, rich, poor, undocumented, black, Hispanic, Vietnamese, Spanish/Mexican population, and "just a big melting pot going on." Groups co-mingling with people that "would not normally interact," which, with the stress of disaster added, created an atmosphere in congregant settings where "you've taken … ten pounds of flour and put it in a five-pound bag" (RN6).

The majority of the nurses' descriptions of their experience of the phenomenon of the disaster environment centered within the existential ground of *world*. Nurses described a difficult work setting that protruded far beyond the usually circumscribed healthcare environment. "The work conditions were tough. It was such a complete devastation" (RN6).

Beyond the geographical distinction of local or distant disaster, some nurses in this study provided disaster assistance from their usual place of employment in an

undamaged, but nevertheless altered, hospital or public health department setting. For other nurses, their usual site of healthcare was destroyed. “The hospital [was] gone,” “a huge amount of our clinics were also destroyed,” “– a lot of doctors’ offices and medical records and stuff all washed out into the ocean.” There was a loss of patient “medical” and “pharmacy records.”

Nurses in both local and deployed settings worked in numerous types of unfamiliar alternate care settings: “the crosstown hospital’s overcrowded emergency department,” “in the field,” in hastily erected “make-shift…triage tents,” a “civic auditorium,” or an “athletic stadium.” Nurses also provided care in “mass shelters” and a “cholera treatment center.” One nurse was “just kind of outside in an outside environment… triaging… you know, survivors… [in]…a field.”

Providers were scarce, without relevant and much needed expertise, or sometimes were non-credentialed. “We didn’t have enough doctors” (RN8). An “OB-trained physician” and an “ophthalmologist” were “running” a cholera treatment center. Whatever the setting, nurses were universally inundated with patients or had too many for the altered conditions: In a hospital experiencing a flood and thus without power, water, or food, “once patients could come in, we’d have to transfer ’em” (RN5). In an alternate care facility, “We … basically, triaged sixteen thousand people” (RN4).

Supplies for nurses were frequently scarce: Nurse were “laying people on tables or on the floor.” Another nurse worked “in a field … with very little supplies. …we had enough to be able to start IV’s, we had enough to be able to, uh, bandage… people up” (RN8). Nurses reserved the limited supplies for the direst circumstances. Diagnostic

capability frequently didn't exist, and diagnoses were based on educated guesses. "We didn't have stuff" (RN11). "We were writing on people's chests what – what we could" (RN11). "We didn't have drugs at all for hours" (RN11). "The few blood tubings that we could get, we deferred those for the patients that came in pulseless. . . . And, of course, no IV pumps" (RN10).

Nurses frequently worked extended shifts: "twenty-six or twenty-eight hours," others would make it to their shelter "by 11:00, midnight," or would end their work when the work "was done." "I reported on the middle of Friday morning and worked twelve hours a day until I was released around 1:00 o'clock on Monday" (RN1). "You have sixteen- to twenty-hour days, to begin with, for the first few days or so" (RN6). "Sixteen, eighteen hours." "Don't matter if I'm laying in my cot, I'm already getting my day planned out for the next day. That's what I'm there for. That's why you fatigue yourself out in the first five days" (RN6). "I worked twenty-two nights straight" (RN10).

Other times, work shifts were shortened because of the discomfort of "walking on … asphalt," working in "steel-toed boots," the "claustrophobic" feeling of the makeshift hospital tent placed on a "parking lot," "the noise of all the generators and everything," or the "hundred and twenty" degree temperatures with "no trees" to provide shade.

Ensuring public health standards became difficult. Cholera beds were "eighteen inches from each other" and there were "flies." Nurses dumped buckets of "bodily fluids" into large "tanks that held feces." "We didn't wear gloves" and patients with "contagious illness" could "not be isolated" (RN10). Nurses had to "compete with, uh, a lot of dirt,

you know, uh, a lot of, uh, you know, just debris and stuff, uh, that – that you would not normally be exposed to" (RN8). "We had …trouble with mice" (RN11).

Municipal "water tanks that are up above were down" and "actually pulled up out of the ground" (RN1).The failure of a community water system prevented hospital surgeries from being performed along with impeding food and linen service, climate control, and the ability to "wash your hands" and "flush the toilets." A hurricane evacuation shelter "lost sewer … [and] lost drinking water" for about three days. At a triage tent, there was a place to "take stool and void [i.e. human waste] and, a dumpsite, um, outside the tent" (RN7) but "no bathroom" for patients.

Nurses lost their homes; some endured mass housing. One nurse didn't "even know…where you're gonna sleep," another "slept between two men … in like a warehouse…with 200 cots" (RN1). Others slept in the "same athletic center as where we were treating the patients, [we nurses] shared … our cots" (RN4), or had to "spend the night in a… prison area." Others slept in a "hotel," spare bedroom in a "gated community," or in a "shelter."

Nurses "didn't have much … access to food right then" (RN1), or had "awful shelter food," or "anything one could find." "There was nobody in the kitchen to cook" (RN5). "The produce, it didn't last for long because there was no refrigeration. There was no milk or eggs or dairy or anything that required refrigeration. No frozen foods" (RN1).

Lack of power disabled other structural systems (e.g. water, communications, and food). Response teams deployed to the disaster region "couldn't get gas" or gas had to be "manually pumped" and was "rationed."

There weren't "enough ambulances." Ambulances had "no oxygen, they have nothing …basically … two people in the front seat, driving. Nobody takes care of the patient on the way" (RN10).

Traffic "lights weren't working." "Roads were torn up" or "were just a parking lot." Buildings and public structures were "just piles and piles of debris, just torn-up debris and, um, blocks and bricks and, um, cement structures [laughing] that were not where they started" (RN7). "In the parking lot … there were no cars. I mean, there were car parts, but there was no cars left intact."

Nurses labored in the "stifling, oppressive heat." Others breathed the "smoke of burning debris" or worked while "it was raining off and on that whole week." There were "vehicles …housing, building materials, a whole bunch of stuff" washed into the ocean. The wind "split apart … two buildings joined together…. It was quite a force."

"Gas and food could not be transported." Transportation for patients was improvised. Patients were "loaded into pickups … cars, whatever they could get 'em into." Nurses abandoned their vehicles and walked, needed "four-wheel drive" vehicles, or flew in a "C-130 cargo plane…a new experience."

Security and safety were reduced as nurses worked in remote areas of disaster: "The military police were back and forth." Nurses had "some of our equipment stolen." One nurse was told to seek shelter from threatening weather in the destroyed hospital itself.

The communications "infrastructure … fell apart." Messages from the state-level health department "didn't get" to the affected county's health department. "Cell phones

[from a specific provider] didn't work" in that area. Cell towers were "knocked down." In a shelter, "the phones didn't work." Cell towers that were working had limited access because they "had a lot of calls on them." Alternate communication methods were utilized as ham radio operators set up in "a parking lot" and "in the newborn nursery."

Cash became a scarce commodity and the only means of exchange for procuring necessities:

> There was no electricity and … the whole banking system went down. … Only those people who had green cash money could go to a grocery store and make a purchase or … purchase gas. (RN1)

Within this chaotic *world,* along with the other existential grounds that nurses experienced during disaster, several themes were discerned. These will now be described.

Figural themes

Central theme: "*You came to not normal land*"

The transcendent theme of "*You came to not normal land"* appears in each participant's transcript. Nurses' environmental experience of disaster nursing, whether planned or accidental, was unlike their 'normal' daily environment of nursing. Across their deployment sites, they described sectors of everyday society which were 'not normal' and which altered their routine and standard ways of functioning as a nurse. The patients they encountered were not part of their usual patient demographics. The physical structure of the hospital was unusable or uninhabitable. Hospital-based care gave way to overcrowded triage tents and public buildings designed for social gatherings. Healthcare supplies became scarce, unavailable, and were not the accustomed and familiar versions. The sanctioned and regulated methods of providing First World nursing were impeded.

Nurses were unable to follow the usual structure of nursing training and hospital policy. Regulations and laws designed to protect patients were broken. These 'not normal' situations of disaster conditions created acute dissonance with the normal expectations, behavior, and actions of nurses.

The thematic structure of nurses' experience of the environment of disaster is shown below (see Figure 4.1). When a disaster occurred, nurses abruptly transitioned from their usual, 'normal' world into 'not normal land.' This central theme "*You came to not normal land,*" found within the inner orange explosion graphic, symbolizes the not normal, chaotic, abruptly disrupted world of the disaster environment. During their response at the disaster location, nurses experienced three interacting, global themes: "*All the resources was gone,*" "*You prepare, and prepare, and you are unprepared,*" "*It can be done, it's just different,*" A final theme, "*Stuff that sticks with you,*" summarizes aspects of the disaster that remained with nurses when they returned to their 'normal' lives.

Theme One: "*All the resources was gone*"

Nurses have an expectation when they report to their place of work - whether school, prison, clinic, or hospital - they will have an adequate amount of suitable and necessary healthcare supplies, clean and private treatment rooms, and a finite, even if lengthy, schedule of patients for the day. They depend upon functional lighting, reasonable climate-control, water, food, medicines and labs, patient and nurse furniture, bathroom facilities, computer and telephone capabilities, and reasonable safety. The

Figure 4.1 Thematic structure of nurses' experience of the environment of disaster

focus of the nurse is on the healthcare setting, and nurses are generally unmindful of their dependence upon municipally- and privately-supplied enabling structural systems.

The disaster event disturbed this normally invisible order, and brought the reliance upon these intertwined supporting sectors to the forefront. Highlighting the dependence on social relationships and functional systems for recovery from a disaster, one nurse explained this in the context of public health and vulnerable populations, the people most in need of assistance and most likely to be encountered after a disaster occurs:

> The populations that you are dealing with in . . . are my public health populations. They're already vulnerable. They're already at risk. . . . But here's the reality: If you have money, if – if you live in a house like I live in, you'll find somewhere to go. You'll have resources. You will work your systems. .. Your – you come from a position of strength. You will have loss, and you may have personal loss, human loss, pet loss, house loss, but you still have systems. …. You usually have relationships and family and friends and people who still have stuff that can sustain you. … When you're living down under the bridge to begin with, and it

> floods, where do you go? What do you do? How do you get food? …. How do you shower when the – the homeless shelter has been washed away that you usually go to in the evening? Um, when you're – you're working poor and you're using public transportation to get to work and that's all wiped out now and you don't know where your next paycheck's coming from, those – those are the populations I'm still dealing with. (RN3)

The loss of these functional systems also impacted the nurse. "The environment" became "so drastically different than where … we had worked in our nice, plush little hospital and we'd complain when it was a little too hot or a little too cold" (RN7).

The usual and all-encompassing work of nursing became a small piece of the multiple challenges facing nurses in the disaster environment:

> A lot of your disasters, it's not nursing as much….. We didn't have sick people coming in. Um, floods, yeah, you have some, but it's not your sick people and things. (RN5)

> I'm a nurse but it was actually a very small piece of what's going on in the grand spectrum of things, and it was learning the cultures and the, um – what I have to work with and what I don't have to work with are even bigger. (RN6)

Determining which resources were still available, overcoming multiple challenges arising from the loss of supporting infrastructure and systems, and fear and discomfort in these chaotic settings became the larger part of each nurse's experience in a disaster environment.

> Their environment … was gone, um, and all the resources was gone…. you had to create an environment to work in. (RN6)

During disaster, nurses did not only experience a failure of their normal environment, the healthcare sector; they experienced numerous failures and breakdowns in the functional sectors of society that are necessary for the healthcare setting to function

as designed by Western standards. They encountered "multiple challenges" of numerous systems that were no longer "normal" during their experiences.

A nurse described the cascading deleterious effects from a contaminated water supply as "it's not business as usual anymore" when the lack of water affected housekeeping, food service, sanitation, climate control, and precluded surgery in the hospital where she was employed. As demonstrated by this outage, the effects of this single system failure became compounded because of its interdependencies with other additional systems. Nurses then had to deal with the "multiple challenges" and "a lot of hurdles to overcome" in the altered environment following a disaster event. Systems, staff, and supplies usually maintained and managed by others became their responsibility, in addition to their normal healthcare responsibilities.

> It was a politically unstable, infrastructure-deficient area. So I think what stands out . . . was the multiple challenges of trying to provide healthcare in this setting in which you had to be acutely aware of every aspect of the surroundings including the political climate, the level of violence surrounding the areas that we worked in, the patient load, the skill level or lack of skill level of the local staff as well as the international staff that was coming in to help, the relative inexperience of most of the national staff that came in, and . . . then the climate was difficult, was, you know, really, really hot, humid, and supplies and resources were very limited. (RN10)

She went on to describe the lack of food, logistical issues regarding toilet paper, scheduling difficulties with nurses, and the inappropriate expertise of physicians in a cholera treatment center:

> You just had to kind of try to figure out all these kind of different multiple things that needed to be done. …We were kind of thrust into these various, you know, positions of, um, trying to do everything, kind of multiple everything for everyone. And it was over Christmas. It was hard. We didn't have very many volunteers. (RN10)

> I remember one night we had four patients that had gone into a pulmonary edema and I had ninety [mg] of Lasix, period. For the whole night, ninety, um, of IV Lasix, no p.o. [oral] diuretics. And it was political, it was election time, so the gangs were out full force. No one – it was the middle of the night--no one would bring us anything because it was too dangerous to be on the roads. And we were working twenty-four-hour shifts at that point in time, trying to stay off the roads as much as possible. So, of course, we were all fatigued. Um, so that was a – you know, that was a challenge, trying to do what you can with very limited resources. (RN10)

Another nurse described the multiple challenges she experienced as both a survivor of a hurricane and then, as soon as she could extricate herself, as a responder. During the hurricane itself:

> The heat…was oppressive. You had all this stress going on. There was so much loss all around you, and then you were seeing this crazy crap going on … if you had a TV. (RN1)

Once she was able to extricate herself from her home and report for work, there was:

> The heat, no water, very limited food, and the food quality … went down immensely. … No pharmacies, no insurance, cash-only basis of rationed gas and food. (RN1)

Following a tornado, communications "was one of the challenges" (RN7) along with the command center being destroyed and the disaster trailer full of response equipment being blown away. There was no power, she was working in a triage tent with a lack of supplies, cell towers were down, it was heat/cold/rain/threatening weather, and the disaster plan had failed.

Another nurse was "horrified at the things that weren't working… communication, strategies, process, things that just did not work very well" (RN2).

Working in disaster conditions is "major challenging" and "extremely difficult."

> It was "culturally, extremely different. Um [pauses], anyway, so those were just some of the things that were stressful as well as the heat, not getting much sleep. (RN10)

> Communication was challenging. Um, I really – I – I concentrate on that a lot because it was so poor at first. But, as I think back about it, um, that changed pretty quickly, too. And – and within twenty-four hours, we had, certainly, a different communication system set up. (RN7)

The litany of challenges that had to be faced by nurses seemed endless. A nurse providing care to victims in a make-shift tent after an F5 tornado touched down in her town and destroyed the hospital building wondered when the challenges would end:

> And they announced, uh, take shelter, another tornado was coming. … *Oh, no! What* – you know, *What else?* We – we live here with tornados…. You know, I'm not super afraid of a tornado. But after going through that and knowing we were already so compromised, no communication, no electricity in many places. We did have it at that building, but just all these things we <u>already</u> don't have, I was like, *How can we have another tornado right now?* (RN11)

There were also multiple challenges within the healthcare sector beginning with the work location. Nurses worked in a variety of altered settings during a disaster, including their usual work setting inside their hospital or public health department. Nurses also worked in unusual locations and circumstances where the usual functions weren't available or weren't convenient. Nurses needed to learn how to function in these new environments. "They were so different than we were used to" (RN11). They "worked in tents that didn't have walls, just … very … quickly put-up structures," or in "a very nice tent with walls but it was a tent . . . with a plastic vinyl floor." "The staff bathrooms were located in a … modular … building outside the tent." "We used bedside commodes for everyone. And then, you know, we had – didn't have rooms with walls. You had tents or drapes that would come and close, so there was a way to maintain

privacy . . . for your patients" (RN7). "You didn't have enough space to move around. You just had like a walkway [laughs] in-between the beds" (RN11).

Healthcare providers were usually a limited resource in both the immediate and extended aftermath of a disaster. Nurses had to manage hospitals, shelters, and temporary care facilities without enough staff, without enough experienced staff, or sometimes without willing staff.

Depending on the nature of the disaster, local staff could not make it in to work. In a rural, mountainous county during a flood, local nurses simply

> couldn't get in … unless they climbed over the mountain. And, you know, some people can't climb over the mountains, and some people, it was more important to take care of their own home. (RN5)

In some cases, there were nurses available but their specialty training rendered them less useful because they were unfamiliar with the basic care of patients:

> Like, they would bring in two or three OB nurses, and they would kind of have nothing to do because there was no deliveries. So eventually they started kind of helping with other things just to keep busy. (RN11)

Nurses who deployed to a distant event had a far different experience than local nurses. During deployed experiences, all nurses commented on the lack of nurses and physicians, which along with the large numbers of patients and clients, created a "desperate," "crazy," and "just nuts" situation in regards to the demands on staff present in the already "chaotic" environment.

There was a lack of physicians, or physicians without the requisite experience or expertise:

> There was a doctor out there who was just totally out of her league. And, uh, the humanitarian thing to do was to get her outta there because she was not practicing safe medicine. (RN2)

> And, for whatever reason, I'm sure there was a shortage of physicians as well, but we had everything from an OB-trained physician to an ophthalmologist running our cholera treatment center. (RN10)

> This kid's looking kind of bad … and the docs that I had, like, didn't – one is an ortho resident, I remember, and one was like a family practice doc. (RN10)

Sufficient levels of nurses to staff care facilities were difficult to obtain for a number of reasons. Nurses may not have been available to deploy, were inexperienced in the type of care needed, unprepared for the disaster conditions in general, or there for the "spending cash" or otherwise unwilling to meet the need at hand.

> And it wasn't a lot of us in that shelter … there was three of us. And there was like hundreds of people! (RN9)

> [Our] cholera treatment center …handled up to two hundred and forty patients … [with] five North American nurses, ten Haitian nurses. It was pretty overwhelming, [our] patient load. (RN10)

> So you can get a nurse for ten days, um, from their employer, perhaps; but you may not be able to get them for three weeks. (RN2)

The lack of nurses and lack of nurses with suitable expertise was common among other nurses deployed domestically in this study. "The level of inexperience was a continual challenge" (RN10). Nurses had discomfort with providing the care needed outside their specialty training, were out of practice because of retirement, or were emotionally or physically unable to tolerate the conditions.

> They've been an OB nurse [laughs], they want to help, but they're not quite – don't have quite the bandwidth, um, and the comfort zone with

> things that are not in their – you know, in their specific area of focus. (RN2)
>
> Some of the nurses that were there helping, um, were retired, you know. So they were – as far as IV skills, they didn't have them. (RN4)
>
> You throw twenty nurses in the same room, *Well, now you guys are all gonna do disaster nursing and then go out in the field and help and do this.* And, uh, you know, one's been an insurance nurse for twenty years. Not knocking her job, it's just there's an expectation of her and it – that's not gonna happen [laughs]. (RN6)
>
> I mostly had labor and delivery nurses, who – who were not used to seeing ….a lot of that sort of, uh, emergencies or – or conditions of the patients coming in. Um, the – there again, the environment, … did affect me because I was over-trying to coordinate labor and deliver nurses [laughing], you know, to act as – as emergency nurses. (RN8)
>
> Our core [Haitian] staff… were …. people who supposedly went to nursing school, medical school, but … many of the nurses couldn't start an IV, didn't know how to regulate IV drips, couldn't do a simple drug calculation, so most of them, … were educated to function about the level of a nurse assistant. (RN10)
>
> Most of the [international] people that came to assist had never treated cholera before. … The vast majority of them had never been to a tropical climate. (RN10)
>
> We were desperately needing help and, um – and so they sent us, like, anyone, like, anyone; like, we got a group in once that was four school nurses, an infection control nurse, a quality assurance nurse, and, you know, like two other nurses that actually had, um, clinical skills that could help us in the cholera treatment center, and four – four older nurses that were retired that were like between seventy and seventy-five years old. (RN10)
>
> We kind of lost [nurses] pretty quickly…. the older ladies couldn't stand the heat. And so we ended up having to put them in the pharmacy, um, back at the base, like counting drugs or something. Anyway, it was kind of crazy. (RN10)

Healthcare providers unwilling to work or meet the needs added to the turmoil, frustration, and workload for nurses on scene. This lack of willingness to work was seen

primarily with "deployed" volunteer nurses and physicians, not HCWs who experienced a local disaster in their own community. It created "difficult" and "chaotic" situations with a resultant shortage of staff, or a shortage of needed specialty coverage.

> There is a percentage [of volunteers] [of workers] all though, that just when they get there, it's like, "Where's my spending cash?" and "Where is –" you know, "Where're we going to eat tonight?" before we even get the day – "Well, you know, we should eat in that restaurant tonight." … I had to fire some–it's like, "Oh, we're going shopping!" [Laughs] And they weren't kidding! … [Laughs] Git! I had to call and get 'em outta there or they would drive me nuts. Not what we're there for at all. (RN6)

> You'd be trying to put together a crew and, you know, people would come with their friends sometimes and so you'd say like, "Okay, great. There's four nurses that work pediatric oncology at some hospital." "Okay, great. So I need one of you on each shift each day." "Oh, no, uh-uh, we have to work together," you know. … And they were volunteers, you know? …So you could try to persuade and you could try to negotiate but, you know, then they'd just do their thing or they just wouldn't show up. You know, they'd just stay in their bed. So, you know. A little chaotic. (RN10)

> And you had all the doctors there and, you know, you might have an endocrinologist and you might have a family practice doctor and you think, *Great!* "So which one of you wants to cover pediatrics?" … "Well, we're not covering pediatrics". "Oh, no, no, I don't like kids". "No, I don't want to work with kids." You know. And, literally, a third of the population was probably ten or under, you know. (RN10)

Cultural differences were perceived by one nurse as a factor in nurse unwillingness to work in Haiti:

> The Haitian staff, um, had this feeling that, you know, regardless of when they were scheduled there were just days they couldn't work. So like on Christmas Day I think I had two Haitian nurses show up. Of the nine that were scheduled. (RN10)

> The Haitian staff, who… really were not used to having jobs…. And weren't used to being reliable and also weren't really used to working. Um, because, apparently, most of them thought the job of a nurse was to sit around and give someone else orders as to what to do. So I had a lot of nurses who refused, for example – it's kind of gross, but cholera cots have

> a hole in the middle … and a bucket underneath, generally. So that bucket, of course, fills with feces, and you have to dump it or it's gonna overflow, right…. So all my ex-pat staff is running around trying to not only see the patients, write some orders, take care of their IV's, but dump buckets, and the Haitian staff were saying, "Oh, no, I don't do buckets. Oh, no, I don't dump – no, I don't dump buckets." … It was just, you know, culturally, extremely different. (RN10)

The problem of uncredentialed, self-deployed HCWs also added to the stress and confusion of the healthcare provisioning scene.

> There wasn't a lot of credential checking….there was a lot of self-deployed people [laughs] …who were flying under the radar and, uh, don't always come with the best of, uh, either intentions, or their intentions are good but their skill set maybe isn't or whatever. (RN2)

In an alternate care facility created in a civic auditorium, one nurse said it was "scary" when she worked with a physician who appeared to be completely unaware of the nature of healthcare required or available in the frantic aftermath following a tornado.

> [He] claimed he was a retired physician and had driven down from a town about an hour and a half north of here, and he was a little bit on the elderly side. But, anyway, he says, "I need a CBC and an EKG stat," and I'm like, "We've had a tornado. We don't have any lab here. We don't have an EKG machine yet." [Laughs] You know. And he was kind of like – looking at me like, "Well, why not?" You know? [Laughs] I was like, *"We had a tornado!"* (RN11)

This quick-thinking nurse also ran across "shady-character-looking people" who claimed to be "CNA's":

> And we said, "Well, uh, we don't need any at this time, and if we do we'll put an announcement on the radio. So why don't you go home and listen for the radio." (RN11)

> There was, uh, a person who was a lab tech that presented themself as a physician, and they were sewing up people and treating people and, uh, removing objects from people and doing – kind of doing kind of minor surgery and stuff. And when that was discovered, they got the Highway

> Patrol in there and got him shut down. … I mean, that … was ridiculous. (RN11)

Nurses who deployed without being fully self-sustaining took away vital resources that were already in short supply in the community because of the disaster. Credentialed nurses who self-deployed had difficulty finding a place to sleep, adding to the stress of the situation and demands on the already overwhelmed:

> Some nurses from [northeast city] that self-deployed and they didn't have a – they couldn't find a place, and so we were working different shifts and it's like, "Well, you can sleep on my cot when I'm out on the floor." (RN4)

A self-deploying nurses in this study

> …bought a [plane] ticket. We went. We rented a car. We drove. And then we find, uh, a [national organization] center there. And so then they told us, "Well, go here," and then they gave us the directions to that shelter….then we had to figure out, *Well, where <u>are</u> we gonna stay?* [Laughing] 'Cause we didn't have anywhere to stay. (RN9)

The lack of adequate numbers of experienced and willing staffing placed additional burdens on nurses in this study. In a flood situation, nursing staff marooned in the hospital filled many roles:

> You didn't have staff to clean, you ended up doing the cleaning. …. you were on minimal staff. And that got tiring after a while. (RN5)

In the Haitian cholera treatment center, new nurses would arrive, require extensive training, and then leave. The remaining nurses bore the brunt from exhausted long-term staff, and, generally, it was "pretty nuts" and "definitely affected the – the capacity of … the staff to function":

> You'd just get them oriented, after three days they'd start to feel comfortable taking care of their twenty or twenty-five patients, and they were good for a day or two and then they'd leave. So, you know, there was

> this continual, um, attempt to – to bring people up to speed on taking care of . . . this kind of a patient. (RN10)

> All we volunteers that were coming in were really not being taken care of very well, and I think that the medical coordinators that had started in Haiti from shortly after the earthquake and had been there all that time were really burned out. And they didn't want to interact with the short-termers at all. (RN10)

> … A lot of the staff… were leaving for Christmas. So those of us that were left holding the fort were new, fairly new at what we were doing … with almost all the regular people gone [things] were just pretty nuts because nobody really understand things. (RN10)

Nurses in this study described the frequent loss of nursing staff because of the difficult and unexpected conditions. Losing these nurses put additional workload on the study nurses:

> We've had people go home the first day or two days 'cause it's just overwhelming emotionally, and [they] can't sleep in the gym. (RN6)

> We had some pretty dissatisfied volunteers. We had a couple of volunteers that just left early. (RN10)

> The school nurses, I found one crying in the bathroom on the third day and said, "I've picked the wrong profession," that, "I'm in the wrong profession. I – I really shouldn't be a nurse," you know…. And I tried to convince her that, like, "Don't base that on our treatment center experience 'cause this is not normal, okay? … You came to Not Normal Land." (RN10)

The lack of nursing expertise along with the patient load and lack of staff also adversely affected patient care:

> Whoever had been on the dayshift had put a nurse in the peds area that didn't have peds experience. So they got an IV in this kid … [and] the kid got eight hundred mils of fluid when he should have been getting somewhere around a hundred and fifty an hour. … So this kid's gotten eighteen hundred mils of fluid in a pretty short period of time and he's, you know, breathing ninety times a minute and protracted and looking kind of bad. (RN10)

Without adequate tangible and human resources, the altered conditions and reduced capability of the disaster environment created conditions where providing healthcare became cumbersome and time-consuming. Nurses first had to learn how to function in the altered care setting before they could provide care to patients.

> They trained us on what we needed to train people on how to operate and function in the tent. … It was things like, um, the safety features, uh, where the fire extinguishers are, um [clears throat], the [pauses], gosh, *Don't hang things on these poles.* It – it was just how – the environment of the tent being so different than we were used to. … *Keep the zipper zipped to keep the flies down and keep the environment controlled*, how to adjust your temperature. And there's just a lot of things about the tent. (RN11)

Patient care was also delayed when patients needing treatment were transported to nearby towns because the local system was damaged and overwhelmed:

> We – we sent a lot of people on school buses to [larger town] or other hospitals. (RN11)

Communication and procurement slowed down as previously automated systems logistics and communication systems were replaced by time-consuming manual solutions:

> We had no tube system, no intercom system. We used, uh, some runners to deliver things. (RN11)

> You didn't have any way to notify the patient or notify families if they were there, and for days…. there were no phones. (RN5)

Already short-staffed, additional manual labor was required by the nurses to replace non-functional sanitation mechanical systems or to compensate for the lack of proximity of portable hygiene facilities. These alternate but necessary solutions further compounded the lack of time available for nurses to provide nursing care to the excessive number of patients.

> We had to assign people….to bucket flush the toilets. (RN4)

> [Taking people to the] portable shower facility …was such an ordeal … that we mostly just did the bed baths. And the water was quite a distance from – I mean, it was kind of like camping out, nothing's [laughs] convenient. (RN11)

Like the loss of the water system, the loss of power had cascading effects on other systems that are integral for providing healthcare. Many systems dependent on electricity were forced to return to manual functioning, or created impediments to obtaining needed information which blocked patient access to needed medications.

> By middle of the day on Monday there was no use of a debit card, no kind of credit card, no going to an ATM. (RN1)

Dependent on internet access for prescription, authorization, verification, and payment, obtaining needed medications became exceptionally problematic and required unusual efforts to obtain them.

> [There was] no electricity to operate the pharmacies, the same situation as with the grocery stores and the gas stations. They didn't have a … computer system, so they couldn't fill prescriptions unless you could show a bottle that said there was refills on it. (RN1)

> There was no insurance because that's all computer and electronic, too, so you had to be prepared to pay cash money for any medication that you got. And some medicines, if you don't have your insurance, are just through the roof, an impossibility to, um, purchase them … unless you got a couple of thousand dollars in cash, you know, around the house, and most people don't. (RN1)

Impassable roads, frequent repairs of vehicle tires damaged by road debris, and road congestion from evacuating residents slowed nurse navigation and transportation, requiring more time than usual to travel anywhere:

> You were forever losing tires [to] puncture[d] tires. (RN1)

> My nurse buddy and I drove as close as we could get and then got out of the car and just left it sitting and climbed over debris and stuff. (RN1)
>
> The thirty-minute drive to [city hospital] was now over two hours, unpredictably two hours. (RN2)

The failures of normal systems and the multiple difficulties help paint the working landscape of the disaster environment encountered by nurses as "weird," "scary," "freaky," "creepy," "uncomfortable," and "odd." Weather conditions were frightening, and nurses' sense of safety was reduced. A nurse was "just freaked out" after experiencing Hurricane Katrina directly. Another nurse saw the tornado warning on the television and had "just kind of a frightening feeling." Viewing the aftermath of Hurricane Katrina, a nurse who deployed into the affected region said it "scared me a little bit to just see how a storm can impact. Like, I just – I couldn't imagine being a person waking up – or coming back and seeing my house gone" (RN9). Because of the wind, opening the door at the shelter "would just suck you and roll you [laughs] all up into the grass and you'd feel the rain and look up and wonder how you got there" (RN6).

The living conditions were unsettling for nurses and survivors:

> In a shelter setting, "You've got a drug, um, addict that's wanting to steal things, trying to go through people's stuff, … threatening them if they have any narcotics, you know, "You have cigarettes? You have any alcohol with you?" that kind of thing. Um, that was freaking people out, obviously. (RN1)
>
> Sharing a warehouse with two hundred …mostly male….people was weird….odd…freaky. (RN1)
>
> [Volunteer housing] didn't feel safe to me. … Just something said, *Don't stay here,* and I didn't. (RN9)

Other unusual conditions were also disturbing for nurses. In devastated areas of a disaster,

> There's no way to call for help. (RN1)

> There was a military environment, a very strong military presence; it had to be there because of looters. (RN1)

> The ICU nurses were freaking out because there were earwigs in the water. (RN4)

> The National Guard said "You can't come down here. It's unsafe." You know. "You need to turn around right away so that, you know, we don't take you in." (RN9)

Hundreds of rows of post office boxes placed by the US government for displaced hurricane survivors became:

> …just a scary, creepy place. And it – if you were going there in the dark, you were asking for trouble. (RN1)

Tasked with providing healthcare when the systems around you are dysfunctional created "an impossible level of work." The disaster environment was described globally by nurses as being "just chaos all around", "chaotic"…not "what we're used to," "unexpected," having "no control," "the swirling … mass," of "disorder," A "disruption" "of pattern" and "order" and "structure," of being "chaos and . . . tension and . . . stress."

> Chaos is the unknown that we spend all of our lives protecting against as humans. We, uh, develop those patterns. We put safe space around us. We have our own world that we live in. ….. And the chaos means that those boundaries have been disrupted and taken away. I think in nursing, uh, you see that individual chaos each time you work with a patient. … I think in disaster it is compounded hand-over-fist and in such an unruly, unexpected way because you have whole communities, whole sectors, that have these boundaries now in shreds, in systems. (RN3)

Nurses experienced chaos at the individual level, questioning their ability to function in the altered and disrupted healthcare setting:

> *Can I do this? Can I really do this? What has my training given me? Am I really gonna be able to do this?* (RN3)

> You don't – you don't really know how well you're gonna perform. Um, you know, are you – are you gonna freeze? You know, are you – what – whatever you see, is it gonna be too much for you to handle? (RN8)

> The poor infection control nurse … she couldn't handle it. So after a day, she dropped out. (RN10)

In summary, nurses experienced a physically and psychologically challenging environment. The healthcare environment presented myriad challenges as normal functions and structures no longer worked as designed. However, nursing was a "small piece" of the multiple challenges from outside of nursing that nurses now had to deal with alongside nursing care for an increased workload of patients, such as political, safety, sanitation, communications, logistical, and transportation issues, to name just a few.

"So, anyway, you just have all these things…" (RN10).

Theme Two: "*You prepare and you prepare but you're not prepared*"

This second identified theme "*You prepare and you prepare but you're not prepared"* is a part of "*You came to not normal land"* in the sense that nurses had not properly prepared for, imagined, thought about, expected, experienced, or simply didn't know about what the actual conditions of disaster response would be. The disaster world they imagined and expected was a normally functioning world, albeit with an enhanced level of patients - by definition an emergency. Their nursing education addressed 'normal' situations and emergency situations in a fully-functioning hospital, and their disaster preparedness training focused on

having systems to support the response. “I don’t think that the whole picture had set in yet for them” (RN4).

Nurses in this study had not received training relevant to the disaster conditions they experienced. This may stem from a mistaken belief that a nurse will not be anywhere close to the scene of disaster. Despite extensive experience with disaster response, one nurse stated:

> So the disaster, yes, it’s icky and it doesn’t look pretty, um, but in the first place, in most of the places nurses end up, they’re not in the hot zone. (RN2)

However, all nurses (including the above nurse) in this study described damage and frontline destruction observed in the “hot zone.”

Nurses had not received disaster-specific information and relevant training for the conditions they encountered. Nurses thought their life experience, their nursing training, or previous work experience would suffice in the disaster setting. Instead, they experienced ‘being thrown’, finding themselves in situations they didn’t choose to be in. All eleven nurses interviewed shared their lack of preparedness for their individual working conditions:

> I was a floor nurse in a hospital where I had at least a year experience, knowing that, knowing those people, knowing my – the routine patients that I had. And then to be disrupted, to be thrown – you know, to be told that you’ve gotta empty your floor, thirty-five patients, by the end of the evening; you’ve gotta figure out who you’re keeping in the hospital, who you’re sending home; you’ve gotta discharge plan ’em; and, after you’re all done with that, by the way, you’re then gonna ship down to the tent and start taking care of the people with the flu. (RN3)

> I wasn’t prepared for where I was going to work. I wasn’t prepared for what supplies we had to use. Um, I wasn’t prepared for the mass flood of turnout of healthcare providers that showed up. (RN7)

Sponsoring disaster relief organizations determine the training they will provide to or require of their nurses. There is no standard beyond being a credentialed RN. As an evacuation shelter manager, a nurse explained that her organization-provided disaster training consisted of "*This is the paperwork you fill out*" (RN2). She said her organization "doesn't make any… bones about, *We're giving you the skeleton of operations; we're not teaching you how to be a nurse"* (RN2). In another situation, the sponsoring organization had deployed their nurse with erroneous information and incorrect expectations:

> [This nurse asked them,] "Do I need a vest?" That was her own home chapter telling her that, "Oh, no, they give you a vest when you get there. Oh, they'll get you a vehicle when you get there." … So she didn't bring like a sleeping bag, she hadn't brought anything, … Somebody on their … chapter end has not educated them properly…It…just makes it tough [for the nurse managing the shelter]. (RN6)

From a systems level, disaster preparedness activities have prepared nurses for emergency and acute types of nursing during disaster, but not the prevailing environmental conditions during a disaster or the fundamental and public health types of caring and healthcare required. Disaster organizations and entities haven't prepared nurses for the failure of structural systems that enable healthcare to function.

> Most of the nurses joined the [volunteer org name] … because they have this mistaken belief that they are coming to fix trauma and it's gonna be exciting and it's gonna be lights and siren and it's going to be – and they have that mistaken belief because the – the systems perpetuate that belief that that's what nursing is in disaster. …. So those are sort of like the preparation levels you get. (RN3)

> Disaster education for nurses is about bigger and better trauma education. It has nothing to do with the aftermath and the sustainment that happens after three days and getting people back into their new lives, um, which I think is truly public health nursing. ….. And I think that even our –

> [laughing] you know, I've always laughed because the disaster training for nurses is, by and far, acute-based. ….. And it's hospital-based. It's just like our nursing education system. And the reality is that you need about ninety percent public health nurses and ten percent acute-based nurses in disaster. …… And, um, that means that the acute-care nurses, who comprise about ninety percent of our population, REALLY (voice raised) need to be trained in public health. (RN3)

> I just wanna puke. It is unbelievable to me, having been in the disaster world for fifteen years, that we think we bring nurses in and teach them how to extract people from cars and vehicles and – and tell them about the systems we have in place – oh, that's another big one, *Here's the systems and they're gonna work for you* – until they don't work, which is about the first hour in – *and, by the way, here's how you triage your patients*, as if that's all there is to learn. (RN3)

Instead, the disaster conditions and broken systems they encountered, as described in the previous theme, were clearly unexpected and 'not normal' to them. Hospital emergency planners had not planned for a disaster to damage their building beyond use. Staff had frequently practiced the preparedness plan, running the drills from the disaster command center, yet when the tornado touched down, their disaster plan became unusable:

> The command center was in the building, you know. The building wasn't there. … I mean, you – you prepare and you prepare but you're not prepared. (RN7)

An experienced disaster nurse described the benefit of disaster planning during a disaster, knowing that plans will fail:

> It goes to hell in a handbasket, any planning you had made. Um, the value of planning, as I see it, is in the relationships, nothing more. Nothing will last on paper, nothing will last on process. (RN3)

There were two identified subthemes within Theme Two: "*I had never experienced anything like that"* and *"You just don't know."*

Subtheme: "***I had never experienced anything like that***"

Nurses in this study had never experienced particular disaster settings or had never envisioned the situation they encountered. These were worlds outside their usual care setting and realm of experience. Erroneous assumptions were made regarding conditions, capabilities, and what will or will not occur during a disaster. Describing her experience of working in a triage tent without toilet facilities for her patients, one nurse admitted she "had always taken for granted [laughing] that [our] patients would have a restroom" (RN7). Others stated that their preparedness planners hadn't expected the actual disaster to happen and had made assumptions that they would never "experience anything like that."

> People, I think personality-wise, think – believe, in their – *Oh, it's never gonna happen.* Oh, yeah, it is! (RN5)

> It was planned that if the hospital was unusable, which everybody thought, *Never gonna happen,* uh, we would go to [local auditorium name]. (RN11)

When a disaster event transpired, unexpected incidents occurred. Nurses had never experienced these situations, had never contemplated the possibility of such events ever occurring. Nurses and HCWs were asked to fill unfamiliar positions and roles. Without prior notice or training, an exhausted, sleep-deprived nurse was pressed into duty as the public information officer (PIO) after working all night in the emergency department of her hospital following a train crash in her city:

> There was somebody from Japan on that train. You know, we were getting calls from London. So all the major news, which I had never experienced anything like that before. (RN4)

In another incident, an ER nurse directed the logistics of an alternate care site set up in a civic auditorium.

> "How did you end up being the one with the mic?" … I said, "You did such a good job," and she goes, "Um, they just handed it to me when I walked in and said, 'You're in charge'" [laughs]. (RN11)

Another nurse was amazed at when local residents dumped unwanted family members at an evacuation shelter during a hurricane.

> I never fathomed in a million years that people would just pull up in hurricane-type weather and just drop people off [at a shelter] and drive off.… it was kind of like the standard 'cause they already had a process for us to monitor it [laughs], something like, *This is the norm here.* Uh, so that was kind of odd, knowing that that's going on. (RN6)

Nurses were not prepared for many of the events they saw and experienced. Unexpected events arose from seemingly logical decisions made to solve immediate problems. A nurse responder from a northern geographic area was unfamiliar with behaviors of southern fauna, and decisions made to solve sanitation issues created unexpected and unusual issues for patient and responder:

> They wanted to put the outhouses … far away from the building, um, so not to create more issues. … As the water tables rose and stuff, it'd get wet and it'd go down in the evenings, and these fields would fill up with coiled snakes. … And, um, so it became a minefield going out to the outhouse. … It was just kind of like, wow, yeah, I never saw that coming, coiled snakes. Minefield [laughs]. You don't think of those things. And then we started – all these black widows [a poisonous spider] started showing up. … It was kind of just like a common thing there. It was – that was really interesting.… (RN6)

Interesting is defined as something that 'attracts your attention and makes you want to learn more about it' (Interesting, 2015). This definition overlaps in meaning with *curious*, 'a desire to learn or know more about something or someone,' but *curious* also describes something 'strange, unusual, or unexpected' (Curious, 2015).

Interesting, as in strange, unusual, or unexpected, was used by nurses in this study to describe many situations that occurred in the disaster environment: "The idea of… an alternate care site" with "basically your infrastructure gone, the hospitals … overwhelmed,…inundated [and] diverting chest pain patients" to their "athletic center;" "a mobile bathroom;" "healthcare supplies….don't have a physician, but I have chest tubes;" the less than desired work ethic of non-local responders; patients' hesitancy towards being bussed to a hospital out of town; townspeople and physicians who had the foresight to consider future transportation needs for patients; the lack of preparedness by administrators; the approach of "threatening weather;" not know "where we were going" when a nurse boarded a C-130 plane during deployment to Hurricane Katrina; and navigating the politics and territoriality of local governments during shelter management.

Different was also frequently used to describe the unusual or evolving conditions of the disaster environment. Pumping water into the hospital from a river during a water crisis was "different." Another nurse felt prepared for the regularly occurring floods in her rural hometown, but she was unprepared for different types of disaster events impacting her rural community: a derecho (straight-line winds and thunderstorms) and water system contamination.

> You know, we're used to floods…… But that, again, was a totally new thing that nobody'd ever worked on….. So, you know, that was different. But that was just a different kind of disaster. … (RN5).

The unexpected levels of unwanted political and media attention and interference following a regional chemical spill that contaminated the county's water were also "different" for her.

A nurse who self-deployed to her first disaster found the entire disaster environment to be different and unknown compared to what she thought it would be like. She ventured from her lodging in a middle-class neighborhood and drove to a lower income neighborhood nearby:

> I was glad I got to see [the socioeconomic difference of impact] 'cause had we not, I wouldn't know, I would have just had this like different idea in my head. But just to see it was different. … So much debris and stuff in the … streets. I wanna say probably only five miles from the shelter from where we were at, and it's just a completely different landscape. (RN9)

Not having any prior disaster training or experience, this nurse:

> … just couldn't imagine. So just the … environment of everything, to me, was just kind of like, *Wow.* I was taken aback from it … And I was like, *Wow,* like it was just surprising … I'd never been to a disaster. I don't know – you know, they would say, "Oh, the National Guard has been sent out and they're gonna help." I'd never seen it. So to actually see that and, you know, just see how a process is put together so quickly, I … was just impressed. (RN9)

Subtheme: **"*You just don't know*"**

In describing their environments during disaster, nurses lacked information regarding the disaster situation taking place around them from the basics of "How do I get there?" and, "When will I be back?" to tactical knowledge of how to interact with the larger systems around them. They didn't know a lot of things. For example, spontaneously creating an alternate care facility in her school of nursing simulation laboratory, a nurse did not know how to tie-in to the local community disaster response plan:

> We realized, *We're not gonna get anybody because they just don't know to bring them here. …* And we didn't know how to let them know that we could have taken patients. (RN7)

Abandoning that tack, she proceeded to drive to the scene of the tornado, but she "didn't know … what [roads were] open" and she "didn't know if the patients were all out of the hospital by that point." Asking a police officer she encountered for the location of the city command center, "it didn't appear to me that anyone really knew" (RN7).

Immersed in the normal workday of her hospital setting, one nurse was unaware of the threatening weather conditions surrounding her:

> We had no warning … that it was hitting. … We knew it was stormy weather, but we didn't know a tornado was on top of us, much less an F5. … F5! So . . . everybody was still in place when it hit, in their normal places. (RN11)

Volunteering for deployment, another nurse didn't know what supplies and gear she needed to bring with her:

> We were told we had to be self-sustaining for two weeks. … So, you know, what do you take? (RN4)

Part of not knowing is never having thought about the full range of possibilities or the ramifications of a situation, or "the scope of things you need to think about." It is difficult to plan for all possibilities of the types of disaster one might encounter.

A public health nurse had not previously contemplated about a specific type of disaster affecting her community. She had her department prepared for flood and influenza:

> …. but some of the things that have come across lately are just things we've never – never thought of … a derecho, didn't even know what a derecho was. Never thought of a, um, water crisis. (RN5)

In a specific care setting, not thinking through the whole picture can be detrimental to those being helped. Setting up a shelter in the middle of summer in the south, one wouldn't think you need to procure wool blankets:

> But the fact is, to keep that shelter habitable, it had to have air conditioning. And if you've got air conditioning on at night, people get really cold. (RN2)

In a more extreme example, an experienced disaster nurse reflected on the humanitarian response to the Haiti earthquake and the unintentional outcomes that resulted from ill-formed decisions when little is known about the capabilities of the surrounding healthcare infrastructure:

> I go back to Haiti and I think about, oh, everybody that went in and cut off all those limbs, saved all those lives, and then [the patients] didn't even last three days. [RN3]

Not thinking about the long term ramifications of decisions and the actual physical conditions also affected staff wellness and ability to obtain much-needed rest:

> There was always a debriefing, you know, like at 6:00 o'clock in the morning, so it didn't matter if you had worked till 1:00 o'clock in the morning, at 6:00 o'clock in the morning everybody got up. So not – maybe not thinking that through, that people really need to – to rest, you know. (RN4)

At the systems level, managers not thinking decisions through results in unwarranted faith in their preparedness status:

> It's the same ventilator discussion. …"Got that covered, got three ventilators at our hospitals, and we ordered fifty more." Who's staffing those? … Who's staffing those ventilators? At what cost to the triaging of your level one, two, and threes? … At what cost? … [And no notion] how that was gonna work with other entities. (RN3)

Nurses were working in an unfamiliar environment. Their lack of knowledge about the expected conditions led to trepidation, fear, and professional doubt.

> I have to tell you, I was a little bit afraid. Even though I had been through all the training, you know. … I had friends at work that, "Are you sure you wanna do that?" And I'm like, "Yeah, that's what I've trained for." But, um, yeah, I mean, I think the fear of the unknown, you know – … *Okay, what are we getting into*? (RN4)

Other nurses were aware of their lack of safety and the "the feeling of not knowing."

> You can still [hear] uh, rumblings, um, and not knowing whether, you know, there was any other bombs that were in the area. (RN8)

> I was standing on the… really stupid, but we were all standing on a bridge overlooking the river because there was no other place to go. … And then all of a sudden, the sirens for the fire department went off and we knew that the water had gone over the floodwall and town was being flooded. It's a scary feeling. … You know, *Oh, town's flooding again, okay.* That's – I mean – and then not knowing. (RN5)

Experienced disaster nurses in this study spoke about accepting the presence of the unknown during disaster. Part of 'knowing' was maintaining an awareness of what you don't know.

> The key to not knowing is to understand – to know that you are not in control, that you're doing the best you can, that you're gonna coordinate, you're gonna facilitate, you'll make decisions to the best of your ability, and they may be different decisions two hours from now. … You cannot know. You can make educated decisions. … I don't think you know what is going on outside your doors. (RN3)

> The first disaster that I went to was … basically, *I need to learn how you do it here.* It was almost like orientation. Even though you have a lot of pre-deployment opportunities for classes to take and things that you can do to kind of get familiar with the lingo of the organization, it doesn't really work for me until my feet are on the ground [laughs]. (RN2)

Experienced disaster nurses in the study spoke of the need for nurses to have a comfort with the unknown:

> [Nurses] who thrive [in disaster]….have a little bit of comfort zone in that not knowing…what's gonna come in the door next… I really wasn't at all worried about what was I gonna find. …… and I think if you – if you are anxious about that kind of thing you're not going to find disaster nursing a comfortable place. (RN2)

Another spoke about her "way of operating that does not flip out in emergency" (RN3).

Preparation, knowledge, and experience helped one nurse maintain a calmness for approaching hurricanes. However, the lack of knowledge for unfamiliar events still frightened her. When notified of an approaching hurricane,

> I said, "Aw, it's a hurricane. It's all right. We can deal with this." People were panicking here. … I went, "Yeah, it's a hurricane, whoopee," you know? "It's okay. We can live through this. This is not a disaster, people. We can live through a hurricane." But if you've never been through a hurricane, I guess it is scary. Now, tornadoes scare the … livin' crap outta me! … I've never been through one. So, you know, you put me in something like that, yeah, it – it would be ugly. … I think it depends on where you live, can you be ready for – you're ready for the disaster that you can't anticipate. (RN5)

Some people may simply not be cut out for disaster work:

> I also think there are some individuals that just don't belong in disaster. . . They can't keep their own boundaries intact while they're trying to address the rest of the boundaries for others. (RN3)

> Some people think more clearly than others and … work together as a team and it works. (RN11)

Experience, training, and preparation for and knowledge regarding the expected circumstances are what permitted nurses to deal with the unknown conditions of disaster effectively:

> I think . . . you can build that up. I think you can train that. And I certainly have done that for my fifteen years in disaster with others. (RN3)

Nurses with experience, who had not panicked, or who had a comfort with the not knowing were able to move forward and provide some semblance of healthcare, restructuring the chaos, and re-establishing professional boundaries at a more basic level. A public health nurse familiar with recurring floods in her community stated:

> Having experience … makes it so that when you're in the field in disaster, you're not quite so freaked out. (RN2)

> The more experience I have, you just know how to deal with that. (RN5)

> I'm much calmer and I thrive on them and I try to keep everybody else calm. ….they don't bother me anymore. It's just sort of like, *Oh. Now I can use what I've been training for.* … And you learn from each one. (RN5)

The unknown aspect of disaster work doesn't go away entirely despite experience, knowledge, and training. A senior administrative level nurse, with many disaster deployments, acknowledged:

> I still experience the not knowing. I still experience … the – is this the right decision? (RN3)

Theme Three: "*It can be done; it's just different*"

During a disaster, "the protocol will not stand ….. You can talk protocol, you can talk theoretical, but it comes down to you and the patient and a split-second decision" (RN3). Given the environment of ruptured systems and reduced resources of time, preparedness plans, personnel, equipment, or supplies, nurses found they could not perform their duties in their routine and familiar ways. The structure and direction provided by norms and standards, law and regulation could not be followed when the hospital building no longer existed, clean water was unavailable, or the only healthcare

available was the provision of shelter, food, and water. The usual routine of healthcare was no longer normal.

Instead, nurses "were kind of by the seat of their pants" (RN2) and they had to "make do with what they had" (RN5). This frequently required creativity and flexibility by the nurse and the otherwise unthinkable breaking of nursing maxims and legislative directives, and a restructuring or reframing of what good healthcare entails.

Nurses shared stories of being forced into autonomy again, having the freedom to think freely, creatively, to utilize the best of themselves in the hazy space between normal and not normal, before the healthcare system had regained its old boundaries.

There were three identified subthemes within Theme Three: *"Nursing 101," "Flexible but … structured," and "MacGyvering"*

Subtheme: **"*Nursing 101*"**

The numerous challenges and broken systems that collectively comprised the disaster environment were overwhelming for nurses. It was easy for nurses to be distracted by the unfamiliar scenes and chaos around them.

> [There is] so much movement going on and so many moving parts. And if you looked – if you chose that minute to look at the big picture, not maintain awareness but to get embroiled in the big picture instead of focus, you were done. (RN3)

At an individual level, nurses recognized this need to control the chaos around them and narrowed their field of view to focus on patient care:

> I think, you know, from the nurses' side, um [pause], even though it was chaos in – in the environment, um, you know, with the structures of the buildings, uh, being down, with there being lots of noise, lots of, uh, sirens, lots of, uh, dust, lots of, uh [pause], unsureness of what was going on, um, the nurses themselves, um, worked through that. It – it was as if

> they put that aside and their first priority was to take care of anybody that needed to be taken care of, you know. … You're going, *Oh, my goodness,* you know. I think the adrenaline kicks in. …You tend to, um, detach yourself, if you will, from what you're really seeing or what's going on, and you perfunctorily do what you know to do. (RN8)

> It is chaos but it's organized chaos. … And I think that's why we were able to perform, uh, sufficiently, uh, to be able to care for people, because it is a form of organized chaos. …To me, I feel like, um, because of our training in – in the medical field, uh, the priority is always to take care of the patient. No matter where you're at, no matter what's going on around you or [pause], basically, what sort of environment you're in, the – the main primary thing is to take care of that patient. … Um, so even though you may have chaos going on around you, uh, you know what your primary focus is, and that's what you do. So that's kind of why I say *organized chaos.* (RN8)

By and large, nurses in this study returned to the nursing fundamentals of safety, food, water, and shelter. A nurse with a national disaster organization was responsible for nurse and patient safety:

> I deal with bedbugs for – in the hotels for our nurses, um, and advocate for our nurses, to get them out of that setting. I will advocate for safety within the shelter; um, what does it mean to have, um, uh, a homeless mix versus a pedophile mix. Um, those are the system things that I think about as a public health nurse in terms of safety. (RN3)

Nurses generally provided first aid, food, water, emotional support, and helped with very basic medical needs of traumatized and scared patients and survivors.

> I would say most of the, um, people that we treated, a lot of 'em had chronic medical conditions that were exacerbated because they didn't have their medications. … the needs were *I haven't had a bath, I'm hungry, I need to talk to somebody*, you know, *I'm afraid, I'm upset because of what's happened.* … So – and there were people, obviously, that were dehydrated. Um, and we had people – we had a birth, we had heart attacks, like I – you know, you still had major medical things going on, um, but – yeah. But, then, you had a lot of people that just, you know, had a lot of emotions that were running. (RN4)

One nurse laughingly referred to it as "jungle nursing," but others described the care as "Nursing 101," or returning to the "basics of nursing care." One nurse equated it to "what you can do with just your two hands and your brain" (RN6).

> It was basic nursing 101, duct tape and Band-Aids and emotional support, um, spiritual support, um, right down to physical – the top three physical needs of food, water, shelter. (RN6)

> It wasn't high-tech. I – I would say it was high-touch, people needed just comfort, reassurance. (RN4)

Even in more acute alternate care site settings of triage tent and auditorium following a tornado, assessment skills and the eyes, ears, touch, and knowledge of the nurse remained paramount because of the lack of usual equipment and assistance:

> I took what I had with me. I had my stethoscope and I had blood pressure cuffs from home. Um, did not have anything for pulse ox or anything; you just use your assessment skills and – and, um, try to identify patients in need. (RN7)

> A lot of it was using just your eyes and your hands. You know, do I feel a rapid pulse or not? And, uh, yeah, you – you get some very basic nursing skills back onboard. [Laughs] You don't have a monitor to tell you what's happening. Um [pause], we – I did have my stethoscope with me. I grabbed that … so … I could do the auscultation. (RN11)

> That's what I love about disaster nursing, it's hands-on. … It's your basic, uh, ABC's, and it's – you don't have the things to help fix people, and you … um, so you had to learn – it was basic. You had to be familiar with basic first aid stuff, just bleeding control stuff with what you have. And it might be, uh – or a broken bone--and it might be a newspaper and a piece of duct tape or – or a magazine and duct – piece of duct tape or, um, splinting with a piece of scrap wood once you find somebody and it's just you out there in the middle of nowhere until help gets there. …There's some medical hands-on I'm doing. But most of it's psychological. (RN6)

Following a tornado, a nurse at her hospital emergency department described her actions as "MASH-type" nursing. Even with these acute types of injuries, she also referred to going back to the basics of patient assessment and nursing:

> The nurses themselves … had to – had to fall back and think more on their medical/surgical training as a nurse. … Uh, and I think it's wonderful that we do have the specialties; however, um, I think sometimes because you get so far away from your basic medical/surgical training that [clears throat] you don't think along those lines. … They don't tend to think along the lines of a medical nurse… you have to develop a sixth sense of knowing when that patient's in trouble. Uh, if they're not necessarily on monitors, um, by telling ,from that patient, their skin color, their temperature color, um, what's going on with their focus with their eyes, um, and I don't see that in some of the other specialty fields 'cause that's not what they're looking for. That's not what they're expecting to see. Um, whereas, an ER nurse or, to me, a med/surg nurse, because you don't have all these monitors like ICU has on the patient, you do have to develop that sixth sense of being able to visually – that ten-minute – ten-minute, ten-second, whatever, assessment over that patient, um, that – that something's wrong. You know, that's gonna prompt you to do other things. (RN8)

In the cholera treatment center in Haiti, nurses had patients who were malnourished, and severely dehydrated from cholera and numerous other causes. The usual technology used in the US setting for these life-threatening conditions were not available to her in Haiti despite the serious nature of the patients.

> So a guy would come in pulseless but still breathing a little bit and, uh, if you could get enough fluid into him quickly enough he generally would resuscitate. … There was no point in taking a blood pressure. (RN8)

She enlisted blood pressure cuffs as pressure cuffs "around the IV … bags" to rapidly get "fluids into 'em." She had "one heart monitor but we didn't use it very often."

> We certainly didn't put it on everyone. Later on, we got some oxygen. We had none for the first couple of months. … So, yeah, it was kind of crazy, because a lot of my background is the ICU and peds cardiac and all this. And, um, it was a very different kind of environment. (RN8)

The current medical paradigm of medical and nursing specialization was a hindrance and took a back seat to the foundations of nursing and population health. One nurse invoked the era of community health and nurse social activism of the early 20th century to describe disaster nursing:

> In disaster it is about that wraparound care again. … It – it's back to the basics. And, by the way, it's back to the basics so let's go back to the acute nurse and how they need to come off of their skills, doing unto, and go back to nursing fundamentals 101. This is what you need in disaster, by and far, as a community nurse. … It's everything you learned as a first lab nurse. That is what you will need. Hygiene, healthy eating, getting food, keeping sanitation, cleanliness as best you can. It's the old, um, Lillian Wald type of hopping over tenements nursing. … That's the kind of nursing that you need in disaster events. Think Lillian Wald. Think basics. Think innovation. Think creativity. Boy, that's why, also, that I think disaster nursing is so totally cool. It's innovation and creativity. (RN3)

Nursing in disaster environments required nurses to do things differently. It required independence of thought and action, and comfort with autonomy. Some enjoyed it, but for some, the autonomy could be frightening:

> It's just <u>you</u> out there in the middle of nowhere until help gets there. (RN6)

> The people that were employees of that facility were so busy that I didn't know who to check in with. Um, tried to find out at the front desk and didn't get an answer to that, so I just went into the ER waiting room and started assessing people. (RN7)

> I think you have – you – you are forced into a situation of – of more autonomy. Um, I think you have to use the knowledge that you have, um, and to process that very quickly. Uh, to make decisions that normally you wouldn't be making that, uh, you know, maybe a physician or a resident or an intern, uh, would be making. But, in lieu of having, you know, that authority there, it falls on the nurse as, uh, uh, the most appropriate decision for that patient's care. (RN8)

> There was a lot of directions that had to be given, um, to those nurses of, uh, not so much on the IV's or – or – I – I – I would say that to act autonomously, you know. … I guess I felt like they would take more of an initiative to be autonomous and I didn't see that in a disaster situation. [Laughing] Which I felt like, you know, maybe they should have. (RN8)

> The [disaster org name] was running an ambulance service, and they were – they were actually picking up patients that had cholera. So we called them 'cause I was gonna try to transfer the kid to a hospital. Um, and I said, "Bring oxygen, … This kid's in respiratory distress." They come, they have no oxygen, they have nothing. And their ambulances are just basically like two people in the front seat, driving. Nobody takes care of the patient on the way. And I'm calling, I'm trying to call hospital. … It's pretty dark. And, um, nobody wants to take this kid because he's coming from a cholera treatment center. And this is one of the problems in Haiti anyways, they can just say no. I mean, they can just not take them. So I thought – I finally just made the decision, like, well, we're not gonna send him in ambulance to be refused in a hospital when he's getting no care along the way, so let's just do what we can do, and if he … arrests, then we'll have to figure out something. … But we had some rather – rather frightening events. (RN10)

Nurses in these settings of reduced healthcare and resources were surprised to learn they could function as nurses without their accustomed supplies and equipment:

> I think [there was] just … a drastic change in the mentality, um, where nurses think, *Oh, I must have this and I must have this and I must have this to provide excellent patient care.* And we discovered that we could provide for our patient with much less. Ideally, it would be nice to have everything we wanted, but it just was not feasible in that situation. (RN7)

> I was kind of astounded that we were able to function in an outside environment in a field, um, with very little supplies. You know, we – we had enough to be able to start IV's, we had enough to be able to, uh, bandage, uh, people up. Um, but I think, you know, working in that sort of environment, that – that – where we're used to in a hospital of it being quasi-sterile, uh, of not having to compete with, uh, a lot of dirt, you know, uh, a lot of, uh, you know, just debris and stuff, uh, that – that you would not normally be exposed to. (RN8)

Working in a tent after the hospital was destroyed,

> We just found, um, so many different ways to do things that we used to do. It's like, well, we'll just – we had a tornado, we can't do it that way, let's do it this way… just a lot of things you have to adapt to doing. Different – it can be done; it's just different. (RN11)

After a while in the setting, whether through enough experience or enough days at the disaster, the reduced setting becomes the new normal:

> What happens is you – you just – less staff, less supplies, and you just know how to deal with that. You know, supplies couldn't come in, staff couldn't come in. Then the economy got bad and staff was laid off, so you were still doing it with less. … And you just know, you just learn how to do it. And then in public health, well, you don't have a lot of money, so you don't – you do work with less a lot of times. … So you learn how to do with less, more. (RN5)

Subtheme: **"*Flexible but … structured*"**

Following a disaster, and its disruption of society's functional systems, disaster nursing required "organizing out of chaos."

> [It is] …looking to fix systems, to put them back into place, so when I talk about reestablishing boundaries, I'm – I'm talking about system boundaries, I'm talking about the types of – of nursing care that public health nurses do on that bigger level and – and – and working, stringing those systems together, pulling in those resources, assuring – uh, assessing, assuring, uh, developing policy on the fly, if you will. … It's just faster, meaner, you gotta – you gotta really get in there. (RN3)

In the absence of a functional hospital, tents, auditoriums, and athletic centers were transformed by nurses into somewhat organized facsimiles:

> The, um, [athletic facility name], we had that divided up into, you know, a pediatric section, an isolation section. There was a critical care section. We did a tracheostomy on the floor there [laughing]. (RN4)

> The hospital [staff] set up the areas of the hospital [in the auditorium]. There was the – here's the (demonstrating with hands) – here's the neuro – here's the neuro floor is this row of tables and here's the cardio – cardiac floor, this row of tables and then, you know, triage was at this end, um [indicating], um – tables and chairs. Tables very much like what we're sitting at now. (RN7)

> There was no critical care areas [in the cholera treatment facility]. All the areas were just patient care areas. No privacy, really. Um, beds, cholera beds, were about eighteen inches from each other, so it was a very cramped working environment. (RN10)

Survivors also felt this need to create their own place from the disruption. As the disruption eased, this nurse also shifted his gaze from the larger destruction to individual people:

> The shelters take on a life of them all of themselves and they become a little town because you've destroyed this town, and now that you've put this town into a gym or a, um, another area. … And so I see this evolving little city becomes inside this gym, and you start to see people – I mean, you go through the – all the phases of happy we survived to now this is my space, stay out of it to the crying and when they start realizing what they've lost and those sort of things. (RN6)

Because systems were broken, protocols and regulations created for normal healthcare situations could not be followed. In many instances, nurses in this study had recognized the incapability of or the need to not follow rules, regulations, policies, laws, or scope of practice. These decisions and actions were not taken lightly, but occurred within a hierarchical assessment of patients' needs and a restructuring of healthcare in the context of the altered disaster setting. Nurses assessed the existing framework, identified impossibilities in the normal system, and modified on the fly for the circumstances.

> There's a lot of scolding about 'you gotta follow the rules' and that 'cause you can't have a bunch of people, volunteers, um, creating their own rules, but I don't think people really were grasping for a while that [the hurricane] was catastrophic. (RN2)

> A major piece of responding in disaster is not getting wrapped around the finer print of your plan. It – it is being street smart about what you keep and what you kick out the door at that minute in terms of, um, what is protocol, what is not, what is – and, yes, all that can come back and bite you later if you are not, um, doing some good decision-making there. And

> it's about risk. How much risk as you – are you as a practitioner willing to take? How much are you willing to take for yourself while still keeping the clients safe? (RN3)

> We don't need to add chaos to chaos. We need – it needs to be structured. Flexible, but it needs to be structured. (RN6)

Nurses balanced available resources with the imperativeness of the situation. In some instances, the basics of usual common sense and safety in a usual world were violated:

> Our security people . . . had developed a relationship with the heads of these gangs. And, actually, fifty percent of our security force at that facility was gang members. … So we . . . used a strategy that actually worked quite well, of hiring a certain number of members from each gang. And as long as you kept that balanced and as long as the head of the security was not from any one of the gangs and was one of our people from outside the area. …It actually worked quite well. (RN10)

In some instances, nurses were officially informed that state health policy had been suspended.

> I would, um, take one team [of out-of-area responders] and go over to where we knew that a shelter was in place. And I would go in and I would talk to whomever was … in control … I did not necessarily personally know those people running it, but I knew their names and they knew my name. So there was a facilitation there and I told 'em, you know, "Don't worry about <u>them</u>, it's all approved . . . The regulations and the policies that we normally, um, follow are set aside, and just let them come on in and take some of the load off of you as far as caring for these people." (RN1)

> I was told, um, that if there were patients that were without their prescriptions, that I as an RN could write it on a piece of paper, their – the full – the full order, sign it as an RN and give it to the patient and they could take it to a local pharmacy and have it filled. Um, that doesn't quite fall in line with the . . . State Practice Act. (RN7)

Nurses also made decisions unilaterally, rejecting normal protocol and regulations because of the exigency of the circumstances. One nurse delegated nursing responsibilities to unlicensed staff:

> Delegation is something I remember grabbing on to. I wouldn't have called it delegation at the time, but I understood I couldn't do it alone. … I understood that I had resources to delegate to as the night – as the evening supervisor, and I used them. I used patients. … I used families coming for patients. … Um, I was using, um, uh, nursing aides in – outside of scope, if you will. … Um, to do discharge planning. But those nursing aides were savvy. They had heard us, you know, time after time giving these instructions. … And, um, people would call that outside of scope, but – so I was using the same resources, but I was using them in – in a way that I had – I could assess their ability to do it and I knew who I was dealing with. (RN3)

When transportation, EMS, and medical systems were overwhelmed, patient safety, documentation, and patient abandonment laws became less important than getting patients quickly over to the nearest unaffected hospital:

> Lots of people just showed up to help transport, and then here we put people in these vehicles with strangers, hoping that they were gonna take 'em over to the other hospital. We didn't know for sure who they were. … You just hope for the best. (RN11)

With communications an impossibility and transportation obstructed by flooding in a rural setting, patients' right to privacy took a backseat to letting patients' families know they were alright:

> It got so that on the radio, once the radio station got hooked up, they would say – and, of course … the ham radios were really good. They were set up in newborn nursery. … And they would say, *So-and-So, your mother called, they're okay,* and that's how word came about, that's how people found out how other people were. Or, um, *Call your family in Michigan,* or whatever. That's how. And it got – it got to be just normal, and –… And then . . . once the regular radio station got up, they were able to get announcements out. (RN5)

Normal standards of nursing were violated, because priorities changed when capabilities for providing nursing care changed. The greater need became providing food, any food, during a flood situation which knocked out power and water in a hospital:

> We gave everybody the wrong foods … "Low salt diet? Oh, here, have a bologna sandwich. Enjoy yourself. That's all we got." (RN5)

Having a needed item became more important than the sterility or cleanliness of the item:

> We had four-by-four gauze pads. They were wet, but we had four by four gauze pads. I mean, some things like that, that I . . . never thought I'd ever use something that's not completely sterile with a patient, but that's what you need and that's what you've got. (RN7)

> They were pretty much out of IV tubing. So I – you know, <u>forget</u> what the hospital tells you, you never changed your IV tubing unless, you know, it had a hole in it — because you just didn't have enough. (RN10)

Patient discomfort was preferable over their death:

> We had to intubate that one guy with no drugs. We did a lot of things with ... no sedation, no pain medication or anything. … Sewing up the lacerations, uh, putting a chest tube in and there wasn't anything for that, just, *Here we go!* [Laughs] *Hang on. Bite! Bite down hard!* (RN11)

Documentation standards were impossible to follow:

> I don't remember using anything other than paper charting at [auditorium name]. … At the clinic setting I don't believe we used computers, to my knowledge. …We really didn't have much paper charting there either [laughing]. (RN7)

> The paperwork, you know, kind of was the last hindsight [laughing] of – of the whole thing. (RN8)

> When we did have medications, if we gave 'em something, we'd write that on … their clothes or on their body. … If we, um, had, uh, found out about an allergy, we would write that on there. Their name … 'cause like the ones that looked like they could lose consciousness or something, if we found out their name we would write that on there. … Most people, we didn't ever even ask their name. There … was no time. … And it was like the least important thing at the time. (RN11)

Nurses in the study had a comfort with the breaking of rules in order to provide care given the contextual circumstances. Not all nurses could embrace this change of priorities without suffering from severe ethical distress. In Haiti, basic principles of public health, sanitation, and infection control were violated:

> We didn't wear gloves every minute of the day. And, um, you know, we had sort of bleached in and out and handwashing stations, actually, but to see the patients that have a contagious illness and not be isolated and not have anything between them and the patient in the next bed and then you had so many patients to take care of and then, you know, you might not have gloves on. (RN10)

> The poor infection control nurse, I mean, she lost it after one shift. She just … couldn't fathom this, you know, it just didn't work for her. …She just … couldn't handle it. So after a day, she dropped out. (RN10)

Another nurse spontaneously and unilaterally began performing procedures and giving orders beyond her scope of practice in the emergency department while the facility received a large influx of trauma patients following a tornado. Flexing the rules, but not abandoning all structure, she based her actions on what she had previously seen physicians do repeatedly:

> We didn't have enough doctors there or – or, you know, medical students to – to be able to disperse everywhere. So the nurses really, um, were doing what they could do, you know … and knowing what they could do. Um, so we were taking care of it, um, you know, uh, uh, stapling, uh, heads, you know. Um, and this one particular girl that I was talking with, uh, I had already stapled her head, and she was telling me about, you know, what exactly had hit her and – and had she lost consciousness and all this. And, from what she was describing to me, I felt like she could've had some type of spinal injury. ..So … I went ahead …and told her … "She needs to go to CT." (RN8)

> Had I not had that experience, uh, I would've probably been a little reticent to have done that … on my own. Um, but having seen, you know, the similar type of injuries come in to the ER and seeing how a resident or

> a physician would respond to that, um, I just kind of followed that lead. Uh, you know … from learning from them. (RN8)

Nurses acted within their scope of practice, but in violation of their affiliated organizational policies in order to fit the situation on the ground:

> There were nurses that were like, "You can't drink here, you can't –" you know, it was – and normally, that's how we would be, "You can't smoke on our campus, you can't drink on our campus, you obviously can't do other illicit drugs and stuff on our campus." But, seventy-two hours is the golden hour in the detox, if you're going cold turkey. That's when they're going to start going into DT's, having delusions, and getting into serious critical medical issues [laughs] with detox. And so that started happening in … a lot of those shelters. Some of them, some of the nurses, figured out, "Okay, you just – you do what you need to do. You go over there*"* – off like – a lot of the shelters were in like a school. It was like, "Go over there to the playground, do what you need to do, and then you can sleep here," you know. (RN1)

> The first, uh, disaster was a way of really getting to test what were the things I had been trained on and how did it actually apply in the field and, um – and what did you need to do, uh, differently than what was in the playbook [laughs]. (RN2)

Another time, with medication dispensing prohibited by the organization at a shelter but with a patient with a severe burn on his back, a nurse deliberately violated the policy.

> [I] called in the pharmacist and said, "You've gotta give us something"… And she did end up getting us some Silvadene. Um, and so we treated that. (RN9)

Subtheme: **"*MacGyvering*"**

> We couldn't do a lot of our interventions 'cause we didn't have stuff. But people getting creative and making, you know, MacGyvering together stuff to make it work. (RN11)

To "*MacGyver*" is to "make or repair (an object) in an improvised or inventive way, making use of whatever items are at hand" (MacGyver, 2015). In disaster situations,

MacGyvering depended upon the nurses' ability to regain their own equilibrium among the chaos, sizing up and understanding the physiological condition or even non-medical systems situations, using what they had, and creatively figuring out a way to take action to "sustain health and wellness in this chaotic environment." Solving medical issues frequently involved non-medical sectors.

Two experienced disaster nurses in the study spoke of having to embrace the situation at hand:

> You roll with it. You – you – you take your opportunity as a seasoned provider to assess that whole system of how the provision is going, and then you work with others to make it be better. (RN3)

> We have floods. We know how to deal with it. [Neighboring] County, not so much; these people panic. .. We just said, *Okay, it's a flood, just put on your flood-kicker shoes and just go out there and do it.* Um, you just anticipate, you look at the water, you look at how things are going. (RN5)

Both experienced and less-experienced disaster nurses had to "figure out" solutions to achieve their end healthcare goals, working with what they had and against structural impediments.

> We just figured it out. That's what we do. … You grab the duct tape and you fix it; that's what you got, you know? And that's what I was able to do out there, but I was doing it against a tide of things that were just stupid mistakes and disorganization and things like that. (RN2)

> Everybody would get together, like all the health officers, we'd get together on a phone – on a call and I'd listen with 'em. And then it was like, "Okay, this is what we're gonna try this time."… Once we figured out what to do, then we could just – we just rolled through because we knew where to get the help from. (RN5)

> It was difficult for us to just have somebody help us to get there. Like, "No, I'm not trained. I haven't done [national org]. I'm a nurse and I have nursing skills, and I feel like I can help." And it just was difficult to – from – on the [Midwest state] site to help – have somebody help us to get there.

> And when that didn't work, we just said, "Let's just get on a plane and go. We'll figure it out when we get there." (RN9)

> [Patients came in dehydrated with] cholera, but sometimes it was malaria, sometimes it was dengue … sometimes it was giardia. We wouldn't even test for cholera. … You also tried to figure that out with very limited resources. We had no lab work. (RN10)

Nurses resorted to "creativity" and "thinking out of the box" with what they had on hand to address lack of usual clinical resources:

> If we had to intubate the kid, what could we use? What could we do? And I'm trying to find equipment and supplies like, okay, what could we use for an NG tube? Okay? You know, we didn't really have a child or infant ambu bag at the time. Like, can I do it with an adult bag, or what else could we do? Eventually fashioned sort of a – sort of an IV, uh, ambu bag out of an LR [lactated ringer's solution], uh, plastic bottle. … So we had some fairly creative times. (RN10)

> We don't have any more supplies for the physician, we don't have a clean scalpel, we don't have … we're just digging through boxes and we found, of all things, some mint-flavored [rubbing] alcohol. Why in the world we ever had such a thing. And I looked at this OR nurse and I said, "You know how to sterilize things. Will this work?" She said, "It's all we got," you know, so we used it. … I mean, you just put together what you had to. (RN11)

MacGyvering went beyond the medical systems sector, however. Assessment, figuring it out, and creativity were utilized to overcome cultural, organizational, or political barriers. Coming in as an outsider, nurses had to recognize their limitations, and merge their capabilities with the local structure in order to help or have something to offer the local community. "If your plan and my plan and that system's plan … are colliding, that ain't gonna work." (RN3)

> We said, "You can't do this with health services. You've got nothing, really, to offer. You are strangers." So we reached out to the [local nursing organization]; they reached out to us about the same time. … We had the ability with the funds for the, uh, medications. They had the ability for the

> prescriptions for the medications. … It was a marriage made in heaven. (RN3)

> So there was this big clash going on at the same time. And then when we came in, I didn't belong in either one of those, when I was trying to help these people. Um, so I had to make friends with the, um, social worker there that was really close with everybody there, and she became my shadow. Um, she agreed to go out with me, so then people started talking to me and then pretty soon I was kind of accepted. (RN6)

> *Something doesn't feel right. This isn't running smooth.* We still have people with piles of wet clothes from the first night and the night before when they started coming in when it all happened. We're not getting blankets, we're eating bread for meals. … [I'm thinking] "We – we have things, we can get things, and there's processes and I have radios and phones and contacts to get things. Why don't we have these things?" [The person in charge said,] "Well, I have 'em coming in from another source, the county." And, um, so it was kind of this – I don't know if it was egos or it was politics, probably both. Um, um, we just weren't getting supplies. So then I finally had to go around that guy that was in charge for the county who wasn't supposed to be in charge of anything at the time!

In the midst of a chaotic, unstructured disaster situation where 'normal' structure has been lost, "out of necessity … you had to learn how" to provide care in a disaster situation. Nurses had to "figure it out" and "you do it." "You worked with less and it got to be normal" (RN5).

> You're looking to fix systems, to put them back into place. …Nurses are [performing] at our best practice when that freedom of – sometimes in that chaos, in that middle part, you get the best health practice that you have seen in a long, long time. … Because the boundaries *are* a bit broken. Because the systems are a bit broken and yet they're coming into control. It's not chaos, but before you lock 'em down again (banging) there's this window of, *Wow, this is working! This is – wouldn't this be great if we could continue this for this population that's already vulnerable? If we could provide this type of care right in this middle part before you lock it down and out of the chaos, wouldn't that be grand?* (RN3)

Theme Four: *"Stuff that sticks with you"*

The bodily and emotional impacts of the *"not normal land"* disaster environment endures with these nurses into the present, for some of these nurses for more than 20-plus years. Airborne remembrances hitchhiked into their lungs, and sights, sounds, and smells of their deployments remain vivid in their minds' eyes. Nurses remembered individuals, people who remain in the forefront of their memory. Across the board, nurses spoke of the environment as being "eye-opening" or "life-changing."

Sometimes it was the first one, sometimes it was the biggest one, or the one that hit their hometown, but nurses' memories were very dramatic, evocative, and sensory-dominant, recalling sights, sounds, and smells:

> That was my first one, so it just lasts, it's just imprinted, um, um, walking through the – through the areas and feeling the – like I said, the heat, the smells. I could smell it again. I could smell, um, um, being there. Um, and you really remember, like, the whole place was such in flags. Flags really bothered me for a while when I came home because there was so much – I had seen – experiencing, like, you know, the husband trying to find his dead wife's wedding ring. (RN6)

Some nurses specifically described the somatic internalization of their disaster due to reduced air quality due to the storm's high winds or during the lengthy recovery phase. Clean-up of the region-wide destruction of Hurricane Katrina entailed the large-scale burning of debris, created an ever-present smoke.

> And it was everything - asbestos, old tires, um, other types of building equipment; anything from, um, old pipes, everything just pushed into one big pile. And it made this, like a smog, across the Gulf Coast. …You couldn't help but breathe the smoke. For six months after Hurricane Katrina I had … what was called the Katrina cough. And, um, I went to the pulmonologist every few weeks and did series after series of very aggressive steroids, and by April … of 2006, after Katrina was in 2005, I

> had taken so many of those high-glucose steroids that I became diabetic. So that was a forever change for me. (RN1)

Working in the destruction zone following a major tornado, a responding nurse experienced a relatively shorter exposure but to larger and potentially more antagonistic particles:

> Um, the air wasn't – quality was not good for some days when the wind really kicked up because we had a lot of fiberglass. You could feel it itch in your lungs after being out there for a while. Um, and then there was asbestos concerns because it was an older area, industry area, too, in some of the destruction. Um [long pause], my mind went blank. Um [pauses], yeah, my mind went blank on that one. (RN6)

Other nurses also experienced moments during their interviews when their minds went blank or they lost their train of thought when recounting the physical realities of their disaster environment:

> That week following Hurricane Katrina, we had several days that we exceeded a hundred degrees. And there was no electricity. A lot of places did not have running water. Um, you saw people bathing in ponds and getting water out of ponds and creeks that you never would have thought you'd see that, but you – you do what you have to do. Um [pauses], okay, where was I going? Okay, my mind just went blank [laughs]. (RN1)

> You set up a command center, everyone knows where to go. The command center's going to be – everyone knows to go to the command center so that you have a starting point for communication. Um, you just don't know that the command center's not gonna have power and – and it's in a structure with – with gases that are leaking and – and it's not a structure that they want to let people enter into. … Um, that was, you know, one of the challenges. Um [pause], I've forgotten what you asked me now. (RN 7)

Everyday events stimulated the nurse's mental return to the disaster setting and the emotions involved. The sight of flags triggered one nurse:

> But, yeah, a couple of times, you know, I caught my wife off guard [clears throat] when I'd see a flag and I'd just [gasps]. You know, I wouldn't really cry or I wasn't – it was a guy thing, <u>wouldn't</u> cry. But, um, it –

> you'd – I could feel it, you know… I would get a lump in my throat and, um, yeah, it was kind of – catch me off guard. But it's – yeah. Not so much now but it still does – flags make me think of [disaster city name] just 'cause of that. (RN6)

The sound of tornado sirens still jolts another nurse:

> For a long time afterwards, you know, hearing a siren or something, it just kind of set – gets a little adrenaline going. It's like, *Oh, no, no,* and then – then it – things get back to normal after a while. … Just, you know, unexpected – you know, I'm normally a very calm, don't-get-upset person, and I wasn't – I didn't expect myself to be so easily excitable, but it just happens…Um, and then you get over it. Um, I think being able to talk about it does help a lot. (R11)

Besides bodily remembrances, the interactions nurses had with survivors remain with them:

> I had clients who – white people--who were very amazed that they were in a building with black people and they were doing okay with it. Um, so the racial – they – I mean, they – they – one guy I remember saying to me, um, "I'm having breakfast with people I would've walked – walked across the street to avoid before this disaster." And so those kind of – I mean, that's – now we're going on ten years. Those memories are still very clear in my head, those conversations, so that was fairly powerful. (RN2)

> Levels of education were across the board, too, because I remember there was this one woman who was there, very well-dressed, um, very well-spoken, and I remember her saying that, you know, she had a degree and she had already gotten all this paperwork done. And she just had this way about how she asked questions and advocated for herself well. … So I noticed that about her. … I remember overhearing her, and she sticks out. Like, for whatever reason, she sticks out in my head. (RN9)

Anticipation of participating in this study by one nurse further heightened remembrance of one particular little girl:

> I remember her. She was about nine or ten years old. And she would come up and talk with us. … We'd just socialize, um, a little bit. But I remember one night when we came in, the daughter – … came up and said, "My mom got approved. We're gonna be in a trailer." Um, she goes, "We got approved and we're being transferred, I don't know if I'm gonna see you

> here tomorrow." … We came back one night in, um, one of our nightshifts and they were gone [Sighs]. So, yeah. [Pause] … And we just cry thinking about her. I think about her once in a while. I've been thinking about her more often since I knew I was gonna participate with you on this. … Yeah. Stuff that sticks with you. (RN9)

Nurses experienced other psychosocial effects that have lingered. One nurse related the short term and long term adverse emotional outcomes she and her fellow nurses experienced as a result of responding to the tornado, not by directly experiencing the weather event, but strictly by being immersed in the aftermath of human and physical devastation:

> Um, probably all of us should have had some counseling. You know, I wasn't there when the storm went through, but the things I saw, um, I had nightmares for twenty-nine days, exactly twenty-nine days, every night. … Um, and I know it was twenty-nine days 'cause on the thirtieth day, I didn't and I'm like, *Wow!* [Laughing] *I didn't dream about tornados last night!* Um, and, you know, thinking back, um, I'm thinking that was definitely stress-related. … My friends that were there, um, they had trauma, they had PTSD, several of them. … I do know of some nurses that were, um – were not there that had some pretty traumatic PTSD. Um, you know, I had nightmares for twenty-nine days. Twenty-nine days, I don't call that PTSD; I think it has to be a little bit longer-lived, um, to be true PTSD. But I do know nurses that were not there at the time at the facility, but going through what they did with the other staff, with their peers and, um, going through all the changes they went through, they – they did really suffer PTSD on a long-term basis, like a year and more after that. (RN7)

> Probably ten years, you know, eleven years after the fact, um, that I gave a speech on this. And I was rolling right along and – and it just kind of hit me and I started getting choked up and, uh, you know, recovered myself. Uh, but it – it's amazing that – to me, I guess, that, uh, even, you know, ten, fifteen, twenty years after this has happened, it still brings up emotions. …You know? Yeah. And makes you shaky, yeah. … I think, for me, um, uh, a deep – a deep sadness. Um, and, just being the person that I am, I don't cry very easily and, uh, that overwhelming feeling of – of – like you're not in control. …That, uh – that you wanna cry but then you're trying to hold that in. So it's – it's kind of a, uh – a <u>very</u> uncomfortable feeling. Yeah. [Very quietly] Yeah. (RN8)

> It was interesting how [nurses] reacted over the years since the tornado. Some people just… you can't tell anything ever happened to 'em, and then there's those that anything at all that reminds 'em of the tornado, they'll get pretty weepy. Uh, there's been a few people that I'm aware of – or, I'll just say one person for sure I'm aware of, that's had some real severe mental issues to the point of, uh, suicide. (RN11)

Despite the physical and emotional difficulties of their disaster environments, nurses also described their experiences as "good" and as a "growth experience." They were rejuvenated by "renewed hope" and "joy" when unexpected positive outcomes occurred, such as a birth or the resuscitation of severely dehydrated patients admitted with pulseless electrical activity. Many nurses spoke with pride of their contribution to "help make it better" for survivors, their "satisfaction" of putting order into the scene of chaos, their "satisfaction" when patients survived, and their "satisfaction" when staff gained skills and became more functional because of a nurses' training of them. Another nurse remained amazed at the "phenomenal response" of "the medical community and …the firefighters and the police … emergency responders and first responders" who had "taken care of" … "everybody" in the aftermath of a bombing (RN8).

Many of the study participants identified their disaster experience as changing their life or giving them gaining greater awareness about the social circumstances of others:

> It was an experience, quite an experience, and it's still vivid in my mind, many of those things. (RN1)

> The fact that some of these patients didn't want to go home, you know, it was a real eye-opener 'cause it really was kind of a horrible place to be. I mean, there wasn't really much pleasant about it, so for them to, you know, be upset about being discharged, 'cause the place they had to go to was, I guess, even worse … that was kind of an eye-opener! (RN10)

Other nurses reflected on the impact of the disaster experience to their professional growth:

> This changed my whole – I mean, that's why I have a doctorate in nursing is because of Katrina. (RN2)

Another nurse reflected on her experiences with internal disasters at her hospital, and how the loss of water affected the healthcare capability:

> It was, uh, a wakeup call, I guess. … When I took over that position in emergency management, you know, I was told, "Oh, all you have to do is two drills a year," you know, "it's no big deal." Well [laughing], it <u>was</u> a big deal. There was a lot of responsibility and accountability. (RN4)

Several nurses recounted a sense of duty:

> I think it … certainly became an eye-opener for my family, that they understood. They may not have liked it, but they understood that it's not 'will you go' or 'can you go,' it's 'I <u>must</u> go'. (RN7)

A nurse with no prior disaster experience and from a distant unaffected state had had the same sense of duty following Hurricane Katrina:

> I just got up and left and went without doing my due process or [in] an organized manner. But, um, at the same time, we just felt like we should've went. (RN9)

Another local nurse was also committed to duty, and was willing to sacrifice her personal possessions in order to reach the alternate care facility:

> I started seeing debris and blowing and stuff. And when I – I thought, *Oh, man, where am I gonna park….* – I saw a spot open, so I just pulled into that and I thought, *Yeah, my car's probably gonna get hit by some of this debris but, oh, well,* and so I flashed my badge and they let me go in. (RN11)

A sense of pride in their response and contribution to affected communities has also endured with these nurses:

> They called me and said, "Would you go?" and I went, "Yeah, sure." And they said, "Well, you've got experience in – in floods," so we went down. And, to me, it's just going into your regular mode. I'm known as the Disaster Queen. I love 'em. (RN5)

> I was really … so very proud of the way … that – that the medical community and – and the firefighters and the police, uh, any emergency responders and first responders, uh, through the chaos was able to work through that. … You know. Um, uh, being able to support the community, get 'em to where they needed to be, uh, and carry on through – throughout that whole process. (RN8)

> Looking back, what stands out the most is how people from all over who've never met one another came together and did great care for patients. (RN11)

> What I get out of it personally, it's just [pauses] – can't put words, can't put money, you can't put a certificate to it. … I had a tattoo put across my back, "It's what I'm here for." (RN6). … It's kind of like giving back that I can go do the deployments when I can. … That's why I feel lucky with it, more humble and lucky than, uh, you know, *Look what I get to do 'c*ause most people can't do that. (RN6)

While the previous nurses spoke of enjoying the disaster experience, this nurse focused on the human suffering aspect:

> So, I mean, tons of people did heroic things and, um [pauses], I was glad I was able to help. I hope I never ever have to do something like that again because, I mean, it's just so devastating to people. (RN11)

The pride of what one can contribute, versus the harm to others, was the difference in this nurse.

Summary

The disaster environment, the contextual grounds of nurses' experience with the environment of disaster extended beyond the realm of the healthcare setting to encompass all sectors of a functional society. The essence of these eleven nurse disaster experiences

can be summed up by the central theme of "*You came to not normal land*," and the four identified related global themes.

The environment of disaster was both "not normal" and challenging, owing to the many simultaneous breakdowns in healthcare supportive systems, situations not previously encountered or imagined in nurses' usual healthcare positions. Additionally, reductions in systems (water, power), structures, staff, and supplies, coupled with the lack of familiarity with alternative care sites, patient populations, and isolated nature of disaster environment added to the challenges confronted. Nurse disaster preparedness or experience did not prepare them for all instances of disaster, and nurses were surprised and unprepared for these events and the physical conditions surrounding them. Policies and regulations that guide the nurses' actions were disregarded in the immediacy of providing care when the usual social framework no longer existed. Nurses experienced and continue to relive the disaster setting sights, sounds, smells, and stories of the people encountered. A strong sense of pride, duty, and willingness to do it again prevails in these nurses.

Chapter 5: Discussion

The purpose of this study was to gain an understanding of the lived experience of nurses who have been exposed to and worked in the disaster environment. The research question used to explore this topic was *"When you think about your disaster environment, what stands out about your experience?"* Eleven nurses with varying specialties and levels of disaster experience from across the US were interviewed using the philosophical lens of Merleau-Ponty's existential phenomenology (Merleau-Ponty, 1962) and the methodology of Thomas and Pollio (2002).

Across nursing specialties, disaster experience level, or type of disaster, all nurses in the study experienced the same transcendent meaning of the environment in which they were immersed, "*You came to not normal land.*" Theirs was a world abruptly transformed with their clinical routine upended, where the usual resources of staff, supplies, and systems they had trained with and been provided to operate the healthcare machinery system were no longer available. The world became "so drastically different" and the process was definitely "not business as usual." Four themes emerged from this contextual ground: "*All the resources was gone*," "*You prepare, you prepare, and you are unprepared*," "*It can be done, it's just different*," and "S*tuff that sticks with you*."

These findings will be discussed below in relation to several lenses, the extant literature, and their relevance to nursing education, practice, training, and policy presented. The chapter concludes with suggestions for future nursing research.

Existential Phenomenology

"Heidegger points out that we need some general sense of our environment and where we are in it before we can understand anything else" (Ree, 1999, p. 16). The phenomenological method provides a philosophy that values the contextual contribution – the general sense of one's environment – as it contributes to a human's figural experience of a 'thing' – that is, anything capable of becoming an object of thought (Thing, 2015). This experience stands out inseparable from the contextual background of body, time, others, and world.

In the contextual ground of *body*, nurses in the study were overwhelmed and exhausted because of the "intense" and "tough" conditions: horrific patient stories, constant bustle and hubbub in their sleeping quarters, and the unending and physical nature of the work. Their main experience as they interacted with the disaster environment was through sensory stimuli: the sounds, smells, and sights were pervasive. They remembered the constant smoke; the smell of rotting bodies and pine trees; sound of eerie quiet or incessant noise while trying to sleep; and the scenes of wide swathes of devastation; and familiar objects juxtaposed in unfamiliar places.

The intensity of their mental remembrances seemed to 'return' their physical sensations to the present as nurses 'lost their train of thought' while relaying their experiences during their interviews. Nurses who experienced Hurricane Katrina also described the extreme sensorial sensations (Jordan-Welch, 2007) and this study corroborates this finding across numerous types of disaster experiences.

Nurses in this study generally labored for extended hours, “sixteen, eighteen hours,” “24-26 hours,” “until the work was done,” yet the contextual ground of *time* was primarily a scarce, used up, and wasted commodity. Nurses made “a million” “split second decisions” while handling overwhelming patient loads of “hundreds” and “thousands.”

Relationships, both good and bad, characterized the existential grounds of *others*. Nurses formed new relationships on the fly as they responded in the moment locally or were deployed farther afield. This forming of bonds, camaraderie, and teamwork with colleagues during the intensity of the disaster response is a prevalent finding in disaster research (Boswell, 2014; Li et al., 2015; Rivers, 2009; Wenji et al., 2014).

Difficult relationships with disaster survivors and colleagues appears to be a new finding of this study. Nurses needed to overcome the initial distrust and resentment of outsider responders by local survivors. Overt recognition of local community strengths and expertise was required for a successful relationship during a disaster response. Previously established professional relationships, both at the individual and organizational level, were utilized to achieve beneficial outcomes for survivors.

Poor working relationships with co-workers hampered the disaster response and caused additional stress for nurses. Responders exhibiting this attitude have been labelled *disaster tourists* - individuals heading to the site of a disaster to see the destruction, take pictures, obtain bragging rights, and “get the shoulder badge” (Van Hoving et al., 2010), and sometimes unflatteringly described as a “space-occupying lesion” (Vermund, S., personal communication, February 28, 2014). Other negative aspects of disaster and

humanitarian work, such as the unintended negative consequences resulting from well-intentioned but ill-informed decisions (Kirsch et al., 2013; Seyedin, Aflatoonian, & Ryan, 2009), neo-colonial actions by responding NGOs (Buffett, 2013; Lancet, 2010), and the placement of nursing students into international settings (Racine & Perron, 2012) are also beginning to garner attention in the disaster field.

Community 'help' hindered responder actions when local volunteers with good intentions lacked awareness of what is needed during a disaster response. Nurses recognized the needing to help or didn't want to discourage other help in order to maintain the relationship with the community.

Another type of relationship encountered was that between the nurse and patient populations unfamiliar to them. While more attention is being focused on groups that are most vulnerable and most likely to be encountered following a disaster event, having an understanding of the context from the patient's view is necessary. Providing for the "cultural safety" of groups outside the nurses' familiarity requires the disaster nurse to be "mindful of [one's] own sociocultural, economic, and historical location" (Anderson et al., 2003, p. 196). Participant nurses' naming of specific populations that stood out and the need for "learning the cultures" suggests these nurses may not have understood these populations' contextual locations.

Not unexpectedly, the existential ground of *world* was primary in these nurses' experience of the environment of disaster, as this is what they were asked. The majority of nurses in this study immediately launched into a lengthy list of structural components that were disrupted or which otherwise hindered them. It was "a very different kind of

environment," with virtually every sector of the basic functional components of society and disaster response mentioned (see Tables 1.1-1.3).

Nursing, they said, "was actually a very small piece of what's going on in the grand spectrum of things." Nurses were "pretty much … on our own" to deal with the "chaos" of the "public health setting" where they had "the bulk of the people … the psych fallout … the damage fallout … the … getting your life back to normal fallout." This world was "crazy," "just nuts," "a lot of commotion," and chaos, a "swirling" mass of "disorder."

Theoretical Lenses

Florence Nightingale classically began to make "some general sense" of the importance of the environment for the health of patients in the mid-1850s. In the chaotic and unsanitary conditions prevalent during the Crimean War, Nightingale dramatically reduced the death rate of soldiers in Scutari Hospital by meticulously attending to long ignored, dirty matters of the environment where they were recovering (Lancet, 1910). Her careful observations of her patients led to her thesis that the "symptoms or the sufferings generally considered to be inevitable and incident to the disease are very often not symptoms of the disease at all, but of something quite different - of the want of fresh air, or of light, or of warmth, or of quiet, or of cleanliness, or of punctuality of care in the administration of diet, of each or of all of these" (Nightingale, 1860/1969, p. 8). She further attributes these environmental conditions as important for the "well," thus emphasizing the influence of one's contextual setting on the health of both the nurse and the patient.

This notion of the environmental influence on health was further developed a century later as ecological theory: a fluid, dynamic, ‘everything connected to everything else’ kind of relationship with expanding layers of increasing organizational complexity (Bronfenbrenner, 1979). Public health has embraced the ecological model as an integral "model of health that emphasizes the linkages and relationships among multiple factors (or determinants) affecting health” (IOM, 2003, p. 1). These factors include “personal behaviors and biologic traits but also on characteristics of the social and physical environments that shape human experience and offer or limit opportunities for health” (Anderson, Scrimshaw, Fullilove, & Fielding, 2003, p. 12).

Both Nightingale’s theory of the environment and the subsequent ecological theory focus on the total environment as a contributing influence on the health of the individual. Nurses responding in a disaster are affected by the same disrupted and difficult aspects of the environment that surround the survivors. These lenses support the influence of environment on disaster nurses’ health, and many aspects of the larger disaster environment that were described as challenging and stressful by nurses in this study.

Following Merleau-Ponty’s philosophical perspective, the environment experienced by a person can be differentiated as *space* or *place* (Tuan, 1977). Space and place co-define each other. *Space* is the wide-open, unstructured, un-demarcated openness around us. There is freedom and movement in the openness; however, space also contains threat and danger of the unknown.

Place is the familiar delineated and marked off space around us, a known place of security, a sense of our own territory. “Places are centers of felt value where biological needs, such as those for food, water, rest, and procreation, are satisfied” (Tuan, 1977, p. 4). Place is where nurses live, call home, and where they work according to specified rules, regulations, and protocols, within the structure of hospital building, floor, room or office. Place is also a ‘pause’ in the unwelcome ‘movement’ of space.

Space and place are encountered through the intentionality and movement of the body, and one’s perspective of the spacious world expands outward from the ‘place’ of the body (Merleau-Ponty, 2012/1962; Tuan, 1977). The body is the center of the world for the individual. All perspective comes from this known ‘place.’ Towards the front of a person one approaches the future; the back, one’s past.

In this study, nurses were transported away from their familiar healthcare setting forward into the unknown space of disaster. They experienced initial confusion, chaotic movement, and the “swirl” of the “large-scale devastation,” whether home hospital or distant deployment. By “figuring out” what “they had to work with” and by “re-establishing boundaries,” nurses’ disrupted equilibrium arising from the unfamiliar and “not normal” disaster setting evolved into a new sense of competence. Nurses “help[ed] to put order into” into the devastation and re-established a familiar, known place, even if they were “doing it with less.” They slowed down the confusion of the space around them and created a place that was their “new normal.”

Themes and the Literature

Theme 1: **"*All the resources was gone*"**

The first theme described by nurses was *"All the resources was gone."* For these nurses, the normal set of healthcare resources, such as having adequate numbers of staff, expertise of staff for the patient population, medical supplies, and a functioning usual place of clinical facilities, was reduced and the process of providing healthcare was altered. Yet nursing, they said, was "a small piece of" their disaster environment. Of greater concern for nurses in this study was the larger disruption of non-healthcare systems surrounding them during their experience. Politics, media, water, sanitation, logistics, transportation, communication, food, shelter, safety, natural environment, and other sectors of a functional society were variously damaged or impeded. These failures contributed to the many and dynamic "multiple challenges" beyond their control and beyond their focus of providing care to victims and survivors of disaster. Even single, non-healthcare system failures, such as water, emphasized the dependency by the healthcare sector on other, intertwined sectors, creating multiple systemic obstacles to the usual process, thus upsetting the routine of healthcare provision. The efficiency of providing care slowed down, as manual methods replaced time-efficacious, automated methods, and nurses needed to create solutions for non-healthcare problems. Whether single or multi-system disruption, the normally tightly controlled framework of nursing became unstructured, disordered, and chaotic in the disaster setting. The emphasis here is that the non-healthcare environment surrounding their healthcare arena was the much

larger dimension of nurses' disaster experience and added greatly to their difficulty of providing optimal, normal, accustomed method and level of care.

As these nurses entered their disaster environments, their normal world of orderly, structured 'place' was left behind to be replaced by an unstructured, confusing, chaotic, wide-open space of immediacy and 'now'. The nurse was in unfamiliar territory practice-wise. "The sense of order and security" were lost. They were unable to find their "sensible location in the flow of things" (Thomas & Pollio, 2002, p. 158). Their world was decidedly "not normal." This finding concurs with numerous other studies where nurses were no longer in control of their domain because of the disruption to systems and the confusion that was wrought (Jordan-Welch, 2007; Sato, Atogami, Nakamura, Kusaka, & Yoshizawa, 2014; Sloand et al., 2013).

The disaster environment has been described in numerous anecdotal accounts of nurses' response experiences. Additionally, aspects of non-healthcare sectors are occasionally researched individually, such as communications failures during disaster (Darsey et al., 2013) or disaster drills (Litman, 2006), along with economics (Xiao & Nilawar, 2013) and transportation (Litman, 2006). As a focus of nursing research, however, environmental aspects of disaster nursing have not been a focus either in general or *in toto*.

There was seemingly not a single personal nor descriptive study of nurses and their disaster experiences that did not describe a disrupted sector of society and difficulties providing care and living in this environment; however, these were background components, or non-research accounts. The centrality of the altered disaster

environment was not a central finding of any studies I could locate in the disaster literature. A recent grounded theory of Chinese nurses described the process of "working in that terrible environment" during the 2008 Wenchuan earthquake (Li et al., 2015). Japanese public health nurses experiences following the 2012 tripartite disaster of earthquake-tsunami-nuclear accident, were described as having "unbeatable challenges" of their environment and having numerous "difficulties and dilemmas" (Kayama et al., 2014). These challenges were related to their prescribed roles as nurses, while concomitantly affecting them as private citizens, with both roles urging their "responsibility to engage with the actual humanitarian situation on the ground." "Unbeatable challenges" of the natural environment as well as lack of healthcare supplies and equipment were identified in another study (Wenji et al., 2014). Nursing as "a small piece" of nurses' disaster experience along with the multiple, non-healthcare challenges created by having "all the resources … gone" are new findings described by this study.

The disaster environment was chaotic for US nurses across the spectrum of type of disaster, similar to the findings of HCWs across disaster type (Boswell, 2014). This is consistent with specific studies of military nurses (Rivers, 2009), and location-specific studies of Hurricane Katrina (Jordan-Welch, 2007) and Haiti (Sloand et al., 2013) among numerous others (Li et al., 2015). Other US nurses have described the disaster environment as hell-like (Jordan-Welch, 2007; Sloand et al., 2013), but this was not a finding in this study. The situations at times were "freaky", and "scary", which is consistent with other studies (Jordan-Welch, 2007; Li et al., 2015; Wenji et al., 2014).

Theme 2: **"*You prepare, and prepare, and you are unprepared*"**

Nurses have an expectation when they report to their place of work, whether school, prison, clinic, or hospital, that they will have an adequate amount of necessary healthcare supplies, clean and private treatment rooms, a limit to the numbers of patients scheduled to be seen, and reasonable safety. They assume the support provided by functional lighting, reasonable climate-control, patient and nurse furniture, bathroom facilities, internet and telephone capabilities, and reasonable safety. They focus on the tightly circumscribed sphere of the healthcare setting, perhaps not consciously noting healthcare's interdependence upon municipally-supplied transportation, power, and clean water; or privately supplied communications and janitorial supplies.

In this study, nurses described being unprepared for the loss of these provisions, and for the damaged infrastructure and natural environment they encountered during their disaster experiences. Training they had received from their deploying agency had not prepared them for actualities they would face in the context of disaster. Nurses, hospitals, and emergency planners trained them for disaster events with an assumption that systems and infrastructure would remain functional. What they hadn't expected or planned for was the entire circumstance to become *not normal*: to lose communications, assistance, water and power, staff, climate control, access to accustomed supplies, and the comforts of home. Whether voluntarily or situationally, they found themselves in nursing circumstances and physically complex situations that were unanticipated, discordant, disconcerting, discomforting, and sometimes even wretched.

In existential philosophy, Heidegger described this as being ‘thrown’, finding oneself unexpectedly in the “midst of some situation … beyond the person’s wishes” (Thomas & Pollio, 2002, p. 16). Nurses found that the boundaries and expected scaffolding of education, training, nurse practice acts, and healthcare laws that had previously provided a calm, steady workplace instead became handcuffs in the whirlwind of chaos and space as the assumptions of enabling social structure failed to materialize. The boundaries no longer existed within the context in which they were created, the context was now severely altered, and nurses were thrown by the changed circumstances. Assumptions had been made (a) of having necessary systems, staff, and supplies, (b) that events would never occur, and (c) that the infrastructure would continue to function. These assumptions did not allow thinking beyond the silo of healthcare to the complexity and dependencies of inter-related systems in the larger context of disaster. Protocols, planning, process, guidelines, and structure became unusable or failed to accommodate the prevailing circumstances. Nurses described disaster events and sights as “different,” “interesting,” “surprising,” “weird,” and “odd” - they were ‘thrown’ by them.

This ‘thrownness’ caused by the unfamiliar surroundings of a disaster setting is well-established in the literature. US nurses stated that “nothing can prepare you” for the disaster conditions they experienced in Haiti (Sloand et al., 2013). Nurses in China were not sufficiently prepared for the rudimentary conditions of outdoor living nor did they possess the knowledge and skills required for large scale trauma care during earthquake response (Li et al., 2015; Yan, Turale, Stone, & Petrini, 2015). US nursing students were unprepared for the basics of nursing: contacting families, teaching basic hygiene,

activities of daily living, helping with psychological trauma, taking vital signs, assisting other professionals, wound care, and triage (Schmidt et al., 2011). The overwhelming majority of these students felt that disaster training should be provided as part of their basic nurses' training.

Related studies quantitatively document the lack of knowledge and low perception of nurse disaster preparedness and competence (Baack 2013, Usher 2015). Preparedness has not been well defined, and has been measured by an individual's perception of preparedness using instruments that measure perception of disaster readiness and ability to respond to decontamination and CBRNE events. None of these measures of required knowledge or training address the possibility that these types of responses might need to be carried out and sustained in a damaged physical environment. This study supports and expands the current population-specific quantitative measures of unpreparedness across nursing specialties and types of disasters to qualitatively describe nurses' lack of preparedness for the environments they experienced, a subject not addressed by any current disaster preparedness measures or trainings.

With the exception of the first few hours immediately following a violent type of manmade or natural disruption, the health needs of any sustained disruption are primarily public health issues (Veenema, 2013). Nurses in this study primarily provided food, water, shelter, sanitation and hygiene, safety, and basic healthcare to prevent further harm to affected populations. They provided this care under situations they had not been prepared for – an altered, non-hospital care site, reduced availability of healthcare

supplies, food, water, shelter, power, climate control, cultural familiarity, sanitation, and especially physicians and nurses.

The lack of nurses' preparedness and lack of disaster knowledge is ubiquitous in the literature. Findings from this study demonstrate that despite their hospital based, Red Cross, and acute care training, these nurses remained unprepared to live in and provide healthcare in the reduced structural resources available of the disaster setting they experienced. This study provides evidence that current disaster training is ineffective in preparing nurses for the contextual and public health conditions of a disaster setting. This is a new finding.

Theme 3: **"*It can be done; it's just different*"**

In theme three, nurses found that their nursing practice can be conducted in the altered environmental space of disaster, it's just done differently. In the wide-open space and disrupted systems of disaster, nurses no longer had the security of known place and were asked to function without much of their familiar entities and landmarks: responsible physicians, ancillary staff, protective buildings, sophisticated patient rooms, storage rooms filled with familiar supplies, standard procedures and protocols for 'normal' (Western) healthcare, or even names of patients. They also lost the comforts of and sustenance of home, family, food, and social support. Nurses were at first lost in the disaster environment, and they worked with other colleagues who were 'lost' "in a space that cannot be navigated because it has … neither signposts nor guides …. to provide direction" (Thweatt, 2000, p. 98).

From disorder, nurses responded and adapted to the environmental limitations, and created appropriate boundaries for their altered context to transform the chaotic space into a relatively organized and calm place. According to Merleau-Ponty, we make space a place "by coating it with dimensions of ourselves" (Thomas & Pollio, 2002, p. 208), with things that have meaning to us. These nurses adapted to the freedom of this in-between world of "shredded systems" by being "street smart" with knowing "what to kick out," what to keep, when to "risk," and when to proceed by "MacGyvering": "We're at our best practice when that freedom of – sometimes in that chaos, in that middle part, you get the best health practice that you have seen in a long, long time" when "the boundaries ...and systems *are* a bit broken and yet they're coming into control. It's not chaos, but before you lock 'em down again (banging) there's this window of, *Wow, this is working!*" (RN3).

Nurses across settings have relied upon improvisation and selectively broke or ignored rules to get the job done during their disaster responses. Nurses in Haiti were "uncomfortable" with "substitutions and trial and error" (Sloand et al., 2012). Nurses during Hurricane Katrina "did anything…everything", whatever "they had to" regardless of preexisting rules in order to care for patients under the reduced conditions and excessive needs of patients (Jordan-Welch, 2007). Nurses in the military (Rivers, 2009), nurses during China earthquake responses (Li et al., 2015), and Japan responders to the earthquake, tsunami, and nuclear events of 2011 (Kayama et al., 2014) also found ways of "making do" with supplies on hand to creatively address patient and personal needs.

The study findings support the results from these studies, and broadens this finding across disasters environments encountered by these US nurses.

What survived of nurses' training and structured environment was the fundamentals of nursing. Nurses spoke of narrowing their focus to what you "can deal with," what you can "control", what "you know," and doing "the best you can with what you have" to respond to the needs. Nurses focused on the patients, the immediate bit of normal world closest to them, and temporarily blocked out the disordered world surrounding them.

Like the nurse in this study who described it as "jungle" nursing, other nurses have referred to nursing during disasters as "primitive" and "archaic" (Fink, 2013; Rivers, 2009; Sloand et al., 2013). The remainder of nurses in this study spoke of the importance of going back to the foundations of nursing. *Foundation* is defined as an underlying base or support; especially as the underlying support upon which a building gains its stability and strength (Foundation, 2015). Foundation is used metaphorically to define the basis (as a tenet, principle, or axiom) or body of knowledge upon which a profession stands or is supported. Without a solid and substantial foundation, the building will waver and disintegrate to rubble and disorder.

The foundations of nursing, harkening back to Nightingale's enduring principles, include patient safety, nutrition, elimination, rest/sleep, mobility, personal hygiene, comfort, pain management, patient privacy, and psychosocial needs, along with utilizing critical thinking and developing interventions to manage illness to solve problems (Schneider & Ruth-Sahd, 2015). According to Schneider, some nurses believe the

fundamentals are beneath them, and some schools of nursing have "eliminated fundamentals courses in order to concentrate on what they consider to be 'higher level' skills" (p. 61). Unfortunately, many nursing errors and adverse patient outcomes can be traced back to neglecting the basics of nursing care and basic assessments (Joint Commission, 2014). Both the WHO and AHRQ have reasserted the importance of fundamental nursing knowledge and skills for improved patient outcomes (AHRQ, 2013; WHO, 2009).

The foundations of nursing were utilized by nurses in many other accounts of disaster nursing (Kayama et al., 2014; Rivers, 2009; Sloand et al., 2013; Yan et al., 2015), and are reflected in their provisioning of the basics of care: food, water, shelter, first aid, and psychological care over specialized medical and nursing interventions. One nurse in the present study summed it up well when he said: "Here's what you can do with your head and hands" to address patient needs.

The need for nurses to recreate systems has been broached in the literature, albeit very narrowly. In Haiti, nurses found ways to re-create systems they needed, but these were limited to the organization of medical supplies, creating a paper system for charting, or discovering why clinics weren't open (Sloand et al., 2013). Nurses in the present study, in addition to their 'normal' nursing duties, had to find ways to restore broken non-healthcare systems that support the basics of nursing care. This is a new finding.

Additionally, the process of creating a known, structured, workable place from tumult and chaos, creating place from space, is a new lens with which to understand the experience of nurses and the context they reside in during their disaster responses.

Theme 4: ***"Stuff that sticks with you"***

In the theme "S*tuff that sticks with you,"* nurses shared emotional and physical artifacts of the disaster experience that have remained with them over the years. Physical and emotional stress from wrestling with nonfunctional systems endure; entombed in their bodies, smoke and debris have lodged in their lungs. Sights, sounds, and smells of the past overwhelming experience reside in their minds and can be triggered by similar stimuli to suddenly catch them off guard emotionally. Nurses also shared the provocative and enduring stories of the people they met during their experience. Along with negative psychosocial and physical sequelae, nurses also shared their sense of satisfaction and pride in their disaster contributions.

Many anecdotal accounts and empiric studies by nurses document that the environment of a disaster is overwhelming, intense, and shocking to the responder (Jordan-Welch, 2007; Li et al., 2015; Sloand et al., 2013). The disaster experience results in sustained emotional stress in HCWs and nurses (Ager et al., 2012; Boswell, 2014; Fullerton et al., 2004; Park, 2011; Rubonis & Bickman, 1991). Stress is an imbalance between the demands placed on a person and that person's ability to cope (Cox & MacKay, 1976). To a point, stress results in increased performance, however a threshold is reached where additional stress results in decreased performance. When a person says they are stressed, the meaning is that one has reached the point where they can no longer handle the demands placed on them.

Exposure to constant trauma and human injury can result in secondary trauma and compassion fatigue in health providers (Duffy, Avalos, & Dowling, 2014; Figley, 1995;

Palm et al., 2004). Disaster nurses can thus be considered disaster victims by virtue of their proximity and constant exposure to post-disaster destruction and human harm. Disaster nurses may also be subjected to further threatening weather and situations during their deployment, as nurses in this study described. Furthermore, as a result of their disaster exposure, nurses can become ill or injured by accident, heat/cold injury, communicable illness, or by any of the multitude of adverse conditions during a disaster event.

Natural and man-made destruction of space and place creates a "loss of property and housing …[and]… severe material damage, but it also carries a powerful symbolic erosion of security, social wellbeing and place attachment" (Boano, 2011, p. 38). Nurses in this study were also abruptly displaced from their familiar environments and subjected to these "violent spaces."

Not only are there long-lasting psychosocial effects in disaster responders from the emotional and physical environments, but enduring physical effects are implicated. Thousands of people at Ground Zero exposed to toxic dust in the air in the aftermath of the 9/11 building collapses have since been diagnosed with cancer, along with over 1,000 deaths due to illnesses attributed to breathing the dust-filled air. The 2010 James Zadroga 9/11 Health and Compensation Act provided a 2.78 billion dollar fund to compensate survivors and first responders for health problems resulting from their 9/11 exposure (British Broadcasting Company, 2014, 2015).

While psychosocial harm in HCWs is well-established as an adverse outcome from the disaster experience, somatic harm as an outcome was not discovered in previous

disaster research. The contribution of the environment to disaster-related stress is also a new finding. Practical, non-medically-oriented contextual training for the physical, political, cultural, and other field conditions of disaster deployments was found to support the mental health for a small group of advanced, rapid responders (Makinen, Miettinen, & Kernohan, 2015). There are organizations that provide contextual training to enhance the trainee's situational awareness of their unusual and reduced surroundings for humanitarian aid providers, although at least one is faith-based (Christian). This religious imposition by responders has damaged 'relationships' with victim/survivors receiving their assistance (Seyedin et al., 2009).

Nurses have recognized the imperative of distinguishing usual care versus disaster care. Following the 2008 Sichuan earthquake in China, and in response to the lack of experienced trauma nurses for the sudden upsurge in need along with the intensely damaged infrastructure, experienced trauma nurses trained inexperienced nurses for trauma assessment, infection control, wound management, psychosocial/mental healthcare, and rehabilitation, with an emphasis on providing care with limited resources in the field (Conlon & Wiechula, 2011).

The relationship of a limited set of environmental resources to stress in HCWs has been demonstrated (Boswell, 2014), but the larger context of environmental resources during disaster experience has not yet been explored as a contributor of stress in nurses, nor have factors of the environment contributing to stress been measured.

Nurses in this study conveyed a sense of pride and satisfaction in their contributions. This is in contrast to other reports (Fink, 2013; Jordan-Welch, 2007;

Sloand et al., 2012; Sloand et al., 2013) of nurses who have judged themselves a failure or felt hopeless about the care they did provide by their provisioning of 'less than' standard Western healthcare. Satisfaction appears to be the result of the process of care they delivered given the supplies and resources available (Rivers, 2009) as opposed to a comparison of the end result with the care available in their usual workplace setting.

Patient satisfaction with outcomes is heavily influenced by numerous contextual variables, such as patient expectations, preexisting co-morbidities, and access to rehabilitation therapy (Ring & Leopold, 2015). Outcome satisfaction is further confounded by the patient's states of depression and anxiety. One study found that the single variable of perceived physician empathy was the largest influence of surgical outcome satisfaction (Menendez, Chen, Mudgal, Jupiter, & Ring, 2015). Today, patient satisfaction with the process of receiving healthcare care is now being tracked and tied to hospital remuneration (Centers for Medicare & Medicaid Services, 2012, 2014).

Nurse satisfaction with their provision of care, and the meaning of "excellence in nursing" was raised by nurses in the thrice-impacted public health setting following the 2011 Japanese earthquake, tsunami, and nuclear incident (Kayama et al., 2014). Conflict occurred between the nurses' prescribed roles and the actual humanitarian needs surrounding them and in their face. It is possible that nurse satisfaction during disaster experiences is a result of recognizing 'excellence' in doing the best one can to provide fundamental nursing care given the circumstances, instead of judging oneself a failure because one cannot provide Western standard interventions. This has not yet been addressed in the nursing research.

Nursing Implications

Nurses in this study were not prepared for the multiple challenges involved with providing disaster healthcare in an altered environment. They were also not ready for the necessity of functioning in an environment without their normal structural systems that support the ability to provide healthcare during a disaster. This finding adds to the large extant body of disaster nursing research that documents nurses' lack of preparedness and disaster knowledge. However, this study brings to attention the fact that the larger part of disaster healthcare has to do with the numerous, non-healthcare issues of providing that care in an altered, reduced, and unfamiliar environment; an environment that limits, challenges, and demands attention and action from nurses in order to provide a level of fundamental nursing care. Nurses "didn't know" about so many aspects of their experience, nor had they previously considered or thought about the context where they might be working during a disaster.

Like nurses in the present study, Australian AusMAT nurses in a pilot study relied on the fundamentals of nursing and figured out ways to provide healthcare given the "full on" circumstances of disaster (Ruskie, 2015, April). Unlike nurses in this study, AusMAT nurse underwent mandatory training that exposed these nurses to the altered context of the disaster and humanitarian setting prior to their deployment. AusMAT nurses were also deployed as part of a team of physicians, logisticians, and other health staff, along with several tons of healthcare supplies and portable living and medical facilities.

Because of Australia's location, many of these nurses also had prior experience with travel to other countries, acclimation to heat and humidity, experience living remotely, and previous exposure to diverse cultural groups. Even with prior environmental training for the expected disaster conditions, AusMAT nurses faced numerous challenges: cultural unfamiliarity, discomfort with unfriendly military presence, lack of communication with key personnel, distress at local standards/capabilities of healthcare, and difficulty with the abrupt disaster entry and re-entry to the "normal" world following their deployment.

These similarities and differences between AusMAT and US nurse disaster experiences suggest the need for improvement of nurse disaster education and training. It is possible that pre-deployment preparedness for likely disaster conditions may provide nurses with additional resilience to deal with unexpected conditions and the difficult work. Reorienting disaster nursing education, practice, training, and policy areas from its healthcare focus to reflect the complete reality and circumstance of the nursing-in-the-disaster-environment should benefit nurses and survivors in these tumultuous, stressful experiences.

Education

Current nursing disaster education does not address aspects of the disaster environment, nor the provision of care in that altered environment. Disaster education content has not been standardized within the US or any other nursing curriculum, nor has included content been shown to be sufficient in addressing the knowledge needs of nurses around the world.

Because every nurse has the potential to experience a disaster in his or her home community, and as the International Council of Nurses expects all nurses to be disaster nurses, it follows that disaster training should be provided at the place where one can reach all nurses. Disaster education should therefore be provided as part of the initial RN education program.

Unless one deploys with a specialty unit, much of the disaster and humanitarian response is focused on population and public health (Rokkas, Cornell, & Steenkamp, 2014). As related by nurses in this study, the fundamentals of nursing care, first aid, and public health are the clinical skills and knowledge utilized most often, not hospital nor acute care. Maintaining an emphasis on the importance of population health and fundamentals of care can easily be integrated with the basics of nursing, and help student nurses maintain awareness that not all settings are a hospital, fully-resourced, or specialized. Practicing critical thinking skills and what-if scenarios will mentally prepare nurses for the likelihood of disaster care. First aid should be a required component of initial nursing education as well.

Nurses in this study encountered and cared for populations with which they had little previous experience. Nurses, as a middle-class, primarily white workforce (HRSA, 2013), should understand that disaster negatively impacts members of 'vulnerable' populations more than individuals with greater resources (Davis et al., 2013; Woodhouse, 2007). Nursing education should include preparedness of nurses to work with the cultural and sociopolitical realities of the populations most likely to be encountered and needing assistance following a disaster event.

Disaster education for nurses should emphasize the contextual circumstances — that is, disaster response occurs in the setting of the disaster. Disaster nursing does not simply 'transplant' the usual clinical practices into a disaster setting, and living conditions and working conditions will likely be far different than the nurses' regular employment setting. Education should leave nurses with an awareness that yes, you may not have what you need, the physical conditions may be difficult, enabling systems may fail, and the political, cultural, and safety environments may also be extremely challenging.

The Sphere Project (2011) has put forth an internationally recognized sets of standards for humanitarian response and disaster preparedness that ***requires*** (emphasis added) humanitarian agencies to ensure that aid workers have the "knowledge, skills, behaviour and attitudes to plan and implement an effective humanitarian response" (p. 71) and "should be prepared, at least, to meet the Sphere minimum standards (p. 10) which address the contextual issues of " water supply, sanitation and hygiene promotion; food security and nutrition; shelter, settlement and non-food items; and health action" (p. 11). According to Sphere, demonstration of the proper preparation of aid workers is to be measured by "the incidence of aid workers' illness, injury and stress-related health issues remains stable, or decreases over the course of the disaster response" (p. 72).

Along with the physical conditions of disaster, nurses should also be prepared for the difficult ethical decisions faced when resources are in short supply but the humanitarian need is great. An understanding of disaster triage - doing the greatest good for the most people - along with understanding that the most vulnerable in our society are

the groups most commonly encountered in disaster work is also necessary. Case studies of issues raised during Hurricane Katrina have been used to stimulate discussion and awareness of ethical situations and conditions faced by HCWs (Priest & Bahl, 2008), and could be used similarly with nurses as a training tool.

Advanced level nurses are perfectly situated for managing public health and population health of disaster situations, as well as providing additional specialty care. Again, nurses at this level should be taught to have an understanding that the contexts of care will be dramatically different.

Another aspect of academic knowledge is the education of the colleagues who work with nurses. Physicians must understand the broader public health aspect of disaster care, and the role of nurses in providing population-level care. Because of nursing's holistic care framework of a patient, whether at the individual or community level, nurses are well suited to organize and manage disaster settings, and for problem solving to attend to the basics of health while physicians attend to injury and illness.

Practice

Nurses in this study found themselves facing practice conditions unlike their usual practice setting. Whether the disaster impacted their place of work, their larger community, or a distant region, they could not perform their 'practice as usual'.

Practice settings need to account for the probability of losing critical systems during a disaster, and personnel should train for this likelihood. Disaster training should discuss the larger contextual setting of disaster, and train personnel as if the disaster is **not** limited to the current focus of surge, CBRNE, decontamination, and trauma in a

normal hospital arena. Practice settings should recognize that normal levels of care may not be pragmatic in a larger disaster scenario, and thus disaster-triage philosophies should quickly supplant hospital-triage practice. Nurses should discuss the implications of this paradigm shift on practice priorities. Nurses in this study altered rules and violated policies and protocols in order to effect the best possible patient care given the circumstances. Discussing or contemplating these morally and ethically difficult decisions should occur in the relatively calm, less stressful normal environment before a disaster occurs. Nurses should engage with their facility disaster preparedness planners and determine if they are planning for surge, decontamination, and trauma, or if they are planning for the larger context of a damaged environment, internally and externally. Nurses should also be involved at the preparedness planning level as well and lead from this level.

Nurses should be aware that if a disaster occurs in their community, they may be stranded at work, without relief or staff, and with large numbers of patients, families and community members seeking refuge. Outside help may not be available for some time, and support systems may fail. For any deployment to a disaster environment, nurses should bring supplies to enable them to be self-sufficient for a number of days, cognizant that their facility may not anticipate increased numbers of patient along with sheltering community members.

Nurses should prepare for providing basics of nursing care, whether at a local disturbance or a distant deployment. Even with critical patients and no definitive care available, or with reduced stocks of supplies and medications, the basics of nursing can

always be offered. This is a shift from end-goal oriented tasks and intervention-driven medical care to one with a focus on the *process* of caring for the human being, as best as one is able given the context of the disaster. The process of caring is part of the basics of nursing; remembering physiology, attending to warmth, nutrition, and comfort, so it ports to disaster easily.

Training

There is insufficient progress in the disaster training of healthcare workers (Jacobson, 2011). Training must occur in a 'not normal' environment, yet we train nurses in 'normal' surroundings for the most part.

Disaster drills are relatively short tests, not typically sustained, and thus do not simulate the cumulative effects of fatigue, sleeplessness, the compounded failure of systems, total chaos, running out of supplies, public health aspects of surge, and shelter. Many of these situations are difficult to duplicate in the short time allotted for disaster drills. However, drilling to failure, instead of success, helps identify gaps in logistical and operational planning, and is more beneficial in understanding and improving an organization's disaster response plan strengths and weaknesses.

Nurses in this study had completed numerous standard disaster trainings: ICS, TNCC, hazmat, BDLS, ADLS, CBRNE, hospital-based, and Red Cross training. While these convey important medical knowledge, nurses remained unprepared for the physical and practical conditions they encountered. Disaster training must prepare nurses for the anticipated conditions. It has to reflect damaged surroundings and reduced resources, with vastly increasing needs. Do the unexpected! Have your radio system fail, and

observe how lack of command and communication affects patient care. Turn the water off and test staff teamwork and critical thinking skills. Have a drill in winter to learn how normal tasks now take twice as long. Identify issues regarding staff and patient physiological safety. Announce that all supplies have been used up to stress your staff for possible real situations. Have disaster-experienced nurses share their experiences of the environment with staff. Talk about Nursing 101. Yes, disaster drills are great; these "contextual experiences" will make them better. Practical training regarding the non-clinical context of disaster medical care can be adapted by thoughtful administrators and preparedness planners for application to the hospital or city environment.

Another issue of training is that of physical fitness. Disaster work is physically and emotionally demanding. Disasters frequently occur in hot and humid regions, and these may likely be the nurses' working conditions. The sudden manual nature of many tasks compounds the physical demands of extended work shifts. Personal physical training and wellness prior to a disaster will help the nurses sustain their capability of giving care under extremely difficult situations. Acclimation through heat and exercise exposure also helps protect nurse and responder safety (Brearley, M., personal communication, Oct. 12, 2014).

Health/Preparedness Policy

US nurses are unprepared for the austerity and limited resources of disaster conditions. Austerity may be relative: being overwhelmed by patients in a hospital setting. Austerity may also literally occur in the scene of a disaster. Current disaster preparedness policy emphasizes a trauma and acute injury response in unharmed

hospitals. In some specific events a high level of this care may be needed (Boston marathon bombing). But many disasters involve the population remaining behind, the ones exposed to flood waters, destroyed housing, living in refugee camps, etc. (Klein & Nagel, 2007; Lee, Low, Ng, & Teo, 2005b; Redwood-Campbell & Riddez, 2006). The ongoing disaster involving displaced individuals is a matter of public health. Policies should emphasize this population focus over the individual, acute focus of current policy. The need during disaster is for public health, generalists, and nurses more so than surgical and specialist physicians (P. Arbon et al., 2006; Darsey et al., 2013; Klein & Nagel, 2007; Lee, Low, Ng, & Teo, 2005a; Miller & Dowd, 2008; Morgan, Ahern, & Cairncross, 2005; Redwood-Campbell & Riddez, 2006).

Policy at every level of government and organization needs to be rewritten to incorporate an understanding that the context of healthcare drastically alters during a disaster situation. Policy should reflect and emphasize that the setting for their policy is not 'normal', but that many systems will likely not be functional.

The excessive work hours required of nurses during a disaster must also be addressed. Wildland firefighters also deal with life-or-death settings, and their governing institutions have established mandatory work-rest ratios of 16:8 (after the initial 24-hours of an incident) to protect and sustain worker health (National Wildfire Coordinating Group, 2012). This safety policy should be imported into the larger disaster arena and replicated for all disaster responders, especially nurses. Nursing care must be provided around the clock, and policy limits that define16:8 ratios requiring agencies and NGOs to

plan this into their response, will help protect nurses' physical and mental health by allowing for adequate recuperative rest.

Recommendations for Future Research

The environment is seldom studied in nursing, much less the upheaval and disorder of the physical environment of disaster nursing. There is no consistent measure of preparedness. There is no consensus on what counts as necessary knowledge or skills required by disaster nurses (basic nursing versus trauma and triage). Research discerning the value and relative contributions of currently taught skills and knowledge (ICS, trauma, triage) to disaster experiences should be undertaken to measure their actual value to the nurse in a disaster. The value of non-clinical, context-based skills and knowledge should be measured against the currently taught clinical skills and knowledge.

Determining actual disaster training needs as specified by nurses who have experienced a disaster is a large arena for future research. Because so many returning nurses have shared they were unprepared for the experience, they have the best perspective of what additional subject matter is required to adequately prepare other nurses for the experience. When the full range of disaster knowledge required has been detailed, actual level of knowledge must be researched, not just nurse perceptions of knowledge.

Causes of stress, and especially causes that are environmental are rarely addressed. Specifically researching aspects of the environment that contribute to nurses' stress and distress is also warranted given the large base of research on disaster stress but little on the causes of that stress.

Specific nurse populations (ED nurses, disaster medical assistance team (DMAT) nurses, international nurses) may have different experiences. These will be important to discover in future research. Nurses from low-resource settings may have pragmatic experiential training that better prepares them for low-resource disaster settings, and this warrants further research as well.

Strengths and Limitations of this Study

There are several strengths of this study. The use of an appropriate qualitative method allows the exploration of an unknown phenomenon and accentuates the expertise and words of the participant. Staying true to the philosophical lens, and use of a systematic process, and well-described method are all strengths. The recruitment of a broad cross-section of nurses on experience level, disaster types experienced, specialty, survivor and/or responder, and results that are universal "across varied situations, this is what the experience is like" suggests that the study findings will be widely applicable to other disaster nurses and settings.

Another strength of this research is the numerous methods used to ensure rigor and validity. I used a bracketing interview and reflexivity to separate my opinions from the data I was analyzing, as well as continuous documentation throughout the process reinforce the validity of this research. The help of the PRG group which critiqued my findings, confirmed findings, and questioned findings, caused me to dig harder for the essences and helped ensure that I held true to the phenomenological bases.

Member checking the central and global themes with the participants further strengthens the validity of the findings. Seven of the participating nurses replied back and

agreed with the findings. One of the most experienced disaster nurses who deployed with a disaster relief organization replied: “Love the themes, very good.” A nurse who experienced her first disaster in her local community said “… this sums it very well. … I find each day we are saying less often ‘before the tornado.’ Things are becoming more normal.” Another thought the themes “were dead on” and hoped this study would help nurses “gain an insight on ‘disaster’ work prior to being thrown into one.”

There are also limitations to this study. The response and timeliness of the various nursing organizations for help with recruiting participants was exceptionally varied.

Dispersal of study recruitment flyers did not occur as broadly as I had hoped due to lengthy delays with some organizations who had agreed to publicize the study (I had contacted most of my selected organizations prior to IRB approval, to determine requirements and contact person). One organization finally approved the posting of the flyer on their website after I had concluded all the interviews. Additionally, some nursing organizations did not deem the study appropriate to their membership or nursing focus. One state emergency nurses’ association deemed the study as inappropriate for their organization. One state nurses association gladly and quickly posted my study announcement, while in a different state, the state nurses association felt that their state’s non-nurse specific Medical Reserve Corps (MRC) was a more suitable place for recruitment, and forwarded my study to them.

The lack of diversity in the study population, despite specific invitation to minority nursing groups to participate, remains a worry and a limitation regarding the generalizability of the results to minority nurses’ experiences. While I acknowledge the

importance of minority-nurse specific research as needed when examining differences between groups, the constant separation of nurses into white and other only enforces and enhances the segregation, and does not move us forward together as 'nurse.' Without a specific reason to query minority nurses separately, it fosters segregation in nursing, not inclusion.

Military nurses at the time of response were excluded from this study, as were nurses who self-disclosed with PTSD. Thus, nurses with relevant disaster experience may have been excluded from this study.

The qualitative interviewing skill of the researcher can be a limitation, as can the personal circumstances of the interviewee on the day of the interview. Both may limit the depth or breadth of the interview content. My experience conducting interviews in several previous quantitative studies should minimize this limitation. Additionally, I utilized a step-by-step checklist to ensure consistency during the interview process. While the personal circumstances of the interviewees were beyond my control, I took time to establish rapport with each participant prior to the commencement of each interview.

Elapsed time since the disaster experience may have moderated informants' feelings and recollections. Because of the interlude, their experiences may be influenced by other nurse-responders, family members, or by news events and literature. Qualitative research does not assume the veridicality of memory, because memories are continually revised throughout life. Instead, qualitative research embraces participants' perceptions of the experience, their multiple realities and socially-constructed meanings of the experience, as truth (Creswell, 2013).

Self-selection by participants is unavoidable, therefore this self-exclusionary process may have left out nurses who also have important disaster experiences that this research was unable to capture. Others not reached by the recruitment strategy were nurses who had experienced a disaster nursing situation, and were no longer in the profession because of their experience. This result is known to have occurred following Hurricane Katrina (Fink, 2013; Jordan-Welch, 2007)

Qualitative findings are a co-creation between the researcher and the participant, and thus the results that I obtain may only be relevant to this particular study sample, interviewer, and point in time (Creswell, 2009). Qualitative research creates detailed descriptions of specific people's experiences, limiting generalizability because other situations do not possess the original time, place, and people. Yet Campbell's principle of proximal similarity suggests that similar people in similar circumstances may also experience similar experiences. Thus, study generalizability, or transferability of these findings to other groups of nurses in other disaster settings is possible based on the nearness or similarity of the new context to the original findings (Polit & Beck, 2010).

Summary

Nurses describe their disaster experiences in unflattering terms. The literature reflects an interest in the internal environment of the nurse - such as stress levels, perceptions of preparedness, and levels of disaster knowledge - but there is little known about the context, the environment where these disaster experiences occur. US nurses are unprepared for disaster, and suffer from adverse psychosocial outcomes following their disaster response. Nurses are prepared for disaster by unstandardized training and

education that focuses on providing hospital-centric trauma and acute care in fully resourced Western conditions and does not include realities of the disaster setting that impacts the ability to provide nursing care as shared in the anecdotal reports of nurses. During a disaster, these assumptions of functional environments are challenged, and nurses frequently encounter stress from trying to provide standard care in an altered environment. This study utilized an existential phenomenological approach and methodology to explore this unknown contextual aspect of nurses' disaster experiences. The research question was, "What is the meaning of the nurse's experience of the environment during disaster response?" Eleven nurses from broad disaster expertise and training levels participated in this research. The contextual grounds of nurses' experience of the environment of disaster extended beyond the realm of the healthcare setting to encompass all sectors of a functional society. The essence of the disaster experiences can be summed up by the central theme of "*You came to not normal land*." Nursing was a small part of the provision of nursing care. Four themes that describe this 'not normal land' were "*All the resources was gone"*; "*You prepare, you prepare, and you are unprepared"*; "*It can be done; it's just different"*; and "*Stuff that sticks with you"*.

The environment of disaster was both "not normal" and challenging owing to the many simultaneous breakdowns in healthcare supportive systems, situations not previously encountered or imagined in nurses' usual healthcare positions. Reductions in systems (water, power), structures, staff, and supplies were coupled with lack of familiarity with alternative care sites, the patient populations, and the isolated nature of disaster environments. Neither nurse disaster preparedness training nor experience

prepared them for all instances of disaster, and nurses were surprised and unprepared for these events in the physical conditions surrounding them. Policies and regulations that normally guide nurses' actions were disregarded in the immediacy of providing care when the usual social framework no longer existed. Nurses experienced and continue to relive the disaster-setting's sights, sounds, smells, and stories of the people encountered. A strong sense of pride, duty, and willingness to respond again prevailed in these nurses.

Nurses cannot change the disaster conditions surrounding them, but they can be prepared for likely conditions of reduced resources and damaged infrastructure by including the contextual setting of disaster nursing in disaster education, practice, training, and policy. Suggestions for further research includes determining the relevance of current disaster training to the nurses' actual disaster experience; determining what non-clinical knowledge or skills or training disaster nurses think would be useful; and identifying and measuring the contribution of environmental factors to disaster nurses' stress.

References

Agency for Healthcare Research and Quality. (2005). Bioterrorism and other public health emergencies: Altered standards of care in mass casualty events. Retrieved from http://archive.ahrq.gov/research/altstand/

Agency for Healthcare Research and Quality. (2013). Making Health Care Safer II: An updated critical analysis of the evidence for patient safety practices. Retrieved from http://www.ahrq.gov/research/findings/evidence-based-reports/ptsafetyuptp.html

Ager, A., Pasha, E., Yu, G., Duke, T., Eriksson, C., & Cardozo, B. L. (2012). Stress, mental health, and burnout in national humanitarian aid workers in Gulu, northern Uganda. *Journal of Traumatic Stress*, *25*(6), 713-720. doi: 10.1002/jts.21764

Albrecht, G., Sartore, G.-M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., . . . Pollard, G. (2007). Solastalgia: The distress caused by environmental change. *Australasian Psychiatry*, *15*(1 suppl), S95-S98. doi: 10.1080/10398560701701288

Anderson, D. A. (2012). *Exploration of nurse and nurse leaders' reports of the competencies needed by rural registered nurses in disasters.* (Ed.D.), University of Hartford. Retrieved from http://proxy.lib.utk.edu:90/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012158662&scope=site Available from EBSCOhost ccm database.

Anderson, J., Perry, J., Blue, C., Browne, A., Henderson, A., Khan, K. B., . . . Smye, V. (2003). "Rewriting" cultural safety within the postcolonial and postnational

feminist project: Toward new epistemologies of healing. *Advances in Nursing Science, 26*(3), 196-214.

Anderson, L. M., Scrimshaw, S. C., Fullilove, M. T., & Fielding, J. E. (2003). The Community Guide's model for linking the social environment to health. *American Journal of Preventive Medicine, 24*(3 Suppl), 12-20.

Arbon, P., Bobrowski, C., Zeitz, K., Hooper, C., Williams, J., & Thitchener, J. (2006). Australian nurses volunteering for the Sumatra-Andaman earthquake and tsunami of 2004: A review of experience and analysis of data collected by the Tsunami Volunteer Hotline. *Australasian Emergency Nursing Journal, 9*(4), 171-178. Retrieved from http://dx.doi.org/10.1016/j.aenj.2006.05.003

Arbon, P., Ranse, J., Cusack, L., Considine, J., Shaban, R. Z., Woodman, R. J., . . . Mitchell, B. (2013). Australasian emergency nurses' willingness to attend work in a disaster: A survey. *Australasian Emergency Nursing Journal, 16*(2), 52-57. doi: 10.1016/j.aenj.2013.05.003

Bahrami, M., Aliakbari, F., & Aein, F. (2014). Iranian nurses' perception of essential competences in disaster response: A qualitative study. *Journal of Education and Health Promotion, 3*, 81. doi: 10.4103/2277-9531.139247

Bayer, A. M., Danysh, H. E., Garvich, M., Gonzalvez, G., Checkley, W., Alvarez, M., & Gilman, R. H. (2014). An unforgettable event: A qualitative study of the 1997-98 El Nino in northern Peru. *Disasters, 38*(2), 351-374. doi: 10.1111/disa.12046

Bechtel, R. B. (1997). *Environment and behavior: An introduction*. Thousand Oaks, CA: Sage Publications.

Bless, M. (2005). *Thoughts on serving: Two weeks as a post-hurricane volunteer*. Retrieved from http://medscapenursing.blogs.com/medscape_nursing/hurricane_katrina_nurses_and_nps_help/

Brooklyn Center for Independence of the Disabled v. Bloomberg, No. 980 F. Supp. 2d 588 (S.D. N.Y. 2013).

Boano, C. (2011). 'Violent spaces': Production and reproduction of security and vulnerabilities. *Journal of Architecture, 16*(1), 37-55. doi: 10.1080/13602365.2011.547002

Borreani, C., Miccinesi, G., Brunelli, C., & Lina, M. (2004). An increasing number of qualitative research papers in oncology and palliative care: Does it mean a thorough development of the methodology of research? *Health and Quality of Life Outcomes, 2*, 7. doi: 10.1186/1477-7525-2-7

Boswell, S. (2014). *"I saved the iguana": A mixed methods study examining responder mental health after major disasters and humanitarian relief events.* (Doctoral dissertation). Retrieved from http://trace.tennessee.edu/utk_graddiss/3111

Brands, C. K., Hernandez, R. G., Stenberg, A., Carnes, G., Ellen, J., Epstein, M., & Strouse, T. (2013). Complete self-sufficiency planning: Designing and building disaster-ready hospitals. *Southern Medical Journal, 106*(1), 63-68. doi: 10.1097/SMJ.0b013e31827cb1b2

Brink, P. J., & Wood, M. J. (1998). *Advanced design in nursing research* (Second ed.). Thousand Oaks, CA: Sage Publications.

British Broadcasting Company. (2014, September 26). *Cancer kills three 9/11 firefighters on the same day.* Retrieved from http://www.bbc.com/news/world-us-canada-29381978

British Broadcasting Company. (2015, August 26). '*Dust lady' of 9/11 Marcy Borders dies of cancer at 42*. Retrieved from http://www.bbc.com/news/world-us-canada-34061442

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Buffett, P. (2013, July 26, 2013). Philanthropic colonialism. *New York Times*.

Burkle, F. M. J., & Greenough, P. G. (2008). Impact of public health emergencies on modern disaster taxonomy. *Disaster Medicine and Public Health Preparedness, 2*, 192-199.

Centers for Disease Control and Prevention. (2013). *CDC's built environment and health initiative*. Retrieved from http://www.cdc.gov/nceh/information/built_environment.htm

Centers for Disease Control and Prevention. (2014). *Strategic National Stockpile (SNS)*. Retrieved from http://www.cdc.gov/phpr/stockpile/stockpile.htm

Centers for Disease Control and Prevention. (2015). *Social determinants of health.* Retrieved from http://www.cdc.gov/nchhstp/socialdeterminants/index.html

Centers for Medicare & Medicaid Services. (2012). *Frequently Asked Questions Hospital Value-Based Purchasing Program*. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-

Instruments/hospital-value-based-purchasing/Downloads/FY-2013-Program-Frequently-Asked-Questions-about-Hospital-VBP-3-9-12.pdf

Centers for Medicare & Medicaid Services. (2014). *Hospital value-based purchasing*. Retrieved from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/hospital-value-based-purchasing/

Conlon, L., & Wiechula, R. (2011). Preparing nurses for future disasters—The Sichuan experience. *Australasian Emergency Nursing Journal, 14*(4), 246-250. doi: http://dx.doi.org/10.1016/j.aenj.2011.08.001

Connor, S. B. (2014). When and why health care personnel respond to a disaster: The state of the science. *Prehospital and Disaster Medicine,* 1-5. doi: 10.1017/s1049023x14000387

Courtney, B. A., Priest, C., & Root, P. (2012). Legal issues in emergency response. *Annual Review of Nursing Research, 30,* 67-88.

Cox, T., & MacKay, C. J. (1976). *A psychological model of occupational stress*. Paper presented at the Medical Research Council meeting, London, England.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, CA: Sage Publications.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches.* Washington, D. C.: Sage Publications, Inc.

Curious.(2015). *Merriam-Webster*. Retrieved from http://www.merriam-webster.com/dictionary/curious

Daily, E., Padjen, P., & Birnbaum, M. (2010). A review of competencies developed for disaster healthcare providers: Limitations of current processes and applicability. *Prehospital and Disaster Medicine, 25*(5), 387 - 395.

Danna, D., Bernard, M., Schaubhut, R., & Mathews, P. (2010). Experiences of nurse leaders surviving Hurricane Katrina, New Orleans, Louisiana, USA. *Nursing & Health Sciences, 12*(1), 9-13. doi: 10.1111/j.1442-2018.2009.00497.x

Danna, D. M., Pierce, S. S., Schaubhut, R. M., Billingsley, L., & Bennett, M. J. (2015). Educating nurses to provide culturally competent care during disasters. *Journal of Continuing Education in Nursing, 46*(3), 135-144. doi: 10.3928/00220124-20150220-18

Darsey, D. A., Carlton, F. B., Jr., & Wilson, J. (2013). The Mississippi Katrina experience: Applying lessons learned to augment daily operations in disaster preparation and management. *Southern Medical Journal, 106*(1), 109-112. doi: 10.1097/SMJ.0b013e31827ca3f2

Davis, E. A., Hansen, R., Kushma, J., Peek, L., & Phillips, B. (2013). Identifying and accommodating high-risk, high-vulnerability populations in disasters. In T. G. Veenema (Ed.), *Disaster nursing and emergency prpearedness for chemical, biological, and radiological terrorism and other hazards*. New York: Springer.

Delacampagne, C. (1999). *A history of philosophy in the twentieth century*. Baltimore, MD: Johns Hopkins University Press.

Department of Homeland Security. (2013a). *National Infrastructure Protection Plan: Partnering to enhance protection and resiliency*. Washington, D.C. Retrieved

from http://www.dhs.gov/sites/default/files/publications/NIPP%202013_Partnering%20for%20Critical%20Infrastructure%20Security%20and%20Resilience_508_0.pdf.

Department of Homeland Security. (2013b). National Response Framework. Retrieved from http://www.fema.gov/media-library-data/20130726-1914-25045-1246/final_national_response_framework_20130501.pdf

Donahue, D. A., Cunnion, S. O., & Godwin, E. A. (2013). The road less taken: Modularization and waterways as a domestic disaster response mechanism. *Journal of Emergency Management, 11*(3), 225-236.

Downey, E. L., Andress, K., & Schultz, C. H. (2013a). External factors impacting hospital evacuations caused by Hurricane Rita: The role of situational awareness. *Prehospital and Disaster Medicine, 28*(3), 264-271. doi: 10.1017/s1049023x13000125

Downey, E. L., Andress, K., & Schultz, C. H. (2013b). Initial management of hospital evacuations caused by Hurricane Rita: A systematic investigation. *Prehospital & Disaster Medicine, 28*(3), 257-263. doi: 10.1017/S1049023X13000150

Duffy, E., Avalos, G., & Dowling, M. (2014). Secondary traumatic stress among emergency nurses: A cross-sectional study. *International Emergency Nursing*(0). doi: http://dx.doi.org/10.1016/j.ienj.2014.05.001

Evans, M., Carlson, J., Barr, P., Kutscher, B., & Zigmond, J. (2012). Left in the dark: Seven years after Katrina, Sandy is teaching hospitals more lessons on how to survive nature's fury. *Modern Healthcare, 42*(45), 6-7, 12, 11.

Farmer, P. (2005). *Pathologies of power*. Berkeley, CA: University of California Press.

Fawcett, J. (1984). The metaparadigm of nursing: Present status and future refinements. *Image: The Journal of Nursing Scholarship, 16*(3), 84-89.

Fielding, J. E., Teutsch, S., & Breslow, L. (2010). A framework for public health in the United States. *Public Health Reviews, 32*, 174-189.

Figley, C. R. (1995). *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized*. New York: Brunner/Mazel.

Fink, S. (2013). *Five days at Memorial*. New York: Crown Publishers.

Foundation. (2015). *Merriam-Webster*. Retrieved from http://www.merriam-webster.com/dictionary/foundation

French, E. D., Sole, M. L., & Byers, J. F. (2002). A comparison of nurses' needs/concerns and hospital disaster plans following Florida's Hurricane Floyd. *Journal of Emergency Nursing, 28*(2), 111-117.

Fullerton, C. S., Ursano, R. J., & Wang, L. (2004). Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. *The American Journal of Psychiatry, 161*(8), 1370-1376. doi: 10.1176/appi.ajp.161.8.1370

Gebbie, K., & Merrill, J. (2002). Public health worker competencies for emergency response. *Journal of Public Health Management and Practice, 8*(3), 73-81.

Gebbie, K., & Qureshi, K. (2002). Emergency and disaster preparedness: Core competencies for nurses: What every nurse should but may not know. *American Journal of Nursing, 102*(1), 46 - 51.

Gebbie, K. M., Hutton, A., & Plummer, V. (2012). Update on competencies and education. *Annual Review of Nursing Research, 30,* 169-192.

Geisz-Everson, M. A., Dodd-McCue, D., & Bennett, M. (2012). Shared experiences of CRNAs who were on duty in New Orleans during Hurricane Katrina. *AANA Journal, 80*(3), 205-212.

Glaser, B. G., & Strauss, A. L. (1966). The purpose and credibility of qualitative research. *Nursing Research, 15*(1), 56-61.

Good, L. (2007). Addressing hospital nurses' fear of abandonment in a bioterrorism emergency. *AAOHN Journal, 55*(12), 493-500.

Groleau, D., Zelkowitz, P., & Cabral, I. E. (2009). Enhancing generalizability: Moving from an intimate to a political voice. *Qualitative Health Research, 19,* 416-426.

Guerisse, P. (2005). Basic principles of disaster medical management. *Acta Anaesthesiologica Belgica, 56,* 395–401.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough?: An experiment with data saturation and variability. *Field Methods, 18,* 59-82. doi: 10.1177/1525822X05279903

Guha-Sapir, D. (2014) *Annual disaster statistical review 2013: The numbers and the trends*. Brussels: Center for Research in the Epidemiology of Disasters.

Hammad, K. S., Arbon, P., & Gebbie, K. M. (2011). Emergency nurses and disaster response: An exploration of South Australian emergency nurses' knowledge and perceptions of their roles in disaster response. *Australasian Emergency Nursing Journal, 14*(2), 87-94. doi: http://dx.doi.org/10.1016/j.aenj.2010.10.002

Health Resources and Services Administration. (2013). *The U.S. nursing workforce: Trends in supply and education.* Retrieved from http://bhpr.hrsa.gov/healthworkforce/reports/nursingworkforce/nursingworkforcefullreport.pdf

Hein, K. (2010). The competency of competencies. *Prehospital and Disaster Medicine, 25*(5), 396 - 397. doi: http://dx.doi.org/10.1017/S1049023X0000844X

Hernandez, D. (2013). Energy insecurity: A framework for understanding energy, the built environment, and health among vulnerable populations in the context of climate change. *American Journal of Public Health, 103*(4), e32-34. doi: 10.2105/ajph.2012.301179

Higginbotham, N., Connor, L., Albrecht, G., Freeman, S., & Agho, K. (2006). Validation of an environmental distress scale. *EcoHealth, 3*(4), 245-254. doi: 10.1007/s10393-006-0069-x

Hochbaum, G., Rosenstock, I., & Kegels, S. (1952). Health belief model. *United States Public Health Service*.

Hsu, E., Thomas, T., Bass, E., Whyne, D., Kelen, G., & Green, G. (2006). Healthcare worker competencies for disaster training. *BMC Medical Education, 6*(1), 19.

Husserl, E. (1933/1960). *Cartesian meditations: An introduction to phenomenology* (D. Cairns, Trans.). The Hague: M. Nijhof.

Institute of Medicine. (2003). *Who will keep the public healthy? Educating public health professionals for the 21st century*. Washington, D. C.: National Academy of Sciences.

Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health*. Washington, D.C.: National Academies Press.

Inter-Agency Standing Committee. (2009). *2009 UNISDR terminology on disaster risk reduction*. Retrieved from http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

Inter-Agency Standing Committee. (2012). *Reference module for cluster coordination at the country level*. Retrieved from http://www.humanitarianresponse.info/system/files/documents/files/iasc-coordination-reference%20module-en_0.pd

Inter-Agency Standing Committee. (2013). *IASC principals transformative agenda.* Retrieved from http://www.humanitarianinfo.org/iasc/pageloader.aspx?page=content-template-default&bd=87

Interesting. (Ed.) (2015). *Merriam-Webster*. Retrieved from http://www.merriam-webster.com/dictionary/interesting

International Council of Nurses. (2006). *Nurses and disaster preparedness*. Retrieved from http://www.icn.ch/images/stories/documents/publications/position_statements/A11_Nurses_Disaster_Preparedness.pdf

Jacobson, J. (2011). 9/11 and Nursing, 10 Years On. *American Journal of Nursing, 111*(9), 19-21.

Jarvis, S., & MacDonald-Evoy, J. (2015, February 26). Internet restored after vandals cut line to northern Arizona. *The Arizona Republic*. Retrieved from http://www.azcentral.com/story/news/local/arizona/2015/02/25/fiber-line-cut-leaves-northern-arizona-areas-without-internet/24009431/

Joint Commission. (2014). *Sentinel event data—Root causes by event type (2004 - 2nd quarter 2015)*. Retrieved from http://www.jointcommission.org/assets/1/18/Root_Causes_Event_Type_2004-2Q_2015.pdf

Jordan-Welch, M. L. (2007). *"Nursing in Hell": The experience of providing care during and after Hurricane Katrina.* (Doctoral dissertation). Retrieved from http://trace.tennessee.edu/utk_graddiss/203

Kawano, R. (2006). Answering Katrina's call. *Minority Nurse,* (June). Retrieved from http://minoritynurse.com/answering-katrinas-call

Kayama, M., Akiyama, T., Ohashi, A., Horikoshi, N., Kido, Y., Murakata, T., & Kawakami, N. (2014). Experiences of municipal public health nurses following Japan's earthquake, tsunami, and nuclear disaster. *Public Health Nursing, 31*(6), 517-525. doi: 10.1111/phn.12140

Kim, H. K., Takematsu, M., Biary, R., Williams, N., Hoffman, R. S., & Smith, S. W. (2013). Epidemic gasoline exposures following Hurricane Sandy. *Prehospital & Disaster Medicine, 28*(6), 586-591. doi: 10.1017/S1049023X13009023

Kirsch, T., Siddiqui, M. A., Perrin, P. C., Robinson, W. C., Sauer, L. M., & Doocy, S. (2013). Satisfaction with the humanitarian response to the 2010 Pakistan floods:

A call for increased accountability to beneficiaries. *Emergency Medicine Journal, 30*(7), 565-571. doi: 10.1136/emermed-2012-201226

Klein, K. R., & Nagel, N. E. (2007). Mass medical evacuation: Hurricane Katrina and nursing experiences at the New Orleans airport. *Disaster Management & Response, 5*(2), 56-61. doi: 10.1016/j.dmr.2007.03.001

Klima, D. A., Seiler, S. H., Peterson, J. B., Christmas, A. B., Green, J. M., Fleming, G., . . . Sing, R. F. (2012). Full-scale regional exercises: Closing the gaps in disaster preparedness. *Journal of Trauma and Acute Care Surgery, 73*(3), 592-597. doi: 10.1097/TA.0b013e318265cbb2

Krol, D. M., Redlener, M., Shapiro, A., & Wajnberg, A. (2007). A mobile medical care approach targeting underserved populations in post-Hurricane Katrina Mississippi. *Journal of Health Care for the Poor & Underserved, 18*(2), 331-340.

Kudo, D., Furukawa, H., Nakagawa, A., Abe, Y., Washio, T., Arafune, T., . . . Kushimoto, S. (2014). Reliability of telecommunications systems following a major disaster: Survey of secondary and tertiary emergency institutions in Miyagi Prefecture during the acute phase of the 2011 Great East Japan Earthquake. *Prehospital and Disaster Medicine, 29*(2), 204-208. doi: 10.1017/s1049023x14000119

Lancet. (1910). Florence Nightingale. *The Lancet, 176*(4538), 571-572. doi: 10.1016/S0140-6736(00)52574-4

Lancet. (2010). Growth of aid and the decline of humanitarianism. *The Lancet, 375*(9711), 253. doi: http://dx.doi.org/10.1016/S0140-6736(10)60110-9

Lee, V. J., Low, E., Ng, Y. Y., & Teo, C. (2005). Disaster relief and initial response to the earthquake and tsunami in Meulaboh, Indonesia. *Annals of the Academy of Medicine Singapore, 34*, 586-590.

Leiby, S. L. (2008). Caring for the caregivers and patients left behind: Experiences of a volunteer nurse during Hurricane Katrina. *Critical Care Nursing Clinics of North America, 20*(1), 83-90. doi: 10.1016/j.ccell.2007.10.007

Li, Y., Turale, S., Stone, T. E., & Petrini, M. (2015). A grounded theory study of 'turning into a strong nurse': Earthquake experiences and perspectives on disaster nursing education. *Nurse Education Today*. doi: 10.1016/j.nedt.2015.05.020

Lim, G. H., Lim, B. L., & Vasu, A. (2013). Survey of factors affecting health care workers' perception towards institutional and individual disaster preparedness. *Prehospital and Disaster Medicine, FirstView*, 1-6. doi: doi:10.1017/S1049023X1300349X

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. California: Sage Publications.

Litman, T. (2006). Lessons from Katrina and Rita: What major disasters can teach transportation planners. *Journal of Transportation Engineering, 132*(1), 11-18.

Loke, A. Y., & Fung, O. W. (2014). Nurses' competencies in disaster nursing: Implications for curriculum development and public health. *International Journal of Environmental Research and Public Health, 11*(3), 3289-3303. doi: 10.3390/ijerph110303289

MacGyver. (2015). Merriam-Webster. *Oxford Dictionaries.* Retrieved from http://www.oxforddictionaries.com/definition/english/MacGyver

Makinen, T. H., Miettinen, S. M., & Kernohan, W. G. (2015). Mental well-being considerations in preparation for disaster health care: Learning from deployment. *Prehospital and Disaster Medicine, 30*(4), 327-336. doi: 10.1017/s1049023x1500477x

Manatū Taonga Ministry for Culture and Heritage. (n.d.). *The 2011 Christchurch earthquake and other recent earthquakes.* Retrieved from http://www.teara.govt.nz/en/historic-earthquakes/page-13

Marshall, M. C. (2007). San Antonio Mental Health Disaster Consortium: Hurricanes Katrina and Rita, a personal perspective. *Perspectives in Psychiatric Care, 43*(1), 15-21. doi: 10.1111/j.1744-6163.2007.00101.x

McDonald, W. (2012). Søren Kierkegaard. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy (Winter 2014 Edition).* Retrieved from http://plato.stanford.edu/archives/win2014/entries/kierkegaard/.

Melnikov, S., Itzhaki, M., & Kagan, I. (2014). Israeli nurses' intention to report for work in an emergency or disaster. *Journal of Nursing Scholarship, 46*(2), 134-142. doi: 10.1111/jnu.12056

Menendez, M. E., Chen, N. C., Mudgal, C. S., Jupiter, J. B., & Ring, D. (2015). Physician empathy as a driver of hand surgery patient satisfaction. *Journal of Hand Surgery*. doi: 10.1016/j.jhsa.2015.06.105.

Merleau-Ponty, M. (1948/2004). *The world of perception*. New York: Routledge.

Merleau-Ponty, M. (1962). *Phenomenology of perception*. Great Britain: Routledge and Kegan Paul Ltd.

Merleau-Ponty, M. (1964). *The primacy of perception* (J. M. Edie Ed.). Evanston, IL: Northwestern University Press.

Merleau-Ponty, M. (2012/1962). *Phenomenology of perception.* (D. A. Landes, Trans.). New York: Routledge.

Miller, M. J., & Dowd, T. (2008). FEMA nurses face "Mission Impossible": Remembering Katrina. *Journal of Holistic Nursing, 26*(1), 56-62. doi: 10.1177/0898010107306200

Moran, D. (2000). *Introduction to Phenomenology*. London: Routledge.

Morgan, O., Ahern, M., & Cairncross, S. (2005). Revisiting the tsunami: Health consequences of flooding. *PLoS Med, 2*(6), e184.

Morris, W. E., & Brown, C. R. (2014). *David Hume*. In E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy (Winter 2014 Edition). Retrieved from http://plato.stanford.edu/archives/win2014/entries/hume/.

Morse, J. M. (2012). Introducing the First Global Congress for Qualitative Health Research: What are we? What will we do? -And why? *Qualitative Health Research, 22*(2), 147-156.

Nasrabadi, A. N., Naji, H., Mirzabeigi, G., & Dadbakhs, M. (2007). Earthquake relief: Iranian nurses' responses in Bam, 2003, and lessons learned. *International Nursing Review, 54*(1), 13-18. doi: 10.1111/j.1466-7657.2007.00495.x

National Wildfire Coordinating Group. (2012). *Interagency incident business management handbook, NWCG Handbook 2, PMS 902, NFES 2160.* Retrieved from http://www.nwcg.gov/sites/default/files/products/pms902.pdf

Nightingale, F. (1860/1969). *Notes on nursing: What it is and what it is not.* New York: Dover Publications, Inc.

Nursing Emergency Preparedness Education Coalition. (2003). *Educational competencies for registered nurses responding to mass casualty incidents.* Retrieved from http://www.nursing.vanderbilt.edu/incmce/competencies.html

Nypaver, M. C. (2011). *Disaster education for nurses: A comparison of two instructional methods for teaching Basic Disaster Life Support in the light of self-efficacy theory.* (Doctoral dissertation). Retrieved from http://trace.tennessee.edu/utk_graddiss/1108

O'Boyle, C., Robertson, C., & Secor-Turner, M. (2006). Nurses' beliefs about public health emergencies: Fear of abandonment. *American Journal of Infection Control, 34*(6), 351-357. doi: 10.1016/j.ajic.2006.01.012

O'Sullivan, T. L., Dow, D., Turner, M. C., Lemyre, L., Corneil, W., Krewski, D., . . . Amaratunga, C. A. (2008). Disaster and emergency management: Canadian nurses' perceptions of preparedness on hospital front lines. *Prehospital and Disaster Medicine, 23*(3), s11-18.

Obama, B. (2011). *Presidential Policy Directive / PPD-8: National Preparedness.* Retrieved from http://www.dhs.gov/presidential-policy-directive-8-national-preparedness

Palm, K. M., Polusny, M. A., & Follette, V. M. (2004). Vicarious traumatization: Potential hazards and interventions for disaster and trauma workers. *Prehospital and Disaster Medicine, 19*(1), 73–78.

Pandemic and All-Hazards Preparedness Act, 120 Stat. 2831, Pub. L. No. 109–417 (2006).

Park, W. H. (2011). *Nurses' posttraumatic stress, level of exposure, and coping five years after Hurricane Katrina.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global. (3489239.)

Partners in Health. (2010). *Tackling acute and chronic disasters.* Retrieved from http://parthealth.3cdn.net/fdb20a0a7ef6b71153_o6m6icn3q.pdf

Piercy, M. (1973). *To be of use*. Garden City, New York: Doubleday and Company, Inc.

Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies, 47*(11), 1451-1458. doi: 10.1016/j.ijnurstu.2010.06.004

Polivka, B. J., Stanley, S. A., Gordon, D., Taulbee, K., Kieffer, G., & McCorkle, S. M. (2008). Public health nursing competencies for public health surge events. *Public Health Nursing, 25*(2), 159-165. doi: 10.1111/j.1525-1446.2008.00692.x

Powers, R., & Daly, E. (Eds.). (2010). *International disaster nursing*. New York: Cambridge University Press.

Priest, C., & Bahl, M. (2008). Nursing during catastrophic disaster: A case study from New Orleans. *Journal of Nursing Law, 12*(4), 157-164.

Pyett, P. M. (2003). Validation of qualitative research in the "real world". *Qualitative Health Research, 13*(8), 1170-1179.

Qureshi, K., Gershon, R. R., Sherman, M. F., Straub, T., Gebbie, E., McCollum, M., . . . Morse, S. S. (2005). Health care workers' ability and willingness to report to duty

during catastrophic disasters. *Journal of Urban Health 82*(3), 378-388. doi: 10.1093/jurban/jti086

Racine, L., & Perron, A. (2012). Unmasking the predicament of cultural voyeurism: A postcolonial analysis of international nursing placements. *Nursing Inquiry, 19*(3), 190-201. doi: 10.1111/j.1440-1800.2011.00555.x

Ranse, J., Hutton, A., Jeeawody, B., & Wilson, R. (2014). What are the research needs for the field of disaster nursing? An international Delphi study. *Prehospital and Disaster Medicine*, 1-7. doi: 10.1017/s1049023x14000946

Ranse, J., Hutton, A., Wilson, R., & Usher, K. (2015). Leadership opportunities for mental health nurses in the field of disaster preparation, response, and recovery. *Issues in Mental Health Nursing, 36*(5), 391-394. doi: 10.3109/01612840.2015.1017062

Ranse, J., & Lenson, S. (2012). Beyond a clinical role: Nurses were psychosocial supporters, coordinators and problem solvers in the Black Saturday and Victorian bushfires in 2009. *Australasian Emergency Nursing Journal, 15*(3), 156-163. doi: 10.1016/j.aenj.2012.05.001

Ravikrishna, R., Lee, H. W., Mbuligwe, S., Valsaraj, K. T., & Pardue, J. H. (2010). Air quality during demolition and recovery activities in post-Katrina New Orleans. *Environmental Toxicology and Chemistry, 29*(7), 1438-1444. doi: 10.1002/etc.210

Redwood-Campbell, L. J., & Riddez, L. (2006). Post-tsunami medical care: Health problems encountered in the International Committee of the Red Cross hospital in

Banda Aceh, Indonesia. *Prehospital and Disaster Medicine, 21*(Supplement), S1-S7. doi:10.1017/S1049023X00015806

Ree, J. (1999). *Heidegger*. New York: Routledge.

Rhode Island State Nurses Association. (2009). *ANA commends President Obama's new "United We Serve" initiative, urges U.S. nurses to join disaster response networks.* from http://nursingald.com/articles/9944-ana-commends-president-obama-s-new-united-we-serve-initiative-urges-u-s-nurses-to-join-disaster-response-networks?query=disaster%20response&s=95

Richardson, S., Ardagh, M., Grainger, P., & Robinson, V. (2013). A moment in time: Emergency nurses and the Canterbury earthquakes. *International Nursing Review, 60*(2), 188-195. doi: 10.1111/inr.12013

Ring, D., & Leopold, S. S. (2015). Editorial—Measuring satisfaction: Can it be done? *Clinical Orthopaedics and Related Research, 473*(10), 3071-3073. doi: 10.1007/s11999-015-4485-5

Rivers, F. M. (2009). *Into the unknown: Military nurses' experiences in disasters response.* (Doctoral dissertation), University of Tennessee, Knoxville.

Rodgers, B. L. (2005). *Developing nursing knowledge: Philosophical traditions and influences*. Philadelphia, PA: Lippincott, Williams, & Wilkins.

Rohlf, M. (2014). *Immanuel Kant*. In E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy, (Summer 2014 Edition). Retrieved from http://plato.stanford.edu/archives/sum2014/entries/kant/.

Rokkas, P., Cornell, V., & Steenkamp, M. (2014). Disaster preparedness and response: Challenges for Australian public health nurses - A literature review. *Nursing & Health Sciences, 16*(1), 60-66. doi: 10.1111/nhs.12134

Romig, L. (2013). Disaster triage. In T. G. Veenema (Ed.), *Disaster nursing and emergency preparedness for chemical, biological, and radiological terrorism and other hazards*. New York: Springer Publishing.

Roof, K., & Oleru, N. (2008). Public health: Seattle and King County's push for the built environment. *Journal of Environmental Health, 71*(1), 24-27.

Rubonis, A. V., & Bickman, L. (1991). Psychological impairment in the wake of disaster: The disaster-psychopathology relationship. *Psychological Bulletin, 109*(3), 384-399.

Ruskie, S. E. (2015, April). *Nurses' perceptions of environment as a factor in their capacity to provide effective disaster care: Pilot study*. Paper presented at the 19th World Congress on Disaster and Emergency Medicine, Capetown, South Africa.

Russell, M. (2006). *Husserl: A guide for the perplexed*. New York: Continuum.

Sandelowski, M. (2010). What's in a name? Qualitative description revisited. *Research in Nursing and Health, 33,* 77-84.

Santella, N., Steinberg, L. J., & Sengul, H. (2010). Petroleum and hazardous material releases from industrial facilities associated with Hurricane Katrina. *Risk Analysis, 30*(4), 635-649. doi: 10.1111/j.1539-6924.2010.01390.x

Santora, M., & Weiser, B. (2013, November 7). Court says New York neglected disabled in emergencies. *New York Times*. Retrieved from

http://www.nytimes.com/2013/11/08/nyregion/new-yorks-emergency-plans-violate-disabilities-act-judge-says.html?_r=0

Sato, M., Atogami, F., Nakamura, Y., Kusaka, Y., & Yoshizawa, T. (2014). Remote community-based public health nursing during a disaster: An ethnographic case study in Japan. *Australasian Emergency Nursing Journal, 17*(3), 106-111. doi: 10.1016/j.aenj.2014.04.001

Schmidt, C. K., Davis, J. M., Sanders, J. L., Chapman, L. A., Cisco, M. C., & Hady, A. R. (2011). Exploring nursing students' level of preparedness for disaster response. *Nursing Education Perspectives, 32*(6), 380-383. doi: 10.5480/1536-5026-32.6.380

Schmitt, R. (1969). *Martin Heidegger on being human*. New York: Random House.

Schneider, M. A., & Ruth-Sahd, L. A. (2015). Fundamentals: Still the building blocks of safe patient care. *Nursing, 45*(6), 60-63.

Seyedin, S. H., Aflatoonian, M. R., & Ryan, J. (2009). Adverse impact of international NGOs during and after the Bam earthquake: Health systems consumers' points of view. *American Journal of Disaster Medicine, 4*(3), 173-179.

Sharkey, P. (2007). Survival and death in New Orleans: An empirical look at the human impact of Katrina. *Journal of Black Studies, 37*(4), 482-501. doi: 10.1177/0021934706296188

Silenas, R., Akins, R., Parrish, A. R., & Edwards, J. C. (2008). Developing disaster preparedness competence: An experiential learning exercise for multiprofessional education. *Teaching & Learning in Medicine, 20*(1), 62-68.

Slepski, L. A. (2007). Emergency preparedness and professional competency among health care providers during hurricanes Katrina and Rita: Pilot study results. *Disaster Management & Response*, *5*(4), 99-110. doi: 10.1016/j.dmr.2007.08.001

Sloand, E., Ho, G., Klimmek, R., Pho, A., & Kub, J. (2012). Nursing children after a disaster: A qualitative study of nurse volunteers and children after the Haiti earthquake. *Journal for Specialists in Pediatric Nursing, 17*(3), 242-253. doi: 10.1111/j.1744-6155.2012.00338.x

Sloand, E., Ho, G., & Kub, J. (2013). Experiences of nurse volunteers in Haiti after the 2010 earthquake. *Research and Theory for Nursing Practice, 27*(3), 193-213.

Sphere Project. (2011). *The Sphere Project: The humanitarian charter and minimum standards in humanitarian response.* from http://www.sphereproject.org/handbook/

Thevenot, B., & Russell, G. (2005, Sept. 26). Rape. Murder. Gunfights. *Time-Picayune*. Retrieved from http://www.pulitzer.org/archives/7087

Thing. (2015). Dictionary.com. Retrieved from http://dictionary.reference.com/browse/thing

Thomas, S. P., & Pollio, H. R. (2002). *Listening to patients: A phenomenological approach to nursing research and practice*. New York, NY: Springer Publishing.

Thweatt, G. M. (2000). *The experience of being lost.* (Doctoral dissertation). Retrieved from ProQuest. (304620442.)

Tomer, J. (2010). Into the ruins: Nurses in Haiti. *Minority Nurse.* Retrieved from http://www.minoritynurse.com/article/ruins-nurses-haiti

Tuan, Y.-f. (1977). *Space and place : The perspective of experience*. Minneapolis University of Minnesota Press.

United States Geological Survey. (2011). *Earthquake Information for 2010.* Retrieved from http://earthquake.usgs.gov/earthquakes/eqarchives/year/2010/

Urrabazo, C. K. (2012). *Anxiety, coping, and post-traumatic stress disorder in nurses who cared for victims of Hurricane Katrina.* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Global. (3520825.)

Van Hoving, D. J., Wallis, L. A., Docrat, F., & De Vries, S. (2010). Haiti disaster tourism--A medical shame. *Prehospital and Disaster Medicine, 25*(3), 201-202.

VanDevanter, N., Kovner, C. T., Raveis, V. H., McCollum, M., & Keller, R. (2014). Challenges of nurses' deployment to other New York City hospitals in the aftermath of Hurricane Sandy. *Journal of Urban Health, 91*(4), 603-614. doi: 10.1007/s11524-014-9889-0

Veenema, T. G. (2013). *Disaster nursing and emergency preparedness for chemical, biological, and radiological terrorism and other hazards*. New York: Springer Publishing.

Warsini, S., Buettner, P., Mills, J., West, C., & Usher, K. (2014a). The psychosocial impact of the environmental damage caused by the Mt. Merapi eruption on survivors in Indonesia. *EcoHealth*. doi: 10.1007/s10393-014-0937-8

Warsini, S., Buettner, P., Mills, J., West, C., & Usher, K. (2014b). Translation, cultural adaptation, and psychometric testing of the environmental distress scale with

Indonesian survivors of a volcanic eruption. *Disaster Medicine and Public Health Preparedness, 8*(3), 229-238. doi: 10.1017/dmp.2014.45

Weber, L., & Hilfinger Messias, D. K. (2012). Mississippi front-line recovery work after Hurricane Katrina: An analysis of the intersections of gender, race, and class in advocacy, power relations, and health. *Social Science & Medicine, 74*(11), 1833-1841. doi: http://dx.doi.org/10.1016/j.socscimed.2011.08.034

Wenji, Z., Turale, S., Stone, T. E., & Petrini, M. A. (2014). Chinese nurses' relief experiences following two earthquakes: Implications for disaster education and policy development. *Nurse Education in Practice*. doi: 10.1016/j.nepr.2014.06.011

Wheeler, M. (2014). *Martin Heidegger*. In E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy (Fall 2014 Edition). Retrieved from http://plato.stanford.edu/archives/fall2014/entries/heidegger/.

Whetzel, E., Walker-Cillo, G., Chan, G. K., & Trivett, J. (2013). Emergency nurse perceptions of individual and facility emergency preparedness. *Journal of Emergency Nursing, 39*(1), 46-52. doi: http://dx.doi.org/10.1016/j.jen.2011.08.005

Willems, A., Waxman, B., Bacon, A. K., Smith, J., & Kitto, S. (2013). Interprofessional non-technical skills for surgeons in disaster response: A literature review. *Journal of Interprofessional Care, 27*(5), 380-386. doi: 10.3109/13561820.2013.791670

Winston, B. K., Jr. (2011). *Nurses' self-perceived knowledge and actual knowledge of disaster preparedness.* (Master's thesis). Retrieved from ProQuest Dissertations & Theses Global. (1499684.)

Woodhouse, E. J. (2007). The lessons of Katrina for intelligent public decision making. *Nature & Culture, 2*(1), 10-26. doi: 10.3167/nc.2007.020102

Woolf, S. H., & Braveman, P. (2011). Where health disparities begin: The role of social and economic determinants-And why current policies may make matters worse. *Health Affairs, 30*(10), 1852-1859. doi: 10.1377/hlthaff.2011.0685

World Association of Disaster and Emergency Medicine. (2002). Health disaster management: Guidelines for evaluation and research in the Utstein Style. *Prehospital and Disaster Medicine, 17*(S3), 144-167.

World Health Organization. (2006). *The contribution of nursing and midwifery in emergencies: Report of a WHO consultation.* Retrieved from http://www.who.int/hac/events/2006/nursing_consultation_report_sept07.pdf

World Health Organization. (2007). *Risk reduction and emergency preparedness: WHO six-year strategy for the health sector and community capacity development*. Retrieved from http://www.who.int/hac/techguidance/preparedness/emergency_preparedness_eng.pdf?ua=1

World Health Organization. (2009). *WHO guidelines on hand hygiene in health care.* Retrieved from http://apps.who.int/iris/bitstream/10665/44102/1/9789241597906_eng.pdf

World Health Organization and International Council of Nurses. (2009). *ICN framework of disaster nurse competencies*. Geneva, Switzerland: WHO.

Xiao, Y., & Nilawar, U. (2013). Winners and losers: Analysing post-disaster spatial economic demand shift. *Disasters, 37*(4), 646-668. doi: 10.1111/disa.12025

Yan, Y. E., Turale, S., Stone, T., & Petrini, M. (2015). Disaster nursing skills, knowledge and attitudes required in earthquake relief: Implications for nursing education. *International Nursing Review*. doi: 10.1111/inr.12175

Yang, Y. N., Xiao, L. D., Cheng, H. Y., Zhu, J. C., & Arbon, P. (2010). Chinese nurses' experience in the Wenchuan earthquake relief. *International Nursing Review, 57*(2), 217-223. doi: 10.1111/j.1466-7657.2009.00795.x

Zanotti, L. (2010). Cacophonies of aid, failed state building and NGOs in Haiti: Setting the stage for disaster, envisioning the future. *Third World Quarterly, 31*(5), 755-771. doi: 10.1080/01436597.2010.503567

Zinsli, G., & Smythe, E. A. (2009). International humanitarian nursing work: Facing difference and embracing sameness. *Journal of Transcultural Nursing, 20*(2), 234-241. doi: 10.1177/1043659608330351

Zoraster, R. M. (2010). Enhancing healthcare sector coordination through infrastructure and logistics support. A*merican Journal of Disaster Medicine, 5*(4), 215-219.

Appendices

Appendix A: Recruitment Flyer

RECRUITING NURSES WITH DISASTER EXPERIENCE for Research Study

You are invited to participate in a research study examining Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

You are eligible to participate if you:

- Worked as a licensed US registered nurse during a major disaster
- Speak and write English
- Are willing to discuss your experiences during a private recorded interview

What is considered to be a disaster?

- Any natural or man-made events that causes harm to life or property and substantially overwhelms the community's resources requiring outside assistance

What is required to participate?

About an hour of your time to share your experience

Are there any risks?

There is no physical risk to this study, though recalling disaster experiences may be stressful for some people
The information you provide will be confidential
No information that could identify you as an individual will be revealed

Are there any benefits?

- Information you share may help nursing and other disaster response organizations provide operationally-relevant training for disaster conditions
- You may contribute to practical improvements in disaster training methods to allow nurses to have a safer disaster deployment experience
- Disaster patient care may be enhanced when nurses can maximize their performance by being prepared for the conditions they will be working in following a disaster

Would you like to participate?

Contact: Stasia E. Ruskie, MS, RN
PhD candidate, Global Disaster Nursing
University of Tennessee
sruskie@vols.utk.edu

Study information website: **http://tinyurl.com/DisasterNurseStudy**

Appendix B: Informed Consent Statement

Informed Consent to Participate in Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

INTRODUCTION

You are invited to participate in research being conducted by Stasia E. Ruskie, MS, RN, a doctoral student in Global Disaster Nursing at the University of Tennessee, in Knoxville, Tennessee, USA. She is exploring the environmentally-related experiences of nurses who have deployed to disaster situations.

INFORMATION ABOUT YOUR INVOLVEMENT IN THE STUDY

There are three requirements to participate in this study:

1) Reading this Informed Consent document and if you agree, signing it with your name.

2) Allowing Stasia E. Ruskie (the researcher) to speak with you in person or via Skype about your experience in disaster and the environmental conditions that were present at the time of your response. The interview will last about an hour, but it may be slightly longer or shorter, depending on what you have to say. It will be over when you decide it is over. There is no right or wrong answer to any question; all that is required is that you share whatever you think is important. The interviewer will arrange to meet with you at a time which is convenient for you. In-person interviews will take place at a location that is convenient and agreeable for you: in your home, workplace, or in a quiet place that will give you privacy. Skype interviews will be held at a mutually convenient time.

3) Allowing the researcher to digitally record the interview. For this study, all interviews must be recorded. Having the recording will help assure that your thoughts and words are accurately documented. Your name, the names of others, or any information that could potentially identify you as a person will be changed when the interview is transcribed.

BENEFITS

There are no direct benefits to you for participating in this study, however many people find satisfaction in sharing their experience with someone who cares, and in knowing that their experience may help improve the training provided to nurses and disaster responders in the future.

RISKS

Risks from participating in this study are expected to be minimal. The primary risk is emotional. Talking about disaster response experiences may be upsetting for some people, but others may find it a relief to tell their story. You are always free to refuse to answer any question, change the subject, or stop the interview. If you decide to stop the interview early, we will keep the information we have up to that point. Your participation is voluntary. You may withdraw from the study at any time, merely by saying that you are ready to end. If you end participation before the interview is concluded, any information you have given to that point will be kept.

_____ Participant's Initials

CONFIDENTIALITY/ PROTECTING YOUR PRIVACY

Your confidentiality will be maintained during and after this research study. Information will be made available to persons directly involved in the research study, including the researcher (Stasia E. Ruskie), four members of the dissertation committee, and members of the Phenomenology Research Group at the University of Tennessee, Knoxville after they have signed a pledge of confidentiality. Written messages, e.g., password-protected texting or email, may be used to communicate with you during the study. All telephonic communication will occur in a private area. Your privacy will be protected by removing all identifiable personal details, e.g., names of people and organizations, on all documents related to the research study. Only the researcher and her advisor, Dr. Sandra Thomas, will have access to the participant names, pseudonym roster, and consent forms. All data sources will be stored in locked cabinets and on a password protected, single-user computers located at the researcher's personal residence and Dr. Sandra Thomas' university office. The University of Tennessee IRB is responsible for oversight of this research study and may be reviewed by federal regulatory agencies.

To protect your privacy, no names will be used when the findings are used in published reports, or presented at professional conferences; there will be no way for your name to be linked to this project. Records such as transcripts will be kept indefinitely by the PI so that they can be added to others collected or analyzed in future research on the role of environment in disaster response. When they are no longer needed, they will be shredded.

COMPENSATION

You are not being paid to participate in this research.

EMERGENCY MEDICAL TREATMENT

In case you feel the need for assistance, crisis support services are available 24/7 from SAMHSA (**1-800-985-5990; TTY: 1-800-846-8517; Text: send** *TalkWithUs to* 66746). SAMHSA also provides a website: disasterdistress.samhsa.gov.

The University of Tennessee does not "automatically" reimburse you for medical claims or other compensation. If physical injury is suffered in the course of research, or for more information, please notify the investigator in charge Stasia Ruskie, at sruskie@vols.utk.edu.

CONTACT INFORMATION

If you have any questions about the research study, you may contact Stasia E. Ruskie, MS, BSN, RN at any time at (218) 428-4516 or sruskie@vols.utk.edu. You may also contact the faculty research advisor, Dr. Sandra Thomas, at (865) 974-7581 or by mail at 1200 Volunteer Boulevard, University of Tennessee College of Nursing, Knoxville, TN 37996. If you have questions about your rights as a study participant, please contact the Research Compliance Officer at the University of Tennessee at (865) 974-7697.

PARTICIPATION

Your participation in this study is voluntary; you may decline to participate or withdraw from the study at any time without penalty. If you withdraw from the study before data collection is completed, any information collected up to that point will be kept.

CONSENT

By signing this document, you are agreeing to speak with the investigator about your disaster deployment experience.

Please initial, print, and sign below:

_____I have read the above information and had my questions answered. I agree to discuss my disaster experience, and have my interview recorded.

Participant's name (Print) _____

Participant's signature _____ Date _____

Investigator’s signature _____ Date _____

Appendix C: Demographic Form

Demographic Information Please choose a pseudonym_____

What is your age? _____

Sex: ____

Race and Ethnicity (select all that apply): Please alter as necessary in order to best describe yourself:

____ American Indian or Alaskan Native Print tribe: _____

____ Asian Print origin: _____

____ Black or Afro-American Print origin: _____

____ Hispanic, Latino, or Spanish Print origin: _____

____ White Print origin: _____

____ Other (Specify) _____

Level of education (select all that apply):

____Diploma in Nursing

____ 2-year degree in Nursing

____ Bachelor of Nursing

____ Master's level in Nursing. Please specify_____

____ Master's level in a non-nursing discipline

____ PhD/DNP in Nursing

____ Doctorate in a non-nursing discipline

____ Other (please specify) _____

Years working as RN: _____

Current nursing position/unit: _____

Specialty training and years in specialty:

_____

Years of disaster experience: _____

Please list any disaster training courses you have received:

Number of disaster deployments: _____

Please list name of disaster, location, length of tour, and roles filled during disaster experience:

LENGTH of TOUR
NAME of DISASTER LOCATION (# of days) ROLES FILLED DAYS

1._____ _____ _____ _____

2._____ _____ _____ _____

3._____ _____ _____ _____

4. _____ _____ _____ _____

5._____ _____ _____ _____

6._____ _____ _____ _____

(Add as needed)

Appendix D: Sample Follow-Up Questions

- Please tell me about the environmental conditions you experienced.
- What about that (specific thing) made that stand out to you?
- Tell me more about ____?
- What do you mean by [topic]?
- Can you tell me more about that?
- I'd like to understand more about how this issue relates to the environment of disaster conditions.
- Is there anything else you would like to add about your experience of the disaster environment?

Appendix E: Transcriptionist Confidentiality Agreement

Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

Principle Investigator: Stasia E. Ruskie, MS, RN

Dissertation Chairperson: Sandra P. Thomas, PhD, RN, FAAN

As a transcriptionist working on this pilot research study, "Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation**,"** I understand that I will be listening to recordings of interviews pertaining to nurses and their experiences of the environment during disaster deployments. The information I will hear has been revealed by participants who have been assured that their personal information would remain strictly confidential.

I hereby agree not to share any information about these participants with anyone except the primary researcher for this project—now or at any time in the future. Any violation of this agreement would constitute a serious breach of ethical standards, and I pledge not to do so. I understand that I have a responsibility to honor this confidentiality agreement.

Print name: _____

Signature: _____ Date: _____

Appendix F: Confidentiality Agreement

Phenomenology Research Group

Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

Principle Investigator: Stasia E. Ruskie, MS, RN

Dissertation Chairperson: Sandra P. Thomas, PhD, RN, FAAN

As a member of Phenomenology Research Group, analyzing transcripts from this pilot research study, "Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation," I understand that I will be seeing information about nurses and their experiences providing healthcare during a disaster situation. The information has been revealed by participants who have been assured that their personal information would remain strictly confidential.

I hereby agree not to share any information about these residents with anyone except the primary researchers for this project—now or at any time in the future. Any violation of this agreement would constitute a serious breach of ethical standards, and I pledge not to do so. I understand that I have a responsibility to honor this confidentiality agreement.

Print name: _____

Signature: _____ Date: _____

Appendix G: SAMHSA Disaster Distress Helpline flyer

Disaster Distress Helpline

PHONE: 1-800-985-5990
TEXT: "TalkWithUs" to 66746

Call us:
1-800-985-5990

Text:
'TalkWithUs' to 66746

Visit:
disasterdistress.samhsa.gov

Like us on Facebook:
facebook.com/distresshelpline

Follow us on Twitter (@distressline):
twitter.com/distressline

Disaster Distress Helpline

PHONE: 1-800-985-5990 TEXT: "TalkWithUs" to 66746

Call 1-800-985-5990
or text 'TalkWithUs' to 66746
to get help and support
for any distress that you or someone
you care about may be feeling
related to any disaster.

The *Helpline* and *Text Service* are:

- Available 24 hours a day, 7 days a week, year-round
- Free (standard data/text messaging rates may apply for the texting service)
- Answered by trained crisis counselors.

TTY for Deaf / Hearing Impaired:
1-800-846-8517

Spanish-speakers:
Text "Hablanos" to 66746

SAMHSA

Administered by the Substance Abuse and Mental Health Services Administration (SAMHSA) of the U.S. Dept. of Health and Human Services (HHS).

Disaster Distress Helpline

PHONE: 1-800-985-5990
TEXT: "TalkWithUs" to 66746

If you or someone you know is struggling after a disaster, you are not alone.

"Ever since the tornado, I haven't been able to get a full night's sleep ..."

"I can't get the sounds of the gunshots out of my mind..."

"Things haven't been the same since my shop was flooded ..."

Talk With Us!

Appendix H: Study Information Website

RECRUITING NURSES WITH DISASTER EXPERIENCE for Research Study
Research Study
You are invited to participate in a research study examining Nurses' Experience of the Environment of Disaster: A Phenomenological Investigation

· Worked as a licensed US registered nurse during a major disaster

· Speak and write English

· Are willing to discuss your experiences during a private recorded interview

What is considered to be a disaster?
· Any natural or man-made events that causes harm to life or property and substantially overwhelms the community's resources requiring outside assistance

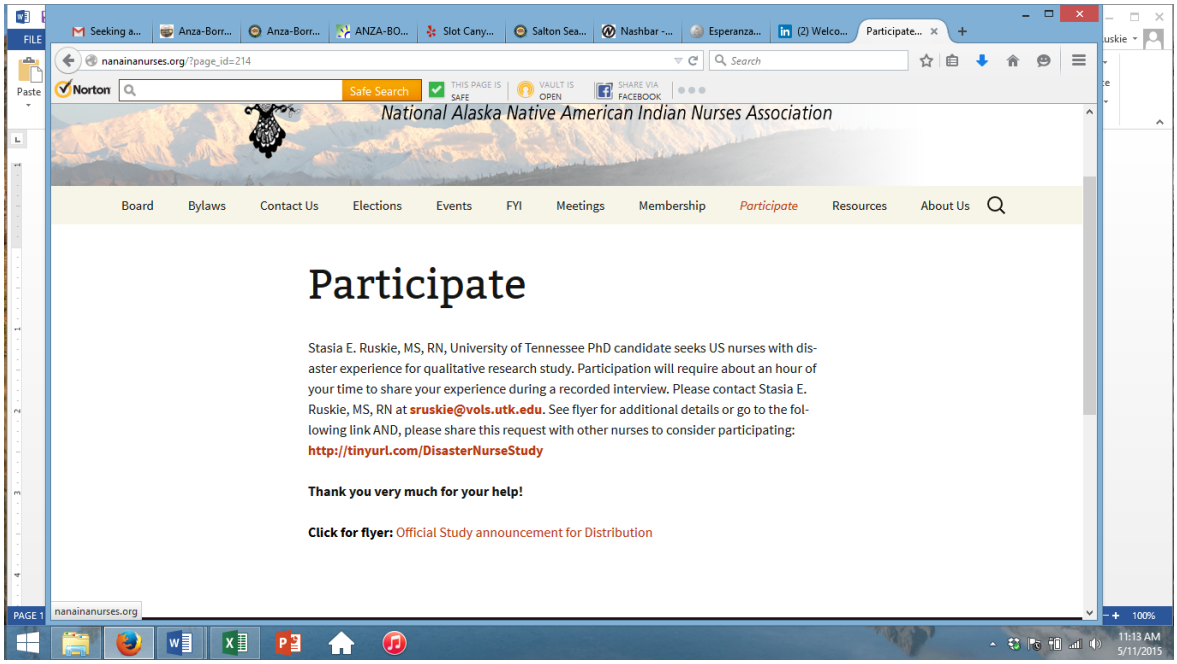
What is required to participate?
· About an hour of your time to share your experience. We can meet for the interview wherever is most convenient for you, such as your home, my office, or a private meeting room that can be reserved by the researcher.

Are there any risks?
· There is no physical risk to this study, though recalling disaster experiences may be stressful for some people
· The information you provide will be confidential
· No information that could identify you as an individual will be revealed

Are there any benefits?
· Information you share may help nursing and other disaster response organizations provide operationally relevant training for disaster conditions
· You may contribute to practical improvements in disaster training methods to allow nurses to have a safer disaster deployment experience
· Disaster patient care may be enhanced when nurses can maximize their performance by being prepared for the conditions they will be working in following a disaster

How can you participate?
Contact:
Stasia E. Ruskie, MS, RN
PhD candidate, Global Disaster Nursing
University of Tennessee
sruskie@vols.utk.edu or 218-428-4516

Appendix I: Screenshot of Website



Appendix J: Nursing Organizations Contacted for Recruitment of Participants

Asian American/Pacific Islander Nurses Association	No response to email inquiry
California Nurses Association	No response to email inquiry
DiversityNursing.com	Self-posted study information to website forum 5/11/2015
Geisinger Regional Medical Center	No response to email inquiry
Louisiana State Nurses Association	No response to email inquiry
Missouri Nurses Association (MONA)	Distributed by MONA to members 5/13/2015
National Alaska Native American Indian Nurses Association (NANAINA)	Placed by NANAINA on website 5/11/2015
National Association of Hispanic Nurses (NAHN)	Placed by NAHN on Facebook page 5/11/2015
NAHN, Phoenix chapter	Personal presentation of study recruitment to members, 5/21/2015
NAHN, Southern Colorado Chapter	No response to email inquiry
National Black Nurses Association	Placed by NBNA on website, 6/22/2015
New Mexico Emergency Nurses Association	Deemed not appropriate for NM ENA
New Mexico Nurses Association	No response to email inquiry
New York State Nurses Association	No response to phone inquiry
Ochsner Baptist Hospital, New Orleans	Forwarding to Nursing Executive Council, felt their nurses were being requested for too many research studies
Oklahoma Nurses Association (ONA) ONA	Forwarded on to OK MRC, deemed not appropriate for ONA
Philippine Nurses Association of America	No response to email inquiry

Sigma Theta Tau International	Self-posted on Member Forum, 5/11/2015
Southern Nursing Research Society	No response to email inquiry
Tulane Hospital	No response to phone inquiry
Western Institute of Nursing WIN	Study request forwarded to board, no reply received
World Association of Disaster and Emergency Medicine	Responded after quota filled, 6/23/2015

Vita

Stasia E. Ruskie was born in Washington, D.C. and attended Potomac Senior High School where several teachers recognized her "uniqueness." Stasia received her ADN with Honors in 2011 from Yavapai College (AZ), her BSN in 2012 from Arizona State University, and a post-master's certificate in Global Disaster Nursing from University of Tennessee in 2015. Stasia has previous undergraduate degrees in wildlife biology, biological science, and computer programming/systems analysis, along with an M.S. in biomedical science and additional PhD studies in oncology. Stasia is also an EMT, and a past wildland firefighter and forest protection officer. Experienced as an incident commander, advanced firefighter, and helitack, she is comfortable with chaotic situations, ICS, communications, safety, and situational awareness. Stasia has participated in multiple wildfire responses, spent two weeks as part of the initial Hurricane Katrina response, and was commended for her performance as a trauma team member during a mass casualty incident during her three-month work stint at South Pole Station, Antarctica. Stasia is also a Disaster Services volunteer nurse with the American Red Cross and a volunteer with the Albuquerque Medical Response Corps. Stasia has disaster training in wildfire suppression, CBRNE emergencies, hazardous materials, SALT triage, and is certified in Basic and Advanced Disaster Life Support as well as Advanced Cardiac Life Support. She holds a General class ham radio operator license and has completed Amateur Radio Emergency Services (ARES) training for ham radio communications disaster response. Stasia thinks life is an adventure, and lives 'to be of use.'