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Disaster Research: A Nursing Opportunity

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Abstract

Nurses working or living near a community disaster have the opportunity to study health-related consequences to disaster or disaster recovery. In such a situation, the researchers need to deal with the conceptual and methodological issues unique to post-disaster research and know what resources are available to guide them, even if they have no specialized training or previous experience in disaster research. The purpose of this article is to review issues and challenges associated with conducting post-disaster research and encourage nurses to seek resources and seize opportunities to conduct research should the situation arise. Current disaster studies and the authors' personal experiences conducting maternal-child research in post-Katrina New Orleans (2005–2013) provide real-life examples of how health professionals and nurses faced the challenges of doing post-disaster research. After catastrophic events, nurses need to step forward to conduct disaster research that informs and improves future disaster planning and health care responses.

Keywords

Disaster; post-traumatic stress disorder; resilience; mental health; ethics; research

Introduction

Local, national and international disasters seem to be happening more frequently and affecting larger numbers of people (Guha-Sapir et al. 2012). In the United States there have been man-made and natural disasters including the World Trade Center terrorist attacks in

2001, Hurricane Katrina in 2005, Hurricane Ike in 2008, Superstorm Sandy in 2012, and numerous episodes of forest fires and catastrophic tornados. The most powerful tornados on earth, measuring EF5 level (highest level of severity) on the Enhanced Fujita Scale, devastated miles of urban neighborhoods in Oklahoma in 2013 and Kansas and Alabama in 2011. Internationally, Superstorm Sandy also devastated communities across the Caribbean where resources for recovery are less available than in the U.S. Likewise, tropical cyclones struck Southeast Asia, the South Pacific and Australia. Tsunamis devastated Southeast Asia in 2004 and Japan in 2011, and major earthquakes affected Haiti, Chili, China, and the Middle East in the past decade. In all societies faced with natural or manmade disaster, the priority of the immediate response is to save lives, rescue those at risk for further injury, and begin psychological first-aid. But as is well documented, the real work comes during the period of disaster recovery, helping individuals affected by disaster cope with the psychological consequences and preventing or minimizing complications associated with physical health co-morbidities.

During the late twentieth century, disaster research emerged as a complex scholarly endeavor. Public health, social and psychological scientists are leading experts in studying the impact of disaster on the human experience. The largest body of human science disaster research has focused on the psychological and mental health consequences of people living through trauma and loss. Landmark studies by Norris and colleagues (2002) and Norris, Friedman and Watson (2002) systematically reviewed two decades of disaster mental health research on 60,000 subjects. This review became the basis for predicting those people who would suffer long-term psychopathology and for the development of post-disaster mental health interventions. However, knowledge gaps still exist. For example, recent disasters that have impacted ethnically diverse and low income populations illustrated the lack of knowledge as to how to support the most socially vulnerable (Harville et al. 2009; Rhoads, Pearman and Rick 2010).

Likewise, managing acute and chronic medical risks and promoting health for people living in a post-disaster environment are also major areas in need of research. People displaced by disaster or who return to live in the recovery area commonly lose contact with their usual health care providers, pharmacies, and hospitals, because the disaster has also devastated the health care infrastructure which must rebuild to capacity. Disaster survivors then are often forced to change health and self-care routines and live without their social support networks of friends, extended family, or churches. Researching post-disaster populations living with heart disease, diabetes, cancer, hypertension, kidney failure, or HIV can help identify their health status and health care needs and guide post-disaster health policy for future disasters (Arrieta et al. 2009; Tan et al. 2012)

Several studies by health professionals describe clinical risks and intervention needs in populations of interest. For example, researchers in Japan described the clinical features and increased incidences of pneumonia, acute heart failure, and deep vein thrombosis weeks following the 2011 earthquake and tsunami (Natamura et al. 2012; Daito et al. 2013; Shibata et al. 2013; Yamauchi et al. 2013). Among many health-related studies after the Hurricane Katrina disaster, Uscher-Pines and colleagues (2009) found a significant association between length of displacement from home and risk for hip fractures in the elderly. Theti

and colleagues (2010) reported the prolonged difficulty post-Katrina diabetic adults had in restoring their health to the pre-disaster level of clinical measures of diabetic health (high density cholesterol, hemoglobin A1c) and controlling co-morbidities such as hypertension. Following the World Trade Center disaster, clinicians studied mental health issues and perinatal outcomes for pregnant women living in New York (Berkowitz et al. 2003; Lederman et al. 2004).

Despite the wide breadth of health-related disaster studies, more clinically focused research is needed to address nursing care concerns. Having the opportunity, nurses should study mental or physical health in post-disaster populations. Since the field of disaster research is relatively new, more emerging nurse scientists should consider this area as a planned program of research, which includes seeking mentorship from experts in the field. In addition, nurse researchers who are working or living near a disaster area can also find ways to initiate research and/or participate as a team member, offering their unique perspective and expertise. After every major disaster to hit the US in the past two decades, the “accidental disaster researcher,” has emerged. These academic or health professionals were thrust into disaster research without much warning or pre-planning primarily because they lived and worked near the site of the disaster. Such was the case following the World Trade Center Disaster in 2001, Hurricane Katrina in 2005, the earthquake and tsunami in Japan in 2011, and continues to happen after every disaster, worldwide.

Seize the Opportunity

First of all, researchers are personally affected by disaster when it strikes their communities. As a result, nurse researchers must evaluate their own personal losses and resources and assess their ability to stay in the community and become part of the recovery process while conducting research. Those of us in September 2005 who could return to the Greater New Orleans area with a home and job believed that the greatest responsibility we had was to create good out of what happened. Like many disaster researchers, doing this work took on a humanitarian or moral imperative. Many of us asked ourselves what could be done with our research knowledge, skills, and interests to fill some gap in what we do not know about the impact of disaster on people in *this* community. As described in the personal account by the first author, if I had not lived through such an event as Hurricane Katrina, I doubt I would have ever studied health issues related to disaster. I had just completed a three year post-doctoral study in genetics with a mentor in July 2005. By August 2005 the entire science department was in disarray and I knew I had lost any immediate ability to seek further training and continue laboratory-based research if I remained living in New Orleans. Yet as a clinical nurse specialist in obstetrics for many years, it was quite natural to wonder and question what effect such an event as Katrina had and would have on childbearing women and their families in our community- not just now, but over time as they returned to New Orleans to live again in a struggling community.

Generally, research studies in progress at the time of the disaster are inadvertently affected by the event which can interrupt at best or even halt existing programs of research (Kuehn 2013). For example, after Hurricane Katrina some researchers chose not to return to New Orleans because of a lack of population or resources (labs, research infrastructure,

collaborators), as to do so would result in an interruption in their research careers (Kaiser 2006). Researchers in New Orleans who were conducting human research studies at the time of the Katrina disaster had to reevaluate study aims based on the disaster event (Savage 2010, et al.). They had these considerations: (1) Would subjects of interest be available for recruitment (in our case pregnant women and new mothers)? (2) How would the population and potential subjects change in relation to loss of permanent housing, possibly increased poverty, stress, and mental health concerns? (3) What new questions now need to be explored? (4) How would the post-disaster recovery environment impact the research methods? In pre-existing studies, once the population being studied is affected by disaster, the study becomes disaster research. This transformation happens whether studying medical conditions such as heart disease, cancer, obesity, or psychosocial and mental health issues, such as trauma, coping, stress, drug abuse, family relationships, grief, or parenting.

Having a study in progress in the affected area before the disaster can be considered good fortune if the researchers can seize the moment to transform it into a post-disaster focused study. Because of the unexpected nature of disaster, few studies have baseline (pre-disaster) data in which to compare to the post-disaster outcomes. A study already in progress before a disaster occurs can be beneficial by having this baseline data and can quickly adjust to adding new measures, such as mental health assessments. The primary challenge is to locate and access the population if they are displaced. Researchers, Paxson and colleagues (2012) as well as Rhodes and colleagues (2010) successfully transformed a study in this way. In 2004, these researchers started a study in New Orleans to follow the academic achievement of low income, African American women attending community colleges. After Hurricane Katrina, a survey research firm located 402 (81.7%) of their participants in which researchers had pre-disaster demographic and health-related baseline data already collected. After study revisions the researchers added measures such as PTSD, stress, hurricane experience, and physical health and the surveys were continued by phone interviews. This study went from studying low income African American women's success in college, to describing how women negotiated a life changing disastrous event that forced them to reestablish every aspect of their lives.

This transformation of current research occurred in a study by Savage and colleagues (2010) that was approved to start before Hurricane Katrina. The initial goal was to survey women subjected to perinatal stress, anxiety and depression, and their use of alternative therapies, but the disaster event transformed this study into a description of perinatal stress in a post-disaster environment. The use of alternative therapies for perinatal coping took on a more profound meaning after the disaster, as women faced increased stress with less available mental health services. Prenatal recruitment sites changed after the loss of eight community hospitals, and new partnerships had to be established with two remaining hospitals. Although it took 9 months to restart a study already in progress, the researchers had a unique opportunity to assess the mental health of prenatal women living every day in the midst of a community-wide recovery environment.

Another successful strategy for conducting disaster research is to establish diverse research partnerships. Local researchers in New Orleans collaborated with expert faculty in disaster research throughout the U.S. Many experts were ready to travel to the site of a disaster with

a field team and conduct studies soon afterward. Funding bodies in the United States, such as The National Science Foundation and National Institutes of Health, provided “rapid response grants” to expedite funding for those individuals with the expertise to develop proposals. The partnerships paired expert disaster researchers with collaborator(s) living in New Orleans who had access to a certain population or local knowledge which was needed to negotiate a post-disaster environment. New collaborations within the local academic environment were forged as well, as professionals across universities and disciplines partnered, capitalizing on the strengths of diverse disciplines. The Head-off Environmental Asthma in Louisiana (HEAL) Project, which studied the environmental impact of disaster in children with asthma living in New Orleans, is an example of collaborative research that crossed many agencies, disciplines, and universities (Grimsley et al. 2012).

Contextual Challenges for Planning a Disaster Study

What is “disaster research,” and what makes it different from any other research? Answering this question starts with a clear understanding of the meaning and nature of community disaster. The key to doing disaster research is to understand how disasters profoundly affect humans and all levels of social systems. Disasters are multidimensional occurrences attributed to natural, technological, or human causes that sweep across every aspect of human life. Disasters impact environmental, social, economic, political, and biological conditions (Hoffman and Oliver-Smith 2002). Stallings (2006) believes the primary difference in doing disaster research rather than standard research is the context in which the study happens and how that context affects everything. As stated by Stallings (2006 55), “The greater the difference between the [disaster] context and the everyday world in which the rest of social science research takes place, the more unique are the challenges of disaster research.” As a result, it is imperative to recognize the factors that make up the contextual differences.

Like any other study proposal, disaster research is guided by theory, a problem statement, study questions or hypothesis, plans for sample recruitment and the description or measurement of phenomena of interest. In addition, proposal development must include some specific considerations unlike other studies. The unique context of each disaster will inform the planning of the study and will determine what makes that study different and more challenging. Many resources exist to help the novice in disaster research preparing proposals and identifying study instruments and strategies for recruitment (Table 1). The following issues that contribute to the unique context of disaster research must be considered in the planning phase: (1) severity of exposure and health consequences, (2) timing of the study, (3) risks and protective factors, (4) methodological concerns. Each of these contextual aspects will be discussed in detail, with implications for nursing research and practical examples of how other researchers dealt with the issues.

Severity of Exposure and Health Consequences

When disaster affects the human population being studied, those hazards or health risks people are exposed to must be well described and/or measured. How risks are described and linked to health consequences is dependent on the goal of the study. For example, if the goal of the study is to examine environmental hazards that affect health, then the risk of exposure

to the hazards during the disaster need to be detailed and linked to the study of specific health problems. As a result, environmental exposures (dust, contaminated water, mold) directly related to the disaster are described and linked to physical health indicators (Nair et al. 2012). Many health studies which followed the World Trade Center disaster described first responder's exposure to hazards and subsequent risks for respiratory symptoms, heart disease, and malignancies (Aldrich et al. 2010; Jordan et al. 2011). In other World Trade Center disaster studies, exposure to the psychological trauma of the event was studied, putting mental health consequences in the forefront (Galea et al. 2002).

Disaster-related stress and the potential for mental health problems are common exposure risks which follow all disaster events. Although the majority of people in the proximity of the disaster may be very resilient and will not develop psychopathology, all people affected will experience some degree of stress, anxiety, and fear. The context of the exposure (type of disaster, type of losses, time, duration, and proximity to the event) is important to consider in determining risks for serious psychopathology. The most prevalent mental health disorders seen after disasters are post-traumatic stress disorder (PTSD), depression, and anxiety (Meewise et al. 2011). In previous mental health studies, PTSD effects have been associated with physical proximity to the disaster and the perceived threat of loss of life. Generally, the closer the person is to the actual disaster – seeing or experiencing the event with a threat of loss of life or extreme fear, the greater the risk of long term mental health problems (Galea, Nandi and Vlahov 2005). Generally, PTSD levels are higher in man-made, mass violence disasters as compared to natural disasters (Neria, Nandi and Galea 2008). The exception to this fact has been in those natural disasters characterized by widespread community devastation, loss of life, and slow response such as Hurricane Katrina and the 2004 Asian tsunami, where the survivors experienced higher levels of mental health pathology over time (Kessler 2008). The known relationship of stress to acute illness and to chronic disease co-morbidities is also important when studying physical health issues following a prolonged time of stress during disaster recovery (Brown, Varghese and McEwen 2004).

Another common consequence to disaster exposure is the feeling of loss and grief. The characterization of losses and their meanings can be complex and widespread. Personal losses may include property, health, and health care routines, family members who died or had to move away. Communal losses may mean loss of jobs, of social networks, of schools, and a cultural way of life. Since disaster is a collective experience, how much individual losses such as homes, income, and employment are influenced by the larger community losses is not clear (Benight and McFarlane 2007). Grief can be more complicated since experiencing sudden personal and communal losses simultaneously can result in loss of rituals for support and comfort, such as social networks and churches. A person's own perception of loss may not match what an outside investigator would assign as a loss, such as the loss of small items with sentimental value or the loss of a pet which may affect a person much more strongly than a major financial loss of a house or car. Similarly, loss of companionship at work may be harder for people to take than loss of a job (Ehrlich et al. 2010).

Timing of the study

Disasters are acute onset, delineated events that happen and follow conceptual phases of the disaster cycle or timeline, based on the model used. More linear models for disaster will describe each phase as pre-incident, impact (0–48 hours), rescue and aftermath (0–1 week), immediate recovery (1–4 weeks), and long-term recovery (years afterward). One needs to consider how the study questions will differ based on the period in which the study is planned (Norris et al. 2006). Research during this early period may include early mental health screening to identify which communities and populations are most in need of mental health services, as well as to what extent the disaster has affected the people. Conducting research in the immediate aftermath of a disaster is a complicated endeavor and requires a sense of urgency. A study must be designed, staff hired or located, institutional review (IRB) approval received, and funding secured, all in an environment where basic services may be difficult to find. For this reason, external researchers who have established protocols and funding streams sometimes have an advantage during this period, though they will require cooperation with local investigators.

While the rescue and immediate aftermath phases are well distinguished, how to characterize the period of disaster recovery is still somewhat unclear. Recovery is not just rebuilding physical structures, but also restoring the social, economic, and natural environments (Smith and Wenger 2006). The recovery period is messy, non-linear, and complicated when the pace of recovery is prolonged because of political, social, or financial reasons beyond the control of the individual or the community (Kaiser Family Foundation 2008). An undetermined period of “disillusionment” that accompanies recovery and the long-term psychological, social, or economic losses that impact the victim’s ability to recover and rebuild are critical aspects to consider (Botterell 2013). Current studies on disaster exposure and the duration of effects on health have challenged the previous belief that there is a slow linear recovery over time. For example, mental health pathology and suicide rates in New Orleans after Katrina actually rose in year two as compared to the first year – this was the first time this trend was reported following a hurricane disaster, and the shifts in population complicated the interpretation of events (Kessler 2008). Describing the post-disaster stressors during the recovery period is also key to understanding the impact of recovery on medical conditions, such as rates of myocardial infarction (Peters et al. 2013) and stability of hemodialysis patients (Hyre et al. 2008). The disaster research field needs better understanding about long term effects on individual and community health when recovery is extended over a prolonged time or impacted by an unstable health care delivery system (Kaiser Family Foundation 2007; Wang et al. 2008). Experts in disaster research have called for more longitudinal studies to follow the effects of disaster as recovery occurs (Norris 2006; Norris et al. 2006).

Risk and Protective Factors

Disaster research is shifting from looking at the nature of the event to looking at the capacity of individuals to anticipate, cope, resist, and recover from the impact of disaster (Hoffman and Oliver-Smith 2002). One studies the concept of vulnerability to determine the degree to which someone’s life and livelihood are put at risk due to a discrete event in nature or society. Risk originates from social, economic or political conditions that are beyond the

individual's control (Thomas et al. 2013). People with chronic mental or physical health conditions or who lack social and material resources prior to a disaster, are more at risk for disaster-related health problems. Of equal importance is understanding what enables some individuals to demonstrate resilience, which is to cope, rebound, and do well after traumatic events in spite of challenging circumstance (Zoellner and Maercker 2006). Factors that promote or deter resilience can be studied from an individual or community perspective. Psychosocial factors found to predict psychological resilience to disaster exposure are age, ethnicity, socioeconomic status, gender, family status (female care-taker, parent) pre-disaster physical and mental health, and social support (Abramson 2008). Although it is well known that trauma and stress are consequences to disaster, a variety of social risk factors will determine the likelihood that the event of disaster will influence physical and mental wellbeing and long term health (Bonanno et al. 2007; Weems et al. 2007).

Methodological Issues

The most common quantitative research designs include single post-disaster assessment (cross-sectional) or two or more post-disaster assessments (longitudinal) of a cohort. The pre-post disaster design is less often used, since it requires a previous relationship and pre-disaster data from the population. However, a pre-post design with pre-disaster clinical data would be useful for the health care provider who continues to follow the same patients after the disaster. In general, cross-sectional studies can more easily access people for one-time measures, but the advantages of longitudinal measures to assess changes over time are lost (Norris 2006). Cross-sectional studies are less useful for causal inference, as well. For instance, in mental health research, it may not be clear whether a given coping style is a cause of depression, or whether depression itself leads to that coping style.

The study questions and purpose of the study will guide who the researcher will study. The investigator who wants to describe variables of interest common to everyone who experienced the disaster can collect census data to assess the immediate health needs representative of the community to validate the need for disaster aid. Early mental health screening will help to explain which communities and populations are most in need of mental health services following a disaster, as well as to what extent they have been affected. In the immediate aftermath of disaster, subjects are recruited in emergency shelters, community centers, emergency management government centers, or health clinics. Retrospective studies can use medical records from this period to describe health issues clinicians faced, before researchers were in the field (Caillouet et al. 2012). Follow-up or longitudinal research into the recovery period brings special issues. Finding subjects over time by telephone, email, or address is certainly challenging. Disaster survivors who live elsewhere and those citizens who return to the community may be living in temporary housing. Addresses and locales change over the course of weeks or months. Researchers doing a longitudinal study have to try proactive strategies such as giving subjects a toll-free number to call as they relocate, but participation in research is unlikely to be a priority for them. Websites that connect the subject and researcher are another possibility. A web-based survey of disaster survivors is also another option when the survivors are evacuated from the site and have computer access, or when they regain computer resources in the community (Norris et al. 2006).

Population surveys often use random selection and larger samples. Using sampling frames such as telephones to create a random selection process would not be useful following a disaster known to destroy phone lines or that shifts key segments of the population out of one area. Non-probability purposive sampling is commonly used to recruit people who meet study criteria within a certain set parameters (children, pregnant women, elderly, and adults with diabetes). When critiquing 225 published mental health disaster studies, Norris (2006) found less severe mental health effects in larger samples with random selection than purposive sampling studies. Norris (2006) theorized this is because the general population would not be expected to show the “severity of impact that victim groups do” (183).

Qualitative designs describe unique contexts and circumstances and explore how culture, histology, sociology, and ethnicity inform the disaster experience (Norris 2006; Norris et al. 2006; Iversen and Armstrong 2008). Ethnography, phenomenology, and grounded theory have been used to make people’s experiences and perspectives explicit and to describe the process living through and coping in disaster (Badakhsh, Harville and Banerjee 2010; Fortherrgill 2004; Giarratano, Orlando and Savage 2008). The phenomenological study conducted with maternity nurses who worked in hospital settings in New Orleans during Hurricane Katrina and the aftermath was one of those unique circumstances that needed to be described and interpreted using the nurses’ voices (Giarratano et al. 2008). Although nurses have always worked through natural disasters, this study was among the first instance in modern U.S. history where civilian nurses worked over 3–6 days to evacuate all patients in large, urban hospitals without back-up power or sources of water and sewerage.

When interviewing research participants who lived through much trauma and loss, the researcher needs to be sensitive to the memories and emotions as they recall the story. Each of the participants in the nurse study (Giarratano et al., 2008) had a period of time where they cried describing memories of patient suffering and their feelings of abandonment. Likewise, the investigator (and transcriber) must be prepared to listen to stories of trauma and human distress, while engaging to understand the participant’s perspective. Researchers who lived through the same disaster have a personal understanding of the event that helps them connect to and understand their study participants. However, that familiarity may also be a source of conflict for the researchers who must put their own (insider) perspective aside and attempt to see the experience through the understanding and expression of the study participant (Hertz 1997).

Ethical Issues in Disaster Research

Disaster research must be conducted in an ethical manner, following established guidelines (National Institutes of Health, 2007). The risk-benefit of all research studies should be approved by a regulatory body, such as the institutional review boards in the U.S. Because disaster survivors are vulnerable, there is a need to make sure the informed consent process is carried out without coercion. Disaster researchers must plan studies keeping in mind that most people experienced post-traumatic stress, extreme anxiety, or depression directly related to the event. Therefore, institutional review boards in the U.S. will look for a plan for immediate mental health referral if you determine this person is psychologically distressed and in need of mental health care.

Be aware that sensitive time periods exist. In summer 2010 the authors started a prenatal long-term disaster recovery study and found the fifth anniversary memorial events of the disaster (August 29) to be an especially difficult time as subjects were exposed to televised images of the Hurricane Katrina devastation from five years earlier. Likewise, community memorial services brought up memories of those individuals who died or were permanently dislocated. Whenever events happened in the world, such as the Japanese tsunami and Mississippi river flooding in 2011, our post-Katrina subjects would often mention they were stressed about seeing the televised images.

Besides stressful memories, many prenatal women we recruited in the disaster recovery study indicated much stress over recovery issues and adjusting to living in New Orleans, without extended family or usual friends for support. Women verbalized stress about recovery issues such as trying to find a mattress to sleep on, preparing food in a home under repair, finding someone to pick up their kids from school if they stayed on bed rest, etc. Since we were bringing stressful recovery issues to light during the study, we believed we had an ethical responsibility to at least provide a social services consult to help subjects' resolve situational stressors or provide social support. This data also served as validation that the traditional prenatal health care system was inadequate in providing social care to women post-disaster.

Unstable Conditions: The Complex Implementation of a Disaster Study

Although any investigator can experience unforeseen difficulties with study sites, subject availability, and agency infrastructure needed to complete a study; disaster research magnifies this difficulty. As stated before, disasters seriously impact all social systems, institutions, and physical structures which will be unstable for months or years to come. Infrastructure such as hospitals, clinics, schools, community agencies, housing, commercial businesses and public transportation will be in flux during the disaster recovery period. Anticipate potential problems and find alternate solutions if the stability of any of these institutions is key to your research plan.

Five years after Hurricane Katrina when the authors started a study with pregnant women living in New Orleans, during the long-term recovery period, we experienced many institutional challenges because of the complexity of post-disaster life. The general purpose of the study was to describe the mental and physical health of women who had returned to live in New Orleans and who were also facing stressful issues of recovery and pregnancy simultaneously. Ironically, some of the stressors affecting the women became the same stressors we had to deal with in implementing a study. The instability of the health care institutions that provided prenatal care became a major barrier to our study and that same instability affected women's access and type of prenatal care afforded them.

For example, one major aim was to compare women's health outcomes to the type of prenatal care services they used and psychosocial support received. In planning the study, we had identified 3 models of prenatal care in place in the recovering community: (1) CenteringPregnancy® group care at two community clinics (2) traditional prenatal care at physicians' offices and community clinics, and (3) women using traditional prenatal care

and also participating in the Healthy Start program that offered social services case management, prenatal education, and a variety of social support referrals. While the study was being reviewed and funded, the Centering Pregnancy® model disappeared completely from the community because of staff and clinic location changes in the rebuilding and recovery process. This fact was disappointing not only for the purposes of the study but also because of the well documented perinatal outcomes of this model of care that could benefit women living in a post-disaster community (Ickovics et al. 2007). We were fortunate our funder agreed to continue the study with revised study aims.

We knew CenteringPregnancy ® (group prenatal care) represented an innovative model of care that was not stable in the community. However, it was surprising when we found that traditional prenatal care at community clinics supported by state Medicaid funding and local medical schools also remained in flux and had to be constantly monitored as the study progressed. The week we planned to orient staff and begin data collection at one of our primary prenatal clinic sites, administrators decided that childbirth delivery services would cease at the usual hospital associated with the clinic and move to a nearby community hospital. Initially it was undecided if the current clinic would continue to deliver prenatal care to women. Although it took a few weeks to arrive at a decision, it was decided that prenatal care would continue there for a while, but the future was uncertain. The study team had to monitor this decision closely so as not to have recruitment at this clinic unexpectedly cease.

The study team maintained a state of hyper-vigilance to stay apprised of all community events impacting the study. Reporting and explaining these study issues to funders, IRBs, and parent institutions became a critical role of the study principle investigator. Especially challenging was explaining the community instability to people living outside the context of a disaster that happened 5–7 years beforehand. Realizing that change and instability were the ‘new normal’ in any post-disaster environment is what helped us respond to challenges and continue. Our awareness that the context of disaster was what made research so challenging, but also helped us understand better how the context of disaster might impact women and young families going through life transitions such as childbearing and childrearing.

Conclusion

Emergency management and response to disaster can take many forms. Conducting disaster research that informs the public and health care professionals on how to prepare for disaster, provide immediate aftercare and psychosocial support, or achieve sustainable recovery and health are among the possible ways for nurse scientists to respond to community disasters. Disaster research is a rare opportunity to study both the vulnerability and resilience of people living through a life-changing crisis. Despite the challenges described in this article, many resources of expert guidance or collaboration to study the impact of disaster on health and discover best practices to address human concerns are available. Be prepared to seize the opportunity and move forward should disaster strike your community.

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Table 1

Resources for Conducting Disaster Research

The National Child Traumatic Stress Network (NCTSN) Database of reviews of tools that measure children's experiences of trauma, mental issues, and parent-child relationships and parenting stress http://www.nctsn.org/resources/online-research/measures-review
National Center for PTSD (US Department of Veterans Affairs) PTSD assessment guides and tools http://www.ptsd.va.gov/professional/pages/assessments/assessment.asp An Electronic Index to Traumatic Stress Literature http://search.proquest.com/pilots/?accountid=28179
Disaster Psychosocial Assessment and Surveillance Toolkit (Louisiana State University Health Sciences Center School of Medicine, Department of Psychiatry) Overviews psychosocial and health-related survey instruments and recruitment guidelines http://www.medschool.lsuhsu.edu/psychiatry/docs/Disaster%20PAST%20Toolkit.pdf
International Society for Traumatic Stress Studies (ISTSS) Resources for planning and implementing studies that include measures of trauma http://www.istss.org/ResearchingTrauma.htm
Michigan Public Health Training Center Online classes to review disaster phases and psychosocial issues (free) Coping with Disasters COWDD0108 https://practice.sph.umich.edu/mphtc/site.php?module=courses
Norris FH, S Galea, MJ Friedman and PJ Watson, eds. 2006. <i>Methods for disaster mental health research</i> . New York: Guilford. Overviews research issues and methodologies specific to mental health and disaster
Rodriguez, H, E Quarantelli and R. Dynes 2006. <i>Handbook of disaster research</i> . New York: Springer. Overviews the disaster research process and unique approaches to studying the impact of disasters on humans
Thomas D, B Phillips, W Lovekamp and A Fothergill. 2013. <i>Social vulnerability to disasters</i> . Boca Raton, FL: CRC Press. Overviews social and cultural disparities related to the impact of disasters on vulnerable populations