Disaster preparedness and response practices among providers from the Veterans Health Administration and Veterans with spinal cord injuries and/or disorders

Timothy P. Hogan^{1,2}, Sally A. Holmes³, Lauren M. Rapacki¹, Charlesnika T. Evans^{1,4}, Laurie Lindblom⁵, Helen Hoenig⁶, Barry Goldstein⁷, Bridget Hahm⁸, Frances M. Weaver^{1,2}

¹Center for Management of Complex Chronic Care, and Spinal Cord Injury Quality Enhancement Research Initiative (SCI QUERI), Edward Hines Jr. VA Hospital, Hines, IL, USA, ²Program in Health Services Research, Stritch School of Medicine, Loyola University Chicago, Maywood, IL, USA, ³Spinal Cord Injury Service, Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX, USA, ⁴Institute for Healthcare Studies, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA, ⁵Spinal Cord Injury Service, Veterans Affairs Medical Center, Hampton, VA, USA, ⁶Physical Medicine and Rehabilitation Service and Spinal Cord Injury, Veterans Affairs Medical Center, Durham, NC, USA, ⁷Spinal Cord Injury and Disorders Strategic Healthcare Group, Veterans Affairs Puget Sound Health Care System Seattle, WA, USA, ⁸HSR&D/RR&D Center of Excellence: Maximizing Rehabilitation Outcomes, James A. Haley Veterans Hospital, Tampa, FL, USA

Objectives: Few empirical studies have examined the disaster preparedness and response practices of individuals with spinal cord injuries and/or disorders (SCI/D) and the healthcare providers who serve them. This study was conducted to understand the experiences of Veterans Health Administration (VHA) providers and Veterans with SCI/D in recent natural disasters, and to identify lessons learned for disaster preparedness and response in the context of SCI/D.

Design: Semi-structured interviews were conducted with providers and Veterans recruited through seven VHA facilities that had sustained a disaster since 2003. Audio recordings of the interviews were transcribed; transcripts were analyzed using constant comparative techniques.

Results: Forty participants completed an interview, including 21 VHA SCI/D providers and 19 Veterans with SCI/D. Disasters experienced by participants were weather related. While many Veterans were evacuated or admitted to nearby VHA facilities, others chose to stay in their communities. All facilities had formal disaster plans and engaged in related training; however, participants explained that many aspects of a response take shape 'in the moment,' and must address both provider and Veteran needs. Dispersion of resources hindered well-coordinated care, but effective communication, teamwork, advanced warnings, and VHA's electronic medical record facilitated efforts.

Conclusions: Even in the case of thorough planning, Veterans with SCI/D and their healthcare providers are faced with pressing needs during disasters, and identifying strategies to coordinate care is critical. The lessons learned are intended to inform the efforts of healthcare providers who may be involved in the care of individuals with SCI/D in future disasters.

Keywords: Disasters, Disaster planning, Veterans, Health personnel, Spinal cord injuries, Qualitative research

Introduction

Over the last two decades, disasters of all kinds have emerged as significant public health concerns.¹ Despite

substantial worldwide initiatives, including the designation of the 1990s as the 'International Decade for Natural Disaster Reduction'² and the subsequent implementation of the 'International Strategy for Disaster Reduction',³ the losses associated with such events continue to increase. In 2008, for example,

Correspondence to: Timothy P. Hogan, Research Service, Department of Veterans Affairs (VA), Center for Management of Complex Chronic Care, 5000 South 5th Avenue, Hines, IL 60141, USA. Email: timothy.hogan@va.gov

disasters killed over 235 000 people worldwide, impacted another 211 million, and cost over 181 billion in U.S. dollars.⁴ In the U.S., Hurricane Katrina, the costliest natural disaster in national history, claimed the lives of nearly 2000 people and caused over \$80 billion in damage when it struck the Gulf Coast region in 2005.⁵

Recent domestic events have underscored the point that healthcare facilities may serve as sources of refuge and care during disasters, but that they may also be directly and adversely impacted. There is a growing evidence base documenting the range of problems, solutions, and best practices in such situations. However, less commonly discussed are the experiences of vulnerable patient groups, such as individuals with physical disabilities, and the healthcare professionals responsible for their care over the course of a disaster.⁶ The present study was conducted to understand the experiences of Veterans Health Administration (VHA) healthcare providers and Veterans with spinal cord injuries and/or disorders (SCI/D) in the face of recent natural disasters.

Background

Healthcare facilities and vulnerable populations in the face of disasters

The onset of a disaster can present unique and pressing challenges for healthcare facilities. Many healthcare accreditation organizations enforce sets of emergency management standards to ensure that facilities have the basic tools to cope with the disaster. For the past 30 years, The Joint Commission, for example, has required that accredited facilities keep detailed emergency plans. Fortunately, many healthcare facilities are never faced with a situation that requires the implementation of their emergency management plans. For those that have had to cope with a disaster, studies have revealed a number of shared experiences. Thoughtful, contextually appropriate emergency planning and preparation processes are critical to effective response efforts.^{7–10} It is rare that healthcare facilities do not have a plan in place, but the established plans often do not sufficiently account for the kinds of problems encountered during a disaster.^{11,12} Previous accounts also suggest that common challenges arise for healthcare facilities in the midst of the disaster itself, including the protection of patients and staff, communication breakdowns, and the conservation of supplies.^{13–16}

Individuals whose health status is stressed or compromised in some way, such as those with mobility impairments, chronic diseases, sensory limitations, or dependencies on medical equipment, or other devices, are at greater risk for adverse health outcomes in the

face of disasters.^{17–20} Existing research indicates that preparation and planning activities are often insufficient in these populations. A recent study revealed that only 47% of people with disabilities had developed plans to evacuate their homes in the event of a disaster and only 54% knew whom to contact about emergency plans in their community.²¹ Other research suggests that people with disabilities are inadequately represented in emergency planning efforts and that emergency management personnel often have limited training with regard to their needs.^{6,22}

The VHA SCI/D System of Care and disaster preparedness

The VHA has the largest single network of SCI/D care in the country and works to meet the healthcare needs of over 25 000 Veterans with SCI/D.²³ The VHA organizes and delivers a range of integrated services, medical supplies, and education to Veterans with SCI/D through a coordinated system of hub and spoke sites collectively referred to as the SCI/D System of Care. The system includes 24 centers (hubs) and 134 other sites (spokes) that have either SCI clinics or SCI primary care teams. Multidisciplinary care teams that practice at regional VHA SCI Centers offer primary care, acute and ongoing rehabilitation, health maintenance, disability management, and other lifelong services.

The VHA has a policy of an ‘all-hazard, comprehensive emergency management approach’ that is executed by a governing body referred to as the Emergency Management Strategic Healthcare Group (EMSHG).²⁴ The charge of the EMSHG, working in conjunction with Area Emergency Managers (AEMs), is to ensure that VHA medical centers can continue to offer effective medical care in the event of any natural or manmade disaster. A limited number of publications have documented disaster planning and response efforts in VHA acute-care and medical-surgical facilities,^{25,26} the impact that previous natural disasters have had on patterns of outpatient service utilization,²⁷ and in one case, the experiences of healthcare providers involved in the evacuation of a VHA SCI/D unit.²⁸ Despite the significance of VHA as a source of SCI/D-related care, no empirical work exists with regard to the disaster preparedness and response practices of VHA SCI/D healthcare providers or Veterans with SCI/D.

Methods

Recruitment

Study investigators worked with VHA SCI/D leadership to identify SCI/D centers and spoke sites across the U.S. that had sustained a natural disaster since

2003. Following receipt of institutional review board (IRB) approvals, the investigators contacted the SCI/D chiefs at these locations and asked them to recommend staff members who might be willing to share their disaster-related experiences. Staff members in turn contacted Veterans who they knew had first-hand experience with a natural disaster and who were receiving SCI/D-related care through the facility. Contact information for those Veterans who expressed interest in the study was then shared with the investigators. Healthcare providers and Veterans from seven different facilities eventually participated, including four SCI/D centers, and three spoke sites, most of which were located in coastal areas.

Data collection

Interviews began in summer 2006 and were conducted through spring 2008 by three of the study investigators, all of whom were knowledgeable about the SCI/D Veteran population and the VHA SCI/D System of Care. The interviews were audio-recorded; five were conducted in person and the rest transpired via telephone. Verbal consent was secured before the start of the interview process and the investigators asked for permission to call participants again should there be any need for follow-up questioning. The study team created two separate semi-structured interview guides, one for providers and one for Veterans.

Provider questions focused on demographic characteristics, descriptions of the disaster(s) that they had experienced, and corresponding aspects of preparedness and response including communication, training, and safety issues, handling of basic services, challenges encountered, and best practices. At the conclusion of each interview, providers were also asked to share any documentation that they developed to inform local disaster preparedness, and response efforts.

Similarly, interviews with Veterans included basic demographic questions and other questions regarding the disaster(s) that they had experienced. The discussion then focused on their response to the disaster(s), their sense of personal preparedness, concerns, and problems that they faced, their communication and social support systems, and their thoughts on responding to future disasters.

Data processing and analysis

Most interviews with providers lasted between 30 and 45 minutes. Veteran interviews were typically 30 minutes or less in duration. Early in the data collection process, audio recordings of a subset of the interviews were reviewed by the study team to assess their consistency with the interview guide and their alignment with the broader study objectives. Research support staff

transcribed the audio recordings and the resulting transcripts were analyzed in multiple rounds by two of the study investigators using constant comparative techniques, which involve deriving basic concepts from data and comparing them with other data to facilitate meaningful categorization.^{29,30}

Outcomes from the first round of analysis included lists of basic thematic categories found across the provider and Veteran interviews. Subsequent rounds of analysis involved the selection and organization of transcript excerpts within and across those categories. The two investigators met weekly during the analytic process to compare and assess the match between their interpretations and to resolve any coding discrepancies. The various documents that were collected from providers were reviewed in conjunction with the corresponding interview transcripts. These data provided additional context with which to interpret comments made during the interviews.

Results

Sample profile

A total of 40 individuals completed a semi-structured interview (21 VHA SCI/D healthcare providers and 19 Veterans with SCI/D). Tables 1 and 2 summarize the key characteristics of each group, respectively. All participants had first-hand experience with weather-related disasters. Hurricanes and associated threats like flooding and high winds were the most frequently reported events; less common were ice and snow storms, and the onset of severe cold. Providers at one facility also described problems associated with a wildfire that broke out in the vicinity. The remainder of the results section is organized in two sections: preparedness and planning and needs and practices during a disaster.

Preparedness and planning

Table 3 includes a list of planning and response tips for healthcare providers and individuals with SCI/D that are based on prominent interview themes. All facilities represented in this sample had formal disaster plans in place, and had developed specific procedures to address the needs of Veterans with SCI/D present in these facilities at the time of a disaster. The extent of disaster planning by community dwelling Veterans with SCI/D at the time of the study varied more. Although many described how they worked closely with loved ones and others to develop plans that accounted for their needs, others expressed a more *ad hoc*, 'fly by the seat of our pants' approach. Despite this variation, providers and Veterans alike emphasized the importance of

Table 1 Characteristics of provider participants

Composition	Number of respondents (n = 21)
Gender	
Male	8
Female	13
Position at facility	
SCI/D care manager/ coordinator	5
Nurse	5
Social worker	4
Physician	3
Therapist (recreational, respiratory)	2
Other hospital coordinator/ director	2
Time working for VHA*	
0–5 years	2
6–10 years	5
11–15 years	5
16–20 years	4
> 20 years	3

*Data missing for two providers.

Table 2 Characteristics of Veteran participants

Composition	Number of respondents (n = 19)
Gender	
Male	19
Age	
40–49	2
50–59	5
60–69	9
70–79	3
Year injured/diagnosed*	
1960–1969	5
1970–1979	4
1980–1989	1
1990–1999	5
2000–Present	3
Cause of SCI/D	
Vehicular accident	6
Service-connected injury	5
Fall	3
Spinal cord disorder (e.g., tumors, discs)	3
Multiple sclerosis	2
Level of injury**	
Thoracic	8
Cervical	7
Lumbar	2
Living situation	
With at least one other person	11
Institutional setting	6
Alone	2
Location of home/facility	
Urban	14
Rural	5
Access to information technologies	
Telephone	19
Internet	15

*Data missing for one Veteran.

**Two Veterans with MS not included.

Table 3 Planning and response tips for healthcare providers and individuals with SCI/D

Develop a disaster response plan that is tailored to your situation/population
Make preparations in accordance with your disaster plan and be prepared to modify them
Identify opportunities to disseminate and exchange preparedness information
Create tools to support the dissemination and exchange of preparedness information
Ensure access to basic resources for providers, staff, and patients
Gather and organize resources whenever possible
Promote teamwork and cultivate sources of social support
Stay in close contact with all stakeholders
Know the information and communication technologies available to you

advanced warnings for making adequate preparations. They also acknowledged that being informed and having ample lead time before a disaster strikes is not always possible.

Table 4 presents a range of activities documented in the dataset that were intended to improve disaster preparedness and to facilitate planning among Veterans with SCI/D and SCI/D healthcare providers. Providers described a variety of innovative practices invoked in the course of routine patient care to raise awareness, educate, and remind Veterans with SCI/D of the importance of disaster preparedness. Some facilities incorporated emergency preparedness curriculum into preexisting classes offered to newly injured Veterans, into annual SCI/D health fairs, or into the printed materials distributed as part of other existing programs. At other sites, providers designed spreadsheets and templates to record Veteran contact details, next of kin, and the specifics of their disaster response plans, and reviewed and updated this information with patients at clinic appointments. Still others described using initial psychological and/or social assessments as an

Table 4 Channels utilized to disseminate preparedness information and support planning

For Veterans with SCI/D	For VHA SCI/D healthcare providers
Inpatient community meetings	Preparedness committees
Annual health fairs	Conferences, meetings
Classes for the newly injured	Local lectures and online courses
Handbooks, booklets	Simulation drills
Outpatient letters, telephone calls	Manuals, memos
Resource checklists	Staff call lists/telephone trees
Templates in which personal disaster plans are recorded and shared	Vulnerable patient lists that pinpoint at-risk patients based on specific criteria

opportunity to create ‘vulnerable patient lists,’ which were inventories of Veterans who were identified as at-risk based on geographic locale (e.g., having a small home near water or in a low-lying area, living a considerable distance from a VHA facility), personal situation (e.g., living alone, having limited contact with loved ones or neighbors), and related criteria. As one provider explained, such tools developed as part of routine care can provide a critical link to Veterans if and when a disaster ensues: ‘It is kind of an ongoing process to make sure because I know come June we will go back into hurricane season When I talk to them it is constant re-stressing As I listen to their plan if it doesn’t quite (seem) realistic to me, I go over it with them and say ‘Look, I understand what you are telling me but you really need to have something else in place.’ ... That is why I have the spreadsheet, in the event that we go into a hurricane warning or watch then I will call them and make sure that they are doing their plan.’

Different preparation and planning practices were also evident across inpatient and outpatient contexts. At the beginning of hurricane season, community meetings and resident council sessions were used to review procedures so that Veterans utilizing long-term care services would know what to expect during an emergency response. Similar approaches were taken in the face of impending disasters. Providers also commented that the provision of home-based care services offered an important opportunity to check the extent of preparations among outpatients and to identify other potentially ‘high risk’ individuals in the community. Other communication efforts directed at outpatients included the mailing of letters, preparedness manuals containing the local VHA SCI/D coordinator’s contact information, scenarios that they should be prepared to confront (e.g., are you prepared to live without electricity for a week? What will you do if your phone does not work?), and ‘checklists’ developed by SCI/D staff that itemized the kinds of supplies that should be kept on hand (e.g., medications, catheters, batteries and generators, and food that will not spoil). As one SCI/D coordinator explained, checklists ‘just create awareness Everybody knows it, but you don’t think about it on a daily basis. It’s a kind of reminder to them.’ Other Veterans living in the community emphasized the importance of communicating with different local agencies (e.g., the power company, the police, and/or fire department) as a preparatory measure, ensuring the availability of sufficient supplies, and in the case of an imminent threat, using scanners, weather radios, the internet, television, and other media to monitor developments.

Similar to those conducted by or for Veterans, disaster preparation and planning efforts were also directed at providers within the VHA SCI/D System of Care. Facility policies, manuals, telephone trees, and call lists were circulated. Disaster planning committees were commonly reported, as was the practice of addressing preparedness topics and disaster scenarios through simulations and drills, staff meetings, lectures, online courses, and other review sessions. Regardless of how they were developed or disseminated, there was widespread recognition among providers that the ‘tweaking’ of preparations and the ‘adjusting’ of pre-established facility response plans is almost always necessary when faced with an actual disaster. As one physician commented, ‘We are aware of the disaster plans but it’s always a nebulous thing until you have to go through it.’

This raises a final point, that the relationship between past disaster experiences and current disaster planning and response efforts is not always straightforward. Previous experience with a threatening event was described as a learning opportunity by many providers and Veterans with SCI/D, and was reported to help motivate planning and preparation. However, having lived through a previous disaster seemed to engender a sense of optimism and confidence that, in turn, diminished motivation to plan or make preparations among some Veterans. As one social worker put it, ‘There has been such a, “I’ve been through Camille I can handle anything ...” Believe it or not, many people still feel that way because it’s “I’ve survived Katrina. If my house stayed here, there is nothing that’s ever going to be that bad again ...” Getting someone motivated to plan is the biggest issue.’

Needs and practices during a disaster

Due in large part to where they were located, the health-care providers in this sample had different perspectives on the disasters that they experienced. Some worked at facilities deemed ‘safe’ and out of harm’s way when a disaster struck, and were faced with the task of admitting other providers and Veterans with SCI/D from more susceptible locations. Others worked at facilities determined to be in danger, and in turn evacuated to different locations along with the patients for whom they were responsible. Regardless of whether they were involved in admission or evacuation efforts, several common themes were apparent across provider narratives.

Healthcare providers described two broad categories of needs, personal, and work related, that they faced during a disaster. Regarding personal needs, many emphasized the importance of transportation assistance so that they could report for work, and the availability

of on-site or nearby lodging if they covered long shifts or if they lived a considerable distance from the facility. For those with loved ones in the area, uncertainty over their safety was a source of considerable stress. As a response, some facilities made arrangements, such as the establishment of onsite nurseries so that providers could bring dependents with them to work. One care manager explained how they developed a system and utilized different spaces in her hospital for this purpose: 'It was set up in such a way that it was very appropriate If family came, and they were welcome to come, they would stay in the auditorium. You would know they were safe there.' In some cases, similar arrangements were made to protect the pets of staff members. Basement space and other available rooms within facilities were utilized to establish makeshift kennels for dogs, cats, and other animals. Work-related needs focused predominantly on access to equipment and supplies necessary for SCI/D care, including wheelchairs, respiratory equipment, proper bedding, wound care materials, and medications. Many providers emphasized the importance of taking steps to ensure the organization and readiness of equipment and supplies prior to moving Veterans. As described below, this practice can be understood as part of a broader theme to provide a coordinated care experience during a disaster.

In light of the specialized needs of individuals with SCI/D, many providers emphasized the importance of promoting coordination of care during a disaster. A variety of factors were identified at the individual and facility levels that can interfere with or facilitate efforts to coordinate care during evacuation or sheltering in place at a facility. Most critical was effective communication between different stakeholders, such as providers, providers and Veterans, facility leadership and providers, and between facilities. Information and communication technologies (ICTs) were often instrumental to such interactions. In situations where a facility's telephone service was interrupted, many providers relied on email, cellular phones, and in some cases walkie-talkies to track Veterans, staff, and resources. Other providers emphasized the awareness that individuals with SCI/D have of their own vulnerability and the importance of giving them continuous updates to alleviate feelings of panic and anxiety. Advanced information sharing between facilities was critical in situations where Veterans had to be moved from one facility to another. An administrator located at a facility responsible for providing shelter to evacuees explained that early access to Veteran information can help manage expectations: '... In our Veterans Integrated Service Network (VISN), the hospitals communicated very

well. We actually had a list of everyone that was coming before they left which allowed us to have a 'presumptive disposition' before they hit the door. We just needed to check vitals and briefly examine the patients and make sure they were appropriate for where we were sending them. They were already loaded in our computer and their orders were transferred from [the other facility].' This remark also alludes to the role played by VA's electronic medical record in facilitating coordination efforts. The ability to access patient records through a single system made it possible to anticipate the needs of evacuated Veterans, and to readily document the care that they received across facilities.

Perhaps the most formidable barrier to coordination was the potential for equipment, supplies, providers, and Veterans to become dispersed in the course of evacuation or sheltering efforts. Dispersion occurred both within and across facilities, typically because there was not a single space sufficient to accommodate all evacuees. In cases where resources and people became spread throughout a facility inadvertently, providers explained that the time necessary to find Veterans, the lack of designated areas to chart or to access computers, and the fatigue associated with traversing significant distances on foot were significant barriers. As a nurse explained, 'That is why the staff was so worn out. We had to walk from unit to unit to put patients back to bed and to pass medications. The nurses were worn from just the walking itself.' Dispersion also exacerbated other challenges, particularly staff shortages and the lengthy shifts that many were covering. Providers described various strategies that they implemented to try and cope with these challenges. Perhaps most useful was simple teamwork, including volunteering to work extra hours and to perform tasks beyond what was normally expected. As an SCI coordinator commented, 'There was no longer any hierarchy in the hospital. Doctors helped bring food; even the lead social worker mopped the floor. There was just a sense of community ... Your job description no longer existed ... Everybody was just working ... We had one objective and that was patient care.' Other strategies included the establishment of temporary command centers at key positions within facilities and the assignment of providers to cover specific units or floors where a substantial number of Veterans with SCI/D had been placed. The evacuation of providers with Veterans to another facility was considered particularly helpful as it made continuity of physician care possible. As one administrator explained, 'They had doctors that the patients personally knew. ... Coming in with staff

who knew the patients personally made life much easier.’

Finally, although many of the Veterans in this sample reported evacuating to another location or being admitted to a VHA facility, there were others who chose to stay in their community or their home in the face of recent disasters. Different factors influenced the decisions of these individuals to remain behind. Some tried to evacuate their homes but found it nearly impossible to do so because of traffic or blocked roadways. Other concerns stemmed from the attributes of emergency shelters, community centers, and other evacuation destinations, including overcrowding and limited privacy, and the extent to which such locations would be equipped to meet the needs of an individual with SCI/D. As one Veteran commented, ‘Shelters don’t deal with people with disabilities ... as far as quadriplegia, they are not really set up to take care of us. [It’s] hard to transfer from a wheelchair down to a cot.’ Returning to a theme presented earlier, some also expressed confidence in their ability to shelter and protect themselves because of their experiences with previous disasters.

Veterans who remained in the community emphasized the importance of having access to necessary equipment and supplies, and receiving assistance from helpful others. Among this subset of participants, ‘materials support,’ or the provision of resources to address practical problems, was the most common type of social support described. In particular, family members, friends, neighbors, and local community agencies often took steps to ensure that they had a consistent supply of power to run home heating and cooling systems, refrigerators for food, and medical equipment. As one Veteran who chose to stay in his home during a recent hurricane explained, ‘I’m in contact with our county sheriff. I’m in contact with our emergency medical service, the ambulance service and the fire department. If something happens, they’ll be here shortly.’

Discussion

Many of the findings presented here with an SCI/D population substantiate those identified in studies of other healthcare contexts and patient groups, including the prevalence of planning at the facility and unit levels, and the importance of tweaking and adjusting existing plans to the unique aspects of a disaster at hand. Further, this study confirms that past experience can have mixed effects on preparation efforts, that effective communication is critical, and that patients and hospital staff have varied needs during a disaster.^{7–13,16} More specifically, the results from this study further our

understanding of the experiences of a highly complex patient population and their providers in the midst of threatening situations. Beyond the themes that are relevant to disaster planning and response more generally, other themes highlight the unique issues that accompany the care of vulnerable individuals.^{14,18,20,31–33}

The healthcare providers in this sample implemented various innovative preparation and planning practices for their Veterans with SCI/D, including the creation of vulnerable patient lists, the distribution of resource checklists, and the use of templates to record and share personal response plans. As the experiences of the Veteran participants suggest, even when there is thoughtful planning and preparation, the physical disabilities and other complex medical needs that accompany SCI/D can impede response efforts and leave individuals susceptible to disruptions in care and potentially poor outcomes. Power outages may render critical equipment like ventilators and power wheelchairs unusable, caregivers may be unavailable, and attempts to move patients may be hampered if vehicles are not properly outfitted. The significant risk to care and patient safety that these issues pose helps to explain why promoting coordination was articulated as a pressing priority by the providers in this sample.

Some of the barriers and facilitators of coordination of care presented here are associated with the needs of the SCI/D population while others reflect characteristics of the VHA and its SCI/D System of Care. The VHA’s electronic medical record warrants specific mention at this point. Similar to other studies focused on disaster response in VHA facilities,³⁴ our findings indicate that access to the electronic records of patients was critical for care coordination efforts, particularly when providers and Veterans with SCI/D had to evacuate from their usual facility. Finally, previous work also documented the range of challenges faced by vulnerable individuals in community settings during the time of a disaster.^{18,20,32,33} The number of patients in this sample who chose to remain outside of VHA facilities, usually in their homes, during recent disasters suggests the importance of accounting for these challenges in preparation and planning efforts directed at individuals with SCI/D. Encouraging patients to cultivate strong relationships with local agencies, neighbors, and others in the community may be one way of ensuring access to vital social support in future disasters.

Study limitations and future work

This study used established qualitative data collection and analysis approaches to describe the disaster-related experiences of VHA healthcare providers and patients,

and to better understand the impact of recent disasters on a vulnerable population. The interviews revealed a range of different strategies used by participants to plan and respond to disasters; however, the design of the study and the methods employed do not support a rigorous assessment of those strategies or their effectiveness. Conducting subsequent studies to specifically test the practices and other strategies identified in the interview data (i.e., the use of checklists) would be a logical next step and a necessary precursor to determining those that are most effective and appropriate for widespread implementation.

The findings from the interviews conducted in this study underscore the essential role that family members, friends, neighbors, representatives from community agencies, and other individuals in one's social network can play in the disaster planning and response efforts of those with SCI/D. Future work should consider the inclusion of these stakeholders as key informants and examine their own extent of disaster preparedness. Regarding the composition of the sample in the current study, although both large (i.e., hub sites) and small (i.e., spoke sites) facilities from the VHA SCI/D System of Care were represented, the majority of participants were recruited from larger facilities. As such, the results of this study may not be generalizable to different-sized (especially small) facilities. Finally, the inclusion of a wide range of provider types facilitated the identification of shared experiences and broad analytic themes, but it should be acknowledged that a study focused on the perspectives of one type of provider (e.g., physicians or social workers) might reveal different issues or priorities during a disaster.

Conclusion

Despite these conceptual and methodological limitations, this study has important implications for health-care facilities and providers who may be involved in the care of individuals with SCI/D in the midst of a disaster. To that end, we conclude with the following lessons learned:

1. *Coordination of care should be a priority:* Reducing the dispersion of people and resources and promoting access to familiar providers, vital supplies and equipment, and critical (not necessarily comprehensive) patient medical information was reported by participants to facilitate coordination efforts (i.e., one could imagine recreating an SCI/D ward in a safe location). It may also increase comfort levels and alleviate anxiety among individuals with SCI/D. Effective communication was also perceived as vital; there may be

value in training facility leadership and providers to use alternative means of information exchange if typical means are not available.

2. *Preparedness and response efforts should account for the needs of all stakeholders:* Tending to the needs of individuals with SCI/D during a disaster is obviously critical; however, it is equally as important to attend to those of the providers and other staff members who are responsible for their care (i.e., ensuring their access to food, lodging, and information about their own families).
3. *Teamwork and flexibility should be emphasized:* It is impossible to anticipate the full range of contingencies that can accompany a disaster and as such, disaster plans must often be modified 'in the moment.' Many of the successes reported by the providers in this study were the result of individuals pitching in, assuming responsibility, and assisting, however necessary in the course of a disaster response. Enlisting the help of community agencies and volunteers (e.g., staff member families) may help balance the potentially overwhelming workloads that providers and other facility staff members sometimes face during disasters.
4. *Basic planning and response tools should be developed:* The remarks from both providers and Veterans in this study suggest that basic tools such as resource checklists, vulnerable patient lists, templates to record disaster plans, and logs of experiences in previous disasters, are perceived as helpful. The extent to which such tools promote shared knowledge and support efficient communication between providers, and between providers and individuals with SCI/D, is key.
5. *Disaster preparedness should be built into routine patient care:* To the extent possible, opportunities for providers and individuals with SCI/D to have candid conversations about the threats posed by disasters and corresponding preparedness should be integrated into the flow of clinical work. Utilizing established clinical practices and existing infrastructure may be a means to do so. For example, within the VHA SCI/D System of Care, Veterans with SCI/D are required to complete an annual evaluation at their VHA facility. This comprehensive physical-psycho-social assessment represents one occasion when providers can ask about experiences with past disasters, assess plans, take inventory of resources, available social support, capacity to communicate by different means, and ability to cope with stressful situations, and update the emergency contact information that they have on file for each individual.

The motivation behind this study was to understand current disaster preparedness and response practices among SCI/D healthcare providers and individuals with SCI/D and identify potential lessons that could be shared with others. While it is an inevitable reality

that healthcare facilities will be adversely affected by future disasters, these findings and those from related investigations provide an important foundation on which to develop planning and response practices appropriate for the context of SCI/D.

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