A Haven of Last Resort: The Consequences of Evacuating Florida Nursing Home Residents to Nonclinical Buildings

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Nursing home administrators (n = 15) and directors of nursing (n = 15) who worked in nursing homes during the 2004–2005 Florida hurricane season participated in a series of 6 focus groups. The purpose of the focus groups was to explore issues faced by nursing home administrators, nurses, and residents during hurricane evacuations. A primary finding was that evacuating nursing home residents to buildings that are not designed to support nursing activities (e.g., a school gymnasium or church) adversely affected resident feeding, sleeping, movement, and security. These nonclinical buildings also presented serious occupational health concerns for nursing staff members who provided care during emergencies. Recommendations for reducing patient and nursing staff injuries for those forced to evacuate to a nonclinical building as the result of an emergency event are provided. (Geriatr Nurs 2012;■:■-■)

When a hurricane warning is issued, nursing home administrators must decide whether they will evacuate their residents or remain sheltered in their own facilities. Historically, administrators have based their decision either to evacuate or to shelter in place on several factors: building structure, location (whether they are in a flood zone), and the strength of the hurricane.1,2 There is a strong incentive for them to shelter in place because this is considered less disruptive to residents.3,5 However, because storms can change direction or increase in strength within a short amount of time, nursing home staff must be prepared to evacuate at a moment’s notice.

Skilled-nursing facilities are required by federal law to create and execute their own disaster plans, and individual states specify additional components. In Florida, nursing homes must which include arrangements for emergency shelter.4,6 During the 2004 hurricane season, more than 10,000 nursing home residents were evacuated in Florida to areas that were less likely to be hit directly by a storm.2 Florida and Louisiana nursing homes are not permitted to use local special-needs shelters that are equipped to handle people with limited medical needs when evacuating.4,7 Instead, nursing home facilities are expected to have mutual aid agreements with other skilled-nursing facilities who agree to provide shelter to their residents during emergencies.8,9 The state of Florida recommends, but does not require, that nursing homes evacuate to another skilled-nursing facility that provides a similar level of care (i.e., a “like facility”).1 However, unanticipated occurrences, such as heavy traffic or worsening weather conditions, can make it impossible for nursing home administrators to adhere to their disaster plans and evacuate to a facility where a mutual aid agreement is in place.10 Existing research and government investigations have examined problems resulting from evacuations to like facilities; however, few studies, to date, have critically evaluated challenges encountered by staff and residents who evacuated to buildings not designed to support skilled-nursing care.11,12 Most research indicates that evacuation, regardless of destination, is a labor-intensive endeavor that is extremely stressful and potentially dangerous for residents and staff alike.1,10,13-15 Transportation is difficult to obtain, residents are at risk for becoming dehydrated if evacuation buses are not air-conditioned, and traffic may delay arrival at a safe destination. Residents, especially those with cognitive impairments, are at increased risk for falls and confusion in a new environment.13 Moreover, residents who evacuate have significant increases in hurricane-related morbidity and mortality compared with those who shelter in place.16
Although researchers have noted cases in which nursing homes have evacuated to school gymnasiums or churches, they have not specifically critiqued the human costs and benefits of doing so. In fact, the research reflects ambivalence about evacuating to nonclinical buildings. For example, at times they address participant concerns about the adequacy of school gymnasiums as evacuation facilities (although without specifying why this would be a problem) but then go on to reinforce the utility of evacuating to nonclinical buildings, especially when these are near the home facility, so that a quick return might be possible. Indeed, in their suggestions, they consider nonclinical buildings to be a sometimes necessary (although temporary) option for disaster planning when more appropriate mutual aid agreements cannot be established.

In a survey administered after Hurricane Gustav in 2006, these same administrators were asked to compare their experiences to those of the 2005 season (Hurricanes Katrina and Rita). Although only 45% of the facilities had evacuated before Katrina, all (n = 16; 100%) reported evacuating for Gustav the following year. It was also revealed that 46% (n = 7) evacuated to a church, gym, college, or other nonclinical building instead of moving to a nursing home. Although the literature suggests that nonclinical buildings are less than ideal, there is little discussion, specifically, as to why they are less desirable. The purpose of this research was to explore the specific challenges that nursing home staff faced while providing resident care during hurricanes. Concerns surrounding the evacuation to nonclinical buildings emerged as a primary theme.

Methods and Procedure

Design

The design of this study is based on grounded theory. In 2008, a series of 6 focus groups were conducted with Florida nursing home administrators and directors of nursing (DONs) who were employed at a long-term-care facility during the 2004–2005 hurricane seasons to determine their primary concerns and challenges.

Recruitment and Sample

Participants were solicited at the 2008 Nurse Leadership Conference sponsored by the Florida Health Care Association and the Florida Association for Assisted Living. Flyers and a poster advertising the focus group were placed in high-volume areas, such as the lobby, where participants could sign up to participate in a focus group. Recruiting participants at this event allowed for the researchers to acquire a purposeful sample of DONs and nursing home administrators (NHA). Conference attendees who did not have experience working in a long-term-care facility during the 2004–2005 hurricane seasons were excluded from the study.

Thirty-five participants registered for 1 of the 6 scheduled focus group sessions. Of these, 30 attended the scheduled session and signed informed consent forms. The 20 participants represented 26 nursing homes located throughout Florida. The 6 focus group discussions were co-moderated by the 3 authors. The focus groups were designed to facilitate discussion among participants about barriers to resident care during hurricanes. Table 1 includes questions asked of the focus group participants.

The focus group sessions lasted approximately an hour. Each participant received a $10 gift certificate as appreciation for their time. The discussions were digitally recorded and transcribed for analysis by the first author. This study was exempt by the University of South Florida Internal Review Board.

Analysis

The first author participated in all of the focus groups and was therefore familiar with the dynamics in each. The first author read through the transcripts multiple times to develop a codebook for focus group comments and to write notes about each group before coding all of the documents using both inductive and deductive approaches. Microsoft Word software was used to manage the data and compile the codebook.

The structured interview prompts solicited 2 major types of responses about disaster response services needed: evacuation and sheltering-in-place. For this reason, a deductive approach was used to determine that responses from the 3 group interviews should be divided into 2 groups based on 1) evacuating from the nursing home to another location and 2) sheltering in place in the nursing home. This was the only time that the deductive approach was used during...
this analysis. Otherwise, the data were analyzed using an inductive approach, which required that the researcher become intimately familiar with the topics discussed by the participants.\textsuperscript{20,21}

The second step of analysis, the open coding stage, was performed by the first author, who summarized participant responses and noted common topics and emergent themes.\textsuperscript{20,22,23} The first author hand-coded the data by compiling all quotes that discussed the same topic into separate Microsoft Word documents that could then be compared.\textsuperscript{22,24} For example, all quotes describing services participants felt were necessary for sheltering in place at their home facility (e.g., building safety or electricity) were copied into 1 document, and all quotes discussing necessary components for evacuation from their facilities (e.g., staff organization or resident stress) were copied into a separate document. A code sheet was created to track and describe each of the properties (subtopics) that were repeated multiple times within the 2 larger themes. In this way, important divisions within and across the data were identified and agreed on by the 3 researchers. If a topic was mentioned more than 3 times, it was given a code category.

The third step of the analysis was the axial coding stage, when the researchers looked for patterns, central phenomena, or causal conditions.\textsuperscript{22} Across all indefinite antecedent subcodes, 3 overarching themes became apparent: 1) resident issues, such as medical or resident rights; 2) staff issues, including staff family, staff safety, or staff decision making; and 3) structural issues, such as physical damage to the building or hosting-facility problems. These 3 subtopics were identified as the central phenomenon, or pattern, that tied all the other categories together.\textsuperscript{22} Descriptions and examples of these topics were entered into the code book.

Results

Three focus groups consisted of DONs (\(n = 15\)) and 3 focus groups consisted of administrators (\(n = 15\)). All of the directors were female, with an average age of 50.8 years. Administrators were, on average, younger (47.6 years old), and the majority were male (10 of 15).

Under evacuation and sheltering in place, the results were divided into 6 subthemes: 1) Evacuation: Resident Issues, 2) Evacuation: Staff Issues, 3) Evacuation: Structural Issues, 4) Sheltering: Resident Issues, 5) Sheltering: Staff Issues, and 6) Sheltering: Structural Issues. During the axial coding stage, “evacuating to nonclinical buildings” emerged as a reoccurring issue that subthemes 1, 2, and 3 had in common. Through this analytical process, the researchers were able to develop an exploratory model of what challenges faced staff and residents when they evacuated to nonclinical sites.\textsuperscript{22}

Structural shortcomings (subtheme 3) presented several challenges to both staff and residents during the evacuation of nursing home residents to nonclinical facilities. The authors discuss the subthemes in the following ways: 1) structural inadequacies of providing care in nonclinical buildings, 2) how these inadequacies impact staff, and 3) how these inadequacies impact residents. The challenges encountered by staff and residents who evacuated to other nursing homes or who were sheltered in place are well reported in the literature.\textsuperscript{11,12,15,26}

### Table 1.

**Questions Asked of the Focus Group Participants**

<table>
<thead>
<tr>
<th>Focus Group Prompt</th>
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<tbody>
<tr>
<td>1. What were some of the greatest challenges at your facility before, during, and after a hurricane? Probe: What is the single greatest challenge to patient care? Why?</td>
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<tr>
<td>2. Did your facility have “sufficient staff” during the hurricanes? (Probes: In your opinion, what is a sufficient number of staff for your facility? Is that same the number that is needed during a hurricane?) If there was not sufficient staff, what can facilities do to address these issues?</td>
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<tr>
<td>3. What does your facility do in the event of a power outage? (Probe: Please explain what a power outage means in regard to patient care.)</td>
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<td>4. What must be done to adequately respond to resident needs? Is this different during a storm?</td>
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<tr>
<td>5. Are there issues (aspects of disaster preparedness or response) that you have identified that no one else has asked about? What else should we be asking about in the future.</td>
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However, our focus groups elicited responses from nurses and administrators who evacuated to structures that were not skilled-nursing facilities.

Treating Residents as They Lay on the Floor

One structural issue that emerged from evacuating to a nonclinical building was the lack of proper hospital beds for residents. In anticipation of not having a sufficient number of standard medical beds available, several facilities transported mattresses along with residents’ medical equipment when they evacuated. In most cases, these mattresses were placed on the floor because the frames (adjustable hospital beds) were too large and heavy to be transported. Mattresses placed on the floors of these makeshift shelters created safety and occupational and physical health problems for residents and staff, respectively. Residents who were unable to independently hold themselves upright were in danger of choking on food or water. To avoid aspiration, several staff members had to physically hold residents upright when they needed to eat or drink:

We couldn’t get anybody up and sitting like in the dining room. The residents with dysphasia or swallowing problems, we would have to hold up the bed. Somebody would sit at one side and hold up the mattress and somebody else could feed them. [DON with 13 years of long-term-care experiences; evacuated to a school gymnasium during Hurricane Charley]

In regard to occupational health risk to staff, a DON reported difficulty with repositioning residents placed on the floor, a medical necessity to prevent painful pressure sores. She noted, “instead of just 1 nurse taking care of 5 or 6 [residents], you need at least 3 [nurses] just to reposition 1 [resident]” (DON with 15 years of long-term care experience; evacuated to a school gymnasium for Hurricanes Charley and Francis). Participants also expressed concern with lifting residents off the floor to help them with toileting. Residents were at risk for falling and staff members were concerned about injuring themselves.

Usually we use a lift [at our facility] … if you cannot stand and pivot-transfer with only stand-by assist from a staff member. [The lift] has reduced our workman’s [sic] compensation claims to next-to-nothing. So, what you are looking at is an employee injury, which is going to be, not only that they are tired and worn out and they have to work through a hurricane, but now they are lifting, repositioning people at a level that is not safe. So, technically, in order to do any kind of care safely, you have to get on your hands and knees to take care of that customer. All the beds are electronic at my work, so you can move it up or down to your level so you can safely reposition person. [DON with 15 years of long-term-care experience; evacuated to a school gymnasium for Hurricanes Charley and Francis]

For nurses attempting to provide care for a continued period of time to residents placed on mattresses, it was physically taxing to reposition those at risk for pressure sores or lift residents for toileting, highlighting a potentially serious public health issue. As 1 participant noted, “the strain and the load that is being put on the staff during hurricanes [increases] the chances are that they are going to hurt their back and, chances are, they will” (DON with 15 years’ long-term care experience; evacuated to a school for Hurricane Charley). Although these concerns exist at any evacuation site without appropriate beds, additional safety concerns apply to nonclinical buildings where staff cannot access the equipment needed for safely repositioning and moving residents.

In addition to difficulty with transferring residents from the floor to wheelchairs for toileting, another DON with 13 years’ long-term care experience who evacuated to an elementary school during Hurricane Charley indicated that there were challenges encountered when evacuating to “an elementary school and the toilets were this high [indicating that toilets were very low to the ground].” The implication of her comment is that transferring the weight of residents from wheelchairs to a toilets (and back again) is much more difficult. Staff must support, pivot, and sometimes lift residents who need assistance with toileting. Using lower-standing toilets that were specifically designed for small children often requires more physical strength and results in awkward movements for residents and staff alike.
Structural Safety Concerns: Plugs, Exits, and Unprotected Windows

In addition to the lack of medical beds and the presence of low toilets, other structural issues such as inadequate electrical sockets, unprotected glass windows, and unsecured exits also affected staff and resident safety in nonclinical settings. Insufficient electrical outlets compromised the staff’s ability to measure medication, pace feeding-tube formulas, or power monitoring systems to prevent people with dementia from leaving the building. One participant reported:

I think for us, we evacuated 150 residents to an elementary school. I think the biggest thing is they were at the school and there were not enough power plugs ... we housed most of our residents in the gym area and there may have been 4 plugs. We had something like 37 tube feeders and that is all run on electricity. [DON with 13 years of long-term care experience; evacuated to an elementary school during Hurricane Charley]

Without an adequate number of electrical sockets for essential equipment, residents may not receive essential medical treatments, even when power is available via a generator.

Other dangers arising from structural inadequacies are described by a participant who had evacuated, with residents, to a church where: “my biggest concern was [that] one whole wall was stained glass. Whoever chose that [church as our evacuation site] did not have really good judgment about that” (DON with 16 years of long-term care experience; evacuated to a church during Hurricane Charley). During a hurricane, a wall of stained glass might not stand up to winds or flying objects and is at risk of shattering in the area where staff members provide care. This DON went on to explain, “I think the issue was that people who were not involved in care made the decision and nobody else looked at it … you need to have that clinical ability to provide care at that site. Not just a room with one wall of glass windows.” This DON suggested that a clinical nurse officer evaluate the shelter site and ask, “will we be able to provide care here?”

Moreover, staff already challenged by resident care demands had to be vigilant to prevent resident elopement. One DON spoke about the difficulty of creating a secure and safe environment for individuals who might become confused when moved to an unfamiliar location:

I had a 7-bed secure unit, so I had these 7 people who were prone to wandering…. We were able to put [the people with dementia] separate from the rest of the residents in the gym … or cafeteria. And we were able to keep the doors locked, but there is a lot going on there because, well, the kitchen is located in the same space, so there is a lot of in and out. [DON with 13 years’ long-term care experience; evacuated to an elementary school during Hurricane Charley]

Staff must be aware of alternate exits through which residents can elope and consider interventions to prevent this from occurring.

Resident Dignity, Privacy, and Confidentiality

Dealing with resident rights to dignity, privacy, and confidentiality was particularly challenging because the structure of nonclinical buildings can also make it difficult to maintain resident rights. Information about special medical treatments, diets (e.g., diabetic), or “do not resuscitate” orders that would normally be placed in a chart or marked discreetly to protect confidentiality were written on resident mattresses to ensure that appropriate medical care was delivered. As one participant described, “There was no privacy … most of our residents in the gym, some were in the hallways (DON with 13 years’ long-term care experience; evacuated to a school for Hurricane Charley). To provide some level of dignity and privacy during toileting, screens were placed around portable toilets located in open areas.

Discussion

This exploratory study reveals that evacuation of frail residents to buildings not designed for providing nursing care not only compromises residents’ health and safety but also increases staff burden and the likelihood of injury as essential care is provided. Staff who relocated residents to buildings without standard equipment and sufficient electrical outlets encountered unique difficulties compared with those who evacuated residents to other nursing homes.
Difficulty treating residents on the facility floor is not necessarily unique to evacuation to nonclinical buildings. Residents evacuating to another nursing home might also be required to stay on mattresses on the floor. One difference is that the receiving facility is likely to have a lift, commodes, and other equipment not likely to be found in churches or schools.

Previous research has hinted that, although evacuating to a nonclinical building might be necessary for the short term, it is not ideal. For example, after Hurricane Katrina in 2005, researchers recommended a 2-tiered approach to nursing home evacuation in Louisiana: 1) to evacuate to a nonclinical building nearby (school gymnasium or church), which would allow for a rapid return to the home facility if it was undamaged, and 2) to identify a “like facility” for long-term sheltering and recovery. This suggestion was made to reduce the burden of transportation on residents and staff alike. However, one of the focus group participants in that study reported that “evacuating to the floor of a gymnasium of a high school is not a proper destination [for nursing home residents],” but no explanation was provided as to why this was a problematic option. This same participant reported that, although their facility had negotiated with other facilities for 2 years, they had been unable to secure a mutual aid agreement with a like facility in Louisiana, highlighting 1 reason why nursing homes might have to evacuate to a nonclinical building. Although we recognize that prolonged sheltering in a school gymnasium is less than ideal, the participants were not specific about why such facilities are unsafe.

After Hurricane Gustav in 2006, the same administrators compared their experiences to the 2005 season (Hurricanes Katrina and Rita). Although only 45% of the facilities had evacuated before Katrina, all 16 (100%) reported evacuating for Gustav, 46% (n = 7) to a church, gym, college, or other facility instead of another nursing home. This suggests that nonclinical buildings remain a highly used option. The administrators cited electrical issues at the receiving facility (2 of 16, or 13%). The authors did not specify whether the electrical difficulties were at “like facilities” or in nonclinical buildings, nor did they elaborate on challenges to clinical care in churches or schools. This may be in part because administrators do not frequently provide hands-on care to residents.

The structural inadequacies of nonclinical buildings need to be considered by nursing home administrators and emergency planning personnel. Without proper hospital beds, staff must provide care to residents placed on mattresses on the floors. It takes more staff to reposition and properly help residents safely eat and drink when they are in this position. It also requires that staff lift residents from an ergonomically incorrect position when they need to be toileted, posing occupational health risks to nurses.

Other structural concerns include unprotected windows and lack of electrical sockets. Unsecure windows (such as the stained glass windows in a church) are vulnerable to flying objects. If these windows are shattered, both evacuated residents and staff are potentially exposed to the elements during and after a storm, in addition to the risks posed by shattered glass. Injury from a blunt object and trauma were the causes of death in 25% of the recorded deaths in Louisiana after Hurricane Katrina.

Residents and staff were also burdened by the lack of a secure area in which they could keep residents with dementia from elopement. Finally, nonclinical buildings can compromise residents’ rights to privacy.

Recommendations

Disasters will continue to occur, and thus the possibility of evacuating to buildings not equipped for nursing care will remain. It is important for administrators and emergency planners to recognize the consequences of evacuating residents to these nonclinical buildings when developing disaster plans. Nursing home disaster plans should have contingencies that include coordinating with local emergency management agencies to ensure safe relocation and sheltering of frail elders. Local emergency management agencies should be familiar with sheltering options in their vicinity. Should a bus with nursing home residents be forced to stop before arriving at their designated destination, a local emergency official should be able to direct them to safe and suitable shelter.

Evacuating nursing home residents to a facility not designed for clinical care (e.g., a school gymnasium or a church) can pose medical concerns for residents and occupational health hazards for nursing staff. Although evacuating to such
facilities may not always be avoidable, clinical staff should evaluate alternative evacuation sites to, as one participant said, “see if I can actually provide resident care here” (58-year-old DON).

The following questions should be asked when considering nonclinical buildings as evacuation sites, to ensure that nursing staff and residents remain safe when evacuating to a nonclinical building: 1) Is there a generator available? 2) Are there enough electrical sockets available for the machines that pace formula and controlled medications? 3) Will nursing staff be able to safely provide care to residents on mattresses placed on the floors? 4) How will resident dignity and privacy be maintained, if at all? If a generator, electrical sockets, or appropriate bedding is not available, appropriate planning can reduce risks to staff and residents.

Planning for Lack of a Generator at Evacuation Sites

Portable generators, available for purchase, can run basic machinery. There are now companies that are beginning to specialize in meeting the generator needs of nursing homes and assisted living facilities.26,29 Although portable generators tend to be less powerful than standby generators, they can ensure some basic safety needs for residents. Before evacuation, staff should assess and triage residents who most need access to electricity (e.g., those who require gastrointestinal tube feedings).30 It is important for staff to be mindful that generators require gasoline, which can be difficult to obtain after a disaster.1 The American Red Cross provides instructions for generator safety, such as ensuring that generators are run out-of-doors to prevent carbon-monoxide poisoning. One solution to the problem of limited power plugs is to bring power strips (an extension cord with multiple sockets) to increase access to the generator. Staff must take extreme care not to overload the generator by plugging in too many devices.

Planning for Beds

Stacking 2 mattresses on top of each other might help bring a resident up to a better height for staff to make resident adjustments; however, this only marginally improves ergonomics for staff attempting to provide care. One DON who evacuated to a chapel reported bringing 2 adjustable hospital beds with them and hooking both of them up to the generator, “so, when they (the patients) needed to be changed, we could put them on the beds and use the electric to raise them up to change them” (10 years’ long-term-care experience; evacuated for Hurricanes Francis and Wilma). A portable lift should be used to transfer the residents from their mattresses on the floor to the available hospital beds. Investing in wedge pillows to transfer along with mattresses may help to substitute for the lack of adjustable hospital bed frames. This might reduce the number of staff required to help a resident sit up in bed during tube feedings.

Portable Lifts

Using a lift can reduce staff injuries, when transferring a resident from a bed to a chair, by 41%.27 Many types of portable lifts can be transported with residents during an evacuation. Keep in mind, however, that many lifts require electricity, which would make them difficult to use in an emergency.

Toileting

Lower toilets can cause toileting problems. When given a choice, nursing home administrators should choose a high school over an elementary school as an evacuation option. If this is not an option, higher-standing commodes should be included in the list of evacuation equipment to ease patient transfer during toileting.

After Action Reports

To improve disaster preparedness, state After Action Reports (AAR) should evaluate the appropriateness of evacuations and sheltering plans for all populations. AARs provide a formal, retrospective analysis on an event.31 The purpose of an evacuation AAR is to debrief on an event or exercise and reflect on what was successful and what might need to be changed and updated in the disaster plan.

Limitations

This research is limited by recall bias.20 Although disasters are traumatic events, and such memories might be more pronounced than
others, the focus group sessions took place 3 years after the named hurricanes.

The sample size was small; ultimately, it was a convenience sample. It is possible that people attending this conference may be different from other nursing staff who evacuated.

Generalizability

As with most qualitative studies, it is difficult to generalize our results to all nursing homes at risk of hurricane evacuation. The experiences of nurses interviewed in Florida may be different from those in other states at risk of hurricanes. Historically, Florida is more likely to be adversely affected by hurricanes than other hurricane-prone states. Moreover, state rules on evacuation vary widely. It is also possible that the nurses attending an annual statewide nurse leadership meeting are more likely to be in larger facilities and members of chains with more resources than smaller non-chain-affiliated facilities. However, these potential biases suggest the problems identified may be worse for residents and staff in smaller facilities or those with limited ability to buy generators. Despite the potential limitation our study detected many parallels between nursing home responses to hurricanes in Florida and Louisiana. There are also similarities in regulations, such as those that prohibit nursing homes from using special-needs shelters.

Although disaster nursing is tremendously challenging, regardless of whether a staff shelters in place or evacuates, our study suggests that asking these critical questions before evacuating to a nonclinical facility can help reduce hazards to both residents and staff.

References