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Selected Topics: Disaster Medicine

PUBLIC PERCEPTIONS OF HOSPITAL RESPONSIBILITIES TO THOSE PRESENTING WITHOUT MEDICAL INJURY OR ILLNESS DURING A DISASTER

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Abstract—Background: During natural and manmade disasters, the hospital is perceived as a central rallying and care site for the public, for both those with and without emergency medical needs. The expectations of the public may outstrip hospital plans and abilities to provide nonmedical assistance. **Objective:** Our objective was to determine the public expectations of the hospital during disasters regarding resource provision. **Methods:** A survey was distributed to adult patients or family members at three emergency departments (EDs). Respondents were asked to evaluate hospital responsibility to provide nine resources to those without emergency medical needs, including vaccination, medication refill or replacement, food and water, grief/stress counseling, Federal Emergency Management Agency (FEMA) access assistance, short/long-term shelter, family reunification, and hospital. Additionally, respondents answered questions regarding prior disaster experience and demographics. **Results:** There were 961 respondents (66.9% were female, 47.5% were white, and 44.6% were black). Respondents agreed or strongly agreed that the hospital should provide the following services: event-specific vaccination (84%), medication refill/replacement (76.5%), food and water (61%), grief or stress counseling (53%), FEMA access assistance (52%), short-term shelter (51%), family reunification (50%), long-term shelter (38%), and hospital transportation (29%). Those 36–45 years of age were less likely to expect services ($p < 0.05$) and nonwhites and those with a family member with a medical

condition requiring electricity were more likely to expect services ($p < 0.001$ and $p < 0.05$, respectively). There were no differences based on frequency of ED use, sex, income, or prior disaster experience. **Conclusion:** There is a high public expectation that hospitals will provide significant nonmedical disaster relief. Understanding these expectations is essential to appropriate community disaster planning. © 2013 Elsevier Inc.

Keywords—disaster preparedness; surge; expectations; resources; resiliency

INTRODUCTION

Recent natural disasters, terrorist attacks, and epidemics, including Hurricane Katrina, the World Trade Center attack, and the severe acute respiratory syndrome outbreak, have underscored the importance of disaster preparedness for many organizations. Hospitals and other health care centers lie at the center of a community's response to an emergency and are a natural focus for efforts to develop and update emergency protocols. Regulatory agencies at the local, state, and national levels have initiated standards to ensure hospitals are capable of handling a surge in patient load in the case of an emergency. For example, the Centers for Medicare and Medicaid

Services Participation Agreement and The Joint Commission on Accreditation of Healthcare Organizations require that hospitals have comprehensive emergency management plans, including provisions to have adequate staff to handle increased patient loads during a disaster (1). Although additional responsibilities have been assigned to hospitals, little supplemental funding has been allocated to see these requirements to completion (1,2). In conjunction with the decline in staff-to-patient ratios, decreased compensation, and increased costs, many hospitals do not have the staff or resources to plan an effective response to a major emergency (1,3,4).

Public perception of the hospital role in the context of a disaster extends far beyond the provision of direct medical care. Recent disasters have shown that the public views hospitals as not only sources of medical care, but also as centralized sources of community support and assistance (5,6). This perception of hospitals as rallying points during an emergency generates expectations that cannot be ignored. Research has indicated that community members are likely to gather at hospitals in search of food and water, family and friends, information regarding the emergency, shelter, or electricity (2,5–7). In addition to meeting immediate medical needs of the community, hospital fulfillment of these nonmedical expectations provides reassurance to the public that one of the fundamental institutions within society is still functional.

Although researchers have speculated that public expectations of hospitals during a disaster may differ dramatically from what hospitals can feasibly provide, the public's expectations of hospitals during disasters have never been measured quantitatively (5,6). The potential mismatch between perceived public utilization of the hospital and actual utilization could lead to the overcrowding of hospitals and the diversion of staff members from medical care to crowd management far beyond current expectations of most hospital emergency planners. The incongruities between the public's expectations and reality need to be examined, so that hospital and community emergency management plans can be revised to address these issues. The purposes of this study are to identify the public's perceptions of hospital responsibilities to those presenting without medical injury or illness during a disaster, and delineate factors associated with higher public expectations.

METHODS

A paper survey was offered to all adults either presenting for emergency care or accompanying a patient to the emergency department (ED) of 3 hospitals in St Louis, Missouri during March through December 2011. Two

of the hospitals were academic urban hospitals; one serving exclusively pediatrics patients (annual ED census 44,000) and the other was an adult facility (annual ED census 36,000). The third hospital was located in a suburban area and served all ages (annual ED census 55,000). All ED visitors/patients were approached during recruiting hours (recruiting hours/shifts consisted of day and night shift, and all days of the week). The only exclusions were age younger than 18 years, those presenting with an Emergency Severity Index of 1 (i.e., those with very high medical acuity), and those who were incapable of reading or speaking English. Only one person per group (patient and his/her accompanying family or friend(s)) could take the survey. Completed paper surveys were collected anonymously.

Survey Questionnaire

Research related to anticipated public expectations of hospitals during a disaster was used as the basis for this questionnaire (2,5–7). Questions related to individuals' experiences during past disasters (such as loss of home/property, injury, etc.), whether the individual had provisions in their personal/family disaster plan related to reunification of family during a disaster, and anticipated need for ongoing electricity for the medical support of self or a family member during a disaster (such as a home ventilator) were also included in the questionnaire. Lastly, demographic questions assessed participants' age, race, sex, relationship to the patient, utilization of the ED, visits to a primary care provider, and number of hospitalizations. A group of 10 U.S. disaster preparedness researchers provided feedback on content validity. The content validity index (CVI) was computed for each item (8). No items had a CVI <0.80, so none were deleted. Items were revised based on feedback from the CVI panel. The final survey contained 15 questions plus demographic items. The questionnaire was then pilot tested using a 10-person panel of representative subjects. The final survey was considered exempt by the Saint Louis University Institutional Review Board.

Data Analysis

The Statistical Package for the Social Sciences (SPSS®) software 19.0 (IBM SPSS, Armonk, NY) was used for all analyses. Data from the paper surveys were entered into the database. Five percent of surveys were secondarily checked for data entry accuracy by the first author. Surveys with extensive incomplete data ($\geq 70\%$) were excluded from analyses. An overall expectations score was calculated by assigning 1 point for each resource/service that individuals expected the hospital to provide during

a disaster (i.e., if they marked that they strongly agreed or agreed somewhat that an item/service should be provided by the hospital). The highest possible expectation score was 9 (i.e., 1 point for each of the 9 items). Descriptive statistics were computed for each question and used to describe individuals' expectations of hospital responsibility during a disaster to those coming to the hospital without a medical problem or to those accompanying someone with a medical issue. Linear regression was used to describe factors associated with higher expectation scores. Nonsignificant variables, such as income, hospital location, and sex, were not included in the final model; only the final model is reported. χ^2 tests were used to compare perceived expectation agreement rates (agree vs. not agree) when comparing response by race (white vs. non-white).

RESULTS

In all, 1,122 eligible individuals were approached to participate. One hundred and eight declined to complete the survey, providing a response rate of about 90%. An additional 53 surveys were excluded due to extensive incomplete data, leaving 961 surveys included for analysis. The majority of participants were female (66.9%, $n = 643$) and white (47.5%, $n = 456$) or black (44.6%, $n = 429$). Participants represented all age groups (Table 1). A full list of participant demographics is provided in Table 1.

Perceived Expectations of Hospitals During Disasters

Perceived expectations consisted of nine resources or services that might be needed by individuals after a disaster. Participants were asked to report how strongly they agreed or disagreed that each resource or service should be provided by a hospital to an individual who arrives at the hospital without a medical problem and without accompanying someone seeking/needing medical care. The most frequently expected resource or service as reported by participants consisted of an event-specific vaccine (such as a pandemic vaccine), medication refill or replacement, and food or water (Table 2). The least frequently expected resource or service as reported by participants consisted of nonemergency transportation to or from the hospital and shelter lasting 3 or more days (Table 2). Participants' perceived expectations were found to vary. Determinants of perceived hospital expectations included those younger or older than 36–45 years of age, race, and having a family member who has a medical condition that requires ongoing electricity (such as a home ventilator or home oxygen) (Table 3). However, not all perceived expectations varied by participants' race. Some perceived expectations were reported as being expected by all races: event-specific

Table 1. Demographics of Respondents

Item	All Respondents (N = 961)	
	%	n
Female sex	66.9	643
Age (years)		
18–25	22.0	211
26–35	27.4	263
36–45	19.6	188
46–55	14.7	141
56 and older	14.4	138
Race		
Caucasian	47.5	456
African American	44.6	429
Other	5.8	56
Relationship to patient		
Self	33.1	318
Parent or guardian	43.8	421
Spouse or significant other	7.6	73
Other	13.0	125
Hospital type		
Urban adult hospital	47.1	453
Urban pediatric hospital	29.3	282
Suburban adult hospital	23.5	226
ED visits in past 12 months for self or patient		
1 visit	37.4	359
2 visits	24.1	232
3 visits	15.8	152
4 or more visits	21.1	203

ED = emergency department.

vaccines, medication refills or replacement, and assistance with reunification of family members (Table 2).

Participants' Experiences during Past Disasters and Anticipated Needs during a Future Event

The majority of participants (63.4%, $n = 609$) reported that they will likely need a medication refill for themselves or a family member during a future disaster (Table 4). There were no differences between anticipated medication need and participants' age or sex. However, whites were more likely than non-whites to indicate that medication refills will be needed during a disaster ($\chi^2 = 10.3$; $p = 0.001$), as well as to report a medically related electricity dependency ($\chi^2 = 13.3$; $p < 0.001$) (Table 4). Less than a third of the participants (30.1%, $n = 289$) reported that they have a personal/family plan that includes having a designated meeting place for family in case of separation during a disaster. There were no differences between having a designated family reunification place and participants' age, sex, or race. Very few participants reported that they have experienced separation from family members (8.1%, $n = 78$), loss of home or property damage (7.8%, $n = 75$), or physical injury to themselves or a member of their family (6.5%, $n = 62$) during a past disaster. There were no differences

Table 2. Respondents' Perceived Expectations of Hospital Nonmedical Resources/Services Provided During a Disaster by Race

Resource*	All Respondents (N = 961)		Response by Race				White vs Non-White
	% That Strongly Agreed or Agreed	n	White (n = 456)		Non-White (n = 485)		
			% That Strongly Agreed or Agreed	n	% That Strongly Agreed or Agreed	n	p Value†
Event-specific vaccination (i.e., pandemic vaccine)	83.7	804	84.9	387	83.1	403	NS
Medication refill or replacement	76.5	735	77.9	355	75.3	365	NS
Food and water	60.9	585	55.0	251	66.6	323	<0.001
Grief or stress counseling	53.4	513	48.7	222	57.9	281	<0.01
Help receiving services from FEMA	51.5	495	42.8	195	59.6	281	<0.001
Short-term shelter (1–2 days)	51.4	494	44.7	204	57.3	275	<0.001
Reunification with family	49.6	477	46.9	214	52.0	252	NS
Long-term shelter (3 or more days)	38.3	368	27.0	123	48.2	239	<0.001
Nonemergency transportation to/from hospital	28.6	275	20.0	91	36.1	175	<0.001

FEMA = Federal Emergency Management Agency; NS = nonsignificant.

* Resource that is expected to be provided by the hospital by someone presenting to the hospital without a medical problem or without someone who has a medical condition.

† Determined by the χ^2 test.

between loss experienced during past disaster and participants' age, sex, or race. Men were significantly more likely than women to report that they had experienced separation from family (13.0% vs. 6.1%; $\chi^2 = 12.4$; $p = 0.001$) or injury to self or family member (10.9% vs. 4.9%; $\chi^2 = 11.4$; $p = 0.001$) during a past disaster. Non-whites were more likely than whites ($\chi^2 = 4.7$; $p < 0.05$) to report a history of personal or family injury during a past disaster (Table 4). There were no differences between separation from family or injury to self or family member during past disaster and participants' age or race.

DISCUSSION

This study had two key findings. First, that there are high expectations from the public for nonmedical resources from hospitals during disasters. Secondly, that few identifiable variables alter those expectations. These findings indicate that all hospitals must expect an influx of non-ill or injured patients expecting services during disasters for which hospital emergency planners may not have accounted. One caveat to this is that this study did not measure individuals' expected utility of these resources, only what individuals expect that hospitals should provide to community members. It is possible that individuals expect more than they might anticipate they would personally need. The relationship between individuals' expectations of hospitals vs. their anticipated needs during an event requires better delineation that should be the focus of future studies.

Findings from this study indicate that the general public expects hospitals to provide a variety of nonmedical resources and services during disasters, something that

is likely not currently addressed in current hospital emergency management plans. This points to the need for hospitals to work with community disaster planners to redirect the public toward more appropriate locations to receive nonmedical resources during disasters. Prior research describes the importance of pre-existing networks and community relationships to rapidly mobilize and distribute resources during disasters (9). Appropriate communication regarding access to resource and services is imperative if the community is to remain resilient during disasters (10).

It is important to note that it is not feasible for hospitals to provide many of the nonmedical resources that surveyed individuals expect to receive during a disaster.

Table 3. Determinants of Perceived Expectations of Hospital Nonmedical Resources/Services Provided during a Disaster

Factor	Perceived Expectations of Hospital*		
	β	SE	p Value
Age†			
18–25 years	.02	.30	NS
26–35 years	-.55	.29	NS
36–45 years	-.73	.30	<0.05
46–55 years	-.19	.32	NS
Race (non-Caucasian)	.86	.18	<0.001
Family member with medical condition requiring electricity	.49	.22	<0.05

SE = standard error; NS = nonsignificant.

* Expectations score range: 0–9.

† Age referent: 56 years or older.

Table 4. Respondents' Experiences during Past Disasters, Extent of Personal Plan, and Anticipated Needs during a Future Event

Resource or service individuals expect to go to the hospital to receive	All Respondents (N = 961)		Response by Race				White vs. Non-White <i>p</i> Value†
	% That Strongly Agreed or Agreed	n*	White (n = 456)		Non-White (n = 485)		
			% That Strongly Agreed or Agreed	n	% That Strongly Agreed or Agreed	n	
Anticipated need for medication refill for self or family member during a disaster	63.4	609	70.4	318	60.3	284	0.001
Personal/family plan includes designated meeting place if family gets separated during a disaster	30.1	289	29.7	135	31.6	150	NS
Need for continuous electricity for self or family member's medical condition (such as a home ventilator)	19.7	189	14.8	67	24.4	116	<0.001
History of separation from family during a past disaster	8.1	78	9.5	43	7.4	35	NS
History of loss of home or property damage during a past disaster	7.8	75	7.7	35	8.3	39	NS
History of physical injury to self or family member that occurred during a past disaster	6.5	62	4.9	22	8.4	42	<0.05

NS = nonsignificant.

* Denominators varied due to missing/incomplete data.

† Determined by χ^2 .

Hospitals cannot be expected to provide food, water, medication refills, or short or long-term shelter for those without medical problems during disasters when event-related medical surge will already be pushing health care facilities beyond their usual limits. Indeed many, if not all, of the nonmedical resources that individuals in this study reported to expect hospitals to provide during a disaster would best be sourced elsewhere in the community. For example, the Federal Emergency Management Agency recommends that event-specific vaccinations and medications be distributed using points of distribution rather than hospitals (11). Community-based shelter is generally planned by the American Red Cross, Salvation Army, and other community-based planning agencies. Lack of functional reunification plans is a recognized gap in community disaster planning (12). In the United States, the American Red Cross has traditionally performed family reunification during disasters. It is possible that hospitals may be able to assist with reunification, but the American Red Cross and community-based organizations, such as local worship centers, may also be used.

Determining the source and distribution plans for resource allocation during disasters is a major function of local and regional emergency managers. Regardless of which community agency or organization will be responsible for distributing resources during a disaster, it is vital that communities educate the general public about accessing resources during an event. Identifying and communicating these plans in advance will maximize

community response to a disaster. It will also help to divert healthy members of the community away from overwhelmed hospitals, allowing the medical community to focus on providing care to the ill and injured. Development of pre-event messages are recommended for shortening response time and decreasing the public's confusion about where to obtain resources during a disaster (13).

Pre-event education and communication are designed to align the public's expectations with the community's abilities to provide resources during a disaster. The public's perceptions and expectations are important to successful and resilient disaster planning, as noted in several studies regarding both the evacuations during Hurricane Katrina in 2005 and the acceptance of vaccination during the Anthrax events in 2001 (14–18). Several researchers have discussed the racial impact on resiliency during and after Hurricane Katrina in 2005 (15,16,19,20). Disproportionate numbers of blacks were negatively impacted by the Hurricane, leading to increasing mistrust of the government's ability to effectively respond to disasters (14,21).

Additional significance was noted in the decreased expectations of the hospital by those aged 36–45 years. The authors postulate that this is due to an age range where families are most secure in their finances and support structures, as they are neither starting out nor aging and feeling more vulnerable. It is also not surprising that those with family members dependent on electricity would have an increased expectation for the hospital to provide

resources during disasters, as they have an intrinsic tie to the hospital and increased medical vulnerability. Otherwise, there were no factors that were determined to alter perceptions on nonmedical hospital responsibilities during disasters, including sex, income, and frequency of ED utilization.

Limitations

This study was limited in its generalizability by geography and lack of a random sample—all three hospitals were within the same metropolitan area of a single city and a convenience sample was used. More details regarding the influences of various factors might be obtained by exploring other geographical regions and by using a random sample from the general population. Additionally, there were few representatives of races other than white or black, which reflects the racial distribution of this region. There may be additional cultural influences that this study was unable to identify. Additional work in this area would be a valuable addition to this study. Finally, this survey took place at a hospital, which could result in a selection bias toward higher expectations of hospitals.

CONCLUSIONS

Understanding the high expectations of the public during disasters for nonmedical disaster relief is key to appropriate community disaster planning. This study indicates that there is a high expectation by the public that the local hospital will be the provider of these resources, a finding that needs to be examined over a broader population. By understanding the plans of the public, community organizations can develop and educate the public about alternate sites of relief centers to allow the hospital to focus on treating patients while allowing the community to address these legitimate public needs.

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ARTICLE SUMMARY

1. Why is this topic important?

Continuity of patient care can only be sustained during disasters by being able to fully plan for public expectations. Large numbers of the public presenting for resources can quickly overwhelm an unprepared hospital.

2. What does this study attempt to show?

This study attempts to define the scope of what the public expects hospitals to provide during disasters for those who do not have an emergent medical injury or illness.

3. What are the key findings?

The public has high expectations of what hospitals are responsible for providing to the public during disasters. These expectations are likely beyond the capabilities of most hospitals to provide.

4. How is patient care impacted?

By understanding public expectations, hospital planners can better prepare their hospital to divert or meet these expectations during disasters, thus allowing the hospital to focus on providing emergency medical care.