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Hurricane preparedness and sheltering preferences of Muslims living in Florida

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ABSTRACT

Objectives: Given the increasing diversity of the US population and the continued threat of hurricane devastation along the heavily populated Gulf Coast region, the lack of research on preparedness and sheltering activities across religious or cultural groups represents a significant gap in the field of hazards and disaster research. To address this void, a questionnaire examining hurricane preparedness attitudes and sheltering preferences was administered to Muslims living in Tampa, Florida.

Design: An exploratory study using a cross-sectional survey of Muslim adults who were attending a religious or cultural event.

Setting: The Islamic Society of Tampa Bay Area and the Muslim American Society located in Tampa, Florida.

Participants: The final convenience sample of 139 adults had a mean age of 38.87 years (±11.8) with males and females equally represented.

Results: Significant differences were found in disaster planning activities and confidence in hurricane preparedness. Notably, 70.2 percent of the respondents were unsure about having a plan or were without a plan. Of the 29.7 percent who actually had a plan, 85.4 percent of those individuals were confident in their hurricane preparedness. This study also revealed that safety, cleanliness, access to a prayer room, and privacy were concerns related to using a public shelter during hurricanes. Nearly half of the respondents (47.4 percent) noted that the events of 9/11 influenced their comfort level about staying in a public shelter during a hurricane disaster.

Conclusions: Disaster planners should be aware of the religious practices of the Islamic community, encourage disaster planning among diverse groups, and address safety and privacy concerns associated with using public shelters.

Key words: disasters, hurricanes, preparedness, shelters, evacuation, Florida, Muslims

Florida, which has an extensive coastline and is situated between the Gulf of Mexico and the Atlantic Ocean, is the most hurricane-prone state in the United States. In fact, 40 percent of all US major hurricanes hit Florida, and 83 percent of category 4 or category 5 hurricane strikes have either made landfall in Florida or Texas.[1] Between 1851 and 2006, Florida was affected by 113 hurricanes.[1] Over the last two decades, several devastating storms have battered Florida, including Hurricane Andrew in 1992; Opal in 1995; Charley, Frances, Ivan, and Jeanne in 2004; and Dennis, Katrina, and Wilma in 2005. Taken together, these events claimed dozens of lives and caused tens of billions of dollars in damages.

Florida is obviously at high risk for natural disaster. Florida is also the fourth most populous and one of the most culturally and racially diverse states in the United States. When compared with the national average, Florida is home to higher percentages of African Americans (15.3 percent vs 12.4 percent), Latinos (20.1 percent vs 14.7 percent), foreign-born residents (18.7 percent vs 12.5 percent), and persons who speak a language other than English at home (25.6 percent vs 19.5 percent).[2] In terms of religious

composition, most Floridians self-identify as Protestant (48 percent), Catholic (26 percent), or Jewish (3 percent).[3] Although Muslims currently account for approximately 1 percent of the total population in Florida, their numbers are increasing rapidly. As a case in point, in 2006, there were approximately 70,000 Muslims in Palm Beach, Broward, and Miami-Dade counties, up from 45,000 in 2001.[4]

A similar pattern is apparent at the national level: Islam is the fastest growing religion in the United States. Some scholars predict that by the middle of the twenty-first century, Islam will become the nation's second largest religion—surpassed only by Christianity in terms of number of adherents.[5,6] According to Ewing,[7] the number of Muslims in the United States doubled between 1990 and 2001. A 2007 study conducted by the Pew Research Center concluded that there are approximately 2.35 million Muslims in America.[3] Other research has estimated that the size of the Muslim American community is likely closer to six or seven million,[8] and journalists commonly characterize the size of the population to range between three and nine million persons.[9]

Muslims represent an important, growing segment of America's diverse sociocultural landscape. Yet, an exhaustive review of the literature revealed no research that specifically explored how Muslims living in hazard-prone regions in the United States prepare for disaster. To address this knowledge gap, a survey was conducted among 139 Muslim adults living in Tampa, Florida. The purpose of this exploratory study was threefold: (1) to examine what Muslims do to prepare for hurricanes, (2) to document their sheltering preferences and practices, and (3) to shed light on their specific cultural and religious needs in public disaster shelters.

This exploratory research is relevant not only because of the growing presence of Muslims in America but also because hazardous locations with large Muslim populations could pose special challenges to emergency management personnel. Observant Muslims must adhere to a number of religious practices such as consuming *halal* food (ie, food that is prepared in compliance with Islamic dietary law), dressing modestly, respecting gender-segregated spaces in public locations, and completing five daily prayers while facing in the direction of the Islamic holy city of Mecca. These and other practices common to Muslims may create barriers to accessing resources, information, and vital services both predisaster and postdisaster, which could translate into elevated levels of risk of morbidity and mortality among the population. Moreover, a discrepancy between the expectations of staff responsible for managing public shelters and those being sheltered could potentially result in misunderstanding, distrust, and strife.

BACKGROUND AND SIGNIFICANCE

Prior research has shown that cultural traditions and religious beliefs may shape perception of hazards risk in significant ways.[10-13] Specifically, religious believers are more likely to attribute natural hazards to supernatural forces (ie, "acts of God"). This external—sometimes fatalistic—approach to understand hazards risk may impede preparedness.[14] Although scholars have largely neglected that religion may play a role in disaster response and recovery activities,[15] some research suggests that disaster survivors may experience heightened religiosity[16,17] as they turn to prayer and other spiritual coping strategies in the face of adversity.[18,19] Moreover, religious institutions and faith-based organizations often provide individuals and families with much needed material support in the postdisaster period.[12]

There is a paucity of research focused on religion and disaster, especially when considering the prominent roles that faith and religion play in the United States. According to the Pew Forum on Religion in American Public Life, the United States is a "highly religious" nation in terms of beliefs and practices, and more than 83 percent of all Americans identify with some established faith.[20] Although Protestantism and Catholicism remain the two largest faith groups in the United States, the American religious landscape has shifted dramatically over the past four decades.[21] Since the passage of the 1965 Immigration and Nationality Act, which lifted highly restrictive immigration quotas that were passed following World War I, people from all over the world have settled in the United States. These "new immigrants" have

arrived with a wide range of educational and professional skills and are more economically, religiously, culturally, and ethnically diverse than their predominantly European immigrant counterparts of a century ago.[21,22]

Today, the United States is widely considered as "the most religiously diverse nation on earth."[21] Yet, the experiences of religious minorities in disaster contexts have received limited scholarly attention. In comparison, we know far more about other potentially "vulnerable groups" in disasters,[23] including the poor,[24,25] racial and ethnic minorities,[26,27] women,[28,29] children,[30] the elderly,[31-34] persons with disabilities,[35] immigrants,[36] and limited English-proficient individuals.[37,38]

Social vulnerability among the aforementioned groups is related to major social structural factors such as uneven distribution of income and lack of access to political power, knowledge, and resources.[39] In other words, members of these groups are not "inherently vulnerable"; instead, the risks they face are shaped by the social, political, and economic environments in which they live. From this perspective, vulnerability is determined by social systems of power and inequality, not by natural forces.[40] Moreover, given that vulnerability factors tend to "cluster," particular groups (such as low-income racial minorities with chronic health conditions) tend to experience amplified vulnerability during times of disaster.[41]

The Muslim community in the United States is extraordinarily diverse. Moreover, since the events of 9/11, Muslims and Muslim Americans have experienced widespread mistreatment based on their religious and ethnic identities.[42] Therefore, understanding the factors that could elevate Muslims' risk and vulnerability (or, conversely, enhance their resilience) in disaster represents a complex undertaking. For one thing, immigrants who come from approximately 70 different countries make up nearly two-thirds of the entire Muslim population.[7] These individuals speak a wide array of languages and they adhere to many different cultural traditions, practices, and beliefs. Most Muslims, although not all, are also ethnic or racial minorities. Of the foreign-born Muslim population, more than one-third (37 percent) are Arab, an additional 27 percent are South Asian, 12 percent are Iranian, 8 percent are

European, and 6 percent are of African descent.[3] Among native-born Muslims, who represent approximately one-third of the total Muslim American population, most identify as Black or African American (56 percent), White (31 percent), or Hispanic (10 percent).[3]

Although we are aware of no previous studies on disaster preparedness activities or sheltering practices among Muslims in the United States, the findings from research on racial and ethnic minorities and immigrants is particularly instructive. In particular, earlier research has shown that members of socially marginalized groups, including African Americans, Latinos, and Asians, are less likely to engage in disaster preparedness actions such as stockpiling supplies, creating an emergency plan, making structural changes to one's home, or purchasing insurance.[27] The cost of engaging in these activities,[25] lower average literacy rates,[43] a lack of disaster-related educational opportunities,[44] and the limited dissemination of culturally sensitive preparedness materials in languages other than English[37] help to explain why racial and ethnic minorities may be less prepared for disaster than their Anglo counterparts.

Studies have also shown that non-English-speaking immigrants and racial and ethnic minorities report lower levels of trust and confidence in public health and emergency management systems.[43] Lack of trust among these populations is rooted in both historical and contemporary policies and practices that have served to exclude and marginalize.[45] A resultant sense of alienation among minorities may limit the effectiveness of traditional risk communication systems and contribute to lower rates of warning compliance.[43]

Racial and ethnic minorities and limited English-proficient immigrants regularly face discrimination and racism during nondisaster times. Thus, it is perhaps no surprise that members of these groups express fear that prejudicial beliefs about their communities could limit their access to disaster-response services.[36,46] Past disaster experience shows that many of these fears are well founded. For example, after the 1989 Loma Prieta Earthquake, the American Red Cross was accused of racism and insensitivity to the cultural needs of Hispanic survivors; the US Department of Justice investigated charges of discrimination against

Mexican Americans in city government; and a complaint was filed against the Federal Emergency Management Agency charging discrimination against low-income and non-English-speaking survivors.[47]

A lack of cultural awareness related to food preparation created issues in shelters that were opened after the Loma Prieta Earthquake and Hurricane Hugo.[27] Following Hurricane Andrew, initial relief information was provided only in English, preventing non-English-speaking Latinos and Haitians from receiving food, medical supplies, and assistance information.[48] In Hurricane Katrina, Vietnamese Americans, who were not viewed as possible "victims" because of their race, were turned away from the public shelter at the Houston Astrodome.[49]

Prior research has clearly established that even when first responders and emergency providers attempt to reach members of disadvantaged communities, the complexities of language and culture often pose serious barriers.[38] This study was designed to add to the growing body of literature on disaster preparedness and response among minority communities by exploring the hurricane preparedness and sheltering preferences among Muslims in Florida.

METHODS

Study site

Tampa, which is located on the west coast of Florida, is the third most populous city in the state. There are an estimated 35,000 Muslims in the Tampa Bay area.[4] Regular and repeated exposure to hurricanes and hurricane threats and frequent evacuations to public shelters made Muslim residents of Tampa an appropriate group to study.

Participants

From January 2007 to April 2007, a convenience sample of Muslim adults, 18 years of age and older (N = 141) were surveyed. Participants were recruited at events held by the Islamic Society of Tampa Bay Area (ISTABA) and the Muslim American Society (MAS). ISTABA provides religious, educational, and social services to the local Muslim community; MAS is a charitable, religious, social, cultural, educational, and not-for-profit organization located in Tampa.

Measures

Hurricane questionnaire. The final questionnaire included 48 items designed to assess hurricane preparedness and sheltering activities among Muslims. Items in the survey were derived from a review of the empirical research literature that examined hurricane preparedness activities, preparedness and sheltering attitudes in adult populations with a special focus on minority groups, and culturally sensitive issues concerning the Islamic faith. The structured questionnaire was reviewed by an outside expert in the study of Islam and Muslims, and then pilot tested with 10 Muslim adults who were representative of the anticipated sample. No specific difficulties or problems were detected from the pilot test; therefore, no major modifications were made to the questionnaire.

Hurricane preparedness activities and sheltering practices. Twenty-two questions assessed participants' attitudes toward and behaviors associated with hurricane preparedness. Of these, nine questions examined hurricane preparedness activities such as storing extra supplies; five questions examined attitudes toward hurricane preparedness; and eight questions examined past experiences with hurricanes and shelters.

Demographic information. Thirteen questions requested demographic information including gender, age, marital status (single/never married, married, separated, divorced, and widowed), highest grade of school completed (0-6 years, 7-11 years, high school degree, some college, college degree, and business or trade school), primary source of transportation (car [I drive], ride from family or friends, public transportation [bus, taxi], and other [please specify]), years lived in Florida, economic status (less than adequate, adequate, and more than adequate), and who lives with the participant (no one, spouse, children, parents, brothers/sisters, other relatives, friends, and other). Three questions examined participants' ethnic background (Puerto Rican, Desi/South Asian, White/Caucasian, Haitian, Spanish Latino, East Asian, Persian, Black/African Descent, Mexican/Mexican American, Asian, Turk, African American, Cuban,

Malay, Afghan, Native American, Pacific Islander, Arab/Arab American, don't know, and other), participants' country of origin (open-ended question), parents' country of origin (open-ended question), and years lived in the United States.

Physical and mental health. Self-ratings of overall physical and mental health were obtained (two questions). Individuals were asked to evaluate their overall health at the present time and to rate their mood or emotions. These two questions used a four-point Likert-type scale ranging from 1 (excellent) to 4 (poor).

Culturally sensitive issues concerning the Islamic faith. Six questions examined culturally sensitive needs and preferences in shelters. Participants were asked if they would prefer to evacuate to a shelter specifically for Muslims. Respondents were asked to check which of the following they would need at a public shelter: separate spaces for men and women, *halal* food, a prayer room, culturally sensitive aid workers, an Islamic religious leader (Imam), and/or other Muslims present. Two questions asked participants to list five items, in rank order, that they would like to have in a public shelter and the five reasons why they would not go to a public shelter. One close-ended and one open-ended question examined whether the events of 9/11, and the ensuing backlash against Muslims, influenced the participants' comfort level about using a public shelter during a hurricane.

Past research has shown that visibility is critical in determining whether or not Muslims are discriminated against.[17,42] Accordingly, participants were asked to indicate whether they were visibly identifiable as Muslim due to their dress or other physical markers, including for women wearing the hijab, jilbab, or abaya; and for men, wearing a robe, kufi, or beard. Participants were also given the option of endorsing "I don't wear anything that would make me stand out as being a Muslim" or "other."

Religious preference. Five questions assessed religious preference. The first assessed religious affiliation (choices included Muslim, Muslim/Sunni, Muslim/Shia, not religious, and not a Muslim). Second, using a four-point Likert-type scale ranging from 1 (very important) to 4 (not important), participants were asked how much they agree with the following statement: "Practicing my religion on a daily basis is important in my life." Third, participants were asked how often they usually attend religious services, meetings, or activities; options ranged from 1 (never) to 6 (nearly every day). Fourth, using a four-point Likert-type scale ranging from 1 (very important) to 4 (not important), participants were asked how important their spirituality or religious faith is to them. The fifth question asked participants how often they pray using a scale from 1 (I pray all the daily prayers and usually pray on time) to 4 (I usually don't pray and if I do it is during special occasions and gatherings).

Procedure

Our research team obtained approval from the Institutional Review Board (IRB) at the University of South Florida before study activities were initiated. To make the necessary arrangements for data collection, we began by contacting mosques and Muslim community organizations in the Tampa Bay area. We visited the sites to meet the key stakeholders to further explain the purpose of the study and to obtain written permission to administer the questionnaire to organizational members. We gained permission from ISTABA and MAS leaders to attend upcoming events and to invite event attendees to participate in the study.

We collected data for this study on four separate occasions: 58 questionnaires at a MAS conference for the Muslim community held on January 7, 2007; 26 questionnaires at a weekly Friday Prayer held on February 23, 2007, at the ISTABA mosque; 25 questionnaires at a MAS Olympics competition for Muslim teenagers and young adults held on March 10, 2007; and 32 questionnaires at a social event for the Muslim community held on April 18, 2007, at the ISTABA mosque. Nonprobability convenience samples are appropriate for exploratory studies when the sample is highly relevant to the topic under study, the sample size is adequate for analytical purposes, and the subjects are characteristic of the population being studied (ie, Muslims living in an area under recurring hurricane threat).[50,51]

At each data collection event, potential participants were given two documents: (1) a participant letter that briefly described the nature of the exploratory study and provided informed consent, and (2) the structured questionnaire. As no identifying information was obtained, the IRB did not require signed consent. A table was set up at each event and researchers were equipped with survey packets and pens. A small piece of peppermint candy was offered to each participant who completed the questionnaire.

Statistical analysis

Descriptive statistics were used in the form of frequencies and means. Relationships between variables of interest were investigated using χ^2 tests and analysis of variance where appropriate. Stata 9.2 was used for all analyses.

RESULTS

Sample characteristics

The study sample was reduced from 141 to 139 as two respondents were ineligible for participation in the study because they were younger than 18. The final sample had a mean age of 38.87 years (±11.8) and 55.6 percent were male. Most participants were of Arab/Arab American ethnic background (46.9 percent), married (63.6 percent), and had obtained more than a high school education (89.3 percent). The majority (87.2 percent) rated their economic status as adequate or more than adequate. The duration of time lived in Florida ranged from 2 months to 45 years with a mean residence of 11.3 years (±8.56; Table 1).

All the respondents in the final sample were Muslims. When asked about whether they identified with a specific subgroup of Islam, 42.4 percent of the participants identified as Sunni and 1.5 percent identified as Shia. More than half (56.1 percent) of the respondents identified as being Muslim alone (not Sunni or Shia). Practicing religion on a daily basis was important to the majority of participants (88.5 percent).

Physical and mental health

When asked to rate their overall physical health at the present time, 36.8 percent rated their physical health as excellent, 47.4 percent rated it as good, 15.0 percent rated health as fair, and less than 1 percent rated it as poor. When asked to rate their overall mood or emotions at the present time, 39.1 percent rated their mood or emotions as excellent, 51.1 percent rated them as good, and 9.7 percent rated them as fair; no one reported poor emotional health.

Hurricane preparedness activities

The majority of participants (83.7 percent) indicated that the 2004 and 2005 hurricane seasons made them more aware of the dangers of hurricanes. If a major hurricane were forecasted, 40.6 percent would make a joint decision to evacuate from their home, 52.9 percent would be alone in making the decision, and 6.5 percent were unsure. If a hurricane was forecasted, 8.3 percent planned to remain in their home regardless of category (ie, strength) of the hurricane. According to the survey, a category 1 hurricane would cause less than 1 percent to evacuate; a category 2, 9.5 percent to evacuate; a category 3, 29.9 percent to evacuate; a category 4, 58.4 percent to evacuate; and last, a category 5, 73.7 percent of the total sample to evacuate. Nearly three-quarters of the sample have a hurricane level at which they would evacuate their home, whereas 18.3 percent are unsure what category of hurricane would cause them to evacuate.

The vast majority (90.6 percent) said that they would evacuate when authorities "required it"; however, only 41.0 percent would evacuate when authorities "suggested it." Differences between those who would evacuate if the authorities suggested an evacuation and those who would not were investigated. No significant differences between these two groups were found.

Participants were asked about how confident they feel in preparing for a hurricane: 44.8 percent responded they were confident, 23.5 percent responded they were not confident, and 31.6 percent were unsure if they were confident. Respondents were also asked if in the event of a hurricane they had a disaster plan to follow. Nearly one-third of the sample (29.7 percent) indicated that they had a disaster plan, 54.3 percent did not have a disaster plan, and 15.9 percent were unsure if they had a disaster plan. When asked whether they have stored extra supplies (such as extra medication, water, food, or tarps) in the

Table 1. Descriptive statistics of demographic variables

N = 139	Frequency (percentage)
Gender	
Male	75 (55.56)
Female	60 (44.44)
Missing	4
Age, mean ± SD (range)	38.87 ± 11.81 (18-65)
Missing	22
Education	
0-6 y	2 (1.53)
7-11 y	2 (1.53)
High school degree	10 (7.63)
Some college	38 (29.01)
College degree	73 (55.73)
Business/trade school	6 (4.58)
Missing	8
Ethnicity	
Arab/Arab American	60 (46.88)
White/Caucasian	17 (13.28)
Other	51 (39.84)
Missing	11
Ethnicity other*	
Asian	10 (7.19)
Other not specified	11 (7.91)
Desi/South Asian	7 (5.04)
African American	6 (4.32)
Black/African descent	7 (5.04)
East Asian	4 (2.88)
Puerto Rican	2 (1.44)

Table 1. Descriptive statistics of demographic variables (continued)

N = 139	Frequency (percentage)
Turk	1 (0.72)
Malay	1 (0.72)
Spanish Latino	1 (0.72)
Cuban	1 (0.72)
Marital status	
Married	84 (63.64)
Single/never married	34 (25.76)
Divorced	13 (9.85)
Widowed	1 (0.76)
Separated	0
Missing	7
Years lived in Florida (n = 119), mean ± SD (range)	11.29 ± 8.56 (2 mo to 45 y)
Economic status	
Less than adequate	17 (12.78)
Adequate	89 (66.92)
More than adequate	27 (20.30)
Missing	6
Transportation	
Car (I drive)	122 (93.13)
Ride (family/friends)	7 (5.35)
Public transportation	1 (0.76)
Other	1 (0.76)
Missing	8

*Note: Ethnicity other presents the responses to an option where respondents could endorse "other" and write in their ethnicity.

event of a hurricane, 47.5 percent claimed that they had stored extra supplies, 41.0 percent had not stored extra supplies, and 10.8 percent were unsure if they had stored extra supplies.

Differences between those who have a disaster plan, those who do not, and those who are unsure of whether they have a plan were investigated (Table 2). The only significant result was the level of confidence respondents reported in relation to perceived preparedness for a hurricane. More than three-quarters (85.4 percent) of those who had a disaster plan felt confident in their preparedness.

Past experiences with hurricanes and shelters

The majority of respondents (83.4 percent) reported experiencing one or more hurricanes, and around one-third (30.2 percent) indicated encounters with five or more hurricanes. Of those who had experienced a hurricane, 18.1 percent sustained home damage and 9.5 percent reported damage to possessions. About one-third (30.2 percent) said that they left their home and evacuated to another area because of a hurricane. Of those who evacuated, a large majority did not evacuate to a public shelter (96.9 percent) and most endorsed having evacuated only once previously in response to a hurricane (62.5 percent). When asked where they evacuated to, 34.4 percent went to a family member's house, 37.5 percent to a friend's house, 28.1 percent to a hotel, and 12.5 percent went elsewhere.

Culturally sensitive issues concerning the Islamic faith

Table 3 presents the frequencies of participants' responses to two fill-in-the-blank questions. The first question asked the respondents to list five items, in ranked order, that they would like to have in a public shelter. The second question asked respondents to list five reasons, also in ranked order, why they would not go to a shelter. The most frequently stated need in a shelter was water (47.6 percent) followed by a prayer room (32.4 percent) and *halal* food (28.6 percent). The most frequent reasons for not going to a public shelter were safety (65.1 percent), cleanliness (36.0 percent), and privacy (31.4 percent).

Anecdotally, Table 4 provides the opportunity to listen to some voices from the Muslim community

about whether the events of 9/11 have influenced their comfort level about staying in a public shelter in a hurricane disaster (47.2 percent responded "yes"; 36.0 percent responded "no"; and 16.8 percent responded "unsure"). Some respondents anticipated that they would feel uncomfortable in a shelter and others feared that they would be discriminated against or even physically attacked. For example, one Muslim wrote, "People are apprehensive about Muslims." Another responded, "People have a higher sense of fear of Muslims. This causes people to behave in an unfair or hateful manner toward Muslims—mainly because of ignorance." Yet, others were not concerned about discomfort in shelters; one respondent, who fit this category, noted, "During natural disasters, I don't think people will care about religion or race."

DISCUSSION AND CONCLUSIONS

In this exploratory study, we surveyed 139 Muslims living in Florida regarding their hurricane preparedness activities, sheltering preferences, and specific cultural and religious needs and concerns about using public shelters. Our results indicate that only 29.7 percent of surveyed Muslims have a disaster plan to follow, but 85.4 percent of those individuals were confident in their hurricane preparedness. These findings illustrate a clear connection between disaster planning and associated levels of confidence. Notably, 70.2 percent of the respondents were unsure about having a plan or were without a plan. Of those respondents who had engaged in predisaster preparedness activities, 50.4 percent stored extra supplies and 31.1 percent had both extra supplies and a disaster plan in place.

Of note is the exceptionally large number of respondents (96.9 percent) who had not previously evacuated to a public shelter during a hurricane. Many of these respondents (65.1 percent) indicated that safety was the primary reason for not using public shelters. This finding, coupled with the number of Muslims (57.9 percent) who currently feel the events of 9/11 might (ie, yes or unsure) influence their comfort level about staying in a public shelter, represent reasons for concern.

The present study highlights the importance of understanding religious needs in the context of hurricane sheltering activities. The majority of our sample

Table 2. Descriptive analyses for respondents with, without, and with unknown hurricane disaster plans

	A plan in place (n = 41)	No plan in place (n = 75)	Unknown whether they had a plan (n = 22)	χ^2	Total (N = 138)*
Age, mean (SD)	38.44 (11.93)	34.10 (11.34)	37.54 (13.03)	F1.63	35.88 (11.81)
Missing	9	8	4		21
Gender, n (percent)					
Male	23 (60.53)	39 (52.00)	12 (57.14)		74 (55.22)
Female	15 (39.47)	36 (48.00)	9 (42.86)	0.78	60 (44.78)
Missing	3	0	1		4
Ethnicity, n (percent)					
Arab/Arab American	16 (44.44)	37 (52.11)	7 (33.33)		60 (46.88)
White	9 (25.00)	7 (9.86)	1 (4.76)	10.18	17 (13.28)
Other	11 (30.56)	27 (38.03)	13 (61.90)		51 (39.84)
Missing	5	4	1		10
Years in Florida, n (percent)					
5 or less	14 (40.00)	14 (21.88)	7 (35.00)		35 (29.41)
6-10	4 (11.43)	21 (32.81)	6 (30.00)	7.44	31 (26.05)
Greater than 10	17 (48.57)	29 (45.31)	7 (35.00)		53 (44.54)
Missing	6	11	2		19
Marital status, n (percent)					
Single/never married	5 (13.16)	24 (33.33)	5 (22.73)		34 (25.76)
Married	26 (68.65)	44 (61.11)	14 (63.64)		84 (63.64)
Divorced	6 (15.79)	4 (5.56)	3 (13.64)	9.74	13 (9.85)
Widowed	1 (2.63)	0	0		1 (0.76)
Separated	0	0	0		0
Missing	3	3	0		6
Confident in hurricane preparedness, n (percent)					
Yes	35 (85.37)	20 (27.40)	6 (27.27)		61 (44.85)
No	2 (4.88)	26 (35.62)	4 (18.18)	42.86	32 (23.53)
Unsure	4 (9.76)	27 (36.99)	12 (54.55)		43 (31.62)
Missing	0	2	0		2
Influence of 9/11 events, n (percent)					
None	8 (23.53)	29 (40.85)	8 (40.00)		45 (36.00)
Yes	20 (58.82)	31 (43.66)	8 (40.00)	3.61	59 (47.20)
Unsure	6 (17.65)	11 (15.49)	4 (20.00)		21 (16.80)
Missing	7	4	2		13

(continued)

Table 2. Descriptive analyses for respondents with, without, and with unknown hurricane disaster plans (continued)					
	A plan in place (n = 41)	No plan in place (n = 75)	Unknown whether they had a plan (n = 22)	χ^2	Total (N = 138)*
Practicing religion on a daily basis, n (percent)					
Very important	32 (86.49)	64 (88.89)	20 (90.91)	0.80	116 (88.55)
Important	4 (10.81)	6 (8.33)	2 (9.09)		12 (9.16)
Somewhat important	1 (2.70)	2 (2.78)	0		3 (2.29)
Not important	0	0	0		0
Unknown	0	0	0		0
Missing	4	3	0		7
Religion, n (percent)					
Muslim	24 (63.16)	40 (55.56)	10 (45.45)	3.29	74 (56.06)
Muslim: Sunni	14 (36.84)	31 (43.06)	11 (50.00)		56 (42.42)
Muslim: Shia	0	1 (1.39)	1 (4.55)		2 (1.52)
Missing	3	3	0		6
Importance of faith, n (percent)					
Very important	33 (86.84)	64 (88.89)	19 (86.36)	0.92	116 (87.88)
Important	4 (10.53)	7 (9.72)	3 (13.64)		14 (10.61)
Somewhat important	1 (2.63)	1 (1.39)	0		2 (1.52)
Not important	0	0	0		0
Unknown	0	0	0		0
Missing	3	3	0		6
Frequency of prayer, n (percent)					
Pray all daily prayers	29 (76.32)	58 (81.69)	17 (77.227)	2.04	104 (79.39)
Try to pray at least three times a day	6 (15.79)	11 (15.49)	3 (13.64)		20 (15.27)
Try to pray at least once a week	3 (7.89)	2 (2.82)	2 (9.09)		7 (5.34)
Missing	3	4	0		7

*Note: One respondent had missing data regarding hurricane plans and was not included in the above analyses; therefore, the final sample for this table is 138.

(88.5 percent) indicated that practicing religion on a daily basis is very important. Most of our participants (79.4 percent) prayed five daily prayers and one-third (32.4 percent) wanted a prayer room available in a public shelter; Muslims are required to pray five times a day. Each of these prayers typically lasts between 5 and 15 minutes. Prayers must be completed while facing in the direction of the Islamic holy city of Mecca. Prayers must also be done in a clean and quiet area. These findings suggest that for Muslims a prayer room is desired, cleanliness is essential, and privacy is an issue when considering use of a public shelter. In addition, more than one-fourth of participants (28.6 percent) said that *halal* food, where food preparation adheres to Islamic dietary guidelines, was important in a public shelter. For many practicing Muslims, these provisions are integral to the Islamic faith.

Apprehension about using public shelters—either because of fear of hostility or due to a perceived lack of cultural and religious sensitivity—should not deter people from using services and staying safe during potentially catastrophic events. Dialog between religious organizations, emergency managers, and community-based response agencies could provide a venue for enhancing outreach, education, and coordination of disaster aid provision.

Each state has an Office of Emergency Services that coordinates emergency support functions (ESFs) and is responsible to the governor for overseeing its disaster response efforts. The purpose of ESF 15, one of the 17 ESFs in Florida, is to coordinate information and activities of voluntary agencies and donated goods received during times of disaster. A recent review of Florida ESF 15 and the Florida Interfaith Networking in Disaster organization, a collaborative of interfaith and community organizations, reveals that the Muslim community is not well integrated into the existing state disaster response plan. It is unknown if local mosques have hurricane emergency plans and resources in place to meet the needs of their members. What is known is that effective interagency and interfaith coordination has the potential to prepare and educate people about disasters, enhance communication and timely dissemination of information, assist in training of volunteers, and

Table 3. Frequencies of needs and reasons concerning public shelter use	
	Frequency (percentage)
Needs in public shelter (n = 105)*	
Water	50 (47.62)
Prayer room	34 (32.38)
Halal food	30 (28.57)
Bathroom facilities	29 (27.62)
Sleep facilities	23 (21.90)
Safety	21 (20.00)
Separation of men and women	18 (17.14)
Communication	12 (11.43)
Family, friends, and other Muslims present	10 (9.52)
Culturally sensitive aid workers	6 (5.71)
Reasons not to go to a shelter (n = 86)*	
Safety	56 (65.11)
Cleanliness	31 (36.04)
Privacy	27 (31.39)
Lack of Muslim religion requirements	19 (22.09)
Location/facilities	16 (18.60)
Unorganized	8 (9.30)
Rather stay at home	5 (5.81)
Noisy	5 (5.81)

*Note: In this section of the survey, respondents were asked to first write in their needs and second to write in reasons for not going to a shelter. Respondents could write in up to five responses for each question. A total of 105 respondents wrote in at least one need, and 86 wrote in at least one reason not to go to shelter.

coordinate disaster responsibilities and resources.[52] A well-developed disaster plan for the Muslim community is equally important as a personal disaster plan. Future research should examine if mosques and

Table 4. Respondents' comments regarding comfort level about staying in a public shelter in a hurricane after the events of 9/11 (n = 28)

• Being Muslim I was nearly attacked while helping people in NY on September 11, so it is a little uncomfortable to try it again if faced with the same situation.	• People have a higher sense of fear of Muslims this causes people to behave in an unfair or hateful manner towards Muslims - mainly because of ignorance.
• Do not want to make others feel uncomfortable. I cannot be comfortable because I feel that everyone would be watching me.	• People look at Muslims in suspicion.
• American skeptic[al] of Muslim.	• People may look at us differently and not feel safe.
• Harassment and discrimination are more tolerated and practiced. I would have to be more vigilant and wary. In tense situation people behave worse than they normally would. I would feel trapped if the situation turned badly.	• My relationship as far as I'm concerned hasn't changed as a result of 9/11, I still can deal positively with the rest of society, my attitude is: I did not cause the events of 9/11.
• Hateness from other to Muslim, may cause fight or unsafe place	• Some people are not very friendly.
• I don't look like a "typical" Muslim but my wife does, so I am afraid for her if I was in a vulnerable situation.	• The level of anti-Muslim hate is scary. Without adequate protection people may attack Muslims.
• I feel people will discriminate against me.	• We need to be better prepared for things. A lot could happen.
• I still have trust in people.	• 9/11 is irrelevant to hurricanes.
• During natural disasters, I don't think people will care about religion or race.	• I worry about sharing the place with people who look at me and my family as foreigners or terrorists. I am willing to educate them but I am not very sure everyone is willing to be educated.
• If I have to evacuate to a shelter, I have no choice, but people would look at me strange.	• I didn't live here when it occurred.
• It makes me a bit more wary of discrimination/being harmed.	• Totally different events not in any way related.
• Minorities will not receive same level of care, supplies, etc.	• I don't feel any different as an American than before 9/11, even though I wear full hijab.
• Racism and prejudice.	• I still have trust in people.
• People are apprehensive about Muslims.	• I feel that situation after 9/11 has become different. People seem prejudiced and sometimes backlash against Muslims.

Muslim cultural organizations have emergency plans and if they are actionable during a disaster. Key Muslim leaders and community stakeholders should meet with state and local officials to share information, increase access to critical resources such as transportation and safe shelters, and enhance involvement with the larger disaster response network.

In addition, public shelters should provide private spaces for religious observance and food consistent with *halal* requirements for communities with Muslim populations. Disaster planners should be aware of the religious practices of the Islamic community and the potential impact on a general community population. Given the demands and constraints inherent in sheltering the public during a storm, accommodations that can be made to meet the needs of all people may benefit those being sheltered as well as the staff providing services.

Limitations of the present study should be noted. First, the generalizability of our results is limited by the size of our sample, which was recruited from religious sites located in Tampa, Florida. Most people in our sample were active in their faith communities, and hence may have more significant religious and cultural needs than unaffiliated or secular Muslims. Nonetheless, because the focus of our study was on religious affiliation and its impact on preparedness and sheltering activities, our decision to survey "active" Muslims living in areas under recurring hurricane threat was warranted.

A second significant limitation of this study is that a convenience sample was used, eliminating our capacity to generalize to other Muslim populations. However, because this study was exploratory and designed to conduct analyses on a significantly understudied minority population, we believe that the findings are meaningful and hope that this study will encourage future research on Muslims and other minority religious groups in disaster.

Third, many of the questions in the survey used a "true," "false," and "unsure" response format. One question, "I feel very confident in preparing for a hurricane," would have potentially yielded more information if a four-point Likert-type scale had been used with a response format with options ranging from 1 (not confident) to 4 (very confident). In exploring past hurricane experiences, cognitive dissonance or social response bias may have influenced recollection of the events. Even in light of these limitations, to our knowledge, this is the first study that has explored hurricane preparedness activities and potential concerns of an adult Muslim population toward using public shelters during disasters.

In the wake of a disaster, it is important that all populations have access to information, resources, and safe shelters. Learning about the Muslim community and engaging community and religious leaders as well as its members prior to a catastrophic event can help disaster response workers to interact with Muslims in a culturally and religiously sensitive manner in the event of a disaster. Consequently, Muslims might feel greater comfort when considering use of public shelters in future disasters. Further, key stakeholders from the Muslim community should be invited and encouraged to participate in ESF 15 and the Florida Interfaith Networking in Disaster organization. Muslim leaders should take an active role in helping integrate their community into the larger county and state response network and to prepare the Muslim community for a disaster. Future research is needed to examine the predisaster and postdisaster ethnic, cultural, and religious differences with Muslims.

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