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Original Paper

Perception of Safety among the Japanese Individuals in the Washington, D.C. Area

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Abstract *Recent terrorist events and psychological consequences to the public have become an important health concern around the globe. Among those affected by terror, their sense of safety, or perceived safety, is a crucial issue related to mental health. Past studies have reported relationships between lower perceived safety and various mental health disorders among affected people. Our study examined perceived safety among 87 Japanese residents living in the greater Washington, D.C. area, a region with ongoing fear of terrorism after the 9/11 attacks. Perceived safety was low overall, and correlated negatively with extent of belief that terrorism will occur in their region in the future. Perceived safety was not associated with any demographic variable analyzed. Also included in the paper is a summary of a preceding study of perceived safety among disaster workers two weeks after September 11, 2001 attacks (Fullerton et al., 2006). These studies illustrate how perception of safety affects the public following terrorist events and threats of terror attacks. Future research is essential to improve understanding of relationships between perceived safety and mental/behavioral health consequences among various populations.*

Key words: perceived safety, acute stress disorder (ASD), posttraumatic stress disorder (PTSD), depression, terrorism, Washington, D.C. (District of Columbia), racial/ethnic minorities, Japanese, disaster workers

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INTRODUCTION In recent years, changes in global politics have brought terrorism to the forefront as a major global challenge to national security. Terrorists typically conduct the acts to advance political, religious, and ideological agendas. Recent terrorist events such as the September 11, 2001 (9/11) attacks on World Trade Center buildings and the Pentagon have shown how terrorism affects not only the direct victims of the violence, but also people around the globe. The ultimate goal of perpetrators is to psychologically assault the individuals and groups and to challenge the safety, security, and cohesion of communities or states (Hamaoka et al., 2004). Accordingly, recent terror events have increased mental health and behavioral concerns not only for individuals, but also communities, organizations, and states.

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Individual consequences following terrorist events include Acute Stress Disorder (ASD), Post-Traumatic Stress Disorder (PTSD), depression, increased substance use, and changes in daily activities. In a study examining the responses of 1,008 Manhattan residents five to eights weeks after 9/11, the prevalence of PTSD and depression were 7.5% (95% confidence interval [CI] 5.7-9.3%) and 9.7% (95% CI 7.3-11.3%), respectively; more than three percent (3.7%) of the respondents met criteria for both disorders (Galea et al., 2002). About one in four subjects (28.8%) reported increased use of substances (tobacco, alcohol, or marijuana), and these people were more likely to be depressed than those who did not report increased use. Individuals who experienced increased smoking of cigarettes and marijuana were more likely to develop PTSD than nonsmokers (cigarettes, 24.2% vs. 5.6%; marijuana, 36.0% vs. 6.6%; Vlahov et al., 2002). Six months after 9/11, however, the prevalence of PTSD declined to less than one percent (Galea et al., 2003), suggesting rapid recovery, i.e., resilience, among the majority of the public. Nonetheless, increased use of cigarettes, alcohol, and marijuana persisted at six months (9.9%, 17.5%, and 2.7%; Vlahov et al., 2004).

Among individuals affected by traumatic events, alteration in sense of safety, or perceived safety, is an important mental health component. Studies have reported changes of perceived safety among victims of sexual assault (Ehlers & Clark, 2000), natural disaster (Kumar et al., 2007), and terrorism (Fullerton et al., 2006; Grieger et al., 2003a; Grieger et al., 2003b). In a study of 77 survivors seven months after the 9/11 Pentagon attack (Grieger et al., 2003a), 14% of respondents had PTSD; lower perceived safety at seven months was associated with greater occurrence of peritraumatic dissociation, PTSD, increased alcohol use, and also with female gender. Another study (Grieger et al., 2003b) examined consequences to 382 hospital workers following a series of sniper shootings which took place in the greater Washington, District of Columbia (D.C.) area in October, 2002; ten people were randomly shot and killed with a rifle and the suspects created terror throughout the region. In this study, six percent met criteria for ASD, three percent for increased alcohol use, and eight percent for depression; lower perceived safety was a predictor for these three changes.

People at increased risk for development of PTSD include women, children, disaster workers, those with a history of traumatic exposure or mental health disorders, those with relatively lower social support, and individuals of racial or ethnic minority (Fullerton et al., 2004; Norris et al., 2002; Stuber et al., 2006). Few studies have focused in changes of perceived safety among these high-risk populations. Our study examined perceived safety among Japanese individuals living in the Washington, D.C. area, a region with ongoing fear of terrorism since the 9/11 attacks (Shigemura et al., 2007). We will also present results of a preceding study conducted among disaster workers in New York City two weeks after 9/11.

PERCEIVED SAFETY OF JAPANESE INDIVIDUALS LIVING IN THE METROPOLITAN WASHINGTON, D.C. AREA

Materials and Methods

Following review and approval by our Institutional Review Board, an Internet-based survey was conducted among Japanese individuals living in the greater Washington, D.C. metropolitan area. The potential subjects were members of Japanese community groups whose leaders had provided written permission to conduct the study.These Washington-based organizations included Japan clubs at two universities, a non-profit organization providing social support in the Japanese community, and an e-mail community of Japanese scientists. Members of the four organizations totaled of approximately 700 individuals. Inclusion criteria were current or past Japanese citizenship, current residence in the greater Washington region, and age between 18 and 65 years.

The survey and informed consent information were distributed electronically between April 15 and May 31, 2005. Study participation was voluntary and anonymous. The survey was provided in English and Japanese languages. Reminder e-mails were sent twice during this time period. A total

of 92 individuals responded by the deadline date. After excluding responses with missing information, 87 subjects were enrolled for the final analysis.

The questionnaire included measurements to assess the respondents' demographic profile, perceived safety, a degree of belief that terrorism will happen in their region, and depressive symptoms. Perceived safety was measured using the Perceived Safety Scale (PSS, Grieger et al., 2003), which includes three questions regarding safety: safety at work, safety at home, and safety throughout the day in usual activities and travel. For each question, safety was scored on a 5-point Likert scale, ranging from 0 (not at all) to 4 (extremely). As a continuous variable, PSS ranged from 0 to 12, with a higher PSS score representing higher perceived safety.

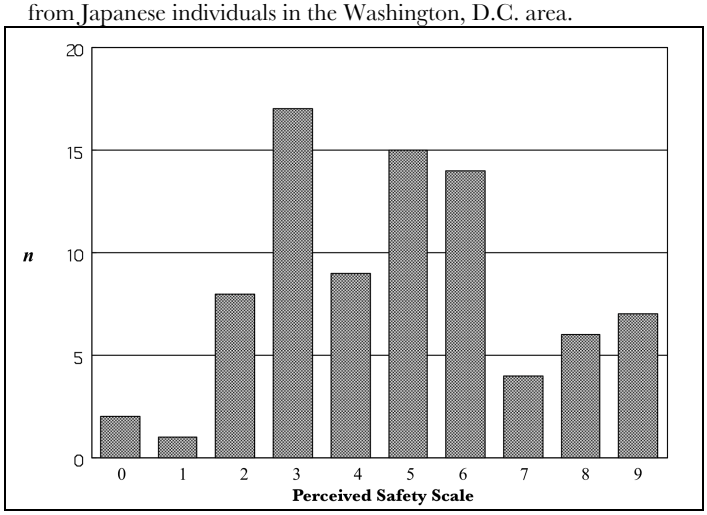
The degree of belief in future terrorism was queried as follows: "To what extent do you believe future terrorist events will occur in the area where you are currently living?". Their responses were assessed by a 5-point Likert scale, ranging from 0 (not at all) to 4 (extremely). Depressive symptoms were examined using Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). Based on past studies in English- and Japanese- language versions of the scale (Radloff, 1977; Shima et al., 1985), a cutoff point of 16 or more was used to determine the presence of current depressive symptoms. Statistical analysis was performed using SPSS 12.0.1 for Windows (SPSS Inc, Chicago, IL, USA). Significance level was set at $p<0.05$.

Results

Ages of the subjects ranged from 21 to 63 years (mean, 37.3±10.1). The subjects had lived in the United States and the Washington area for an average of 8.1±9.0 and 6.0±2.9 years, respectively.

PSS responses showed sufficient internal consistency (Cronbach's alpha=0.85). The mean PSS score was 4.84±2.23; the numbers of the subjects with each PSS score are shown in Figure 1.

Figure 1 Distribution of Perceived Safety Scale scores obtained in 2005 from Japanese individuals in the Washington, D.C. area.



Note: High scores reflect higher perceptions of safety

The PSS score correlated negatively with the subjects' degree of belief in future terrorism in the region (r=-0.264, p=0.016). PSS was not related to any demographic variable or to depression (See Table 1 below).

Table 1 Relationship between demographic characteristics, Fear of Terrorism Score, and Perceived Safety Scale

			Perceived Safety Scale		
				Analysis	
	n	%	Mean (SD)	*t*	*p*
Total	87	100.0	4.84 (2.23)		
Age, years				1.11	0.270
≤ 35	43	49.4	5.13 (2.20)		
> 36	44	50.6	4.58 (2.26)		
Gender				1.50	0.137
Female	60	69.0	4.60 (2.24)		
Male	27	31.0	5.40 (2.16)		
Education				-1.13	0.264
College or less	43	49.4	4.57 (2.14)		
Master/doctoral	44	50.6	5.12 (2.32)		
Work Status				*F*=1.14	0.327
Student	19	21.8	4.89 (2.03)		
Worker	56	64.4	5.02 (2.38)		
Neither	12	13.8	3.91 (1.70)		
Marital status				0.72	0.475
Single	34	39.1	5.06 (2.06)		
Married	53	60.9	4.70 (2.35)		
Have children				-0.43	0.668
No	51	58.6	4.76 (2.09)		
Yes	36	41.4	4.97 (2.46)		
Permanent US resident				0.79	0.435
No	53	60.9	5.00 (2.35)		
Yes	34	39.1	4.61 (2.06)		
Past DC or NY resident during the 9/11 attacks				0.22	0.829
No	55	63.2	4.88 (2.23)		
Yes	32	36.8	4.77 (2.28)		
Depressive symptoms (CES-D)				1.18	0.243
Low	65	80.2	4.94 (2.16)	(*df*=75)	
High	16	19.8	4.20 (2.21)		

n slightly vary owing to missing values

PERCEIVED SAFETY OF 9/11 DISASTER WORKERS (FULLERTON ET AL., 2006)

Materials and Methods

Two weeks after the 9/11 attacks and following approval by the Institutional Review Board, an anonymous survey was distributed to disaster workers who came to or were aboard a hospital ship stationed in New York City as a respite area. A total of 89 surveys were returned (response rate: 22%). Most of the subjects were white (n=74, 85%), had an education level of some college or more (n=69, 78%), were married (n=50, 57%), and had children (n=50, 57%). The survey included questions regarding demographics variables, along with measurements of perceived safety, posttraumatic traumatic symptoms, and depression.

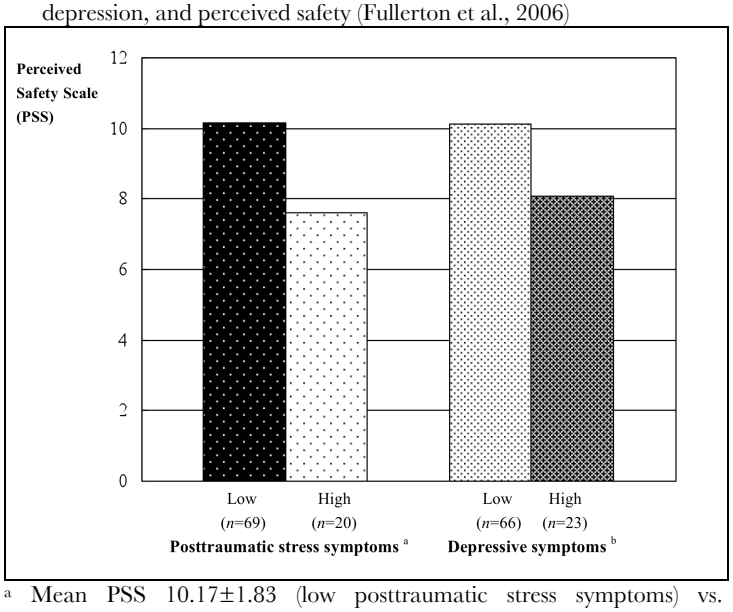
Perceived safety was measured by the PSS. The subjects were dichotomized into two groups according to PSS score: low safety (PSS 0 to 10, n=55, 62%) and high safety (PSS 11 or 12, n=34, 38%). Posttraumatic stress symptoms were measured using the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997). A total score of 22.3 or more, according to earlier IES studies, was

taken as an indicator of clinical concern. Depression of clinical concern was assessed using the Zung Self Rating Depression Scale (Zung, 1965) using a cutoff score of 50 or more. Significance was set at $p<0.05$.

Results

Perceived safety was not related to any demographic feature. Individuals with posttraumatic stress symptoms of clinical concern reported lower perceived safety. Subjects with lower safety were 7.78 times more likely to report posttraumatic stress symptoms of clinical concern (Wald $\chi^2=6.86$; $p=0.009$; 95% CI 1.68-36.15). Those who were depressed showed lower perceived safety (See Figure 2).

Figure 2 Relationships between posttraumatic stress symptoms, depression, and perceived safety (Fullerton et al., 2006)



[a] Mean PSS 10.17±1.83 (low posttraumatic stress symptoms) vs. 7.60±2.62 (high); $t=24.91$; $df=87$; $p<0.01$.

[b] Mean PSS 10.12±1.87 (low depressive symptoms) vs. 8.09±2.73 (high); t=3.31; df=29.5; p<0.01.

DISCUSSION In the first study, which involved Japanese people living in the Washington region, perceived safety did not associate with any demographic feature. Moreover, an association was noted between perceived safety and a subjective belief in future terrorism. Also, PSS scores were notably lower than for the subjects in the second study. The first study was carried out more than three years after the 9/11 and subsequent anthrax attacks; although tightened security measures were in place and occasional evacuation orders were issued, no disaster was unfolding at the time of the study. Nonetheless, the subjects of the first study reported diminished perceived safety, a finding with several possible explanations. Safety-related issues beyond the scope of the survey, such as crimes, may have lowered their sense of safety. Racial or ethnic minority status of the subjects also may have had influenced the results. Such minority members are at higher risk for PTSD (Norris et al., 2002), being more likely to experience a variety of stress related to transcultural issues, language barriers, and limited social support. Our results suggest that racial/ethnic minority status might be a

potential risk factor for lower perceived safety, and further studies are necessary to better understand this relationship.

The second study showed significant relationships between lower perceived safety, posttraumatic symptoms, and depression among disaster workers in New York City two weeks after 9/11. Workers with clinical symptoms were likely to experience lower perceived safety, and these changes took place in the midst of their mission. Disaster workers carry out a crucial role not only in the recovery of disaster-affected areas but also in enhancing the resilience of affected individuals and groups. However, disaster workers' mission experiences make them susceptible to stress-related disorders, depression, and other mental/behavioral disorders (Fullerton et al., 2004). Understanding their responses and how their perceived safety affects their mental health and behavior is crucial to bolstering their effectiveness and enhancing their own mental health.

The first and second studies both have limitations to their interpretation, reflecting small sample size, low response rate, self-report survey, and cross-sectional design. Despite these limitations, our results are compatible with previous studies stating that subjective threat perception is associated with development of PTSD (Olff et al., 2007). Our findings also highlight the vulnerability of racial/ethnic minorities and of disaster workers to the consequences of disasters, as well as the importance of these two groups in disaster prevention programs and in post-disaster interventions. Future research is essential to improve the understanding of relationships between perceived safety and mental health consequences of disaster among various populations.

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