

**Table 1. Factors Associated With Elevated Risk of Clinical Levels of PTSD<sup>a,b</sup>**

| Factor   | $\beta$ | SE    | Adjusted OR<br>(95% CI) | P<br>Value |
|--|---------|-------|-------------------------|------------|
| Age, y   | -0.016  | 0.007 | 0.984 (0.971–0.997)     | .013       |
| Sex, female vs male  | 0.486   | 0.192 | 1.626 (1.116–2.369)     | .011       |
| Marital status, married<br>vs not married                        | -0.136  | 0.185 | 0.873 (0.607–1.254)     | .461       |
| Education, college or<br>higher vs lower                         | 0.095   | 0.181 | 1.100 (0.772–1.567)     | .599       |
| Loss of personal<br>property or belongings                       | 1.136   | 0.243 | 3.114 (1.935–5.012)     | <.001      |
| Witnessed injury due<br>to Hurricane Sandy                       | 0.450   | 0.270 | 1.568 (0.923–2.663)     | .096       |
| Recollection of Hurricane<br>Katrina in 2005 <sup>c</sup>        | 0.365   | 0.085 | 1.441 (1.219–1.703)     | <.001      |
| Recollection of the<br>WTC terror attack<br>in 2001 <sup>d</sup> | 0.560   | 0.073 | 1.750 (1.516–2.021)     | <.001      |

<sup>a</sup>Elevated risk of PTSD was defined as having a score  $\geq 33$  on the Impact of Events Scale-Revised.

<sup>b</sup>Data were missing among the variables for 7 to 18 participants (0.7%–1.8% of total; complete data were available for 967 participants). Participants with missing data were excluded from the analysis.

<sup>c</sup>Per answer to the question, “Since Hurricane Sandy, how often do you think of Hurricane Katrina?”

<sup>d</sup>Per answer to the question, “Since Hurricane Sandy, how often do you think of the 9/11 WTC terror attack?”

Abbreviations: PTSD = posttraumatic stress disorder, WTC = World Trade Center.

### The Association of Disaster-Related Experiences and Self-Reported Recollections of National Trauma With Posttraumatic Stress Disorder Symptoms Following Hurricane Sandy

**To the Editor:** Hurricane Sandy struck the New York Metropolitan Area on October 29, 2012, leading to massive property damage and more than 100 casualties. The effect on the infrastructure was severe, with more than 8 million New York Metropolitan Area residents suffering from power outages, accompanied by food shortages and mobility restrictions resulting from the widespread flooding. Previous studies show that exposure to natural disasters increased the risk for psychological distress,<sup>1–4</sup> while recollections of these events hindered mental health recovery.<sup>5,6</sup> Little is known about the association between recollections of national trauma with posttraumatic stress disorder (PTSD) symptoms in the aftermath of natural disaster.

**Method.** Following approval by the ethics committee of the School of Social Work at Ariel University, we conducted an online survey using Toluna USA, Inc (us.toluna-group.com) of 1,000 people in states affected by Hurricane Sandy 1 month after the hurricane

(response rate = 83.3% of a potential 1,200). We used the same method employed in other medical and psychological studies.<sup>7,8</sup>

We assessed sociodemographic characteristics: age (mean [SD] = 45.16 [14.30] years), gender (n = 655 women; 65.5%), marital status (n = 606 married; 60.6%), and education (n = 455 having college degree or above; 45.5%). We also assessed disaster-related experiences (“Did you lose personal property or belongings during Hurricane Sandy?” with replies on a dichotomous scale of 0 = no and 1 = yes) and self-report recollections of national trauma (“Since Hurricane Sandy, how often do you think of Hurricane Katrina from 2005?” and “Since Hurricane Sandy, how often do you think of the 9/11 World Trade Center [WTC] terror attack?”, with replies to both questions made according to a 5-point Likert Scale ranging from 0 = not at all to 4 = very much). PTSD symptoms were assessed by the Impact of Event Scale Revised (IES-R),<sup>9</sup> a 22-item scale including PTSD domains of intrusion, avoidance/numbing, and hyperarousal. Scores range from 0 to 88, with a score of 33 or higher indicating elevated risk of clinical levels of PTSD symptoms (Cronbach  $\alpha = 0.975$ ).<sup>9</sup> This instrument has been used widely in other disasters such as the Haiti earthquake in 2010<sup>3</sup> and the Fukushima earthquake, tsunami, and nuclear disaster in 2011.<sup>4</sup>

Logistic regression analysis was conducted for the above factors as independent variables while IES-R score of 33 or higher was the dependent variable entered into the model. SPSS version 19.0 (IBM Corporation, Armonk, New York) was used. A 2-sided  $P < .05$  was used to indicate significance. An a priori test showed that the variance inflation factor ranged from 1.021 to 1.400 and tolerance ranged from 0.714 to 0.979, indicating the absence of multicollinearity.<sup>10</sup>

**Results.** Elevated risk of clinical levels of PTSD symptoms was significantly associated with loss of personal property or belongings (OR = 3.114 [95% CI, 1.935–5.012],  $P < .001$ ), recollections of Hurricane Katrina (OR = 1.441 [95% CI, 1.219–1.703],  $P < .001$ ), and recollections of World Trade Center terrorist attacks (OR = 1.750 [95% CI, 1.516–2.021],  $P < .001$ ). Other significant associations with elevated risk of clinical levels of PTSD were lower age (OR = 0.984 [95% CI, 0.971–0.997],  $P = .013$ ) and female sex (OR = 1.626 [95% CI, 1.116–2.369],  $P = .011$ ) (Table 1).

The prevalence of elevated risk of clinical levels of PTSD symptoms (IES-R score: 33) 1 month after Hurricane Sandy was 23.6%. After Hurricane Sandy, a large portion of the participants had recollection of Hurricane Katrina (81.7%) and 9/11 WTC terror attacks (61.4%), whereas only a small portion of the participants reported loss of property or personal belongings (18.4%). These results were similar to other studies pertaining to Hurricane Andrew<sup>1</sup> and Hurricane Katrina.<sup>2</sup> Expanding past research, recollections of previous major national trauma were associated with exacerbation of mental health.<sup>5,6</sup>

Several limitations warrant discussion. Our report was cross-sectional with oversampling of women and of people who are more likely to be in a less-affected area and who had access to electricity and communication. We obtained neither baseline measures nor long-term outcomes. PTSD symptoms were measured by a self-report questionnaire, and no comparison group was available.

Recall of past events may potentially prime for future psychological distress following disasters. Clinicians can benefit from attending to preexisting anxieties when identifying those likely to present with higher levels of PTSD symptoms.

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