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Screening for Generalized Anxiety Disorder Symptoms in the Wake of Terrorist Attacks: A Study in Primary Care

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Abstract

Little is known about the mental health impact of terrorism beyond posttraumatic stress disorder (PTSD) and depression. The associations between exposure to the September 11, 2001 (9/11) attacks in New York City and generalized anxiety disorder (GAD) symptoms were examined in a sample of 929 primary care patients. After controlling for PTSD, depression, panic and substance use disorders, and pre-9/11 trauma, patients who screened positive (vs. negative) for GAD symptoms were roughly twice as likely to report having a loved one at the 9/11 disaster site, twice as likely to know someone who was killed by the attacks, and twice as likely to know someone who was involved with the rescue/recovery efforts after the disaster. Implications for treatment and future research are discussed.

The terrorist attacks of September 11, 2001 (9/11) have affected large numbers of people, sending a clear message that terrorism is primarily psychological warfare rather than conventional military warfare. Terrorism is deliberately intended to inflict harm, induce fear, and diminish a sense of safety, thereby heightening anxiety in the form of worry (Neria,

Gross, & Marshall, 2006; Susser et al., 2002). Most research on the psychological reactions to the terrorist attacks has focused on posttraumatic stress disorder (PTSD) and depression (Galea et al., 2002; Neria et al., 2006; Schlenger et al., 2002), and no study to date has examined whether exposure to terrorism may be associated with clinical elevation of exaggerated and uncontrollable worries above and beyond PTSD and depression. The aim of the current investigation is to address this gap of knowledge by focusing on the association between exposure to the 9/11 attacks and symptoms of generalized anxiety disorder (GAD).

Generalized anxiety disorder is a chronic and disabling mental disorder characterized by excessive and uncontrollable worrying, anxiety, hypervigilance, and numerous somatic symptoms of anxiety (American Psychiatric Association [APA], 1994). Individuals with GAD are at increased risk for impaired social and role functioning and overall reduced physical and mental well-being (Henning, Turk, Mennin, Fresco, & Heimberg, 2007; Stein & Heimberg, 2004). Although community studies estimate a lifetime prevalence rate of GAD of approximately 5.7% (NCS-R: Kessler, Chiu, Demler, & Walters, 2005), estimates of its prevalence in primary care are higher, with rates as high as 14.8% (Olfson et al., 2000). Primary care providers are often the first to see individuals with a history of trauma and GAD (Brown & Baron, 1992); however, identification of GAD in primary care settings is challenging because GAD is frequently complicated by unexplained medical symptoms (Katon, Sullivan, & Walker, 2001).

A small but growing body of literature has examined the prevalence of GAD among populations exposed to disaster-related trauma. Elevated levels of GAD symptoms were observed among survivors of the Mt. Saint Helens disaster (Shore, Tatum, & Vollmer, 1986) as well as the Exxon Valdez Oil spill (Palinkas, Downs, Peterson, & Russell, 1993). Generalized anxiety disorder was observed at 50% greater prevalence than PTSD in individuals who experienced the 2004 Florida hurricanes (Acierno et al., 2007).

A handful of studies have focused on GAD after terrorist attacks. Following the 9/11 attacks, a survey of 4,739 Pentagon personnel indicated that 26.9% of the respondents screened positive for GAD, whereas 17.7% screened positive for depression and 7.9% screened positive for PTSD (Jordan et al., 2004). A longitudinal study of predominantly Caucasian (92%) adults (Cohen et al., 2006) found elevated levels of GAD symptoms, higher than both PTSD and panic disorder (PD) in both 2001 and 2002, and that levels of GAD were higher than PTSD in 2003.

Studies of the 9/11 terrorist attacks have left several issues unresolved. It remains unclear whether the trauma of terrorism is related to GAD, and if this relationship exists, if it is independent of past traumas. Moreover, although research has shown that patients increasingly utilize primary care for mental health concerns in the wake of disaster exposure, the impact of the 9/11 terrorist attacks on GAD has not been investigated in a primary care setting.

Thus, in the current study we examined the associations between exposure to trauma before and during the 9/11 attacks and a positive screen for GAD symptoms, independent of psychiatric disorders frequently associated with GAD. We hypothesized that (a) exposure to 9/11-related traumatic events would increase the likelihood of screen-positive GAD symptoms; (b) the association between 9/11-related trauma and screen-positive GAD symptoms would not be fully explained by 9/11-related PTSD symptoms, depression, panic disorder, or substance use disorders; (3) the association between 9/11-related trauma and screen-positive GAD symptoms would not be fully explained by a history of pre-9/11 trauma exposure; and (4) patients with (vs. without) screen-positive GAD symptoms would exhibit significantly worse functioning.

METHOD

This study was conducted at the Associates in Internal Medicine (AIM) clinic at Columbia University Medical Center in Northern Manhattan between December 2001 and January 2003. This primary care clinic serves approximately 20,000 adults from the surrounding community each year.

The Institutional Review Boards of Columbia Presbyterian Medical Center and the New York State Psychiatric Institute approved the study protocol, including the Spanish translation of all data forms and questionnaires. All participants provided written informed consent.

Participants

A sample of adult patients seeking primary care treatment at the AIM clinic was invited to participate in the study during the period 7–16 months after the 9/11 attacks. Participant recruitment has been described in detail elsewhere (Neria et al., 2006). Patients were approached in a systematic fashion based on the location of their seat in the waiting room. Each day, seats were approached consecutively starting at the back of the waiting room. Patients were screened for eligibility until our recruitment goal of about 1,100 patients was achieved. Eligible patients were those who were between 18 and 70 years of age, had made at least one prior visit to the practice, could speak and understand Spanish or English, were waiting for face-to-face contact with a primary care physician, and were in good enough general health to complete the self-report survey. Of the 3,145 patients who were approached, 1,118 met eligibility criteria, and of these, 992 (88.7%) consented to participate in the study. Among the consenters, 929 (93.6%) provided sufficient data on trauma, posttraumatic symptoms, and GAD symptoms to comprise the analytic sample for the present report.

Bilingual research assistants approached the patients, determined eligibility, obtained consent, and administered the survey. Participants had the choice of the English or Spanish version and could complete the questionnaire themselves or have it read to them by the research assistant. All assessment forms were translated from English to Spanish and back translated by a bilingual team of mental health professionals. The Spanish translations were approved by the Hispanic Research and Recruitment Center at Columbia University Medical Center.

Measures

Information regarding age, gender, marital status, race/ethnicity, level of education, household income, and pre-9/11 trauma were collected using a history form. Age was grouped into four categories (18–44, 45–54, 55–64, and 65–70), marital status was grouped into two categories (married/cohabitating and other), and race/ethnicity was grouped into three categories (Hispanic, Non-Hispanic/Black, and Non-Hispanic).

Types of exposure to the 9/11 disaster were determined by the following yes/no questions: (a) “Did you directly witness the attacks or collapse of the World Trade Center (WTC) or the smoke after the disaster?” (b) “Was a loved one or somebody close to you in the WTC during the attacks?” (c) “Was there a time immediately following the WTC attacks that you were concerned that a loved one or somebody close to you might have been hurt?” (d) “Did you know somebody who was physically injured during the WTC disaster?” (e) “Did you know somebody who was killed by the WTC disaster?” (f) “Were you involved in the recovery and rescue efforts after the WTC disaster?” and (g) “Do you know somebody who was involved in the recovery and rescue efforts after the WTC disaster?”

The Life Events Checklist (LEC; Gray, Litz, Hsu, & Lombardo, 2004) is a 17-item scale assessing exposure to various types of common traumatic events. The utility of the LEC in assessing exposure to trauma has been previously demonstrated (Gray et al., 2004). For this study, we added “World Trade Center attack” to the list of events. Trauma history was determined based on a positive report of at least one traumatic event (response of “[it] happened to me” or “[I] witnessed it”). Patients were not asked if each trauma had occurred before or after 9/11, however they were asked to identify the age at which the earliest of these traumas had been experienced. All surveys were administered between 7 and 16 months after 9/11; accordingly, to classify a patient’s trauma history as predating 9/11, we required that the reported age of earliest trauma be at least 2 years less than the patient’s reported age at interview.

The Patient Health Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999) is a self-report version of the PRIME-MD (Spitzer, Williams, & Kroenke, 1994), a validated measure of common mental disorders based on symptoms according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (APA, 1994). The diagnostic validity of the PHQ is comparable to the original clinician-administered PRIME-MD (Spitzer et al., 1999). In the current study, the PHQ was utilized to screen for the following disorders: depression, PD, substance use disorders, and GAD. The Spanish version of the PHQ, validated by Diez-Quevedo, Rangil, Sancez-Planell, Kroenke, and Spitzer (2001), was used with Spanish-speaking patients (for the diagnosis of any PHQ disorder, $\kappa = 0.74$; overall accuracy = 88%; sensitivity = 87%; specificity = 88%).

A continuous score for depression was obtained by using the Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001), a self-report subscale comprised of nine items that directly relate to each of the nine symptoms of depression as defined by the *DSM-IV*. Each of the items is scored from 0 to 3, resulting in a maximum total score of 27, with higher scores representing an increased severity of depression.

The PHQ GAD screen first asks, “Over the last 4 weeks, how often have you been bothered by feeling nervous, anxious, on edge or worrying a lot about different things? (*Not at all, several days, more than half the days*).” If it is “*more than half the days*,” then the following six symptoms, corresponding to *DSM-IV* GAD Criterion C, are assessed with the same prompt, time frame, and response choices as above: (a) feeling restless so that it is hard to sit still; (b) getting tired very easily; (c) muscle tension, aches, or soreness; (d) trouble falling asleep or staying asleep; (e) trouble concentrating on things such as reading a book or watching TV; and (f) becoming easily annoyed or irritable. If at least three of the six symptoms are experienced “*more than half the days*” over the last 4 weeks, the respondent screens positive for GAD. All six symptoms in *DSM-IV* GAD Criterion C are assessed in the PHQ GAD module; however, the PHQ GAD module uses a period (past 4 weeks) that is different from the *DSM-IV* (past 6 months; Criterion A). Although there are no data available comparing the PHQ GAD module with a gold-standard interview assessment of GAD, the PRIME-MD, upon which the PHQ is based, has been validated (e.g., Spitzer et al., 1994). Both the PRIME-MD and the PHQ require a positive response to a question about anxiety and worry and at least three of six criterion symptoms for GAD.

The PTSD Checklist-Civilian Version (PCL-C; Weathers et al., 1993) is a 17-item self-report PTSD symptom screening instrument that has been shown to have good internal consistency, strong correlations with other PTSD scales, and high diagnostic efficiency (Weathers et al., 1993). Respondents rate the extent to which they have been bothered by each symptom using a 5-point Likert scale (1 = *not at all* to 5 = *extremely*). Items can be summed to yield a total score that serves as a measure of PTSD symptom severity (e.g., Fiszman et al., 2008). In the current study, participants were asked specifically to consider

their symptoms during the past month related to their experience and response to the WTC attacks.

The Short Form Health Survey (SF-12; Ware, Kosinski, & Keller, 1996) is a 12-item self-report summary measure of perceived physical and mental disability. It provides Mental Component Summary (MCS) and Physical Component Summary (PCS) scores, with lower scores indicating greater disability. The SF-12 has satisfactory psychometric properties and is reliable and valid in a variety of clinical populations (Ware et al., 1996). The SF-12 instructions were to assess health over the past 4 weeks to correspond with the study design.

The Sheehan Disability Scale (SDS; Leon, Shear, Portera, & Klerman, 1992) includes three 10-point subscales that measure impairment in the following areas of a patient's life: work, social life, and family life/home responsibilities (0 = *none*, 1–3 = *mild*, 4–6 = *moderate*, 7–9 = *marked*, 10 = *extreme*). For each subscale, significant impairment was defined by a rating of 7 or higher. Because only 20% of the sample was gainfully employed, the work subscale of the SDS was not used in the analyses.

Data Analysis

The prevalence of current screen-positive GAD symptoms was based on the diagnostic algorithm for “Other Anxiety Syndrome” on the PRIME-MD PHQ (Spitzer et al., 1999). This screen diagnosis has been called GAD because the symptoms map reasonably well onto *DSM-IV* GAD (Brenes et al., 2008). Sociodemographic and clinical differences between those with and without screen-positive GAD symptoms were assessed with chi-square analysis for categorical variables and the Wilcoxon two-sample test for ordinal variables. Binary logistic regression was used to predict screen-positive GAD symptom status from each trauma variable, with odds ratios and 95% confidence intervals reflecting the increased or decreased likelihood of screen-positive GAD symptoms as a function of the trauma. To isolate the associations between trauma and screen-positive GAD symptoms, we also conducted these regressions with covariates to reduce potential confounding. We selected covariates based on rational and statistical criteria. Wherever possible, we used continuous covariates (e.g., PHQ-9 depression score and PCL-C score) rather than the diagnostic classifications derived from these scales (PHQ MDD [yes/no] and PCL-C PTSD [yes/no], respectively) to optimize the adjustment. The dichotomous versions of these variables are likely to have less statistical power, in part because the cutoff underlying the classification might not be the one that maximally differentiates those with and without GAD symptoms. Group differences on continuous outcomes (SF-12 Mental and Physical Component Summary scores) were assessed with linear regression, with screen-positive GAD symptoms (yes/no) as the focal predictor, and are expressed as mean difference (β) with 95% confidence interval (CI). All tests were conducted with Statistical Analysis Software (SAS; SAS Institute, Inc., 2003), and were two-sided with significance set at .05.

RESULTS

The prevalence of screen-positive GAD symptoms in the entire sample was 10.5%. Compared to those who screened negative, those screening positive were significantly more likely to be female, unmarried, middle-aged, and poorer (Table 1). Those screening positive for GAD symptoms also had significantly worse current PTSD symptom scores and current PHQ-9 depression scores, and a higher screen-positive rate of current PD. In the analyses to follow, we adjusted for all these variables as well as for race/ethnicity, education, and positive screen for current substance use disorder, which were marginally associated with GAD symptoms. This set of 10 covariates will be referred to as the *standard covariate set*.

Screen-Positive GAD and Trauma Exposure

Lifetime exposure to traumatic events was common in this sample (Table 2). A similar percentage of participants in the GAD and non-GAD groups reported that the WTC attack “happened to me” or “[I] witnessed it” (67.3% vs. 61.5%, respectively). This high percentage probably includes instances of witnessing the event live on television. Significant differences in crude trauma rates were all in the direction of the GAD group being more likely to have experienced various types of assault (physical assault, assault with a weapon, sexual assault, and other unwanted sexual experience); illness, injury, or death (life-threatening illness/injury of a family member, a sudden violent death, sudden unexpected death of someone close, serious injury or harm caused to another); transportation accidents; and exposure to a toxic substance. After adjusting for the standard covariate set, the likelihoods of three types of trauma were significantly greater in the GAD group. Those with screen-positive GAD symptoms were approximately 6 times as likely to have had exposure to a toxic substance, 3 times as likely to have had an unwanted sexual experience, and twice as likely to have experienced a physical assault.

Although the endorsement that the 9/11 attacks had “happened to” or were “witnessed” by participants was not associated with the likelihood of screen-positive GAD symptoms (see above), a number of specific 9/11-related events were significantly related to the likelihood of screen-positive GAD symptoms (Table 3). Those with (vs. without) screen-positive GAD symptoms were more likely to report exposure to 9/11-related events that explicitly reference others (i.e., having a loved one in danger or being concerned that a loved one was hurt, knowing someone who was injured or killed, or knowing someone involved in the rescue/recovery efforts) (all p s < .05). After adjusting for the standard covariate set, the GAD group was still approximately twice as likely to have had a loved one in danger on 9/11, know someone who was killed in the disaster, and know someone who was involved in the rescue/recovery efforts. When adjusting additionally for exposure to pre-9/11 trauma (any vs. none), the GAD group had the same increased likelihood of having experienced the abovementioned 9/11-related traumas (respectively: odds ratio [OR] = 2.1, 95% CI = 1.1 to 4.0; OR = 2.3, 95% CI = 1.3 to 4.3; and OR = 2.3, 95% CI = 1.1 to 4.6).

Screen-Positive GAD Symptoms, Functioning, and Impairment Post 9/11

As compared to the non-GAD group, the GAD group had significantly worse SF-12 Mental Component Summary (MCS) scores (30.7 [9.4] vs. 47.7 [11.3]; $B = -16.8$, $SE = 1.2$, 95% CI = -19.1 to -14.4; $p < .001$). After adjusting for the standard covariate set, those with screen-positive GAD symptoms had a mean expected MCS score 4.1 points lower than those without screen-positive GAD symptoms ($B = -4.1$, $SE = 1.1$, 95% CI = -6.2 to -2.0, $p < .001$). The GAD group also had significantly worse SF-12 Physical Component Summary scores (35.0 [10.7] vs. 40.4 [11.4]; $B = -5.2$, $SE = 1.2$, 95% CI = -7.5 to -2.7, $p < .001$); however, this difference was not significant after adjusting for the standard covariate set ($B = 0.5$, $SE = 1.3$, 95% CI = -2.0 to 3.1, ns).

Compared to the non-GAD group, the GAD group was more likely to have any current social impairment (50.0% vs. 13.0%; OR = 6.7, 95% CI = 4.2 to 10.6, $p < .001$) and family life impairment (38.5% vs. 11.1%; OR = 5.0, 95% CI = 3.2 to 8.0, $p < .001$); however, these effects did not remain significant when adjusting for the standard covariate set (for social impairment: OR = 1.1, 95% CI = 0.6 to 2.1; for family impairment: OR = 0.8, 95% CI = 0.5 to 1.6). For each impairment outcome, the inclusion of PHQ-9 depression score and PTSD symptom score as covariates was responsible for the large reduction in the unique association between screen-positive GAD and impairment. Results on the SF-12 Summary Scale and the Sheehan Impairment Scale were nearly identical when adjusting additionally for pre-9/11 trauma.

DISCUSSION

To our knowledge, this is the first study to screen for GAD symptoms in a primary care setting in New York City after the attacks of 9/11, and to examine the relationship between GAD symptoms and exposure to the disaster. This study provides evidence that a number of 9/11-related traumatic events were associated with screen-positive GAD symptoms, and that this association is not simply accounted for by commonly co-occurring disorders or a history of pre-9/11 trauma. Consistent with our hypotheses, our findings indicate that after controlling for levels of PTSD symptoms related to 9/11, level of depression, panic disorder, substance use disorders, pre-9/11 trauma, and potentially confounding sociodemographic characteristics, patients who screened positive (vs. negative) for GAD symptoms were roughly twice as likely to report having a loved one at the 9/11 disaster site, twice as likely to know someone who was killed by the attacks, and twice as likely to know someone who was involved with the rescue/recovery efforts after the disaster. The current study is only a preliminary step in exploring the relationship between exposure to terrorism-related trauma and GAD, and the use of a GAD screening instrument instead of a diagnostic interview does not allow for certainty in distinguishing GAD from PTSD or other mental health disorders.

There are few previous studies with which to compare our findings. Although the relationship between exposure to a terrorist attack and GAD symptoms has not been previously examined, our results are consistent with past studies indicating that exposure to trauma, particularly assaultive trauma, is associated with GAD (Brawman-Mintzer, Monnier, Wolitzsky, & Falsetti, 2005; Roemer, Molina, Litz, & Borkovec, 1997), and that an emotional connection to victims is associated with stress symptoms (Dixon, Rehling, & Shiwach, 1993; Terr et al., 1999). Indeed, past studies have shown that disasters may have a negative effect on mental health when a loved one or acquaintance is harmed or when an individual personalizes the event (Dixon et al., 1993). This is a limitation in the current study, and future studies are needed to better understand how emotional connections to others influence stress reactions after a disaster.

Previous studies of disasters have shown that individuals involved with the rescue and recovery efforts may be particularly vulnerable to postdisaster emotional difficulties (Dunning & Silva, 1980; Hartsough & Myers, 1985; Palinkas et al., 1993; Taylor, 1987). In the aftermath of a terrorist attack, rescue and recovery workers are likely to have extended exposure to perceived threat and are most likely to have contact with the victims of the event (Palinkas et al., 1993). Our results lend support to the notion that involvement with rescue and recovery efforts is associated with screen-positive GAD symptoms.

Although our findings suggest that patients who screened positive for GAD symptoms had significantly worse mental health-related quality of life, we were surprised to find that GAD symptoms were not independently associated with social or physical functioning. Results from prior studies examining the influence of comorbidity on functional impairment in primary care patients with GAD have been inconsistent. Some studies found that GAD is independently associated with substantial impairments and disability (Kessler et al., 1994; Stein & Heimberg, 2004), whereas others indicate a negligible relationship between GAD and functional impairments, especially when considering individuals with GAD and comorbid depression (Olfson, Fireman, & Weissman, 1997; Stein et al., 2005). The comorbidity of GAD with depression is particularly interesting considering the extensive literature indicating high levels of comorbidity between GAD and depression and the status of depression as one of the most burdensome disorders in primary care (Murray & Lopez, 1996; Wells & Sherbourne, 1999). Given that 80% of the sample was unemployed, a general impairment floor effect may have influenced this finding. The question of whether GAD is

independently associated with impairment or disability, or whether the impairments are due to other comorbid disorders, warrants further study.

This study has several limitations. First, psychiatric disorders were assessed retrospectively by self-report screening instruments rather than a clinical interview, and the GAD screener used has recently been improved (Spitzer, Kroenke, Williams, & Löwe, 2006). Because the GAD screening instrument cannot replace a structured clinical interview and diagnosis, the external validity of our results are limited. In addition, the GAD screener uses a time frame that is different from the *DSM-IV*, which may have influenced the findings. Second, considering the significant symptom overlap between GAD and PTSD, individuals who screened positive for GAD may have actually had subclinical PTSD, although we attempted to address this possibility by controlling for level of PTSD symptoms in our main analyses. Third, our study focused on 9/11-related PTSD and may have potentially missed PTSD symptoms related to other traumatic events. Fourth, our sample was a predominantly low-income, minority sample from an urban general medical setting, which may limit the generalizability of the findings. Fifth, the cross-sectional nature of the data limits inferences about the temporal relationship between previous exposure to trauma and post-9/11 GAD. Sixth, because the assessment occurred 7–16 months after the 9/11 attacks, the timing of the assessment may have influenced the results. Longitudinal studies that measure disaster exposure and course of GAD symptoms are necessary to clarify the nature of the relationship between these events.

It is known that low-income, minority populations tend to rely on primary care services for their mental health needs (Olfson, Broadhead, & Weissman, 1996), and our findings underscore the importance of accurately assessing individuals who have experienced traumas so that appropriate posttrauma care can be provided. The recognition of GAD as a distinctive psychiatric outcome emanating from exposure to trauma may facilitate attention to trauma victims who may suffer from a wide range of anxiety and mood symptoms, not limited to PTSD and depression. Accurately detecting patients with GAD in the aftermath of trauma exposure may guide primary care physicians to assist patients in obtaining appropriate treatment. Greater availability of effective treatments for anxiety disorders in primary care settings may improve functioning and reduce the health care utilization associated with this disabling condition.

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Characteristics of 929 Adult Primary Care Patients by Current Screen-Positive Generalized Anxiety Disorder (GAD) Status

Table 1

	All patients (N = 929 ^b)			Current screen-positive GAD ^a					
	n	%		Yes (n = 104)	%	n	%	Odds ratio	95% CI
Demographic characteristics									
Age range, years ***									
18-44	249	26.8	19	18.3	230	27.9	2.71		0.90-8.12
45-54	287	30.9	41	39.4	246	29.8	5.46		1.91-15.57
55-64	258	27.8	40	38.5	218	26.4	6.01		2.10-17.18
65-70	135	14.5	4	3.9	131	15.9	1.00		-
Gender *									
Female	646	69.5	83	79.8	563	68.2	1.84		1.12-3.04
Male	283	30.5	21	20.2	262	31.8	1.00		-
Marital status *									
Married/cohabitating	297	32.0	24	23.1	273	33.2	0.60		0.37-0.98
Other	630	68.0	80	76.9	550	66.8	1.00		-
Race/ethnicity									
Black (Non-Hispanic)	123	13.2	8	7.7	115	13.9	0.49		0.23-1.04
White/Other (Non-Hispanic)	45	4.8	2	1.9	43	5.2	0.33		0.08-1.39
Hispanic	761	81.9	94	90.4	667	80.9	1.00		-
Level of education									
No high-school diploma	508	55.2	64	61.5	444	54.4	1.34		0.88-2.04
At least a high-school diploma	412	44.8	40	38.5	372	45.6	1.00		-
Household income, annual **									
<\$6,000	375	40.7	56	54.9	319	39.0	1.91		1.26-2.89
\$6,000	546	59.3	46	45.1	500	61.1	1.00		-
Clinical characteristics									
PTSD symptom score ^c , M (SD) ***	10.9	25.7	14.8	34.8	9.8	24.6	$\chi^2 = 7.21$		
Depression score ^e , M (SD) ***	6.8	7.8	5.1	16.7	6.1	6.7	$\chi^2 = 12.6$		

	All patients (N = 929) ^b		Current screen-positive GAD ^d				Odds ratio	95% CI
	n	%	Yes (n = 104)	n	%	No (n = 825)		
Panic disorder ^{d,***}								
Yes	37	4.0	15	14.7	22	2.7	6.25	3.13–12.5
No	885	96.0	87	85.3	798	97.3	1.00	–
Alcohol or drug use disorder ^a								
Yes	72	8.1	13	12.5	59	7.5	1.76	0.93–3.34
No	819	91.9	91	87.5	728	92.5	1.00	–

Note. CI = confidence interval; PTSD = posttraumatic stress disorder.

^a Assessed with the PRIME-MD Patient Health Questionnaire (PHQ).

^b For some characteristics, N is less than 929 due to missing data.

^c Assessed with the PTSD Checklist–Civilian Version (specific event was the 9/11 attacks). Possible score range is 17–85; higher scores are worse.

^d Wilcoxon two-sample test.

^e PHQ-9 depression score from the PRIME-MD PHQ. Possible score range, 0–27; higher scores are worse.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2
History of Traumatic Events^a by Current Screen-Positive Generalized Anxiety Disorder (GAD) Status

Traumatic event	Current screen-positive GAD				Odds ratio	95% CI	Adjusted odds ratio ^b	95% CI
	Yes (n = 104)	%	n	No (n = 825)				
Natural disaster	42/104	40.4	286/819	34.9	1.26	0.83–1.92	0.94	0.55–1.62
Fire or explosion	26/104	25.0	176/825	21.3	1.23	0.77–1.97	0.93	0.51–1.71
Serious accident	23/104	22.1	156/824	18.9	1.22	0.74–1.99	1.40	0.73–2.69
Exposure to toxic substance	17/104	16.4	36/825	4.4	4.28	2.31–7.94***	5.95	2.49–14.24***
Physical assault	33/104	31.7	131/823	15.9	2.46	1.56–3.86***	2.09	1.14–3.86*
Assault with a weapon	30/104	28.9	130/824	15.8	2.16	1.36–3.44***	1.59	0.87–2.90
Sexual assault	13/104	12.5	52/824	6.3	2.12	1.11–4.04*	1.20	0.54–2.67
Other unwanted sexual experience	10/104	9.6	26/824	3.2	3.26	1.53–6.98**	3.18	1.09–9.28*
Combat exposure	5/104	4.8	36/824	4.4	1.11	0.42–2.88	1.24	0.31–4.92
Captivity	3/104	2.9	11/825	1.3	2.20	0.60–8.01	2.15	0.46–10.11
Life-threatening illness/injury (self)	28/104	26.9	202/824	24.5	1.13	0.72–1.80	0.91	0.51–1.62
Life-threatening illness/injury (family member)	27/102	26.5	136/824	16.5	1.82	1.13–2.93*	1.74	0.94–3.21
Sudden violent death	14/104	13.5	44/823	5.4	2.75	1.45–5.22**	2.25	0.98–5.18
Sudden unexpected death of someone close	25/103	24.3	118/813	14.5	1.89	1.16–3.08*	1.26	0.68–2.35
Serious injury/harm/death you caused to another	5/104	4.8	13/809	1.6	3.09	1.08–8.86*	4.05	0.95–17.35
World Trade Center (Twin Towers) attack	70/104	67.3	502/816	61.5	1.29	0.84–1.99	0.98	0.56–1.73
Other transportation accident	19/103	18.5	89/823	10.8	1.87	1.08–3.22*	1.55	0.75–3.22

Note. CI = confidence interval.

^aTraumatic event exposure was positive if the event “happened to me” or “[I] witnessed it.”

^bAdjusted for demographic characteristics (gender, age group, marital status, race/ethnicity, education, and household income) and measures of current clinical status (Patient Health Questionnaire-9 depression score, PTSD Checklist-Civilian version score, positive [vs. negative] screen for alcohol or drug use disorder, and positive [vs. negative] screen for panic disorder).

* $p < .05$.

** $p < .01$.

***
 $p < .001$

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Table 3
Association Between 9/11-Related Events and Current Screen-Positive Generalized Anxiety Disorder (GAD)

9/11-Related event	Current screen-positive GAD				Crude odds ratio	95% CI	Adjusted odds ratio (Covariate set 1) ^a	95% CI (Covariate set 1) ^a	Adjusted odds ratio (Covariate set 2) ^b	95% CI (Covariate set 2) ^b
	Yes (n = 104)		No (n = 825)							
	n	%	n	%						
Directly witnessed the attacks or the smoke after the disaster	18	17.3	145	17.9	0.96	0.56–1.65	0.94	0.48–1.85	1.10	0.54–2.25
Had a loved one in the World Trade Center or Pentagon during the disaster	40	38.5	146	17.7	2.90	1.88–4.48***	2.12	1.22–3.69**	2.11	1.12–3.96*
Immediately after the attacks, had concern that a loved one was hurt	44	72.1	359	56.5	1.99	1.11–3.56*	1.46	0.70–3.03	1.22	0.55–2.73
Knew someone who was physically injured during the attacks	27	26.0	118	14.3	2.10	1.30–3.39**	1.57	0.84–2.93	1.64	0.84–3.22
Knew someone who was killed by the disaster	49	47.6	203	24.6	2.78	1.83–4.22***	2.25	1.30–3.90**	2.32	1.27–4.25**
Involved in rescue/recovery efforts after the disaster	4	3.9	11	1.3	2.96	0.93–9.47	2.54	0.53–12.10	4.41	0.82–23.65
Knew someone who was involved with rescue/recovery efforts after the disaster	24	23.1	108	13.1	1.99	1.21–3.28**	2.33	1.22–4.44*	2.29	1.14–4.61*

Note. CI = confidence interval.

^a Adjusted for demographic characteristics (gender, age group, marital status, race/ethnicity, education, and household income) and measures of current clinical status (Patient Health Questionnaire-9 depression score, PTSD Checklist-Civilian version score, positive [vs. negative] screen for alcohol or drug use disorder, and positive [vs. negative] screen for panic disorder).

^b Adjusted for all the variables in footnote a and for the presence (vs. absence) of pre-9/11 trauma.

* $p < .05$.

** $p < .01$.

*** $p < .001$.