

Prevalence and Psychological Correlates of Complicated Grief Among Bereaved Adults 2.5–3.5 Years After September 11th Attacks

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A Web-based survey of adults who experienced loss during the September 11, 2001, terrorist attacks was conducted to examine the prevalence and correlates of complicated grief (CG) 2.5–3.5 years after the attacks. Forty-three percent of a study group of 704 bereaved adults across the United States screened positive for CG. In multivariate analyses, CG was associated with female gender, loss of a child, death of deceased at the World Trade Center, and live exposure to coverage of the attacks on television. Posttraumatic stress disorder, major depression, anxiety, suicidal ideation, and increase in post-9/11 smoking were common among participants with CG. A majority of the participants with CG reported receiving grief counseling and psychiatric medication after 9/11. Clinical and policy implications are discussed.

Different from natural or technological disasters, terrorist events are deliberately aimed at inflicting harm on civilian populations and many times result in a considerable loss of life, affecting large social networks that are related to the deceased (Neria, Gross, & Marshall, 2006; Pfefferbaum, 1999). Nationwide studies suggested that between 4–11% of the U.S. adult population knew someone who was killed in the attacks of September 11, 2001 (Schlenger et al., 2002; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). In New York City, three reports found that 11–14% of adults reported losing a friend or relative (Galea et al., 2002, 2003; Neria, Gross, Gameroff et al., 2006). Despite previous reports suggesting that unpredictable loss by malicious violence is one of the most pernicious human experiences (e.g., Pfefferbaum et al., 2001; Raphael & Martinek, 1997; Rynearson & McCreery, 1993; Spooen, Henderick, & Jannes, 2000/2001; Zvizdic & Butollo, 2001), to date, the mental health impact of traumatic loss from 9/11 has received little examination, with almost exclusive research focused on the impact of exposure to the attacks and resulting rates of posttraumatic stress disorder (PTSD) and major depression (e.g., Galea et al., 2002; Neria, Gross, Gameroff et al., 2006; Schuster et al., 2001; Silver et al., 2002).

The aim of this study was to examine the long-term grief reactions among bereaved adults following the attacks of September 11, 2001, using a Web-based survey. A growing literature has noted that this type of data collection can facilitate access to personal and sensitive data,

allowing reliable reporting of symptomatology and reducing social desirability bias (Batinic, Reips, & Bosnjak, 2002; Couper, 2000; Schlenger & Silver, 2006; Schlenger, Jordan, Caddell, Ebert, & Fairbank, 2004). Recent reports have suggested that when study participants are not exposed to an interviewer, they might be more forthcoming about revealing personal information regarding themselves and others (Lau, Thomas, & Liu, 2000; Turner, Lessler & Gfroerer, 1992; Turner et al., 1998), resulting in greater accuracy of the reports as compared to less anonymous interview techniques such as telephone surveys (Chang & Krosnick, 2001; Krantz & Dalal, 2000; Reips, 2000).

Although emerging research suggests that the majority of people are able to adjust to loss and regain functioning after a traumatic event (Bonanno et al., 2002; Bonanno, Wortman, & Nesse, 2004), a salient minority of individuals may develop chronic grief reactions, referred to as complicated grief (e.g., Prigerson et al., 1996; Prigerson et al., 1995) or traumatic grief (Jacobs, Mazure, & Prigerson, 2000; Prigerson, Shear, et al., 1997; Prigerson et al., 1999) manifested by persistent mourning, yearning, and loss-related anguish and withdrawal.

Multiple studies have shown enduring grief reactions to be associated with increased risk of hospitalization for mental illness (Li, Precht, Olsen, & Mortensen, 2005), suicidality (Latham & Prigerson, 2004; Prigerson, Bridge, et al., 1997), medical comorbidity, such as cancer (Levav et al., 2000), cardiac events and high blood pressure (Prigerson, Bierhals, et al., 1997), and mortality (Levav, 1982; Li, Mortensen, & Olsen, 2003).

Previous studies of the association between kinship relationship and grief outcomes have consistently shown that the loss of an adult child results in more intense or persistent grief (Cleiren, Dieksta, Kerkhof, & van der Wal, 1994; Leahy, 1992; Nolen-Hoeksema & Larson, 1999; Sanders, 1979). This finding was replicated in non-U.S. populations in Israel (Levav, Friedlander, Kark, & Peroz, 1988) and The Netherlands (Cleiren et al., 1994). A recent study (Shear, Frank, Houck, & Reynolds, 2005) found that parents who lost a child showed a much lower response to complicated grief treatment as compared to patients who experienced other types of loss (17% vs. 60%, respectively).

Although not included in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV;* American Psychiatric Association, 1994), research is accumulating to support construct validity for a complicated grief syndrome, following the historical nosologic models that identified now established disorders (Marshall & Klein, 1999), and there is a growing expert consensus regarding its core features (Prigerson et al., 1999). In particular, a number of studies support the differentiation between complicated grief (CG) and major depression (Boelen, van den Bout, & Keijser, 2003; Prigerson et al., 1995; Prigerson et al., 1996), based on both phenomenological studies and the principle of pharmacologic dissection, i.e., core features of CG are not substantially improved by antidepressant treatment (Pasternak et al., 1991; Reynolds et al., 1999). Most recently, Shear and colleagues found that complicated grief responds to psychotherapy that specifically addresses this syndrome (Shear et al., 2005) and was superior to interpersonal psychotherapy (IPT), a psychotherapy validated for depression.

It is possible that sudden death due to extreme acts of violence, such as terrorism or war, might cause additional strain on the natural course of grief because the traumatic aspects of the loss might compound the burden of grief. In particular, it has been hypothesized that PTSD is likely to interfere with the normal grieving process, leading to significant post-loss impairment (Neria & Litz, 2004).

The psychological effects of disasters, especially those that are manmade, may exceed the scope of the particular epicenter (Galea et al., 2002; Marshall et al., 2006;

Silver et al., 2002) and might not be limited to the well-documented dose-response associations of trauma and effect. Although Neria, Gross, Gamaroff et al. (2006) in their study of primary care patients exposed to 9/11 attacks in north Manhattan did not find indirect exposure to the World Trade Center (WTC) attacks by itself to be related to posttraumatic stress disorder (PTSD), other studies conducted after the attacks of 9/11 (e.g., Galea et al., 2002; Silver et al., 2002), in distant areas after the Oklahoma City Bombing (Pfefferbaum et al., 1999) and in Israel after the 1991 Iraqi Scud missile attacks (Bleich, Dycian, Koslowsky, Solomon, & Wiener, 1992) suggest evidence for probable relationships between indirect exposure and PTSD in the short-term. The study presented here provides a rare opportunity to address this topic.

The aim of this study was to characterize the prevalence and the correlates of complicated grief reactions reported in a large Web-based survey of persons who suffered a personal loss of varying kinds due to the attacks of September 11, 2001. Specific aims of the study were to (a) estimate the prevalence of positive screen for CG in a large convenience sample; (b) examine the associations between demographic, nature of loss and exposure characteristics and CG; and (c) report on comorbidity, suicidality, smoking, and treatment seeking among participants who screened positive for CG.

METHOD

Participants and Procedure

The study was conducted by means of a Web-based, secured and encrypted survey similar to those conducted by Schlenger et al. (2002) and Silver et al. (2002). Because no registry of 9/11 victims existed at the time of the study and an estimate for potential number of participants was yet to be known, a convenience sample of adult participants was recruited over the time period of 2.5–3.5 years after 9/11, using an online invitation that was placed on Web sites of 9/11 family organizations (e.g., Families of September 11; Voices of September 11th) or was sent to the members of such organizations in a nonsystematic way. The

Institutional Review Boards of the Columbia Presbyterian Medical Center and The New York State Psychiatric Institute and the Department of Veterans Affairs Medical Center approved the study protocol, and all participants gave informed consent. Subject recruitment started on March 14, 2004 and was completed on February 5, 2005.

Participants reviewed a consent form online and, if they decided to participate in the study, were electronically provided with a digital password and a personal pin-number. Eligible participants were between 18 and 70 years of age, had reported loss of a family member, colleague, or friend due to the 9/11 attacks and could read and understand English. Of the 871 persons who consented to participate in the study, 704 (81%) provided detailed data with regard to their location on 9/11, and their PTSD and CG symptoms; they comprise the analytic sample of this study.

Measures

The study questionnaire assessed three primary domains: (a) loss of human life related to the 9/11 attacks, (b) trauma exposure related to 9/11, and (c) mental health.

To assess the specific type of loss on 9/11, participants were asked about their relationship to the deceased (e.g., child, spouse, parent, other family member; nonfamily member: friend, colleague, acquaintance, neighbor), and the location of the death on 9/11 (e.g., World Trade Center, the Pentagon, or one of the crashed planes).

To assess exposure to other 9/11-related traumatic experiences, participants were asked about their location at the time of the attacks (e.g., World Trade Center, the Pentagon, other locations), and whether they watched the attacks live on television.

Complicated grief reactions were assessed using a nine-item screening measure (Prigerson, 2004; Prigerson & Jacobs, 2001). The scale queries about the following symptoms: yearning for the deceased, preoccupation with the deceased that interrupts normal activities, trouble accepting the loss, detachment, bitterness, loneliness, feeling that life is empty, feeling that part of one's self died, and loss of security or safety. Respondents indicated the frequency of

these experiences in the past month on a 5-point scale (*almost never, rarely, sometimes, often, always*). Internal consistency in this study was excellent (Cronbach's alpha = .86). Following Prigerson's (2004) recommended algorithm, the screen was considered positive when participants reported loss on 9/11 and at least five other symptoms (including yearning) scored 4 or 5 (*often or always*).

The PTSD Checklist-Civilian Version (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993), a well-validated screening instrument for PTSD (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) was used to screen for current 9/11-related PTSD. The PCL-C consists of 17 items corresponding to each *DSM-IV* PTSD symptom. Respondents were directed to consider the 9/11 loss as the Criteria A event. Possible scores for each item range from 1 (*not at all*) to 5 (*extremely*). To determine the PCL cut-point, we reviewed the literature and found a broad range of cut-points from 30 for patients seeking care at medical clinics (Walker, Newman, Dobie, Ciechanowski, & Katon, 2002) to 38 for female veterans (Dobie et al., 2002), 42 for ex-prisoners of war (POWs; Cook, Thompson, Coyne, & Sheikh, 2003), 44 for motor vehicle accident victims and sexual/physical assault survivors (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), and 35 to 50 for cancer patients (Andrykowski, Cordova, Studts, & Miller, 1998; Smith, Redd, DuHamel, Vickberg, & Ricketts, 1999). For conservative estimates of PTSD, recent studies of male veterans (Hoge et al., 2004) and 9/11 samples (Neria et al., 2006a; Schlenger et al., 2002) have used a conservative cut-point of 50 for PTSD probable screen positive. Thus, to achieve a strict estimate of PTSD in this predominantly female sample, a cut-off score of 50 was similarly used to determine a diagnosis of probable PTSD.

Anxiety symptoms were assessed with the six-item anxiety subscale of the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983). Participants rated their level of distress using a 0–4 Likert-type scale (0 = *not at all* and 4 = *extremely*). A mean score below 1.7 is considered normative in psychiatric outpatients and was used as the cut-off score (Derogatis & Melisaratos, 1983). The Primary

Care Evaluation of Mental Disorders (PRIME-MD) and Patient Health Questionnaire (PHQ; Spitzer et al., 1994) was used to assess current symptoms of major depression disorder (MDD). Suicidal ideation was defined as having been bothered by “thoughts that you would be better off dead or thoughts of hurting yourself in some way” for at least several days in the last 2 weeks. Cigarette smoking was assessed with a question about the amount of smoked cigarettes since 9/11. Mental health care was assessed with two questions about grief counseling and medication use related to the loss of 9/11.

Data Analysis

Our analytic approach was first to provide background characteristics for our sample. Chi-square analysis was used to compare patients with and without CG on demographics (age, gender, race/ethnicity, marital status, educational attainment, annual household income, employment status), type of loss (relationship of the deceased to the participant and location of the deceased on 9/11), and degree of traumatic exposure on 9/11 (participant’s location, watching the attacks live on television).

Multivariate logistic regressions were conducted to investigate the association between CG and the different variables. A logistic regression model using a hierarchical approach was performed to measure the relationship between the predictor variables and CG. We first entered demographics, then 9/11 loss variables, followed by exposure variables. Ninety-five percent confidence intervals (CIs) were calculated as estimators. Finally, we examined the associations between CG, other mental health conditions, and mental health care. We conducted comparisons between patients who did and did not screen positive for CG using logistic regression for the following categorical variables: PTSD, MDD, anxiety, suicidal ideation, post-9/11 smoking, grief counseling, and use of prescription drugs in the past month. Data analysis was conducted using SPSS software, version 12. Significance was set at .05, and all tests were two-sided.

RESULTS

Of the 704 participants who provided complete data, 559 (79%) were women and the mean age was 45.13 ($SD = 11.47$) years. Over 80% reported that their annual family income was \$40,000 or above, and 93% were White. Fifty-five percent were married. About 6 of 10 participants (64%) had completed at least 4 years of college education.

Approximately 91% (95% CI = 89%–93%) of the participants reported one or more current complicated grief symptoms, and a total of 304 (43%; 95% CI = 40%–47%) screened positive for current CG. The most commonly reported CG symptoms in the entire study group were yearning for the deceased (70%) and preoccupation with thoughts about the deceased that interrupt functioning (63%).

Descriptive statistics on the demographics, loss and the trauma exposure variables as a function of CG screening status are presented in Table 1. Complicated grief was more prevalent in the older age group (≥ 55 ; OR = 1.71, 95% CI = 1.26–2.31), in individuals with lower educational attainment (OR = 1.91, 95% CI = 1.40–2.61), and in those not gainfully employed (OR = 1.53, 95% CI = 1.11–2.13). Complicated grief was significantly related to a loss of a child on 9/11 (OR = 3.23, 95% CI = 2.14–4.88). The association of CG and loss of a child largely explains the relationship between age group and CG (68% of participants who were 55 years or older lost a child on 9/11, compared to 6% in the <55 group). Complicated grief was more common when the deceased was killed at the WTC site as compared to the Pentagon or as an airplane passenger (OR = 1.83, 95% CI = 1.20–2.79). Finally, watching the attacks live on TV was significantly associated with CG.

A logistic regression analysis was used to examine the multivariate associations between CG and the predictor variables. First, demographic variables were entered; age (OR = 2.70, 95% CI = 1.64–4.40), gender (OR = 2.67, 95% CI = 1.42–5.03), and level of education (OR = 1.65, 95% CI = 1.00–2.70) were significantly related to CG (data not shown). Once the loss variables were added to the regression model, age and level of education lost their significance, although gender remained significant

Table 1. Sociodemographic and Exposure Differences Between Individuals With and Without Positive Screen for Complicated Grief (CG)^a

Variable	CG Positive		CG Negative		Test
	<i>n</i>	%	<i>n</i>	%	
Age					$X^2(4, N = 694) = 16.90^{**}$
<35	43	32.6	89	67.4	
35–44	89	39.2	138	60.8	
45–54	78	45.1	95	54.9	
55–64	72	55.0	59	45.0	
65+	17	54.8	14	45.2	
Sex					$X^2(1, N = 704) = 1.55$
Male	56	38.6	89	61.4	
Female	248	44.4	311	55.6	
Race/ethnicity					$X^2(1, N = 694) = 1.35$
White	274	42.5	371	57.5	
Non-White	25	51.0	24	49.0	
Marital status					$X^2(3, N = 696) = 2.53$
Married	161	42.1	221	57.9	
Separated/divorced	28	39.4	43	60.6	
Widowed	73	48.3	78	51.7	
Never married	37	40.2	55	59.8	
Educational level					$X^2(2, N = 702) = 18.34^{***}$
High school graduate or lower	39	60	26	40.0	
Some college or Tech school	96	51.1	92	48.9	
At least 4 years of college	168	37.4	281	62.6	
Household income (annual)					$X^2(1, N = 595) = 2.68$
<\$40,000	61	50.8	59	49.2	
≥\$40,000	202	42.5	273	57.5	
Gainfully employed					$X^2(1, N = 618) = 6.74^{**}$
Yes	143	38.6	227	61.4	
No	122	49.2	126	50.8	
Relationship of deceased to participant					$X^2(4, N = 557) = 46.75^{***}$
Child	83	64.8	45	35.2	
Spouse	73	46.2	85	53.8	
Parent	17	35.4	31	64.6	
Other family member	47	33.8	92	66.2	
Non-family Member	19	22.6	65	77.4	
Location of deceased on 9/11					$X^2(2, N = 700) = 8.11^{**}$
World Trade Center (WTC)	267	45.8	316	54.2	
The Pentagon	12	34.3	23	65.7	
One of planes	25	30.5	57	69.5	
Participant location on 9/11					$X^2(1, N = 697) = 0.12$
WTC/lower Manhattan	35	43.8	45	56.3	
Other locations	266	43.1	351	59.9	
Watching the 9/11 attacks live on TV					$X^2(1, N = 589) = 12.99^{***}$
Yes	204	47.0	230	53.0	
No	47	30.3	108	69.7	

^aComplicated grief was assessed with the Complicated Grief Inventory. Participants screened positive for CG if they met all of the following: (a) Experienced loss in the 9/11 attack; (b) met at least the yearning symptom, and an additional four symptoms; and (c) these symptoms were experienced *often* or *always* (vs. *almost never*, *rarely*, or *sometimes*).

* $p < .05$. ** $p < .01$. *** $p < .001$.

(OR = 2.88, 95% CI = 1.48–5.60). In addition, loss of a child (OR = 3.70, 95% CI = 1.84–7.39), and location of the deceased on 9/11 (OR = 2.14, 95% CI = 1.17–3.89) were found to be significantly associated with CG (data not shown). When exposure variables were included in the final regression model (presented in Table 2), few significant relationships were found between the predictor variables and CG (Table 2). Specifically, there were no statistically significant associations between CG and age, ethnicity, marital status, level of education, household annual income, employment status, and location of the participant on 9/11. Female participants, individuals who lost a child, those who lost a close one at the WTC site, and individuals who were exposed to the attacks live on television were those participants who were more likely to have CG.

Examining the bivariate relationships between CG and comorbid mental health, counseling, and post 9/11 medication use, suggested a number of significant relationships. Approximately one half (51%) of the participants who screened positive for CG also met criteria for either MDD or PTSD; 43% met criteria for PTSD; and approximately one third (36%) of the responders who screened positive for CG also met criteria for MDD (presented in Table 3). A screen positive for CG was also significantly associated with anxiety, suicidal ideation, and increased post-9/11 smoking. Participants who screened positive for CG were also more likely than those without CG to seek grief counseling, and to report past-month use of prescribed medication for psychological problems related to 9/1 independent of MDD and PTSD.

DISCUSSION

Four in 10 participants from a large sample of adults who experienced 9/11 loss, screened positive for current complicated grief 2.5–3.5 years after the attacks. The high prevalence estimate in this sample (43%), albeit based on a convenience sample, underscore the debilitating and enduring consequences of traumatic loss in the context of terrorist and mass violence events (Galea et al., 2002; Galea et al., 2003; Neria, Gross, Gamberoff et al., 2006; Norris et al., 2002; Pfefferbaum

et al., 2001; Rynearson et al., 1993; Silver et al., 2002; Silverman, Johnson, & Prigerson, 2001; Spooen et al., 2000; Zvizdic & Butollo, 2001).

More than 6 in 10 participants who lost a child screened positive for CG in this study. This finding is consistent with a number of studies (Cleiren et al, 1994; Leahy, 1992; Levav et al., 1988; Nolen-Hoeksema & Larson, 1999; Sanders, 1979), which have consistently shown that the loss of an adult child might result in more intense or persistent grief than any other type of loss.

A significant percentage of participants with CG also had probable depression (36%) or PTSD (43%). Previous studies suggested somewhat comparable rates of co-occurrence of CG with depression (Prigerson et al., 1995), but no study to date has documented such a strong association between CG and PTSD (Silverman et al., 2001). The magnitude of this association might be related to our study design where participants were asked to refer to “loss during 9/11” as the PTSD Criterion A event. Therefore, it is possible that the presence of PTSD symptoms among participants with CG is mostly related to bereavement rather than to trauma exposure. However, the unprecedented nature of 9/11 attacks among persons who experienced loss might have created a dual emotional burden inflicted by intense exposure to mass violence event in addition to the experience of loss (Neria & Litz, 2004).

Consistent with post-9/11 studies that documented the relationship between exposure to television and PTSD on or after 9/11 (Ahern et al., 2002; Ahern, Galea, Resnick, & Vlhov, 2004; Galea et al., 2002; Schlenger et al., 2002), we found that having viewed the attacks live on television was strongly associated with CG, nearly half (47%) of these individuals screened positive for CG. It could be that those who were at risk of losing a loved one watched more television on 9/11 to obtain information about their loved one’s whereabouts. Alternatively, it could be that exposure to live coverage of mass violence is one of the many uniquely haunting memories that play a role in a range of long-term, postdisaster mental health problems (Ahern et al., 2004).

Previous research found that persons with unresolved grief were at high risk for suicide ideation (Latham &

Table 2. Multivariate Model Predicting Odds of Screening Positive for Complicated Grief

Variable	OR	95% CI
Age ≥ 45	1.51	0.83–2.76
Female gender	2.93**	1.50–5.77
Ethnicity Non-White	1.19	0.40–3.53
Marital status non-married	1.19	0.68–2.08
Educational attainment < college degree	1.64	0.97–2.78
Household annual income < 40,000	0.87	0.45–1.66
Not gainfully employed	1.04	0.62–1.74
Loss of a child	3.94***	1.92–8.06
Location of deceased on 9/11 at the WTC site	2.00*	1.08–3.72
Participant location on 9/11 WTC/lower Manhattan	1.74	0.19–15.67
Watched 9/11 attacks live on TV	2.74**	1.52–4.94

* $p < .05$. ** $p < .01$. *** $p < .001$.

Prigerson, 2004; Prigerson, Bridge, et al. 1997). Our findings indicate that persons who screen positive for CG have high rates of suicidal ideation after adjusting for comorbid depression. From a public health perspective, this finding supports the importance of screening bereaved individuals for suicide risk.

Individuals who screened positive for CG reported higher utilization of mental health care services after 9/11. Other studies that focused on the general population and on war veterans suggested that visits to mental health professionals and use of psychiatric drugs decreased over time after the 9/11 attacks (Boscarino et al., 2004; Galea et al., 2002), or were unchanged (Druss & Marcus, 2004;

Rosenheck, & Fontana, 2003, Neria, Gross, Gameroff et al., 2006). Our findings suggest that persons with CG received more grief counseling after 9/11, and reported more current (past month) psychotropic drugs use, compared to those without CG. These findings highlight the considerable need for effective grief-focused mental health services following mass violence with multiple casualties. Effective treatment for CG may depend on increasing recognition of the disorder in the community and successful dissemination of available evidence-based treatments to clinicians. Few grief-focused treatments are available to date (Prigerson & Jacobs, 2001), and only one trial demonstrated specificity of

Table 3. Comorbid Psychopathology and Mental Health Care Among Participants Who Did and Did Not Screen Positive for Complicated Grief (CG)

Variable	% of CG Positive with condition	% of CG Negative with condition	OR	95% CI
PTSD	43.3	5.0	14.55***	8.32–25.46
MDD	36.0	7.2	7.26***	4.40–11.96
Any of the above disorders	50.8	9.9	9.41***	6.07–14.58
Overall anxiety	33.6	7.2	6.53****	3.97–10.74
Suicidal ideation	34.9	11.9	3.97***	2.58–6.10
Increase in smoking after 9/11	36.0	19.2	2.38***	1.48–3.82
Grief counseling after 9/11	73.8	63.2	1.65***	1.19–2.28
Psychotropic prescription drug after 9/11	39.1	16.3	3.29***	2.23–4.86

Note. PTSD = Posttraumatic Stress disorder; MDD = major depressive disorder.

** $p < .01$. *** $p < .001$.

a psychosocial treatment approach (Shear et al., 2001; Shear et al., 2005). In a recent report, Marshall, Amsel, Neria, and Suh (2006) provided preliminary data on a post 9/11 dissemination program to train frontline clinicians in a manualized treatment for CG (Shear et al., 2001; 2005). We noted a high demand for effective grief-related interventions to be provided by trained clinicians involved in grief-related work in a postdisaster environment.

Our study has several limitations and results must be interpreted carefully. First, selection bias likely limits the generalizability of the findings, and may compromise internal validity. If those most affected were more likely to participate in the study, the prevalence of CG and its association with other mental health problems might be inflated. If, however, those most affected were less likely to participate in our study, the results would underestimate the true effects of traumatic loss. Second, due to the cross-sectional nature of data collection, it is impossible to establish causal or temporal relationships between CG, PTSD, and MDD. Third, a self-report CG instrument was used, for which there are yet no well-established psychometrics in persons who have experienced traumatic loss and some overlap between this instrument, MDD and PTSD is likely to exist. Fourth, lack of information with regard to previous psychological disorders, trauma exposure, and the immediate subjective response to the event might have hampered a more systematic investigation of potential predictors of CG. Fifth, this study did not examine the role of post 9/11 intervening events such as secondary victimization in CG. Finally, this study was unlikely to include individuals without keyboard literacy and Internet access.

Nevertheless, this study provides data on the largest group of individuals who experienced traumatic loss on 9/11 studied thus far, and establishes a unique cohort of persons affected by unprecedented trauma. Other strengths of this study include the neutrality and anonymity provided by administering emotionally loaded questions by means of a Web-based study design (Schlenger et al., 2002; Silver et al., 2002).

In conclusion, symptoms of complicated grief in individuals who experienced traumatic loss following 9/11 were common, clinically significant, and strongly associ-

ated with a range of comorbid conditions, suicidal ideation, and mental health care. Catastrophic mass-violence acts, such as the 9/11 attacks, occur indiscriminately with regard to personal histories and demographic profiles of the affected individuals (Norris et al., 2002). Studying the long-term impact of such events, and assessing the clinical needs of individuals affected by their magnitude, might provide the knowledge needed to plan for public health interventions. Improving awareness and knowledge on detection and management of postloss morbidity will enhance preparedness for the future.

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