HHS Public Access

Author manuscript

Int J Emerg Ment Health. Author manuscript; available in PMC 2015 March 13.

Published in final edited form as:

Int J Emerg Ment Health. 2015 ; 17(1): 274–282.

Volunteerism and Well-Being in the Context of the World Trade Center Terrorist Attacks

Richard E. Adams, Ph.D.[1] and **Joseph A. Boscarino, Ph.D., MPH**[2,3,4,*]

[1]Department of Sociology, Kent State University, Kent, OH, USA

[2]Center for Health Research, Geisinger Clinic, Danville, PA, USA

[3]Department of Psychiatry, Temple University School of Medicine, Philadelphia, PA, USA

[4]Departments of Medicine & Pediatrics, Mount Sinai School of Medicine, New York, USA

Abstract

Using a community sample of New York City residents (N=1681) interviewed 1 and 2 years after the World Trade Center Disaster (WTCD), we estimated several logistic regression equations to assess predictors of volunteerism and the relationship between volunteerism and later well-being. Multivariate results show that those with more education, higher exposure to WTCD events, many life-time traumatic events, and pre-WTCD mental health problems were more likely to report volunteerism post-WTCD. African Americans and Latinos were less likely to volunteer, compared to Whites. Respondents scoring high on the Srole Anomie scale and reporting physical disabilities were also less likely to report volunteering in the aftermath of the WTCD. Multivariate results with volunteerism as an independent variable suggest that people who engaged in this activity were less likely to have poor well-being as measured by the SF-12 physical and mental health scales. We discuss these results as they relate to identity theory, the stress process model, and resilience and how community disaster researchers need to pay closer attention to how people interpret and give meaning to traumatic events.

Keywords

Community disasters; *volunteerism*; *well-being*; *identity salience*; *resilience*; *social psychology*

Over the past 30 years, a number of studies have examined the physical and mental health consequences of community disasters (Adams, Boscarino, & Galea, 2006; Adams et al., 2002; 2011; Bromet, 2012; Bromet et al., 2011; Bromet, Parkinson, & Dumm, 1990; DiGrande, Neria, Brackbill, Pulliam, & Galea, 2010; Dhara, Dhara, Acquilla, & Cullinan, 2002; Goldmann & Galea, 2014; Norris et al., 2002; North, Pfefferbaum, Tivis, Kawasaki, & Spitznagel, 2004; van Griensven et al., 2006). The majority of these studies have reported that survivors often suffer from a wide range of physical and mental health problems, sometimes for years after the event (Bromet et al., 2011; Norris et al., 2002). On the other

*Correspondence regarding this article should be directed to: jaboscarino@geisinger.edu.

Previous Presentation A version of this paper was previously presented at the 63rd Annual Meeting of the Society for Study of Social Problems (SSSP), New York, NY, August, 2013.

hand, most survivors seem to experience these traumatic events with relatively little decline in their well-being (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Brewin, Andrews, & Valentine, 2000; Goldmann & Galea, 2014; Knudsen, Roman, Johnson, & Ducharme, 2005).

There are several lines of research which attempt to explain why some survivors of trauma show relatively few physical and psychological problems, while others experience an array of disorders, such as posttraumatic stress disorder (PTSD), substance use disorders, depression, and lower physical well-being. First, a number of researchers focus on individual survivors' resilience or psychological hardiness (Bonanno et al., 2006; Goldmann & Galea, 2014; Luthar & Dante, 2000). Located mostly in the psychological literature, studies on resilience contend that some individuals are psychologically better able to meet the challenges of a stressful event and emerge from it relatively unharmed.

Second, based on the stress process model (Pearlin et al., 1981; Pearlin, 1999), studies have shown that individuals confronted with a disordered or challenging environment respond both physiologically, through alterations in the neuroendocrine and hormone systems (Boscarino, 1997; 2008), and psychologically, usually through alterations in cognitive functioning (Turner, Wheaton, & Lloyd, 1995). The consequence of exposure to stressful events can be decreased well-being, often in the form of depression, stress response disorders (e.g., PTSD), or poor physical health (Adams & Boscarino, 2011; Adams et al., 2006; 2011; Boscarino & Adams, 2008; Turner et al., 1995). However, people who have various types of social and psychological resources, such as those with high social support and self-esteem, typically endure these events with few physical or psychological problems (Adams et al., 2006).

A third perspective comes from identity theory in social psychology, which has roots in symbolic interactionism (Simon, 1997; Thoits, 2012). This perspective argues that people assign meanings to objects and people, including themselves, within social contexts (Rosenberg, 1979; Stryker & Vryan, 2003). Many of these self-definitions are tied to social roles (e.g., father, brother, student, academic, etc.). Negative life events that impact one or more important role identity can have a greater impact on a person's well-being, compared to negative events affecting less important identities (Thoits, 2012; Thoits & Hewitt, 2001). On the other hand, enacting valued, salient identities (i.e., self-definitions about social roles that are important to people and influence their behavior, give meaning to their lives, and provide a sense of purpose) can enhance psychological health (Thoits, 2012). In these instances, successfully meeting the expectations of salient social roles positively affects well-being because identities provide individuals with purpose and a way to find meaning in their lives. In other words, they provide a partial answer to the existential of question, “Who am I?”

VOLUNTEERISM AND COMMUNITY DISASTERS

Following Wilson (2000: 215), we define volunteerism as “any activity in which time is given freely to benefit another person, group, or organization.” A number of studies look at factors that explain who provides help to others during and after a community disaster.

Research tends to show that people with more economic resources are more likely to volunteer as are those who are more religiously active (Beyerlein & Sikkink, 2008; St. John & Fuchs, 2002). People who are personally affected by the disaster (e.g., experience property damage, know someone hurt or killed) identify with it more strongly and are, therefore more likely to volunteer compared to those who are less affected and have a weaker identification (Beyerlein & Sinkkink, 2008). Thus, imagining the adverse circumstances of others may increase the desire to volunteer. Beyerlein and Sinkkink (2008) analyze data from the Religion and Public Activism Survey and find support for their contention that people volunteered to help relief efforts in the post-9/11 period, in part, as an expression of their "identity as an American."

From an identity theory perspective, helping others is an intentional act which reflects the person's attempt to validate the definition of one's self via the volunteer role (Finkelstein et al., 2005; Thoits, 2012). Although the initial desire to volunteer often comes from external sources like parental, religious, or school expectations, the individual can internalize the volunteer role as a component of the self or role identity (Callero, Howard, & Piliavin, 1987; Finkelstein et al., 2005). This process has the same underlying source as expressing one's patriotism and identity as an American in the Beyerlein and Sinkkink (2008) study: a motivation to validate a salient identity through activities that help others affected by a community disaster.

Given the importance of volunteerism in a community's response to a disaster, it is surprising how little research has been conducted on this activity. Past research consistently demonstrates the positive effects of helping others on people's well-being (Binder & Freytag, 2013; Li & Ferrero, 2006; Musick & Wilson, 2003; Wilson, 2012). In a recent paper, for example, Thoits (2012) examined the association between the volunteer role and several measures of well-being. Using data collected from former heart attack patients who volunteer to visit current patients, Thoits (2012) found that time spent in the volunteer role increased feelings of mattering to others and purpose/meaning in life, which, in turn enhanced happiness, life satisfaction, self-esteem and mastery. The positive effect of volunteering on well-being during a disaster was also found for individuals helping during a large oil spill in New Zealand (Sargisson et al., 2012) and in the aftermath of the World Trade Center Disaster (WTCD) (Steffen & Fothergill, 2009). Given these findings and drawing on concepts from the stress process model and identity theory, we hypothesize individuals who participated in volunteer efforts in the post-WTCD rescue efforts will have higher well-being one year later, compared to those who did not report any voluntary participation in these efforts, controlling for other factors that influence well-being.

METHODS AND DATA

Data for this paper come from a prospective cohort study of adults living in New York City on the day of the terrorist attacks against the World Trade Center (September 11, 2001) and on the day contacted for the baseline interview. Using random digit-dialing, we conducted a baseline survey 1 year after the attacks (October–December, 2002). A follow-up survey occurred 1-year later (October 2003–February 2004). Interviews were conducted in English and Spanish. Questionnaires were translated into Spanish and then back-translated by

bilingual Americans to ensure linguistic and cultural appropriateness. For the baseline, 2,368 individuals completed the survey. We were able to re-interview 1,681 of these respondents in the follow-up survey. Using standard survey definitions, the baseline cooperation rate was 63% (American Association for Public Opinion Research, 2008), and the re-interview rate was 71%, consistent with previous investigations (Galea et al., 2008; North et al., 2004).

The primary aim of the overall study was to assess service utilization in the aftermath of the WTCD. Therefore, we over-sampled NYC residents who reported receiving mental health treatment a year after the attacks by use of screener questions at the beginning of the survey. The baseline population was also stratified by the 5 New York City (NYC) boroughs and gender, and was sampled proportionately. Sampling weights were developed for each wave to correct for potential selection bias and for the over-sampling of treatment-seeking respondents (Groves, Fowler, Couper, Lepkowski, Singer, & Tourangeau, 2009). Thus, even though we oversampled persons who received treatment during the baseline survey, the survey weights take this sampling into account. Demographic weights also were used to adjust follow-up data for slight differences in re-interview rates by demographic groups (Kessler, Little, & Groves, 1995). With these survey adjustments, our study is representative of adults living in NYC on the day of the WTCD (Adams & Boscarino, 2005; Adams et al., 2006). Additional details on these data are available elsewhere (Boscarino & Adams, 2008). The Geisinger Clinic Institutional Review Board (IRB; Danville, PA), currently serves as the IRB of record for this study.

Dependent Variables

Volunteerism—The baseline survey asked respondents a series of questions about specific ways they could have helped in the post-WTCD rescue efforts (see Appendix 1 for a complete list). For this study, we focused on voluntary help that was not part of the person's job (e.g., professional counseling services) and was a service that the person actively did (e.g., donate blood), rather than a more passive type behavior (e.g., cheered rescue workers, prayed). Thus, we divided our sample into two groups, respondents engaged in active volunteer work related to the WTCD where those who replied yes to any of the following—donated time, money, blood, or food to the rescue effort or gave shelter to the rescue workers—versus those who did not report any active volunteerism (0=no volunteer help vs. 1=any volunteer help).

Our measure of volunteerism is similar to the one used by St. John and Fuchs (2002) in their study of volunteerism in the aftermath of the Oklahoma City bombing. Like their measure, ours focuses on concrete behaviors that respondents reported doing, including only items that we classify as active helping behavior. Other studies of volunteerism ask more general questions about “ever volunteering” or “volunteering in unpaid work,” without reference to particular acts (e.g., Binder & Freytag, 2013; Finkelstein et al., 2005). In their study on volunteerism and depression, for example, Musick and Wilson (2003) ask respondents “if they had done volunteer work” for religious and secular organizations. An additional strength of our data regarding volunteerism is that we have both volunteers and non-volunteers. Thus, we can assess factors that influence volunteering and the extent to which volunteering influences later physical and psychological well-being. Other studies that

sample only volunteers (e.g., Thoits, 2012) focus on the amount of time spent volunteering and its association with well-being, but cannot examine why some people volunteer, while others do not.

Well-Being Outcomes—We included five different measures of mental and physical well-being from the follow-up survey as outcomes. First, for major depression, we used a version of the Structured Clinical Interview for DSM Disorders (SCID) major depressive scale from the non-patients version (Spitzer, Williams, & Gibbon, 1987), which has been used in several telephone-based population surveys (Acierno et al., 2000; Galea et al., 2008; Kilpatrick et al., 2003). Following Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria (American Psychiatric Association [APA] 1994), we classified respondents as being depressed if they had five or more symptoms for at least two-weeks (Cronbach's alpha=0.87). Second, we assessed anxiety using the Brief Symptom Index-18 (BSI-18) anxiety subscale. The BSI-18 is a short version of the Symptom Checklist-90, a widely used measure of psychological distress having excellent psychometric properties (Asner-Self, Schreiber, & Marotta, 2006; Derogatis, 2001). The questions asked respondent to assess anxiety related distress during the past 30 days (Derogatis, 2001). General physical and psychological well-being was assessed using the Short Form-12, version 2 (SF-12-v2). This scale consisted of 12 items scored so that high scores reflect better health (Cronbach's alpha=0.87). Following recommended scoring algorithms, the items were converted into standardized T-scores and summed to form two scales (Ware, Kosinski, & Keller, 1996). In our study, we used the recommended score of less than 35 to define individuals as unhealthy cases for each measure. Finally, our PTSD outcome was based on the DSM-IV (APA, 1994). This measure was developed for telephone administration and used in previous national surveys (Kilpatrick et al., 2003), as well as in WTCD studies (Galea et al., 2008). To be classified as having PTSD, a respondent had to meet all DSM criteria (A through F) for one or more traumatic events (Cronbach's alpha=0.90). We report elsewhere data supporting the validity of this PTSD instrument (Adams & Boscarino, 2005; Boscarino & Adams, 2008).

Independent Variables

Demographic Characteristics—Our analyses included 7 demographic variables: age, gender, marital status, household income, education, church attendance, and race/ethnicity. Age was coded to the nearest year and dummy coded: 18–44 vs. 45+ years old. Gender, marital status, income, education, and church attendance were also dummy coded with male, not married, income less than $40,000, and attendance less than once a week as the reference categories. Race/ethnicity was self-identified. We classified all respondents as follows: non-Hispanic White, non-Hispanic Black or African American, Hispanic, and Other Race/No Race Given.

Stress/Risk and Moderator Factors—Our analyses included measures for four stress/risk factors, two social resources, and one pre-WTCD psychological health status variable. The first stressor was WTCD event exposure, which was the sum of 12 possible events (yes; no) that the respondent could have experienced during the attacks (e.g., in the towers when plane hit, forced to move, lost job as a direct result of the WTCD). We dummy coded

participants into two groups: those experiencing 0–2 vs. those reporting 3 or more events. Second, the survey contained five alienation/anomie questions from the Srole Anomie Scale (Cronbach's alpha=0.69), reflecting alienation from government or a pessimistic view of society's future (Srole, 1956). The Srole Anomia Scale is the sum of five items, with scores ranging from 5 to 20. For the current study, we dummy coded the scale: scores 15 or lower vs. 16 or higher. Third, the Negative Life Events scale (Freedy, Kilpatrick, & Resnick, 1993) was the sum of eight experiences that the respondent could have had in the 12 months before the WTCD (e.g., divorce, death of spouse, problems at work), dummy coded: 0 or 1 vs. 2 or more events. The fourth measure focused on 10 lifetime traumatic events (Freedy et al., 1993), other than the WTCD (e.g., forced sexual contact, being attacked with a weapon, serious accident). The items were dummy coded: no traumatic events vs. one or more events.

The two social resource variables were self-esteem (Rosenberg, 1979) and social support (Sherbourne & Stewart, 1991). The self-esteem measure was the mean of a shortened version of Rosenberg's self-esteem scale (Cronbach's alpha=0.73) and dummy coded: low (scores 4 or lower) vs. high (scores of 5+) self-esteem. Our social support measure was the mean of four questions (Cronbach's alpha=0.83) about emotional, informational, and instrumental support (range 4–16), coded: low (score less than 14) vs. high (score of 14+) social support.

Finally, the analyses address the possibility that physical health or pre-WTCD psychological problems influenced helping behavior and our post-WTCD well-being outcomes. For physical health, the baseline survey had a single item asking if respondents had any current physical disabilities or handicaps that limited their work or physical activities (0=no; 1=yes). The survey also inquired about life-time PTSD, depression, and panic attacks. A yes to any of these three psychological problems occurring before the WTCD was dummy coded 1, otherwise it was coded a 0. These scales and measures have been validated in previous studies (Adams et al., 2006; Adams & Boscarino, 2005; Boscarino & Adams, 2008).

Statistical Analysis

We present the bivariate cross-tabular results for volunteerism by the demographic characteristics of our sample, the stress/risk factors, and the physical limitations and pre-WTCD mental health problems variables (Table 1). We also present tabular results for volunteerism by our five outcome measures (Table 2). Following those analyses, we estimate a logistic regression with volunteerism as the dependent variable and demographic, stress/risk, resource, anomie, baseline disabilities, and pre-WTCD mental health problems as predictors (Table 3). Finally, in order to assess the role of volunteerism at baseline on well-being at follow-up, we estimated five multivariate logistic regressions, with demographic, stress, resource, and pre-WTCD mental health problems as independent variables. Due to the sampling design, we use the survey estimation (svy) command set in Stata, version 13 (Stata Corporation 2013) to generate our frequency distributions, cross-tabulations, and logistic regression models. This estimation procedure adjusts the data for our sampling design, which included stratification by city borough and gender, and for case weights.

RESULTS

As reported elsewhere (Adams & Boscarino, 2005), our sample did not deviate from NYC Census data for age, gender, race, or borough, which suggests that it is not biased by cooperation rate or sample selection. As Table 1 shows, survey respondents who actively provided some type of voluntary help to the post-WTCD rescue and recovery efforts were from higher income households, tended to be better educated, and were White. Gender, marital status, and church attendance had no significant association with helping behavior. In terms of stress/risk and resource factors, volunteering was related to greater exposure to WTCD events, experiencing a traumatic event other than the WTCD, and reporting some type of pre-WTCD mental health problem. Unsurprisingly, people who scored high on the Srole Anomie Scale and who had a physical health disability or handicap were less likely to actively volunteer. Interestingly, negative life events and social/psychological resources like self-esteem and social support were unrelated to volunteerism.

Turning to the five outcomes (Table 2), engaging in active helping behavior at baseline is related to better physical and mental health a year later. More specifically, people who report actively volunteering to help in the post-WTCD rescue and recovery efforts were more likely to be healthy on both the SF-12 physical and mental health measures a year later. In addition, there was a statistically significant association for people involved in volunteer work to be less anxious a year later. Volunteerism was not related to depression or PTSD.

The results for a multivariate logistic equation, with volunteerism as the dependent variable, are presented in Table 3. Looking first at demographic characteristics, participants with higher education (OR=1.44) were more likely to provide voluntary help compared to the less educated. In addition, both African Americans (OR=0.62) and Latinos (OR=0.63) reported less volunteerism relative to Whites. Voluntary helping behavior was also related to high WTCD event exposure (OR=1.56), experiencing a lifetime traumatic event (OR=1.43), and having a pre-WTCD mental health problem (OR=1.59). Finally, respondents scoring high on the Srole Anomie Scale and those reporting physical health problems or handicaps at baseline were less likely to engage in helping behaviors (ORs = 0.63 and 0.59, respectively).

The final set of analyses examined how reported volunteerism at baseline relates to our five well-being outcomes at follow-up (Table 4). Overall, those who responded that they engaged in voluntary helping behavior had better physical and mental health a year later, compared to respondents who did not report such behavior. However, only for two of the outcomes do these associations reach statistical significance: SF-12 mental and physical health at follow-up (OR=0.38 and 0.45, respectively). There is a trend (OR=0.66), $p<0.10$) between volunteerism and BSI Anxiety at follow-up.

The other independent variables display a pattern which is similar to what disaster researchers report in previous studies. More specifically, for depression at follow-up, none of the demographic variables were statistically significant, except for Latinos who were more likely to be depressed compared to Whites. As expected, people who had many WTCD exposures, negative life events, low self-esteem, and pre-WTCD mental health

problem were more likely to meet study criteria for depression. A similar pattern of association can be seen for the BSI-Anxiety: Educated people are less anxious, whereas Latinos are more anxious at follow-up. Respondents were also more anxious at follow-up if they experienced many WTCD events, more negative life events, had lower self-esteem, and had a pre-WTCD mental health problem.

Turning to the two SF12 subscales, women tended to be classified as psychologically unhealthy. Poor mental health at follow-up was also related to experiencing more WTCD events, more negative life events, and lower self-esteem one year earlier. Poor physical health at follow-up was associated with being older, having a lower household income, being less educated, being Latino, and experiencing more negative life events at baseline.

Finally, meeting study criteria for PTSD was not related to any of the demographic characteristics that we examined, controlling for other variables in the model, except for Latinos who had an elevated probability of suffering from this psychological problem. Respondents were also more likely to meet criteria for PTSD if they experienced many WTCD events, many negative life events, and many traumatic events. People with high self-esteem had a lower probability of meeting criteria for PTSD. None of the other variables were statistically significant.

DISCUSSION

This prospective study focused on the role of volunteerism on well-being among a sample of NYC residents exposed to the WTCD. The impact of voluntarily helping others during a community disaster on well-being has been mixed in the literature. Studies which take an epidemiological perspective tend to show that such activities have negative consequences on physical and mental health (Thormar et al., 2010). Conversely, research on volunteerism from an identity perspective in social psychology suggests that these activities can have beneficial effects on physical and mental well-being (Thoits, 2012). Overall, the results from the current study lend tentative support to the claim that engaging in voluntary helping behavior in the post-WTCD rescue efforts had positive associations with our outcome measures a year later and is, therefore, more in line with predictions from identity theory. The results do not support the claim that disaster survivors are at greater risk for mental and physical health problems as a consequence of their volunteer work.

There are popular perceptions that people typically behave in panicked or irrational ways during a community disaster (Boscarino, Figley, & Adams, 2003; Voorhees, 2008). The mass media often focus on looting and other deviant acts in the post-disaster environment or emphasize how people fled in panic from the disaster site. In contrast, much of the research on disasters suggests that people often take rational actions and tend to help those less fortunate in the post-disaster environment (Voorhees, 2008; St. John & Fuchs, 2002).

Who were the people most likely to report volunteering in the aftermath of the WTCD? As found in other studies (e.g., Li & Ferraro, 2006; Penner & Finkelstein, 1998; St. John & Fuchs, 2002), those with greater material resources (e.g., college graduate) and exposure to stressful events (e.g., WTCD exposure, lifetime traumas) had a higher probability of

volunteering, while being a racial/ethnic minority and having physical health limitations reduced the likelihood of this prosocial behavior. It is noteworthy that church attendance was not significantly related to volunteerism in either the bivariate or multivariate analyses, as might be expected based on previous research (e.g., St. John & Fuchs, 2002). Interestingly, age, gender, income, all of which were related to volunteering in previous research, did not have an association with this outcome in our study. From an identity theory perspective, while material resources may allow a person to more easily enact a valued identity (volunteer), it is possible that self-definitions around being someone who has suffered similar adversities increase the salience of the volunteer identity, and make it more likely that the individual will engage in behavior compatible with this identity. Since we do not have measures of identity or of pre-WTCD volunteerism, future research should explore these factors more thoroughly.

On the other hand, Stryker and Vryan (2003) and others within the identity perspective (e.g., Simon 1995; Simon & Marcussen 1999) note that one's place in the stratification system influences the salience of some identities (e.g., mother for women, worker for men). Our work here suggests that Whites, even after controlling for economic status, are more likely to volunteer during the WTCD, compared to African Americans or Latinos. Why this might be the case is, at present, unknown. Since very little work has been conducted on volunteerism during community disasters, future research needs to place individual volunteers within a social context and assess how different contexts and social statuses (e.g., gender, race, social class) affect the meanings a person has for the volunteer identity, particularly for racial and ethnic minorities. Similar arguments can be made for the need to examine the link between volunteerism and resiliency.

Our results need to be considered in the context of the study's limitations and strength. We excluded individuals without telephones or those who spoke a language other than English or Spanish in our sampling frame. Thus, our generalizations are limited with respect to recent immigrants and language groups living in NYC who do not speak English or Spanish. Given that our measures are self-reported, there may also be some cultural difference in reporting psychological symptoms, as well as issues recalling past traumas, psychological problems, or volunteerism. As noted above, our study did not include direct measures of identity salience or pre-disaster volunteerism, which are additional study limitations. The strengths of the study include data collected from a large, representative sample of NYC residents, the assessment of physical and mental well-being using well known, respected measures, a theoretically driven focus on identities and the stress process model to help explain the results of our analyses, and the use of the longitudinal data to strengthen our findings by time-ordering some of the variables in the model.

Most research on the physical and mental health consequences of community disasters take an epidemiological perspective and treat demographic (e.g., race/ethnicity or gender) and psychological (e.g., mastery) variables as risk or protective factors (e.g., Dhara et al., 2002; DiGrande et al., 2011; Gala et al., 2008; Norris et al., 2002; van Griensven et al., 2006), but these studies rarely offer theoretical reasons for why gender or race/ethnicity raise or lower a person's risk for problems after surviving a community disaster. Alternatively, many researchers use the stress process model (e.g., Adams et al., 2002; Adams et al., 2006;

Bromet et al., 2011; Lu, 2011), which rarely includes the meanings events have for disaster survivors or how traumatic events might impact important identities. Recent articles by McLeod (2012) and Thoits (2012) argue that the stress process perspective can be improved in its ability to predict physical and mental health problems by including how people attach meaning to these events, how stressors relate to people's self-definitions, and how traumatic events impact salient identities. Perceptions of stressful events were included in earlier formulations of the stress process (e.g., Lazarus & Folkman, 1984), and future researchers should look for ways to include how people interpret traumatic events in studies of community disasters (see also Adams et al., 2011). The resilience literature also focuses on traumatic events and the ways they can change how people see themselves and relate to others, again suggesting the need to research how this concept relates to trauma and identities within the context of a community disaster.

Binder and Freytag (2013) offer convincing evidence that not only does volunteerism improve psychological and physical health, but that the longer one engages in this pro-social behavior, the stronger the effects on well-being become. Given these apparent positive consequences for volunteering, policy makers and disaster officials should consider developing training efforts and allocating research funding around organizing communities and survivors to help themselves following a community-wide disaster. Oftentimes, at least in the immediate aftermath, this is all there is in the community.

Acknowledgments

Support Supported in part by grants from the National Institute of Mental Health (Grant # R01-MH-066403 and R21-MH-086317) and the Pennsylvania Department of Health (Contract #4100042573), to Dr. Boscarino.

Appendix 1

Type of help that respondents could have provided to the post-WTCD rescue efforts. (**Bolded** items included in the active voluntary help measures.)

Work at site-EMT

Work at site-healthcare professional

Work at site-construction personnel

Worked at hospitals-healthcare personnel

Volunteered time at rescue centers

Donated/prepared/served food

Donated blood

Tried to donate blood, but turned away

Donated money/supplies

Professional counseling services

Informally counseled family members/people who were upset

Gave shelter to displaced persons

Attended memorial services

Prayed/prayer group/prayer vigil (prayed)

Cheered on rescue workers

REFERENCES

Acierno R, Kilpatrick DG, Resnick HS, Saunders B, De Arellano M, Best C. Assault, PTSD, family substance use, and depression as risk factors for cigarette use in youth: findings from the National Survey of Adolescents. Journal of Traumatic Stress. 2000; 13:381–396. [PubMed: 10948480]

Adams RE, Boscarino JA. Stress and well-being in the aftermath of the World Trade Center attack: The continuing effects of a community-wide disaster. Journal of Community Psychology. 2005; 33:175–190. [PubMed: 17106484]

Adams RE, Boscarino JA. A structural equation model of perievent panic and posttraumatic stress disorder after a community disaster. Journal of Traumatic Stress. 2011; 24:61–69. [PubMed: 21351165]

Adams RE, Boscarino JA, Galea S. Social and psychological resources and health outcomes after World Trade Center disaster. Social Science & Medicine. 2006; 62:176–188. [PubMed: 16002196]

Adams RE, Bromet EJ, Panina N, Golovakha E, Goldgaber D, Gluzman S. Stress and well-being in mothers of young children 11 years after the Chornobyl nuclear power plant accident. Psychological Medicine. 2002; 32:143–156. [PubMed: 11883724]

Adams RE, Guey LT, Gluzman SF, Bromet EJ. Psychological well-being and risk perceptions of mothers in Kyiv, Ukraine, 19 years after the Chornobyl disaster. International Journal of Social Psychiatry. 2011; 57:637–645. [PubMed: 21813484]

American Association for Public Opinion Research. Standard definitions: Final dispositions of case codes and outcomes rates for surveys. American Association for Public Opinion Research; Ann Arbor, MI: 2008.

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th Ed. American Psychiatric Association; Washington, DC: 1994.

Asner-Self KK, Schreiber JB, Marotta SA. A cross-cultural analysis of the Brief Symptom Inventoory-18. Cultural Diversity and Ethnic Minority Psychology. 2006; 12:367–375. [PubMed: 16719583]

Binder M, Freytag A. Volunteering, subjective well-being and public policy. Journal of Economic Psychology. 2013; 34:97–119.

Bonanno GA, Galea S, Bucciarelli A, Vlahov D. Psychological resilience after disaster: New York City in the aftermath of the September 11th terrorist attack. Psychological Science. 2006; 17:181–186. [PubMed: 16507055]

Boscarino JA. Diseases among men 20 years after exposure to severe stress: Implications for clinical research and medical care. Psychosomatic Medicine. 1997; 59:605–614. [PubMed: 9407579]

Boscarino JA. Psychobiologic predictors of disease mortality after psychological trauma: Implications for research and clinical surveillance. Journal of Nervous and Mental Disease. 2008; 196:100–107. [PubMed: 18277217]

Boscarino JA, Adams RE. Overview of finding from the World Trade Center Disaster Outcome Study: Recommendation for future research after exposure to a psychological trauma. International Journal of Emergency Mental Health. 2008; 10:275–290. [PubMed: 19278144]

Boscarino JA, Adams RE, Figley CR. Mental health service use after the World Trade Center Disaster. Journal of Nervous and Mental Disease. 2011; 199:91–99. [PubMed: 21278537]

Boscarino JA, Figley CR, Adams RE. Fear of terrorism in New York after the September 11 terrorist attacks: Implications for emergency mental health and preparedness. International Journal of Emergency Mental Health. 2003; 5:199–209. [PubMed: 14730761]

Boscarino JA, Kirchner HL, Hoffman SN, Sartorius J, Adams RE. PTSD and alcohol use after the World Trade Center attacks: A longitudinal Study. Journal of Traumatic Stress. 2011; 24:515–525. [PubMed: 21882246]

Brewin CR, Andrews B, Valentine JD. Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. Journal of Consulting and Clinical Psychology. 2000; 68:748–766. [PubMed: 11068961]

Bromet EJ. Mental health consequences of the Chernobyl disaster. Journal of Radiological Protection. 2012; 32:71–75.

Bromet EJ, Parkinson DK, Dunn LO. Long-term mental health consequences of the accident at Three Mile Island. International Journal of Mental Health. 1990; 19:48–60.

Bromet EJ, Guey LT, Taormina DP, Carlson GA, Havenaar JM, Kotov R, Gluzman SF. Growing up in the shadow of Chornobyl: Adolescents' risk perceptions and mental health. Social Psychiatry and Psychiatric Epidemiology. 2011; 46:393–402. [PubMed: 20221882]

Beyerlein K, Sikkink D. Sorrow and solidarity: Why Americans volunteered for 9/11 relief efforts. Social Problems. 2008; 55:190–215.

Callero PL, Howard JA, Piliavin JA. Helping behavior as role behavior: Disclosing social structure and history in the analysis of prosocial action. Social Psychology Quarterly. 1987; 50:247–256.

Derogatis, LR. Brief Symptom Inventory 18: Administration, Scoring, and Procedures Manual. NCS Pearson, Inc; Minneapolis, MN: 2001.

Dhara VR, Dhara R, Acquilla SD, Cullinan P. Personal exposure and long-term health effects in survivors of the Union Carbide Disaster at Bhopal. Environmental Health Perspectives. 2002; 110:487–500. [PubMed: 12003752]

DiGrande L, Neria Y, Brackbill RM, Pulliam P, Galea S. Long-term Posttraumatic Stress Symptoms among 3,271 civilian survivors of the September 11, 2001, terrorist attacks on the World Trade Center. American Journal of Epidemiology. 2011; 173:271–281. [PubMed: 21190987]

Finkelstein MA, Penner LA, Brannick MT. Motive, role identity, and prosocial personality as predictors of volunteer activity. Social Behavior and Personality. 2005; 33:403–418.

Freedy JR, Kilpatrick DG, Resnick HS. Natural disasters and mental health: Theory, assessment, and intervention. Journal of Social Behavior and Personality. 1993; 8:49–103.

Galea S, Ahern J, Tracy M, Hubbard A, Cerda M, Goldmann E, Vlahov D. Longitudinal determinants of posttraumatic stress in a population-based cohort study. Epidemiology. 2008; 19:47–54. [PubMed: 18091003]

Goldmann E, Galea S. Mental health consequences of disasters. Annual Review of Public Health. 2014; 35:169–183.

Groves, RM.; Fowler, FJ.; Couper, MP.; Lepkowski, JM.; Singer, E.; Tourangeau, R. Survey Methodology. Wiley Publishing; Hoboken, NJ: 2009.

Kessler RC, Little RJ, Groves RM. Advances in strategies for minimizing and adjusting for survey nonresponse. Epidemiologic Reviews. 1995; 17:192–204. [PubMed: 8521937]

Kilpatrick DG, Ruggiero KJ, Acierno R, Sanders BE, Resnick HS, Best CL. Violence and risk of PTSD, major depression, substance use/dependence, and comorbidity: Results from the National Survey of Adolescents. Journal of Consulting and Clinical Psychology. 2003; 71:692–700. [PubMed: 12924674]

Knudsen HK, Roman PM, Johnson JA, Ducharme LJ. A changed America? The effects of September 11th on depressive symptoms and alcohol consumption. Journal of Health and Social Behavior. 2005; 46:260–273. [PubMed: 16259148]

Lazarus, RS.; Folkman, S. Stress, Appraisal, and Coping. Springer; New York: 1984.

Li Y, Ferraro KF. Volunteering in middle and later life: Is health a benefit, barrier or both? Social Forces. 2006; 85:497–519.

Lu A. Stress and physical health deterioration in the aftermath of Hurricanes Katrina and Rita. Sociological Perspectives. 2011; 54:229–250.

Luthar SS, Cicchetti D. The construct of resilience: Implications for interventions and social policies. Development and Psychopathology. 2000; 12:857–885. [PubMed: 11202047]

McLeod JD. The meanings of stress: Expanding the stress process model. Society and Mental Health. 2012; 2:172–186.

Musick MA, Wilson J. Volunteering and depression: The role of psychological and social resources in different age groups. Social Science and Medicine. 2003; 56:259–269. [PubMed: 12473312]

Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K. 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. Psychiatry. 2002; 65:207–239. [PubMed: 12405079]

North CS, Pfefferbaum B, Tivis L, Kawasaki A, Spitznagel EL. The course of posttraumatic stress disorder in a follow-up study of survivors of the Oklahoma City bombing. Annals of Clinical Psychiatry. 2004; 16:209–215. [PubMed: 15702569]

Pearlin, LI. The stress process revisited: Reflection on concepts and their interrelationships. In: Aneshensel, Carol S.; Phelan, Jo C., editors. Handbook of the Sociology of Mental Health. Springer; New York: 1999. p. 395-415.

Pearlin LI, Menaghan EG, Lieberman MA, Mullan JT. The Stress Process. Journal of Health and Social Behavior. 1981; 22:337–356. [PubMed: 7320473]

Penner LA, Finkelstein MA. Dispositional and structural determinants of volunteerism. Journal of Personality and Social Psychology. 1998; 74:525–537.

Rosenberg, M. Conceiving the Self. Basic Books; New York: 1979.

Rubonis AV, Bickman L. Psychological impairment in the wake of disaster: The disaster-psychopathology relationship. Psychology Bulletin. 1991; 109:384–399.

St. John C, Fuchs J. The heartland responds to terror: Volunteering after the bombing of the Murrah Federal Building. Social Science Quarterly. 2002; 83:397–415.

Sargisson RJ, Hunt S, Hanlen P, Smith K, Hamerton H. Volunteering: A community response to the Rena Oil Spill in New Zealand. Journal of Contingencies and Crisis Management. 2012; 20:201–218.

Sherbourne CD, Stewart AL. The MOS social support survey. Social Science in Medicine. 1989; 32:705–714.

Simon RW. Gender, multiple roles, role meaning, and mental health. Journal of Health and Social Behavior. 1995; 36:182–194. [PubMed: 9113142]

Simon RW. The meanings individuals attach to role identities and their implications for mental health. Journal of Health and Social Behavior. 1997; 38:256–274. [PubMed: 9343964]

Simon RW, Marcussen K. Marital transitions, marital beliefs, and mental health. Journal of Health and Social Behavior. 1999; 40:111–125. [PubMed: 10467758]

Spitzer, RL.; Williams, JB.; Gibbon, M. Structured Clinical Interview for DSM-III-R – Non-Patient Version. Biometrics Research Department; New York State Psychiatric Institute; New York, NY: 1987.

Srole L. Social integration and certain corollaries: An explortory study. American Sociological Review. 1956; 21:709–716.

Stata Corporation. Stata. version 13.0. Stata Corporation; College Station, TX: 2013.

Steffen SL, Fothergill A. 9/11 volunteerism: A pathway to personal healing and community engagement. The Social Science Journal. 2009; 46:29–46.

Stryker, S.; Vryan, KD. The symbolic interactionist frame. In: Delamater, J., editor. Handbook of Social Psychology. Kluwer Academic/Plenum; New York: 2003. p. 3-28.

Thoits PA. Role-identity salience, purpose and meaning in life, and well-being among volunteers. Social Psychology Quarterly. 2012; 75:360–384.

Thoits PA, Hewitt LN. Volunteer work and well-being. Journal of Health and Social Behavior. 2001; 42:115–131. [PubMed: 11467248]

Thormar ST, Gersons BPR, Juen B, Marschang A, Djakamaba MN, Olff M. The mental health impact of volunteering in a disaster setting: A review. The Journal of Nervous and Mental Disease. 2010; 198:529–538. [PubMed: 20699716]

Turner RJ, Wheaton B, Lloyd DA. The Epidemiology of Social Stress. American Sociological Review. 1995; 60:104–125.

van Griensven FML, Chakkraband S, Thienkrua W, Pengjuntr W, Cardozo BL, Tantipiwatanaskul P, et al. Mental health problem among adults in the tsunami-affected area on southern Thailand. Journal of the American Medical Association. 2006; 296:537–548. [PubMed: 16882960]

Voorhees WR. New Yorkers respond to the World Trade Center attack: An anatomy of an emergent volunteer organization. Journal of Contingencies and Crisis Management. 2008; 16:3–13.

Ware JE, Kosinski M, Keller SD. A 12-item short-from health survey: construction of scales and preliminary tests of reliability and validity. Medical Care. 1996; 34:220–233. [PubMed: 8628042]

Wilson J. Volunteering. Annual Review of Sociology. 2000; 26:215–240.

Wilson J. Volunteerism research: A review essay. Nonprofit and Voluntary Sector Quarterly. 2012; 41:176–212.

Table 1

Descriptive Statistics for the World Trade Center Disaster Study by Volunteerism (N=1681)*

Baseline Variables	Entire Sample n (%)	No Helping Behavior n (%)	Helping Behavior n (%)	X^2 (p-value)
Age				
18–44	880 (55.6)	597 (54.4)	283 (58.7)	1.59 (.208)
45+	801 (44.4)	568 (45.6)	255 (41.3)	
Gender				
Male	693 (46.2)	486 (45.6)	207 (47.8)	0.42 (.514)
Female	988 (53.8)	679 (54.4)	309 (52.2)	
Marital Status				
Not Married	972 (49.7)	693 (51.2)	279 (45.8)	2.53 (.112)
Married	709 (50.3)	472 (48.8)	237 (54.2)	
Yearly Household Income				
Less than $40,000	784 (44.7)	607 (49.8)	177 (31.4)	29.63 (<.001)
$40,000+	897 (55.3)	558 (50.2)	339 (68.6)	
Education				
Less Than College Grad	906 (58.3)	687 (63.7)	219 (44.4)	33.00 (<.001)
College Graduate	755 (41.7)	478 (36.3)	297 (55.6)	
Church Attendance				
Less Than Once a Week	1126 (66.1)	782 (65.9)	344 (66.7)	0.05 (.820)
Once a Week or More	555 (33.9)	383 (34.1)	172 (33.3)	
Race/Ethnicity				
White	782 (43.0)	494 (37.9)	288 (56.3)	10.92 (<.001)
African American	422 (26.0)	315 (28.7)	107 (18.9)	
Hispanic	367 (24.1)	281 (26.5)	86 (17.7)	
Other	110 (7.0)	75 (6.9)	35 (7.1)	
WTCD Event Exposure				
Low/Moderate(0–2)	1058 (68.3)	774 (71.6)	284 (59.7)	14.38 (<.001)
High(3+)	623 (31.7)	391 (28.4)	232 (40.3)	
Anomia				
Low (score 15 or lower)	1176 (71.6)	785 (67.7)	391 (81.7)	24.59 (<.001)
High (score 16 or higher)	505 (28.4)	380 (32.3)	125 (18.3)	
Negative Life Events				
None-One	848 (56.0)	597 (55.9)	251 (56.2)	0.01 (.927)
Two or more	833 (44.0)	568 (44.1)	265 (43.8)	
Lifetime Traumatic Events				
None	466 (33.6)	354 (37.0)	112 (24.8)	13.37 (<001)
One or more	1215 (66.4)	811 (63.1)	404 (75.2)	
Self-Esteem				
Low (scores 1–4)	1021 (57.2)	712 (57.1)	309 (57.4)	0.01 (.933)
High (scores 5)	660 (42.8)	453 (42.9)	207 (42.7)	
Social Support				

Baseline Variables	Entire Sample n (%)	No Helping Behavior n (%)	Helping Behavior n (%)	X^2 (p-value)
Low/Moderate	1217 (71.6)	866 (72.8)	351 (68.2)	2.27 (.132)
High	464 (28.4)	299 (27.2)	165 (31.8)	
Physical Health Problems				
No	1297 (80.6)	870 (78.0)	427 (87.4)	15.19 (<.001)
Yes	380 (19.4)	292 (22.0)	88 (12.6)	
Pre-WTCD MH Problems				
No	1012 (68.8)	744 (72.7)	268 (58.7)	21.38 (<001)
Yes	669 (31.2)	421 (27.3)	248 (41.4)	

MH-Mental Health, WTCD-World Trade Center Disaster.

*AII percentages are weighted, n's are unweighted.

Table 2

Association between Volunteerism and Follow-up Outcomes (N=1681)*

Follow-up Outcomes	Entire Sample n (%)	No Helping Behavior n (%)	Helping Behavior n (%)	X^2 (p-value)
Depression Past Year				
No	1404 (88.4)	971 (88.2)	433 (89.1)	0.28 (.594)
Yes	277 (11.6)	194 (11.8)	83 (10.9)	
BSI-Anxiety				
No	1464 (90.9)	1003 (90.0)	461 (93.2)	4.02 (.045)
Yes	217 (9.1)	162 (10.0)	55 (6.8)	
SF-12-v2 Mental Health				
Healthy	1532 (93.4)	1043 (92.3)	489 (96.3)	7.67 (.006)
Not Healthy	149 (6.6)	122 (7.7)	27 (3.7)	
SF-12-v2 Physical Health				
Healthy	1518 (92.5)	1032 (91.0)	486 (96.4)	13.74 (<.001)
Not Healthy	163 (7.5)	133 (9.0)	30 (3.6)	
PTSD Past Year				
No	1547 (94.5)	1067 (94.1)	480 (96.0)	2.37 (.124)
Yes	134 (5.5)	98 (5.9)	36 (4.0)	

BSI = Brief Symptom Inventory; SF-12-v2 = Short Form-12, version 2.

*AII percentages are weighted, n's are unweighted.

Table 3

Logistic Regression Odds Ratios (OR) and 95% Confidence Limits for Baseline Demographic, Stress and Resource Variables Predicting Volunteerism during the WTCD Event (N=1681)

Baseline Variables	OR (95% Confidence Limits)
Age 45+	0.82 (0.61–1.12)
Female	1.05 (0.79–1.41)
Married	1.06 (0.80–1.42)
Yearly Household Income $40,000+	1.36 (0.98–1.88)
Education College Graduate or Higher	1.44 (1.05–1.97)*
Church Attendance Once a Week +	1.25 (0.92–1.70)
Race	
African American	0.62 (0.43–0.90)*
Latino	0.63 (0.41–0.97)*
Other Race	0.72 (0.42–1.24)
WTCD Event Exposure (3+ Events)	1.56 (1.16–2.09)**
Anomia (High)	0.63 (0.44–0.89)**
Negative Life Events (1+)	0.99 (0.74–1.32)
Lifetime Traumatic Events (1+)	1.43 (1.02–2.01)*
Self-Esteem (High)	0.86 (0.63–1.17)
Social Support (High)	1.00 (0.74–1.37)
Physical Health Problems (Yes)	0.59 (0.40–0.85)**
Pre-WTCD Mental Health Problems (Yes)	1.59 (1.18–2.15)**
Constant	0.24 (0.14–0.42)***

OR=odds ratio.

WTCD = World Trade Center Disaster.

* $p<0.05$

** $p<0.01$

*** $p<0.001$

Table 4

Logistic Regression Results Predicting Post-disaster Well-being at Follow-up (FU) from Baseline Volunteerism, Demographic Factors, Stressful Events and Psychological Resources (N=1,681)

Baseline Variables	FU Depression OR (95% CI)	FU BSI-Anxiety OR (95% CI)	FUSF12-Mental Health OR (95% CI)	FUSF12-Physical Health OR (95% CI)	FU PTSD OR (95% CI)
Volunteerism	0.83 (0.55–1.28)	0.66 (0.41–1.06)	0.38 (0.21–0.68)***	0.45 (0.24–0.82)**	0.64 (0.36–1.16)
Age 45+	0.80 (0.55–1.18)	1.15 (0.72–1.84)	0.90 (0.56–1.43)	5.45 (3.19–9.29)***	1.10 (0.66–1.83)
Female	0.90 (0.62–1.32)	0.97 (0.62–1.53)	1.88 (1.17–3.02)**	1.54 (0.90–2.57)	1.07 (0.64–1.77)
Married	0.93 (0.63–1.37)	0.81 (0.52–1.25)	0.61 (0.37–1.01)	0.74 (0.43–1.25)	0.87 (0.52–1.46)
Yearly Household Income $40,000+	0.81 (0.52–1.25)	0.78 (0.48–1.27)	0.92 (0.52–1.63)	0.49 (0.29–0.82)**	0.76 (0.44–1.31)
Education College Graduate or Higher	0.91 (0.59–1.41)	0.58 (0.37–0.93)*	1.09 (0.62–1.91)	0.45 (0.26–0.77)**	1.35 (0.74–2.47)
Church Attendance Once a Week +	0.94 (0.63–1.40)	1.21 (0.77–1.93)	1.11 (0.68–1.81)	0.88 (0.55–1.41)	0.87 (0.53–1.44)
Race					
African American	1.15 (0.71–1.85)	1.01 (0.57–1.77)	0.62 (0.32–1.19)	1.63 (0.92–2.88)	1.21 (0.64–2.29)
Latino	2.24 (1.33–3.77)**	2.86 (1.68–4.86)***	1.46 (0.84–2.55)	1.92 (1.02–3.61)*	3.22 (1.63–6.36)***
Other	0.72 (0.35–1.48)	1.73 (0.73–4.12)	1.44 (0.65–3.24)	0.62 (0.18–2.18)	1.07 (0.45–2.54)
WTCD Exposure (3 Events +)	1.94 (1.33–2.83)***	1.84 (1.21–2.80)**	2.15 (1.34–3.44)***	1.40 (0.89–2.20)	2.56 (1.51–4.35)***
Negative Life Events (1+)	2.97 (2.00–4.43)***	2.66 (1.71–4.13)***	1.64 (1.01–2.65)*	2.45 (1.49–4.02)***	3.74 (2.11–6.64)***
Lifetime Traumatic Events (1+)	1.51 (0.97–2.39)	1.57 (0.91–2.70)	1.09 (0.64–1.85)	1.41 (0.80–2.48)	2.13 (1.07–4.26)*
Self-Esteem (High)	0.37 (0.23–0.59)***	0.26 (0.14–0.46)***	0.37 (0.20–0.66)**	0.83 (0.49–1.40)	0.35 (0.19–0.67)***
Social Support (High)	0.80 (0.52–1.25)	0.61 (0.36–1.05)	0.78 (0.41–1.50)	1.18 (0.66–2.09)	0.72 (0.37–1.38)
Pre-WTCD Mental Health Problems (Yes)	1.93 (1.29–2.88)***	1.87 (1.16–3.02)*	1.62 (1.00–2.65)	1.43 (0.89–2.30)	1.16 (0.70–1.91)
Constant	0.05 (0.02–0.11)***	0.04 (0.02–0.10)***	0.05 (0.02–0.11)***	0.02 (0.01–0.04)***	0.01 (0.00–0.03)***

WTCD = World Trade Center Disaster; SF-12-v2= Short Form-12, version. 2; FU= Follow-up; OR= odds ratio; BSI = Brief Symptom Inventory; PTSD = Posttraumatic Stress Disorder.

* p<.05

** p<.01

*** p<.001.