

SAMHSA Disaster Technical Assistance Center

Supplemental Research Bulletin

Issue 5: *Traumatic Stress and Suicide
After Disasters*

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Supplemental Research Bulletin: Issue 5

Traumatic Stress and Suicide After Disasters

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The Substance Abuse and Mental Health Services Administration (SAMHSA) Disaster Technical Assistance Center (DTAC) is pleased to provide you with this supplement to our ongoing monthly e-communication, the *SAMHSA DTAC Bulletin*. This supplement will be sent twice annually in an effort to inform the field of new and salient research. Please email your feedback or suggestions for topics to: DTAC@samhsa.hhs.gov. To subscribe, please enter your email address into the “SAMHSA DTAC Bulletin” section of the [SAMHSA DTAC Resources](#) page of our website.

SAMHSA DTAC is administered by the Emergency Mental Health and Traumatic Stress Services Branch of the SAMHSA Center for Mental Health Services Division of Prevention, Traumatic Stress, and Special Programs, located at 1 Choke Cherry Road, Rockville, MD 20857.

SAMHSA DTAC provides disaster technical assistance, training, consultation, resources, information exchange, and knowledge brokering to help disaster behavioral health professionals plan for and respond effectively to mental health and substance use needs following a disaster.

To learn more, please call 1-800-308-3515, email DTAC@samhsa.hhs.gov, or visit the SAMHSA DTAC website at <http://www.samhsa.gov/dtac>.

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In This Issue

“The frequency of major disasters in the United States alone is staggeringly high: once a week on average, a new disaster strikes somewhere in the United States. Considering the frequency and devastation caused by such events in the United States and worldwide, understanding the psychiatric sequelae of major disasters is a public health issue of paramount importance” (North et al., 2012, p. e40).

This issue of the *Supplemental Research Bulletin* focuses on research highlights related to traumatic stress and suicide, including suicide rates, suicidal ideation, and suicide plans and attempts, in relation to disasters. These topics are particularly timely in that climate change may lead to more extreme weather over time, or to shifts in seasonal weather patterns, highlighting the need for all-hazards preparedness throughout the year, as well as a coordinated disaster response that incorporates physical safety, health, and behavioral health.

Research on the behavioral health consequences of disasters encompasses case studies, cross-sectional and longitudinal research, and reviews of literature from across the United States and around the world. In this issue, we focus on research published in the last 5 years and with adult participants in the United States—though we include some research that is older, and some that includes participants from other countries. We also identify populations that research has shown may be especially vulnerable in disasters, and we note some risk and protective factors in relation to traumatic stress and suicidality as they pertain to disasters.

Because disasters happen in real time and involve many variables that are difficult or impossible to control for, it might seem that it would be hard to find consistencies in the chaos—lessons learned that can be applied to any disaster. However, certain strong themes do recur throughout the literature—for example, resilience is more common than not among disaster survivors. As North et al. note in a report on 10 disaster-related investigations, “We found that one-third of survivors experienced a post-disaster disorder. Although these results provide considerable evidence of the adverse mental health effects of disasters, they also attest to human psychological resilience because most survivors did not suffer psychiatric illness despite substantial disaster exposures” (2012, p. e44). We hope that this issue of the *Supplemental Research Bulletin* supports you in your work to contribute to disaster behavioral health research, and to bring lessons learned to the field.

Warmest regards,

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Traumatic Stress and Suicide After Disasters

Following are the articles that we reviewed in depth in developing this issue. At the end of the issue is a comprehensive list of all articles cited in this issue.

Gordon, K. H., Bresin, K., Dombeck, J., Routledge, C., & Wonderlich, J. A. (2011). The impact of the 2009 Red River Flood on interpersonal risk factors for suicide. *Crisis*, 32(1), 52–55. doi: 10.1027/0227-5910/a000051

Hackbarth, M., Pavkov, T., Wetchler, J., & Flannery, M. (2012). Natural disasters: An assessment of family resiliency following Hurricane Katrina. *Journal of Marriage and Family Therapy*, 38(2), 340–351.

Kölves, K., Kölves, K. E., & De Leo, D. (2013). Natural disasters and suicidal behaviors: A systematic literature review. *Journal of Affective Disorders*, 146, 1–14. <http://dx.doi.org/10.1016/j.jad.2012.07.037>

North, C. S., Oliver, J. & Pandya, A. (2012). Examining a comprehensive model of disaster-related posttraumatic stress disorder in systematically studied survivors of 10 disasters. *American Journal of Public Health*, 102(10), e40–e48. doi:10.2105/AJPH.2012.300689

Pietrzak, R. H., Tracy, M. Galea, S., Kilpatrick, D. G., Ruggiero, K. J., Hamblen, J. L., Southwick, S. M., & Norris, F. H. (2012). Resilience in the face of disaster: Prevalence and longitudinal course of mental disorders following Hurricane Ike. *PLOS One*, 7(6), e38964, 1–14. doi: 10.1371/journal.pone.0038964

The Context

Suicide is a pressing public health issue. In 2013, the most recent year for which final national data are available from the Centers for Disease Control and Prevention, 41,149 people in the United States died by suicide, making suicide that year's 10th leading cause of death. Among young people in the United States, suicide was the second leading cause of death in 2013. According to an estimate cited by the American Association of Suicidology, for each death by suicide in the United States that year, there were 25 attempts (Drapeau & McIntosh for the American Association of Suicidology, 2015).

In this issue, we have chosen to focus on disasters, traumatic stress, and suicide and suicidality for several reasons. Because suicide and suicidality relate closely to a range of issues in behavioral health, we saw this focus as a way to understand more about behavioral health responses to disaster in general. Also, we wanted to look at an apparent paradox in the research: although traumatic stress is a risk factor for suicide, and traumatic stress increases in the aftermath of disaster, in many cases suicide rates have not increased after disasters. Finally, by reviewing highlights of research on suicide, suicidality, and traumatic stress linked to disasters, we hoped to find ways to provide more effective support to disaster survivors.

Key Research Questions

This issue of the SAMHSA DTAC *Supplemental Research Bulletin* covers research highlights that help to address several important questions about traumatic stress, associated mental disorders, and suicidality in association with disasters. The following depicts the order of the research topics that we present in this issue:

1. Changes in suicide rates associated with disasters
2. How disasters affect suicidal ideation, plans, and attempts
3. Whether disasters affect different groups of people in different ways in terms of suicidal ideation, plans, and attempts
4. Other factors that may affect post-disaster suicidality
5. Post-disaster traumatic stress and related behavioral health problems
6. Factors that make people vulnerable to these issues
7. Factors that may be protective

Note: This issue offers major conclusions of recent research investigations in this area. The highlights presented here do not reflect an exhaustive review of the literature.

Do suicide rates increase after disasters?

In a paper on interpersonal risk factors for suicide among survivors of the 2009 Red River flood in North Dakota, Gordon et al. (2011) cite several studies that found no increases in suicide rates for 4 years following natural disasters (Krug et al., 1999), as well as studies that found decreases in suicide rates over 3 years after natural disasters (Nishio et al., 2009; Shoaf et al., 2004). Pridemore et al. (2009) found no statistically significant increases or decreases in suicide rates at local, state, and national levels after the September 11, 2001, terrorist attacks and the 1995 Oklahoma City bombing.

In comparison, in a review of empirical research on suicidal behavior after natural disasters around the world, Kølves et al. (2013) found that suicide rates sometimes dropped, held steady, or increased after natural disasters. However, increases in suicide rates were generally limited to population subgroups (men after the 1999 Nantou earthquake in Taiwan, and youth in the United States, though not to a statistically significant extent, after Hurricane Andrew in 1992) (p. 12).

Does suicidal ideation and do suicide plans or attempts increase after disasters?

Gordon et al. (2011) cite cases from the research literature in which rates of suicidal ideation decreased following natural disasters (a heat wave in France in August 2003; Morali et al., 2008; and Hurricane Katrina in 2005 in the United States; Kessler et al., 2006), although “overall rates of psychiatric disorders doubled in both cases” (p. 51). Morali et al. looked at depressive disorders, anxiety, stress disorder, and suicidal behavior from June through October 2003 among people seeking emergency psychiatric care at a general hospital in Paris. They compared these rates to rates for the same hospital for the same months in 2002.

In their study, Kessler et al. (2006) screened for anxiety and mood disorders, including some serious mental illnesses and some mild-moderate mental illnesses. Although their research cited lower prevalence of suicidal ideation 5 to 8 months after Hurricane Katrina, later research conducted as part of the same effort showed a significant increase in suicidal ideation, among roughly the same population. In the 2006 report on their research, Kessler et al. showed that, among people estimated to have mental illness, suicidal ideation and suicide plans were significantly less prevalent after Hurricane Katrina (2005) than before it. In their report, they compared data from the National Comorbidity Survey-Replication (NCS-R) conducted before Hurricane Katrina in areas later affected by the hurricane to data from a survey done 5 to 8 months after the hurricane with the Hurricane Katrina Community Advisory Group (CAG), a

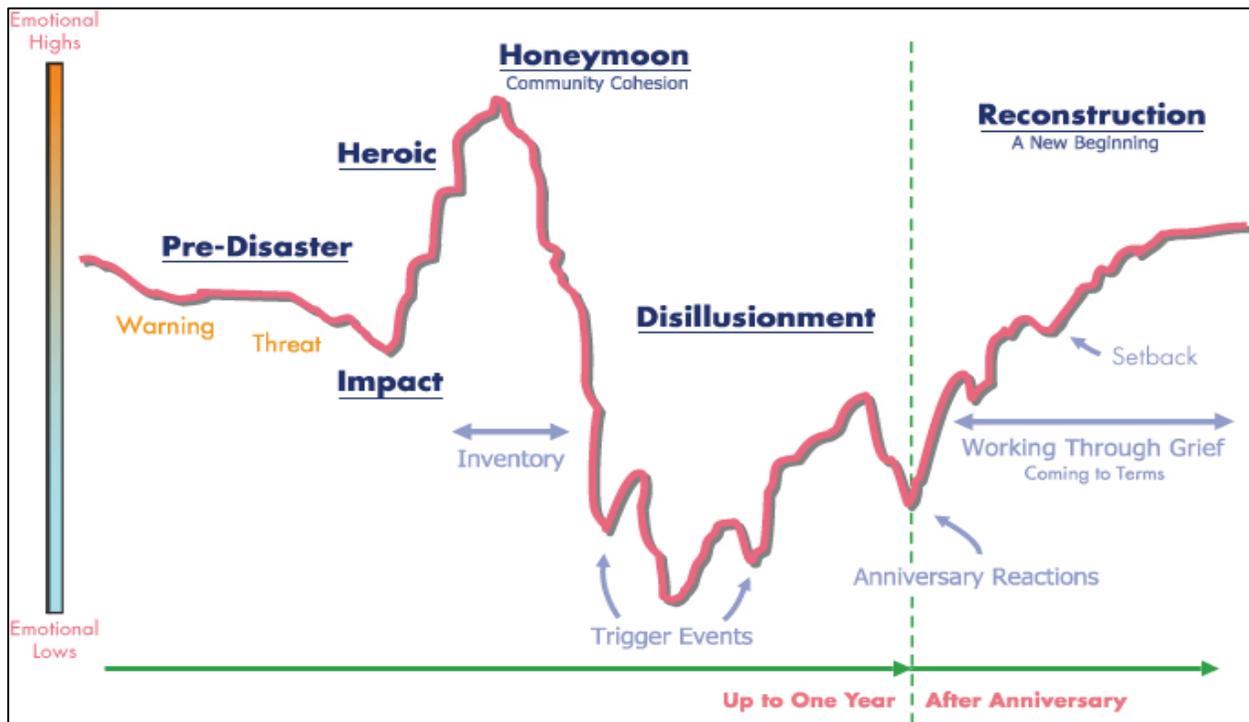
sample of 1,043 Katrina survivors who had agreed to take part in several surveys in the years after the hurricane to help researchers understand how effective the disaster response was.

Members of the CAG were surveyed again a year after the 5- to 8-month post-disaster survey. In a 2008 paper that included results of the later survey, another team led by Kessler notes significant increases in prevalence rates for suicide ideation and plans (as well as posttraumatic stress disorder [PTSD]) from the 5- to 8-month post-hurricane survey to the survey a year later. They attribute these and other outcomes they observed at follow-up to the fact that stressors associated with the hurricane remained common at the time of the follow-up, which was nearly 2 years after the hurricane. The persistence of these stressors may have led to the increases they saw.

Pietrzak et al. (2012) assessed prevalence of suicidality (ideation, plans, and attempts), as well as of several mental disorders, in three waves of interviews after Hurricane Ike (2008), of people who had lived in the geographic areas affected by the disaster for at least 1 month before the hurricane. Study team members conducted interviews 2 to 5 months after Hurricane Ike in the first wave; 5 to 9 months post-hurricane in the second wave; and 14 to 18 months after the hurricane in the third wave. Although the team did not interview people in their sample prior to the hurricane, they asked them about their experiences before the hurricane in the first wave of interviews. Investigators reported that prevalence of PTSD linked to a trauma other than Hurricane Ike, as well as depression, panic disorder, and suicidality, held fairly steady across assessments, while PTSD linked to Hurricane Ike and generalized anxiety disorder declined in the second-wave assessment and stabilized at the third. However, from the second wave of assessment to the third, the prevalence of suicidality increased (Pietrzak et al., 2012).

To understand trends in suicidality in these studies, it may help to consider typical phases of psychological reactions to disasters. Zunin and Myers initially described these phases, which were also covered in a SAMHSA training manual in 2000 (DeWolfe, 2000). In this model (please see Figure A), survivors' emotions generally become more difficult to manage around the time of disaster warning, and their negative feelings increase through disaster threat and impact. Their emotions improve in a heroic phase, in which they are inclined to try to contribute to the disaster response, followed by a honeymoon phase, when community cohesion peaks. Following the honeymoon, however, is disillusionment, sometimes spurred by disappointment in the slower-than-expected pace of disaster recovery. Disillusionment typically occurs in the second half of the year after the disaster, and after the disaster's first anniversary, it is generally followed by reconstruction, as survivors come to terms with their "new normal" after the disaster.

Figure A. Phases of Psychological Reactions to Disasters



Adapted from Zunin & Myers as cited in DeWolfe, 2000.

In the 2006 paper by Kessler et al., the reduction in prevalence of suicidal ideation and suicide plans among people estimated to have mental illness may have related to the fact that they conducted their second survey 5 to 8 months after the hurricane, at which point survivors may have been in the heroic or the honeymoon phase. In their 2008 paper, Kessler et al. reported significant increases in prevalence of suicidal ideation and plans and PTSD from the 5- to 8-month post-disaster survey to another survey 1 year later. Their latter survey was administered at a point at which survivors would generally be in the reconstruction phase. In the reconstruction phase, emotions have not returned to the highs they rose to in the heroic phase, and particularly in the honeymoon phase. Also as mentioned above, their findings may have reflected survivors' emotional responses to the protracted pace of recovery that distinguished Hurricane Katrina. Pietrzak et al.'s (2012) finding of increased prevalence of suicidality from the second wave of assessment (5 to 9 months after Hurricane Ike) to the third (14 to 18 months after the disaster) may also have reflected the transition from heroic and honeymoon phases to the reconstruction phase, which, though it involves more positive emotion, does not involve the intensity of positive emotion of heroic and honeymoon phases.

In an article reviewing research literature on natural disasters and suicidal behavior from around the world, Kølves et al. (2013) also note the relationship of their findings to typical phases of disaster response. According to Kølves et al., “There seems to be a drop in non-fatal suicidal behavior in the initial post-disaster period (Kessler et al., 2008; Yu et al., 2010), which appears to occur during the ‘honeymoon’ phase (Madianos and Evi, 2010), although some studies also indicate this tendency during the ‘pulling together’ phenomenon (Gordon et al., 2011). A delayed increase in suicidal ideation was observed after Hurricane Katrina (Kessler et al., 2008) and the Nantou earthquake in Taiwan (Chou et al., 2007), likely having occurred during the disillusionment phase” (2013, p. 12).

Do suicidal ideations, or suicide plans or attempts, increase after disasters among specific groups of people?

In their 2006 report, Kessler et al. note that suicidal ideation correlated significantly with only two of the sociodemographic variables they examined: age (being between 18 and 39 years) and race/ethnicity (non-Hispanic white) (p. 935).

Kølves et al. report conflicting findings about whether males or females are at higher risk for suicidal ideation or behaviors following disasters, or whether risk does not differ based on gender. As mentioned, this research team looked specifically at research on natural disasters (2013, p. 12).

Are there other factors that make people more likely to engage in suicidal ideation, planning, or attempts following a disaster?

Kølves et al. cite several studies suggesting an association of current major depression and PTSD and previous mental health problems with increases in suicidal behaviors following natural disasters. They also identify some experiential factors that may be associated with suicidal behaviors, including severe destruction of property, injuries sustained by relatives, and danger to one’s own life, as well as adverse economic conditions, including high rates of unemployment (2013, p. 12).

Which types of traumatic stress issues and related diagnoses may arise after a disaster?

Norris et al. (2002) reviewed approximately 250 articles, chapters, and books describing research on 160 samples of survivors of a range of types of disasters around the world. The total sample size exceeded 60,000 people. Investigators grouped outcomes of disasters into six sets: specific psychological problems, nonspecific distress, health problems, chronic problems in living,

resource loss, and problems specific to youth. They reported that “[o]utcomes in the first set, specific psychological problems, were identified in 121 (77 percent) of the samples. . . . Undoubtedly, the condition most often assessed and observed in these samples was PTSD (109 samples, 68 percent)” (Norris et al., 2002, p. 211). In a companion article, the research team adds a qualification to their findings: “In interpreting [our] results, it should be kept in mind that the relative frequencies of these outcomes are a function of how frequently they were assessed as well as how frequently they were observed if assessed” (Norris et al., 2002, p. 241).

North et al. (2012) examined data on 811 survivors of 10 disasters, including natural, technological, and intentionally caused disasters, from October 1987 through April 1995. Specifically, they looked at data from interviews completed by the survivors from 1 to 6 months after the disaster they had experienced. The interviews assessed PTSD, major depression, alcohol and drug use or dependence, panic disorder, and generalized anxiety disorder, as well as disaster experiences that survivors might have found traumatic. They found that one-third of the disaster survivors they interviewed had a post-disaster disorder, the most prevalent of which was PTSD (one-fifth)—echoing the Norris et al. (2002) findings.

In Kessler et al.’s 2008 report on research with the Hurricane Katrina CAG, they also note statistically significant increases from interviews of survivors 5 to 8 months after Hurricane Katrina (2005) to interviews conducted 1 year later in estimated prevalence of PTSD and serious mental illness (p. 378).

In the first wave of Pietrzak et al.’s interviews 2 to 5 months after Hurricane Ike (2008), they found a past-month prevalence of 20.6 percent of any of several mental or substance use conditions, including PTSD related to Hurricane Ike or to another trauma, generalized anxiety disorder, panic disorder, depression, alcohol dependence and use, and suicidality. By the third wave of interviews, past-month prevalence dropped to 10.9 percent, but these conditions were evident in all three waves of interviews, except for alcohol use and dependence, which were not assessed in the second and third interview waves (2012, p. 6). Pietrzak et al. note, “PTSD, both due to the hurricane and other traumatic events, was the most prevalent disorder at Wave 1 assessment. This finding is consistent with a large body of prior research, which has similarly documented high prevalence of PTSD following disaster exposure [3,4,5,43,44,45]” (2012, p. 10).

Which groups are most at risk for traumatic stress and related diagnoses after a disaster?

In describing their research on more than 800 survivors of 10 disasters, North et al. write that “predictors of PTSD were female gender, younger age, Hispanic ethnicity, less education, ever-married status, pre-disaster psychopathology, disaster injury, and witnessing injury or death; exposure through death or injury to friends or family members and witnessing the disaster aftermath did not confer additional PTSD risk” (2012, p. e40). The researchers note, “This study did not detect differences in PTSD by type of disaster” (2012, p. e47).

In their paper, North et al. (2012) explain that the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)* PTSD criteria include three groups. Group B includes re-experiencing symptoms, group C includes avoidance or numbing symptoms, and group D includes hyperarousal symptoms. They observe that, while more than two-thirds of survivors who were interviewed as part of their research met DSM-IV-TR criteria in group B and group D, less than one-third of them met the full diagnostic criteria (including the avoidance or numbing symptoms in group C). However, 84 percent of people meeting the group C criteria met the full set of criteria for a diagnosis of PTSD. The researchers note that group C criteria may therefore serve as a marker for PTSD—i.e., people who show the avoidance and numbing symptoms that are in this group may be more likely than others to go on to develop full PTSD (2012, p. e44). In their earlier review, Norris et al. (2002) made a similar observation: “Among those studies that examined the separate criteria for PTSD, a common finding was for intrusion [group B] and arousal [group D] to be highly prevalent and avoidance [group C] less so, and thus the latter tended to drive the diagnosis of PTSD (Catapano et al., 2001; McMillen et al., 2000; Maes et al., 1998; Norris, 1992; North et al., 1999)” (pp. 211, 216).

According to research by Kessler et al. (2008) with the Hurricane Katrina CAG, increases in rates of PTSD were significantly higher among group members ages 40 through 59 than among respondents in other age ranges. Low family income also was a statistically significant predictor of increased prevalence over time of PTSD, as well as of serious mental illness and suicidal ideation (2008, p. 378).

Which groups are least at risk for traumatic stress, suicidality, and related behavioral health problems after a disaster?

Norris et al. classified samples from studies in their review by degree of impairment linked to physical and behavioral health problems and other effects of disasters. They assigned values

ranging from 1, which indicated “minimal impairment, highly specific or selected effects, or very transient effects,” to 4, the value for samples in which more than half had psychopathology (2002, p. 218). They underscore the resilience of rescue and recovery workers, pointing to their finding that of the samples consisting of rescue and recovery workers, only 13 percent were classified as 4, or severely impaired.

Gordon et al.’s 2011 research suggests that time spent volunteering in disaster-related efforts may reduce suicidality among disaster survivors. Specifically, among their sample of undergraduate students, they found that more time spent volunteering in disaster-related efforts around the time of the Red River flood in Fargo, North Dakota (2009), correlated positively with lower levels of “thwarted belongingness” and “perceived burdensomeness,” two components identified by Joiner (2005) in his interpersonal-psychological theory as part of the desire for suicide. This suggests that volunteering to assist with disasters could improve well-being and reduce the likelihood of suicide, although Gordon et al. also hypothesized that the physical hardships involved in volunteering could make the volunteers more likely to develop a third component necessary for death by suicide in Joiner’s theory: the acquired capability for suicide, or the ability to commit suicide, which he proposes is strengthened by experiences of physical pain and difficulty. Gordon et al. found that more hours of volunteer work did indeed correlate with higher levels of acquired capability for suicide, though not to a statistically significant degree.

Pietrzak et al. observed lower levels of prevalence of most of the disorders they examined—including PTSD, depression, and panic disorder—among members of their Hurricane Ike (2008)-affected sample than have been observed in survivors of other disasters. Among possible explanations they posit for this phenomenon is that the participants in their study, as residents of a geographic area frequently affected by hurricanes, may have been “stress inoculated,” or protected by their prior experience of disasters, as well as better prepared to deal with the consequences of hurricanes (2012, p. 12). They add that there is some support for this idea in the fact that 47.8 percent of their sample in the Wave 1 interviews reported prior experience of a natural disaster (2012, p. 12).

Research by Hackbarth et al. (2012) suggests that families as units may have attributes that help them cope more effectively with disasters. Specifically, they found that families cope more effectively with challenging situations such as disasters if they also possess hope; spirituality/religiosity; and hardiness, which they describe as internal strengths and resilience of the family unit, as well as the family’s ability to collaboratively address issues initially

confronting one of their members. Similarly, as Kõlves et al. relate from the research they reviewed, “Family support may act as a buffer against the worst effects of natural disasters (Tang et al., 2010) (2013, p. 12).

In Conclusion

Of the studies cited in this issue, several found no increases in suicide rates after disasters, particularly in the United States. According to studies in this issue, suicidal ideation, plans, and attempts are more likely to start to occur several months after a disaster, rather than immediately after it. Some studies found decreases in suicidal ideation, plans, and attempts in spite of increases in some mental disorders. The studies cited did not consistently find that specific populations are at heightened risk for suicidal ideation, plans, or attempts after disasters.

One study *did* find greater risk for suicidal ideation among people between the ages of 18 and 39 years and among non-Hispanic white people (Kessler et al., 2006). PTSD seems to be the most common type of traumatic stress diagnosis after a disaster; however, as Norris et al. (2002) point out, this may be in part because researchers are more likely to assess populations under investigation for this disorder than for others. Groups who may be at higher risk for PTSD after disasters include females, young people, and people who have been injured or who witnessed injury or death. People with avoidance and numbing symptoms may be more likely than those with other PTSD symptoms to develop the disorder. Individuals who volunteer in disaster-related efforts may experience less suicidality. Rescue and response workers may be less at risk for behavioral health problems after disasters, as may people who have survived prior disasters. Families may have attributes that make their members better able to cope with disasters.

Abstracts

Gordon, K. H., Bresin, K., Dombek, J., Routledge, C., & Wonderlich, J. A. (2011). The impact of the 2009 Red River Flood on interpersonal risk factors for suicide. *Crisis, 32*(1), 52–55. doi: 10.1027/0227-5910/a000051

Background: Natural disasters are frequently associated with increases in risk factors for suicide, yet research indicates that suicide rates tend to stay the same or decrease in the wake of disasters (e.g., Krug et al., 1999). **Aims:** The present research sought to shed light on this counterintuitive phenomenon by testing hypotheses derived from Joiner’s (2005) interpersonal-psychological theory of suicidal behavior, which proposes that the desire to die by suicide is the result of feeling like one does not belong and feeling like one is a burden on others. During natural disasters, community members often pull together in volunteering efforts, and it was predicted that such behaviors would boost feelings of belonging and reduce feelings that one is a burden. **Methods:** The present study tested these predictions in a sample of 210 undergraduate students in Fargo, North Dakota, following the 2009 Red River Flood. **Results:** Consistent with prediction, greater amounts of time spent volunteering in flood efforts were associated with increased feelings of belongingness and decreased feelings of burdensomeness. **Conclusions:** The findings in the current study are consistent with the notion that communities pulling together during a natural disaster can reduce interpersonal risk factors associated with the desire for suicide.

Hackbarth, M., Pavkov, T., Wetchler, J., & Flannery, M. (2012). Natural disasters: An assessment of family resiliency following Hurricane Katrina. *Journal of Marriage and Family Therapy, 38*(2), 340–351.

This study explored the role of family characteristics in the coping process of a family after having experienced Hurricane Katrina to gain an understanding of the relationship between family resiliency, hope, family hardiness, and spirituality for survivors of this natural disaster. It was hypothesized that families who demonstrate higher levels of hope, family hardiness, and spirituality would be more likely to effectively cope after the storm. Further, great resource loss was hypothesized to diminish a family's ability to cope. Four hundred fifty-two participants completed the survey. Results indicate a relationship between hope, family hardiness and

spirituality, and the criterion variable, family coping. The importance of these findings in terms of exploring family resiliency following a natural disaster is discussed.

Kölves, K., Kölves, K. E., & De Leo, D. (2013). Natural disasters and suicidal behaviors: A systematic literature review. *Journal of Affective Disorders, 146*, 1–14.

<http://dx.doi.org/10.1016/j.jad.2012.07.037>

Background: Various consequences including suicidal behaviors can arise in the aftermath of natural disasters. The aim of the present review was to systematically analyze the existing literature on the potential impact of natural disasters on suicidal behaviors. **Methods:** A systematic search of English-language articles indexed in electronic databases was conducted. The current review covers 42 papers containing empirical analyses of the relationship between natural disasters and suicidal behaviors. **Results:** In total, 19 papers analyzed suicide mortality and 23 non-fatal suicidal behaviors. The effects of earthquakes on suicidal behaviors are the most frequently studied among natural disasters (n = 20), followed by hurricanes (n = 11). Further, there were four papers about tsunamis, three about floods, three about heat waves and drought, and one investigating the effects of multiple natural disasters. The studies show different directions in suicide mortality following natural disasters. Nevertheless, there seems to be a drop in non-fatal suicidal behaviors in the initial post-disaster period, which has been referred to as the ‘honeymoon’ phase. A delayed increase in suicidal behaviors has been reported in some studies. However, other factors increasing the risk of suicidal behaviors after natural disasters have been reported, such as previous and current mental health problems. Furthermore, contributing factors, such as economic conditions, should also be considered. **Limitations:** The exclusion of non-English articles. **Conclusions:** In light of the various methodological limitations observed, there is a need for further studies using proper designs. Mental health and suicidal behaviors should continue to be monitored for several years after the disaster.

North, C. S., Oliver, J. & Pandya, A. (2012). Examining a comprehensive model of disaster-related posttraumatic stress disorder in systematically studied survivors of 10 disasters. *American Journal of Public Health, 102*(10), e40–e48. doi:10.2105/AJPH.2012.300689

Objectives: Using a comprehensive disaster model, we examined predictors of posttraumatic stress disorder (PTSD) in combined data from 10 different disasters. **Methods:** The combined sample included data from 811 directly exposed survivors of 10 disasters between 1987 and

1995. We used consistent methods across all 10 disaster samples, including full diagnostic assessment. **Results:** In multivariate analyses, predictors of PTSD were female gender, younger age, Hispanic ethnicity, less education, ever-married status, pre-disaster psychopathology, disaster injury, and witnessing injury or death; exposure through death or injury to friends or family members and witnessing the disaster aftermath did not confer additional PTSD risk. Intentionally caused disasters associated with PTSD in bivariate analysis did not independently predict PTSD in multivariate analysis. Avoidance and numbing symptoms represented a PTSD marker. **Conclusions:** Despite confirming some previous research findings, we found no associations between PTSD and disaster typology. Prospective research is needed to determine whether early avoidance and numbing symptoms identify individuals likely to develop PTSD later. Our findings may help identify at-risk populations for treatment research.

Pietrzak, R. H., Tracy, M., Galea, S., Kilpatrick, D. G., Ruggiero, K. J., Hamblen, J. L., Southwick, S. M., & Norris, F. H. (2012). Resilience in the face of disaster: Prevalence and longitudinal course of mental disorders following Hurricane Ike. *PLOS One*, 7(6), e38964, 1–14. doi: 10.1371/journal.pone.0038964

Objectives: Natural disasters may increase risk for a broad range of psychiatric disorders, both in the short- and in the medium-term. We sought to determine the prevalence and longitudinal course of posttraumatic stress disorder (PTSD), generalized anxiety disorder (GAD), panic disorder (PD), depression, and suicidality in the first 18 months after Hurricane Ike. **Methods:** Six hundred fifty-eight adults representative of Galveston and Chambers Counties, Texas participated in a random, population-based survey. The initial assessment was conducted 2 to 5 months after Hurricane Ike struck Galveston Bay on September 13, 2008. Follow-up assessments were conducted at 5 to 9 and 14 to 18 months after Hurricane Ike. **Results:** Past-month prevalence of any mental disorder (20.6 percent to 10.9 percent) and hurricane-related PTSD (6.9 percent to 2.5 percent) decreased over time. Past-month prevalence of PTSD related to a non-disaster traumatic event (5.8 percent to 7.1 percent), GAD (3.1 percent to 1.8 percent), PD (0.8 percent to 0.7 percent), depression (5.0 percent to 5.6 percent), and suicidality (2.6 percent to 4.2 percent) remained relatively stable over time. **Conclusions:** PTSD, both due to the hurricane and due to other traumatic events, was the most prevalent psychiatric disorder 2 to 5 months after Hurricane Ike. Prevalence of psychiatric disorders declined rapidly over time, suggesting that the vast majority of individuals exposed to this natural disaster ‘bounced back’ and were resilient to long-term mental health consequences of this large-scale traumatic event.

Citations

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