Quick Response Report #104 DISSOCIATIVE AND POSTTRAUMATIC REACTIONS TO THE NORTHERN CALIFORNIA FLOODING OF 1997

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Return to Hazards Center Home Page
Return to Quick Response Paper Index

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DISSOCIATIVE AND POSTTRAUMATIC REACTIONS TO THE NORTHERN CALIFORNIA FLOODING OF 1997

The Central Valley of northern California was the site of disastrous flooding during the early part of 1997. Reports of the flooding confirm that this disaster was exceptionally widespread, severe, and protracted because of repeated flooding and threats of reflooding. The State of California Flood Center estimated that property damages in the Central Valley totaled over $1.6 billion. During the flooding, there were ten deaths, more than 100,000 people evacuated, and more than 150,000 acres flooded. More than ten thousand people sustained damage to their homes. In addition, numerous sites reflooded, requiring repeated evacuations in some areas. Two areas of the state are among the most devastated and are located in rural/agricultural areas: Yuba/Sutter Counties, including the towns of Yuba City, Marysville, Arboga and Olivehurst, and Stanislaus/San Joaquin Counties, including Modesto and Stockton.

This study examined demographic characteristics of the sample, exposure to the flooding, types of coping used during the flooding, and symptoms of Acute Stress Disorder (ASD) and Posttraumatic Stress Disorder (PTSD) in these two Central Valley counties from one to four months following the floods. According to the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV) (American Psychiatric Association [APA], 1994), ASD includes dissociative and posttraumatic symptoms and occurs during the first four weeks after a traumatic stressor. The diagnosis of PTSD includes symptoms of reexperiencing the traumatic event (such as in nightmares), avoidance of reminders of the event, and hyperarousal which last more than 30 days after a

traumatic stressor (APA, 1997). It was hypothesized that greater amounts of exposure to the flooding would be associated with greater severity of both shorter term (ASD) and longer term (PTSD) stress symptoms.

METHOD

Procedure:

Participants completed a survey which included questions about their contact with and reactions to the flooding. Survey materials were distributed with a stamped, self-addressed envelope attached so that participants could complete the survey at home and return it by mail. Survey materials included a cover letter from the first author and two copies of the consent form (one to sign and return with the survey and one to keep for reference). The staff at a number of community agencies agreed to assist in the distribution of the surveys. Although more than 1,000 copies of the survey materials were given to community representatives to distribute, it is not possible to calculate a response rate because some survey materials may not have been distributed. In addition, the first author and graduate research assistants made several trips to the flood areas to distribute surveys.

Participants:

One hundred thirty-one participants were recruited from several sites, including the employees of a local hospital, mental health professionals attending a disaster relief meeting, students of a community college, persons seeking assistance at one-stop community flood relief centers, and persons shopping at discount department stores. This sampling strategy was designed to include a broad range of the residents of these communities who were expected to vary with respect to their actual contact with the flooding. Table 1 shows the demographic characteristics of the sample.

Instruments:

The current study examined demographic characteristics of the sample, exposure to the flooding, types of coping used during the flooding, and dissociative and posttraumatic reactions in two Central Valley counties from one to four months following the floods. In addition, other measures were administered that addressed previous stressful life events, the strength of religious and spiritual beliefs and practices, and recontact information.

Demographic characteristics:

Demographic characteristics were assessed by self-report items on gender, age, marital status, education, employment status, household income, ethnicity, religious affiliation and proximity of residence to the flooding.

Contact with the floods:

A 16-item instrument examined participants' exposure to the flooding, including being evacuated, property losses and damage, injury, and participation in helping others (i.e., sandbagging). This instrument is a modification of one used to assess contact with the Oakland/Berkeley firestorm (Koopman, Classen, & Spiegel, 1996). An index of flood exposure was calculated by counting the number of flood contact items each participant endorsed.

Coping during the flooding:

Participants are asked to indicate what actions they took during and in the immediate aftermath of the flooding or evacuation order. These 18 items were designed to reflect active, passive, avoidant, and dangerous coping. This instrument is a modification of one used to assess coping during the Oakland/Berkeley firestorm (Koopman, Classen, & Spiegel, 1996).

Acute stress reactions in the immediate aftermath of the flood:

Acute stress reactions were assessed by the Stanford Acute Stress Reaction Questionnaire (SASRQ; Carde¤a, Classen, & Spiegel, 1991), which is a comprehensive assessment of dissociative and posttraumatic responses experienced during and following a traumatic event. Participants were asked to rate how much they experienced each of 30 symptoms during and in the first four weeks following the flood. Ratings were made on a six-point scale ranging from "not experienced" to "very often experienced."

Posttraumatic stress disorder (PTSD) symptoms:

The PTSD Checklist-Civilian Version (PCL; Weathers, Huska, & Keane, 1991) is a 17-item self-report measure that assesses the 17 PTSD symptoms required by the DSM-IV (APA, 1994). Because the PTSD diagnosis requires that symptoms must be present for more than 30 days following the trauma, the PCL was only distributed to the 60 participants who completed the survey more than 30 days following the end of the flooding. Participants reported on how much they had been bothered by the flood in the previous four weeks.

RESULTS

Contact with the flood

Participants in this study ranged from persons with no contact with the flooding to persons who were severely affected by the flooding and its aftermath. One hundred participants (76%) reported seeing the water rise and 26 (20%) heard the flood waters. Sixty-six (50%) were evacuated. During the flooding, 76 (58%) thought that their residence might be in danger and 27 (21%) thought that their own life or safety was threatened. Four persons (3%) were injured during the floods, 34 (26%) saw someone injured, 7 (5%) were actually caught in the floods and

none were rescued from the flood waters. Eighty-six (66%) assisted others (such as by sandbagging). Twenty participants (15%) reported losing their homes and 32 (24%) suffered other property loss. Sixty-six participants (50%) reported moving temporarily following the flood. Almost everyone in the sample knew someone who had suffered a loss or was injured during the flooding (n = 112, 85%) or saw homes and property destroyed (n = 101, 77%).

Relationships of Flood Exposure to Acute Stress and PTSD Symptoms

Spearman correlations were computed to test the relationships between flood exposure and the two stress symtpom measures. Greater total amount of contact with the flooding was significantly associated with higher levels of symptoms of ASD ($\underline{r}s = .61$, $\underline{p} > .001$) and PTSD ($\underline{r}s = .54$, $\underline{p} > .001$).

Coping during the Flood

Passive coping activities were the most commonly reported. Listening to reports of the flood on the television or radio was reported by 121 participants (92%). Talking to others about the flood (n = 119, 91%) and worrying (n = 94, 72%) were also common passive coping responses. Active coping included sandbagging one's home or yard (n = 19, 15%), helping others (n = 91, 70%), packing belongings (n = 66, 50%), making plans for evacuation (n = 78, 60%), and evacuating (n = 79, 60%). Dangerous coping included trying to get a closer look at the flood as it was occurring, which was an act taken by 35 participants (27%). Passive/avoidant coping included staring at the rain or flood water (n = 64, 49%), doing working unrelated to the flood (n = 55, 42%), sleeping (n = 23, 18%), eating to take one's mind off the flood, using alcohol, drugs or cigarettes to relax (n = 22, 17%) recreational activities (n = 17, 13%), and getting distracted while evacuating (n = 27, 21%).

DISCUSSION

These results demonstrate that some Central Valley residents were exposed to severe stress and losses during the flooding and its aftermath, and that contact with the flooding tends to be associated with higher levels of symptoms of acute and posttraumatic stress.

A substantial proportion of participants were severely exposed to stress and losses associated with the flooding. A sizable proportion of the participants were evacuated and had to move temporarily after the flood. The widespread property loss in this area was also experienced in the study sample: 15% reported loss of their homes and 24% reported other property loss. In addition to actual home and property losses, a significant proportion of the sample was exposed to the stress of fearing for their property or lives during this catastrophic flooding. Following the flood, a majority of participants were exposed to the losses and injuries experienced by others.

Given the severity of exposure to stress and loss, it is unsurprising that some study participants also evidenced symptoms of two stress disorders: acute stress and posttraumatic stress disorder. The significant relationships between flood exposure and symptoms of both of these disorders demonstrated that flood exposure is associated with both shorter term and longer term stress reactions. It is important to note that this study examined symptoms of stress disorders rather than the actual diagnosis of disorders. Thus, even though greater flood exposure was associated with elevated levels of stress symptoms, participants did not necessarily qualify for the formal diagnosis of a mental disorder.

An additional focus of this study concerned the types of coping used during the flood. Passive coping activities were the most commonly reported, such as listening to reports of the flood on the television or radio, talking to others about the flood, and worrying. Active coping activities reported by a majority of the participants included helping others, packing belongings, making plans for evacuation, and evacuating. Both of these types of coping were reported by a majority of the sample and appear to reflect functional coping methods, in the sense that these coping activities may tend to enhance the safety of victims

during a flood.
In addition, an important percentage of the sample reported coping activities that appear to be less functional in the sense that these coping activities may potentially exposure a flood victim to greater danger. Dangerous coping included trying to get a closer look at the flood as it was occurring, which was an act reported by 27% of the sample. Passive/avoidant coping may also be less effective in reducing one's exposure to the danger of flooding. These activities, such as staring at the rain or flood water, doing work unrelated to the flood, sleeping, eating to take one's mind off the flood, using alcohol, drugs or cigarettes to relax, recreational activities, and getting distracted while evacuating, were reported by a sizable minority of study participants.
In conclusion, both shorter term and longer term stress reactions were found in this sample of persons exposed to flooding. In addition, participants reported the use of several types of coping, including both functional and more dangerous coping activities. These findings highlight the importance of both immediate and longer term mental health interventions with flood victims. In addition, public education efforts might emphasize teaching ways of coping with flooding that would enhance safety, rather than endanger it, in the face of catastrophic flooding.

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Table 1

Sample Demographics

Variable	Mean	Std Dev	Minimum	Maximum	n
Age	42.98	12.56	18	73	131

Education	14.80	2.24	8	21
127				

Variable	Frequency	Valid Percent
Gender		
Male	40	30.8
Female	90	69.2
Marital Status		
Single	26	19.8
Married	75	57.3
Separated	2	1.5
Divorced	25	19.1
Widowed	3	2.3
Employment Status		
Not Employed	25	19.1
Part Time	23	17.6
Full Time	83	63.4
Household Income		
less than $10,000	11	8.9
$10,000 to 19,000	14	11.3
$20,000 to 39,000	37	29.8
$40,000 to 59,000	27	21.8
$60,000 to 79,000	15	12.1
$80,000 to 99,000	6	4.8
over $100,000	14	11.3
Ethnic Background		
Caucasian	100	76.3
Latino/a or Chicano/a	11	8.4
Mixed	12	9.2
Asian/Asian-American	3	2.3
Native American	3	2.3
African American	2	1.5

Religious Affiliation		
Christian (non-Catholic)	60	46.9
Catholic	39	30.5
Other	4	3.1
None	25	19.5

Return to Hazards Center Home Page

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