The Professional's Psychological Response in Disaster: Implications for Practice

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The purpose of this study was to determine the psychological impact of a disaster, the 1989 Loma Prieta Earthquake, on health-care providers.

Four specific questions were addressed: What are the major stressors for health-care providers following an earthquake? How do health-care providers cope in a disaster? How does a disaster affect the lives of health-care providers? What recommendations do health-care providers have for disaster preparedness and operation?

Four research hypotheses were formulated to determine subjective distress:

1. Cognitive and affective intrusion is higher in health-care providers following an earthquake than in the standardized norm.
2. Avoidant behavior is higher in health-care providers following an earthquake than in the standardized norm.
3. Health-care providers, 6 month’s postdisaster, have less intrusive thoughts and affect about the earthquake than at 7 weeks postdisaster.
4. Health-care providers, 6 month’s postdisaster, have less avoidance behavior concerning the earthquake than at 7 weeks postdisaster.

The concepts of intrusion and avoidance are based on Horowitz’s (1976) postulate that there is a predictable pattern of response following a severe stressful event. Victims typically experience recurring, distressing thoughts about the event and attempt to avoid thoughts and behavior associated with the disaster. As one works through the stressful event, the victim vacillates between intrusion and avoidance, with the magnitude of those oscillations being much stronger at first. According to Horowitz (1985), individuals’ responses to disasters tend to be cyclic in an attempt toward restoring an equilibrium between the self and new realities brought on by the stressful event.

Review of Literature

There are few published studies specific to the health-care provider in a disaster, but there is a growing number of reports on rescue workers’ reactions in a disaster. Findings from these studies, coupled with the shortage of literature specific to health-care providers’ reactions, served as the impetus for this research.

Health-care providers in Kalamata, Greece, experienced great subjective distress following a major earthquake in their area. Seven months postdisaster and 1 month postdisaster, both cognitive and affective intrusion and avoidance behavior, as measured by the Impact of Event Scale, were significantly greater than for a Greek non-disaster population. The major areas of concern for the health-care providers in Greece were for the victims left home-
less by the earthquake and the aged population, who would now have to "start all over again" (Laube-Morgan, 1988).

Laube (1985) studied 101 health-care providers following the 1974 devastating tornado in Xenia, Ohio. The subjects were grouped into three categories: those who had family responsibilities and determined their family's welfare before reporting for duty; those who had family responsibilities but reported immediately for duty (or stayed on duty); and those who had no family responsibilities and thus no family/community role conflict. Subjective distress, manifested by depression, anxiety, and somatic concerns as measured by the Psychiatric Status Scale, was prevalent in all three population groups during the first 2 weeks after the tornado, and was still evident 2 years postdisaster.

Miles, Demi, and Mostyn-Aker (1984) surveyed 54 rescue workers following the 1981 collapse of the skywalks at the Hyatt-Regency in Kansas City, Missouri. The disaster killed 114 individuals and injured 138 people. The rescue workers were asked to complete three questionnaires; the Hopkins Symptom Checklist (HSCL), the Health Assessment Questionnaire (HAQ), and a disaster personal-experiential questionnaire. Responses on the HSCL were higher than the established norms but were not statistically significant. However, data from the disaster personal-experiential questionnaires indicated that rescue workers experienced emotional difficulties. The authors suggested that the contradictory findings may be attributed to the different periods tapped for the two instruments. The HSCL referenced time point was "the past 7 days," and the disaster personal-experiential questionnaire referred to the time "since the disaster." The most commonly reported health problems on the HAQ were emotional/psychological and musculoskeletal.

In a study 1 month following a rail disaster in Australia (Raphael, 1983-84), 77 out of 95 rescue workers found the experience stressful; 20% of those experienced specific psychological problems. The remaining number felt more positive about their own lives as a result of the helping experience.

In Laube's (1973) study of nurses after the devastation of Hurricane Celia, it was found that nurses coped with their anxiety without impairment of their professional role. Major stressors identified by the subjects were excessive physical demands, concern for their safety, concern for their patients' safety, inadequate supplies, and concern for their family's safety.

A successful mental health intervention program for health-care providers and victims was described by Stanley (1990). Based on expected reactions to disaster, a crisis stabilization program was initiated in Charleston, South Carolina, to assist hospital nurses following Hurricane Hugo (Stanley, 1990). Basic crisis intervention techniques, along with formal debriefing sessions, were successfully employed. It was concluded that such a program reduces recovery time.

Summary of Literature. Rescue
workers and health-care providers experience the same disturbing, and sometimes dramatic, emotional problems as those found in disaster victims. They are not to be considered mentally ill but rather as normal persons reacting in a very normal manner to an abnormal condition. However, the performance of duties during disaster operations carries high emotional risk and may result in harmful consequences for the worker and the worker’s family. Disaster workers, at any level, should be considered as groups for whom services may be needed.

Event

At 5:04 PM, Pacific Daylight Time (PDT), October 17, 1989, northern California was struck by an earthquake measuring 7.1 on the Richter scale. The epicenter was approximately 60 miles south of San Francisco in the Santa Cruz Mountains. The eruption extended north beyond San Francisco with extensive damage and deaths from Watsonville and Santa Cruz to the San Francisco marina area and Oakland’s Cypress Structure. The earthquake was named Loma Prieta after one of the mountains in the epicenter area.

The economic impact from the Loma Prieta Earthquake has been estimated at $8.3 billion in direct losses. There were 62 deaths and 3,000 injured as a result of the earthquake. Approximately 116,882 buildings were damaged; 14,000 were left homeless (Earthquake Engineering Research Institute, 1989). No estimates of the psychological impact have been given.

Method

Sample. The total sample consisted of 74 health-care providers who lived and worked in the area of the Loma Prieta Earthquake. As defined in this study, health-care providers were nurses and physicians from acute health-care settings and mental health-care workers, social workers, psychologists, and psychiatrists from mental health centers. Demographic data were available for 59 of the 74 (80%) health-care providers. Analysis of that data revealed a population of 22% men and 78% women. Their ages ranged from 29 through 61 years, with a mean of 43.

Interviews were conducted with 47 of the study population. Eight (17%) of the interviewees were men and 35 (74%) were women. Their ages ranged from 22 through 58 years, with a mean of 39.

Instrument. The Impact of Event Scale (IES) (Horowitz, 1979) was used to assess the health-care provider’s subjective distress following the earthquake 7 weeks and 6 months postdisaster. It is particularly valuable in collecting longitudinal data as it can be tied to the same stressor over the entire span of data collection.

The IES is divided into two subscales: intrusion, signs of cognitive and affective intrusion; and avoidance, blocking or suppression of thoughts and images. There are only 15 items on the scale: seven intrusion items and eight avoidance items. It is self-administered and may be completed in 10 minutes or less.

Some examples of intrusive thoughts are that the victims think about the disaster when they don’t mean to do so; have dreams about it; or other things keep causing them to think about it. Examples of intrusive emotions (affect) are pictures of the event keep popping into their mind; they have strong waves of feelings about the event; or any reminder brings back feelings about it. For protection, victims employ avoidance maneuvers. Actively avoiding the subject and staying away from any reminders of the event are examples of avoidance behavior.

Scores are determined by assigning a value of 0, 1, 3, and 5 to the fre-
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Frequency categories (never, rarely, sometimes, and frequently) for each item. The values are then summed for the scores; the highest score possible for the intrusion scale is 35 and the highest score possible for the avoidance scale is 40.

Medical students, who had just witnessed their first autopsy, constituted the population that Horowitz, Wilner, and Alvarez (1979) used to establish norms. Reliability established by test-retest was 0.89 for the intrusion subscale and 0.70 for the avoidance subscale. The Chronbach's alpha was 0.79 for the intrusion subscale and 0.82 for the avoidance subscale.

A structured interview schedule developed by Laube (1973) was used as a second data collection measure. The questions related to the subjects' feelings and behavior following the event: where the subjects were when it occurred; the number of continuous hours worked without relief; the subjects' major stressors and coping responses; how they have been affected; and recommendations for disaster preparedness.

Procedure. On-site data collection, completion of the IES, and interview was initiated 7 weeks postdisaster and continued over an 11-day period. A follow-up was conducted 6 months following the earthquake.

Confidentiality was assured and participation was voluntary. All health care providers who were in the hospital or mental health agency at the time of the researcher's visit were given the opportunity to be interviewed by the researcher and complete an Impact of Event Scale. Subjects who consented to a follow-up contact were asked to give their names and addresses. Otherwise, only age and gender were requested. Copies of the IES were left for distribution to off-duty staff who might choose to participate, and then returned in stamped envelopes addressed directly to the researcher. In the mental health centers, all of the IES forms were completed while the researcher was on site.

The IES was used to again assess the professional's subjective distress 6 months following the earthquake. The forms were mailed to the 38 subjects who had put their names and addresses on the first administration of the IES in December 1989. They were requested to complete the forms, using the October 17th earthquake as the identified stressor, and were invited to add comments on the situation. A stamped addressed envelope was included for their convenience. Seventeen completed forms were returned for a 49% return rate. Three were returned by the post office due to having "moved, left no forwarding address."

To determine if the second sampling group was representative of the total original sample, the normal z test, two-tailed 0.05 probability, was used to analyze the responses. The mean scores in December on the intrusion subscale for the total group was 15.87 and 12.21 for the second group. The difference of 3.36 was statistically significant. The mean scores in December on the avoidance scale for the total group was 11.92 and 9.94 for the second group. The difference of 1.98 was statistically significant. The follow-up group was not representative of the total health care provider sample. Thus, the results from the longitudinal study cannot be generalized to the total sample population.

Results

Analysis of IES Scores. On data collected 7 weeks after the earthquake, out of a possible score of 35, the range for the total group on the intrusion subscale was 0 to 35, with a mean of 15.87. On the avoidance subscale, the range for the total group was 0 to 35, out of a possible score of 40, with a mean of 11.92. The mean of the norm group on the intrusion scale was 3.64 and 5.1 on the avoidance scale.

Hypotheses 1 and 2 were both accepted at the .0001 probability level, normal z test. Cognitive and affective intrusion was higher in health-care providers following the earthquake than in a normal population under less stressful conditions. Avoidant behavior was higher in health-care providers following the earthquake than in a normal population under less stressful conditions.

Analysis of the subscales by each item revealed that the item, "Other things kept making me think about it," had the highest mean score on the intrusion scale. On the avoidance subscale, the highest mean response was to "I avoided letting myself get upset when I thought about it or was reminded of it." The Table lists the mean scores of each item on the Impact of Event Scale.

A t-test for paired samples, two-tailed probability, was used for testing the third and fourth hypotheses with the following results: mean scores on the intrusion subscale were 12.21 and 12.47, 7 weeks after the earthquake and 6 months after the earthquake, respectively. There was essentially no change in cognitive and affective intrusion during that time.

The fourth hypothesis was accepted at p < .05 level. Mean scores on the avoidance subscale were 9.94, 7 weeks after the earthquake and 8.53, 6 months postdisaster. Health-care providers had less avoidant behavior 6 months after the earthquake.

Analysis of Interview Data. All of the subjects had experienced previous small earthquakes, but fewer than 20% had experienced a major disaster. Only four of the 47 interviewed suffered any damages from the disaster.

The earthquake occurred at 5:04 PM, PDT. With few exceptions, all of the persons interviewed were on duty or had just left for home. Several spoke of a near miss; they would have been on the Bay Bridge, or the Cypress Structure, except that they were running late or had some type of schedule change.

Although many admitted to being scared, panicky, or terrified, no one felt
that they were called on to do anything for which they were not prepared. After the immediate protection of themselves during the earthquake, such as diving under a desk or standing in the doorway, they went into their disaster plan. They evacuated their buildings, calmly in some agencies and with much confusion in others. They went through their buildings to assess the damage and check on the safety of patients and staff, calmed pediatric patients, discharged patients, and set up triage. Only two people of the 47 interviewed worked longer than their regular shift; they each worked 14 hours without relief. Many of the mental health-care professionals went directly to the Cypress Structure to support the victims’ families.

The thoughts and feelings some of the people remembered from that time concerned their own safety and their fear of dying. Many spoke of concern for their families. The phone lines were down and they were unable to make outside contact. Some spoke of periods of up to 6 hours before they had any communication from, or about, their families. Two persons spoke of feeling angry. Causes of greatest stress for professionals, following their immediate fright, were the concern for the safety of their families (46%), not knowing how they were for several hours, and the disaster casualties. Other identified stresses were the aftershocks (they “just kept coming”), the unending 24-hour television coverage, and communication difficulties because the phones were out of order.

The hospitals did not receive many disaster victims because most of the injuries were so severe that the victims were killed rather than injured. Seeing, and thinking about, the large number of dead victims caused the most problems for the subjects. They spoke of going to the Cypress Structure, a three-tiered portion of an interstate that had collapsed, and watching in horror as rescue workers attempted to remove victims from their mangled cars. One person reported that a refrigerated truck, parked outside of her office window, was a constant reminder of the grim reality: it was to be used as a temporary morgue.

One person, whose home withstood major damage, said that standing in line all day to get her damage assessment was the hardest for her. She knew how victims felt because she was a victim, too.

The responses varied to the question, “How has this affected you?” Several reported they could not sleep or eat for days. Others said the experience had deepened them spiritually. They spoke of physical exhaustion and not caring when clients did not keep appointments. Guilt was expressed by some, guilt that they were not doing more and that they were saved. They said it triggered feelings about unresolved losses. Some spoke of panicking if it was after 5 PM and they were still in their offices. They still could not go by the Cypress Structure or cross over the Bay Bridge. A few admitted to decreased work productivity and not caring.

Conversely, there were some who spoke of the disaster as promoting a better self and community. They said it made them realize that nothing is forever and, as a result, turned to God. They spoke of being more thoughtful and of putting things in perspective. They were pleased that the community seemed to come together in that period of crisis. In the words of one person, “Life, as I knew it, ended that day.”

When asked how they coped, only two persons out of 47 said they were so terrified that they were dysfunctional. Fifteen (32%) reported they received help through counseling or debriefing. Prayer was important to many. Six admitted to indulging in excessive smoking, eating, or sleeping. No one admitted to excessive drinking or use of drugs. One mental health professional said he organized a workshop to help deal with the victims’ trauma, but he was sure now that he did it for himself as well.

In response to the question regarding their current status, 17 subjects indicated that they were “back to normal.” Several said that they still jumped at any noise, and one mentioned a “clutching” in the chest when a truck would go by and the building would shake. No one admitted to being incapacitated, although, in the words of one person, “I haven’t recovered, but I manage to get through work.”

Summary of Comments 6 Months Postdisaster

Several people reported that there were aftershocks measuring 5.1 and 4.7 exactly 6 months after the October 1989 Loma Prieta Earthquake, during the follow-up period, and felt the shocks could unduly influence their responses. Others noted the aftershocks and used that to compare how they had responded to the earthquake. They said it was hard to put things in the past with so many earthquakes and predictions of strong earthquakes to come.

Selected comments regarding their status included:

- “The aftershocks conjure up thoughts of the big earthquake but do not have the after effects, such as sleeplessness and bad dreams. They are no longer bringing out bad feelings.”
- “My heart beats faster every time I feel a vibration, such as when a heavy truck passes. The aftershocks and recent small quakes seem to upset me more than all the years since 1963 when I moved to California.”
- “Day to day, I am more hypervigilant to noises and shocks. Part of me doubts my experience, wants to deny; the other part reaches out for support.”
- “I am beginning to put things back into proper perspective.”
- “I used to shrug off the quakes in California, but no longer. I take them all seriously.”

One must use caution in interpreting
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KEY POINTS


1. Victims typically experience recurring and distressing thoughts about a disaster and attempt to avoid thoughts and behavior associated with the event. As one works through the stressful event, the victim vacillates between intrusion and avoidance, with the magnitude of those oscillations being much stronger at first.

2. Although health-care workers may respond effectively following a disaster, they are not immune to its stresses. They must attend to the victims, regardless of their own needs, taxing even the toughest of the tough.

3. A crisis team should be established to work with the staff before disaster strikes, to be highly visible during a disaster to maintain staff support and emotional stability. They should take an active role in organizing and conducting mandatory debriefing sessions after a disaster to ward off traumatic effects.

Discussion and Implications for Practice

The significantly high scores on the Impact of Event Scale validate the pain experienced by health-care providers after the Loma Prieta Earthquake. Even in those individuals who did not score high, evidence of stress was apparent from their interview data.

Although health-care providers responded effectively following the Loma Prieta earthquake, as can be seen from the data analysis, they are not immune to the stresses of disaster. They must attend to the victims, regardless of their own needs, taxing even the toughest of the tough.

There is no way to completely ward off the traumatic effects of disaster, but that does not mean intervention programs should not be designed. The data suggest developing a primary, secondary, and tertiary prevention program for the caregivers. For primary prevention, develop a crisis team to work with the staff before a disaster strikes. Composition may vary, but including a chaplain, social worker, nurse, and psychiatric consultation is advocated in hospital settings. This team should have input into the agency’s disaster plan and be active in disaster drill critiques and debriefing.

At a secondary level, the same team should be highly visible during the impact of disaster. They could serve as monitors for the emotional stability of staff as well as maintaining support for staff. On the tertiary level, following the disaster, they should take an active role in organizing and conducting mandatory debriefing sessions. They would also recognize the staff’s needs for counseling referrals. Again, they have an important role during the critique of the agency’s disaster operation. Further roles and responsibilities of this team could evolve, all with the purpose of preventing burnout and emotional casualties of the health-care provider.

Finally, the following recommendations for disaster preparedness or operation, made by the subjects in the interview process, warrant consideration by administration:

- Develop a healthy lifestyle to enhance health and help prevent negative effects of stress.
- Have a predetermined plan for families of staff, so that their safety can be quickly determined and so the families can provide support for one another.
- Keep the disaster plan current—staff home telephone numbers, etc. Include a list of sign language translators in your community.
- Conduct annual disaster drills, followed by a comprehensive critique.
- Provide a mandatory debriefing for all staff involved in the disaster.
- Provide support groups or counseling sessions.
- Plan a formal recognition by the organization for staff’s participation in the disaster operation.

References


Laube, J. Health-care providers as disaster victims. In J. Laube, S. Murphy (Eds.), Perspectives on disaster recovery. Norwalk, CT: Appleton-Century-Crofts, 1985, pp. 210-228.


