NATURAL DISASTERS AND PSYCHOLOGICAL ADJUSTMENT: IMPLICATIONS OF RESEARCH FOR PREVENTION EFFORTS

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ABSTRACT

Natural disasters occur frequently worldwide and have a tremendous impact on individuals and communities. This paper presents theory and research on human responses that are directly relevant to preparing for and recovering from disaster. We present a multivariate risk factor model that examines factors that may influence positive and negative functioning after a disaster. We also examine factors that may negatively impact emergency personnel working in a post-disaster environment. Specific recommendations are offered that emergency management personnel can use to plan short-term and long-term intervention programs. These programs may minimize or prevent distress and aid recovery for survivors and emergency personnel.

INTRODUCTION

Natural disasters threaten our health, safety, welfare, and property. Unfortunately, disasters are not uncommon. Between 1900 and 1986, there have been 2,400 natural disasters and 42 million disaster-related deaths worldwide, excluding the United States. Over 75% of all disasters and disaster-related deaths occurred in developing countries (US Agency for International Development 1986). The potential impact of natural disasters is so great that the United Nations declared the 1990's as the International Decade of Natural Disaster Reduction (UN 1987).

Because natural disasters occur frequently worldwide and have a tremendous impact on individuals and communities, it is vital that persons concerned with emergency management understand the human reaction to disaster. "Emergency management is the practice of identifying, anticipating, and responding to the risks of catastrophic events to reduce to more acceptable levels the probability of their occurrence or the magnitude and the duration of their social impacts" (Lindell and Perry 1992, p. 2). Although theory and research concerning human reactions to disaster have paralleled advances in environmental and engineered systems, the findings have not been widely accessible to geographers, geologists, civil engineers, and emergency management personnel because most are published in specialized journals and technical reports.

This paper addresses the need for integration of research findings on human responses that are directly relevant to preparing for and recovering from disaster. Because we take a psychological approach, our focus is on the behavior of individuals who have survived a natural disaster. We examine the disaster characteristics, survivor characteristics (e.g., mental health history), experiences (e.g., separation from family, displacement, injury), and social systems that have been shown to be related to positive and negative functioning after a natural disaster. This is critical in identifying persons at risk for adjustment and recovery difficulties. We also examine the psychological impact of working in a post-disaster environment on emergency personnel. Finally, we offer specific recommendations emergency management personnel can use to plan short-term and long-term intervention programs for survivors and emergency personnel that may minimize or prevent distress and aid recovery.

A MULTIVARIATE RISK FACTOR MODEL

The relationship between natural disasters and subsequent psychological adjustment and recovery can be understood through a multivariate risk factor model

(Freedy *et al.* 1993). According to the model, adjustment is a complex process that occurs over time and is influenced by individual and environmental factors at three stages: **pre-disaster**, **within-disaster**, and **post-disaster**. In this section, we present the model and research findings that support the model.

Pre-disaster Factors

Pre-disaster risk factors exist before the disaster. They include demographic characteristics, prior mental health problems, traumatic events, and stressful life events.

Demographic characteristics. Research suggests demographic risk factors include having limited financial resources, not being able to evacuate before a disaster, and being dependent upon or responsible for other people. Groups that may be at increased risk for adjustment and recovery difficulties include children, parents, elderly, and poorer individuals (Lystad 1990; Raphael and Middleton 1987; Sattler and Kaiser 1994). Research also suggests that women report more emotional distress (e.g., anxiety, depression) than men (Gleser *et al.* 1981; Sattler and Kaiser 1994; Shore *et al.* 1986), and men report more substance abuse and behavioral problems than women (Gibbs 1989; Gleser *et al.* 1981).

Prior mental health problems. Research suggests that individuals with prior mental health problems may be at risk for negative functioning and adjustment difficulties after a disaster. Approximately 20% of the United States population may suffer from a psychological disorder (Regier *et al.* 1984). We suspect that the incidence of psychological disorder may be higher in some countries and lower in other countries. Until additional research findings examine in detail the relationship between prior mental health problems and adjustment, we recommend considering prior mental health problems as a potential risk factor for adjustment difficulties.

Life events. Research suggests experiencing a traumatic life event (e.g., combat experiences, violent crime, serious accidents, natural disasters) may be related to difficulties adjusting to a disaster. This is especially important when we consider that traumatic life events are neither rare nor unusual across the lifespan (Breslau *et al.* 1991; Noris 1992; Resnick *et al.* 1994). It also is likely that rates of traumatic life events may be higher among the populations of certain countries. Other stressful life events, such as unemployment and physical health problems during the year prior to the disaster, may lead to adjustment difficulties (Freedy *et al.* 1993).

Within-Disaster Factors

Within-disaster factors include the victim's experiences during the disaster, including exposure to physical damage and cognitive appraisal of the situation.

Disaster exposure. Disaster exposure refers to the victim's experiences within the first few days after the disaster. Individuals may be at risk for adjustment difficulties if they have little or no warning before the disaster. This is so because individuals will not have time to take self-protective actions (e.g., securing property, evacuating). In addition, individuals who are physically present during the disaster may be at risk of bodily injury and may be exposed to grotesque sights (Green 1990). In general, research suggests disaster exposure may lead to increased mental health symptoms (Green 1990).

Cognitive appraisal. Research suggests that individuals who believe they have little control over the situation, cannot predict outcomes, and believe their lives are threatened may experience emotional distress (Foa *et al.* 1989; Kilpatrick and Resnick 1993).

Post-Disaster Factors

Adjustment can be conceptualized as occurring at two stages: acute and ongoing. The acute stage occurs from the first few days up to four months after the disaster. The ongoing stage occurs from the first few months up to several years after the disaster (cf. Weiss 1993).

Acute stage. Research suggests that positive adjustment is directly related to immediately meeting basic survival needs following a disaster (e.g., shelter, food, safe drinking water, clothing), having reliable means to meet basic needs (e.g., money in savings, insurance, assistance from family, neighbors, friends), and returning to normal daily routines. The loss of material resources (e.g., household contents) and personal and social resources (e.g., sense of optimism, feeling in control, family stability) can negatively impact adjustment (Freedy *et al.* 1992; Freedy *et al.* 1994; Hobfoll 1989). Survivors may experience mild to serious physical and mental health problems. These include sleep disturbances, difficulty concentrating, changes in appetite, irritability and anxiety, lethargy, difficulty with emotional intimacy, lack of feelings, fear of being alone, and pessimism (Baum 1987; Freedy *et al.* 1992; Green *et al.* 1990; Sattler and Kaiser 1994).

Ongoing stage. Natural disasters may produce

stressful life events (e.g., unemployment, displacement) that can remain for months or years. The chronic stress related to these life events and the loss of personal and social resources can negatively impact adjustment (Hobfoll 1988, 1989; Solomon and Canino 1990). For example, low levels of social support have been shown to be associated with increased psychological distress (Cook and Bickman 1990). But replacement or replenishment of resources may improve an individual's ability to cope with the post-disaster environment and reduce feelings of distress (Hobfoll 1989).

Survivors may continue to experience or develop mild to serious physical and mental health problems. These include post-traumatic stress disorder, substance abuse, and clinical depression (Freedy *et al.* 1994; Green *et al.* 1990; Rubonis and Bickman 1991; Solomon 1989; Steinglass and Gerrity 1990). Research suggests there is a 17% increase in psychopathology after disasters (Rubonis and Bickman 1991). In addition, disaster survivors may experience increased rates of domestic violence and divorce. Fortunately, most negative psychological symptoms dissipate within 18 to 24 months if pre-disaster conditions return (Cook and Bickman 1990; Freedy *et al.* 1993; Rubonis and Bickman 1991; Solomon and Green 1992). Research also indicates survivors may experience positive reactions, including personal growth and increased self-respect.

Table 1
Risk Factors for Adjustment Difficulties

- Lower income
- Elderly persons
- Prior mental health problems
- Prior violent crime victimization
- Prior history of other traumatic events
- Intense initial emotional reactions to disaster
- Perceived threat of serious injury or death to self or family during disaster
- Higher post-disaster rates of stressful events
- Lack of important resources in the post-disaster environment (e.g., family stability, stable employment, social support)
- Negative coping behavior (e.g., alcohol abuse)

Table 1 presents the primary risk factors for adjustment difficulties following a natural disaster during the acute and ongoing stages. The presence of one or more of these factors may be associated with increased risk for adjustment difficulties (Freedy and Kilpatrick 1994).

PSYCHOLOGICAL REACTIONS OF EMERGENCY PERSONNEL

Emergency personnel (e.g., on-site rescue workers, ambulance personnel, fire and police personnel, doctors and nurses, mental health personnel, administrators) working in the post-disaster environment may be at risk for experiencing negative psychological reactions (Gibbs *et al.* 1993). The relationship between working in the post-disaster environment and subsequent psychological difficulties may be understood in part through the pre-disaster and within-disaster components of the model described above. Emergency workers often have intense and prolonged exposure to harsh conditions, including grotesque sites, and a stressful and chaotic environment. In addition, emergency personnel may have experienced and survived the disaster, lost their home, property, and social support system. Research indicates emergency workers may experience grief, depression, anxiety, distress, difficulty sleeping, loss of appetite, headaches, and body aches (Anderson 1988; Bartone *et al.* 1989; Duckworth 1986; Raphael 1986). In addition, workers may abuse alcohol and other substances (Berah *et al.* 1984; Green *et al.* 1985).

IMPLICATIONS AND RECOMMENDATIONS FOR PREVENTION EFFORTS

The research findings and theory presented above can be applied by emergency managers in practical ways to assist survivors of natural disasters. In this section we offer specific recommendations that emergency management personnel can use to plan and implement preventive short-term and long-term mental health interventions. These interventions may help reduce or prevent psychological distress, and facilitate the adjustment and recovery of disaster survivors.

A number of recommendations are proposed to promote physical and psychological well-being after a natural disaster. We review and elaborate on several recommendations that have been proposed previously (Allen 1993; Dunning 1985; Freedy and Kilpatrick 1994; Gibbs *et al.* 1993; McFarlane 1994; Mitchel 1983; Ochberg 1991), and offer additional suggestions.

1. Early relief efforts (the first 6 months post-disaster) should assist individuals and families in obtaining basic goods and services. Taking care of basic needs can provide a solid foundation for positive functioning and adjustment.

2. Survivors should be encouraged to become involved in collective self-help efforts. Family should help family, neighbors should help neighbors.

Immediately after the disaster, informal networks (e.g., family, friends) may provide assistance to survivors. Disaster plans may include development of informal neighborhood groups that can be prepared to offer assistance in the aftermath of a disaster.

3. Special efforts should be taken to assist forgotten groups. Certain groups, including the elderly, poor, physically and mentally ill, and persons living in rural areas may become isolated following a natural disaster.

4. An important intervention strategy that may minimize or prevent psychological distress is actively educating the public about typical symptoms, and how to cope with the symptoms in the aftermath of a natural disaster. This can be accomplished by having mental health personnel make presentations through the media (e.g., public service announcements, articles in newspapers, television, and radio interviews) and at group meetings (e.g., shelters, community centers, work, churches). This information may reach survivors who might not otherwise seek assistance from a mental health professional. Survivors should be encouraged to share their disaster related experiences with other people.

5. Assistance and recovery programs should be prepared to provide formal mental health services for a full range of psychological difficulties for adults and children. Survivors with certain characteristics (e.g., demographics, employment, injury, experience during the disaster) may be at risk of developing serious mental health problems (see Table 1 for the risk factors). The need for these services may develop within the first few months following the event and continue up to 24 months. In addition, short-term needs (during the acute stage) are likely to be different than long-term needs (during the chronic stage).

6. Disaster plans should clearly define the role of mental health professionals. The plan should consist of teams of mental health professionals who can provide a variety of services, including counseling sessions for individuals and groups (Allen 1993; McFarlane 1994). If possible, mental health professionals should be included in designing the plan.

7. A system to determine whether the services being provided are effective and appropriate should be developed. Feedback might be obtained from community leaders or representatives in the community.

8. It is vital that the disaster plans provide ways to support and reduce the stress of emergency personnel. Personnel who are distressed may not be able to effectively perform their jobs. An effective strategy to assist emergency workers is having mental health personnel conduct debriefing sessions in which workers discuss their symptoms and experiences in the disaster environment, and educate the workers about normal stress reactions and coping techniques (Mitchell 1983). These debriefing groups should be mandatory for all emergency personnel and should continue for several weeks (Allen 1993).

CONCLUSIONS

Theory and research findings suggest that a broad approach to managing the human response to natural disasters is warranted. Each disaster creates new challenges. Survivors are likely to have a variety of needs over time. Most survivors will require information, advice, and reassurance, and many will need assistance securing vital goods and services. A small percentage of survivors may develop serious psychological problems and require comprehensive mental health services.

Emergency management personnel and the engineering community can take specific actions that can promote the health, safety, welfare, and property of citizens and emergency workers. For citizens, intervention programs focusing on reducing or preventing psychological and physical problems should be conducted on an ongoing basis after the disaster. For emergency workers, programs that may minimize vulnerability to negative physical and psychological outcomes should be developed and executed. Before any disaster, training programs for emergency workers should present detailed information on how to perform the job, what to expect emotionally, and how to maintain physical health (e.g., adequate sleep, good nutrition). During the disaster, workers should be given adequate supervision, time off to minimize long-term exposure to extreme conditions, and debriefed about the situation and their reactions. Future research should continue to explore risk factors for psychological distress, and the effectiveness of post-disaster intervention programs for survivors and emergency workers.

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