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AFTERMATH OF A DISASTER:
PSYCHOLOGICAL RESPONSE TO THE MADISON, FLORIDA TORNADO

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FINAL FIELD REPORT -- MADISON, FLORIDA

Tornadoes do not generally strike in northern Florida. One April morning in 1988 at 4:55 A.M. the small northern Florida town of Madison (pop. circa 3,500) abruptly awoke to the proverbial "sound like a freight train" which was a tornado cutting a path a mile wide and 12 miles long right through the community. The only hint of a warning had been that of a seasonal thunderstorm preceding the tornado, causing restless sleep for some. Others recounted awakening to deafening sounds of debris smacking into the sides of their houses, followed by increasing vibrations of the whole house. Wood splintering and ripping apart heralded the moment that entire homes were literally lifted from their foundations and carried off by the force of the 150 mph winds. The destruction was completed in a matter of just seconds.

The townspeople credited the timing of the tornado in the pre-dawn hour as the reason that only four people were killed and just 17 injured in the face of so much property destruction. The tornado received an official rating of F-4 on a severity scale of F-0 to F-6 (F-6 being most severe). In all, 30 structures were completely destroyed and 70 were severely damaged, and many of these were nonresidential. The governor declared the area a State Disaster area.

The Red Cross moved in to help, offering food and clothing to the victims. The close-knit Madison community proved to be extraordinary in that the citizens selflessly suspended their own personal business to help out. Within two hours all the victims were located and accounted for. Not long after, power was restored, and hundreds of helpers rallied with cranes and bulldozers and chain saws to begin clearing the debris and to commence the rebuilding process. Families and neighbors fed and housed all those who had lost their homes, and there was no need for the Red Cross to set up a shelter.

The tornado-ravaged community carried the permanent physical scars of a war zone. Conspicuous vacant lots lay where thriving churches, college buildings, and homes had stood only days before. Empty foundations sat with only an occasional water heater or toilet upon them, and still-standing staircases led up to the nothingness of houses that once were. Acre upon acre of stately towering pine trees had been razed as if a giant bulldozer had gone through; mighty tree trunks had been snapped off a few feet from the ground; others were cleanly uprooted. Large pieces of metal from destroyed barns were wrapped around tops of trees still standing. No leaves remained on any trees near the path of the tornado. The empty horizon was a sad reminder of the loss of the trees so loved by the community.

In an effort to help individuals cope with their losses, the local mental health center provided a free counseling session to the public, in the form of a support session. The month following the tornado was a very busy one for this town trying to put itself back together.

Although low-income mobile home courts are known to be notoriously vulnerable to tornadoes, the Madison tornado was nondiscriminating. It had twisted through upper-, middle-, and lower-income neighborhoods alike, destroying everything in its path.

Method

We elected to interview a representative adult member of each household in the path of the tornado. Subjects were located with the assistance of the local sheriff and the director of the mental health center, both of whom knew most of the victims personally. Newspaper accounts provided a few more subjects for the study, as did door-to-door investigation of the areas that were hit. In order to avoid oversampling female subjects, whenever possible an attempt was made to sample an adult male from each household; when none was

available, a female was interviewed. Overall, 42 subjects participated in the study, and five refused, for a total completion rate of 89%.

Subjects were interviewed about their psychiatric and social status using a modified version of the Diagnostic Interview Schedule/Disaster Supplement (DIS/DS) (Robins and Smith 1983). This interview was designed for the ECA Hazards Study funded by NIMH (Smith et al. 1986) and has been used by investigators in several recent disaster studies. It elicits information about the disaster experience and the individuals' perceptions of the event, use of formal and informal support systems, behavioral response to the traumatic event, and 15 DSM-III diagnoses selected for their potential relevance to the disaster experience. Respondents were asked to comment on the disaster's effect on their philosophical or spiritual perspective, and they were also asked if they could think of anything positive that came about as a result of their experience.

For each disorder that was ascertained to have occurred, age of onset and age at last symptom were obtained, thus providing lifetime as well as current psychiatric status. Onset and recency for each positive symptom were also obtained, making information available regarding the presence or absence of each symptom during the interval between the disaster and the interview, and prior to the disaster.

Interviews were completed four weeks after the tornado, and most were conducted in-person, though a few had to be accomplished via telephone for various reasons. All subjects were offered \$10.00 for participating and were asked to sign informed consent statements prior to beginning the interview. The interview took an average of approximately 90 minutes to administer. Since rates of positive findings were very low, numbers were too small to provide sufficient statistical power for significance testing, and thus the results will be presented in a descriptive fashion.

Results

The sample was 55% female and all Caucasian (except for one black male) with a mean age of 44.0 years. Subjects reported 13.2 mean years of education, and all but three had completed high school or an equivalency.

Seventeen of the 42 subjects reported that their homes had been completely demolished, and another 18 subjects claimed severe damage to their homes (e.g. a tree crashed through the roof into the bedroom). Nineteen individuals reported that they had been involuntarily displaced from their homes due to the tornado. Only six subjects sustained minor damage (e.g. a broken window; shingles blown off) or no damage to their property. Two subjects were injured seriously enough to require hospital admission; nine more had injuries requiring attention from a physician. Household members of two subjects had injuries requiring hospital admission, and three more required medical treatment.

Respondents were asked how upset they had been after the tornado, and how much they felt they had been harmed. Perceived degree of upset was scored high ("very upset") by almost half (48%). About one-fifth (21%) denied feeling at all upset. Almost two-thirds (62%) felt the tornado had caused them a great deal of harm. By one month the overwhelming majority (92%) felt at least partially recovered, and 40% reported complete recovery. Clearly, a large portion of the perceived recovery had already taken place within the first month after the event.

Rates of diagnosable psychiatric disorder were low at one month after the tornado. Only five subjects met criteria for a psychiatric diagnosis. There was but one case of post-traumatic stress disorder (PTSD). Of the two cases of generalized anxiety disorder, one was a pre-existing condition, and one developed only after the disaster. There were three new post-disaster cases

of major depression, and one mild recurrent depression. There were no alcohol disorders.

Even though there was only one occurrence of PTSD, symptoms of this disorder were common, with 38% of the sample reporting at least one symptom. Insomnia was the most frequently reported PTSD symptom, endorsed by almost one-third (31%) of subjects; jumpiness/hyperaltness was the second most frequent symptom, reported by 29%. For example, in the week following the tornado Madison experienced an ominous-looking thunderstorm that frightened several subjects who reported that normally they would not have been upset by a storm. Mean number of PTSD symptoms was 1.59 per subject. The occurrence of PTSD symptoms was not associated with amount of property damage, displacement, or physical injury.

Interestingly, very few subjects reported terror or extreme fear during their experience of the tornado itself. They frequently stated that the tornado happened so fast and was over so quickly (30 seconds or less for most) that there wasn't time to think or feel. Many did not even have time to get from their beds to the hallway before the peak force hit and was gone. Some reported that they didn't know what was happening till it was over.

Only two subjects were upset enough to see a physician or mental health professional after the tornado. Five subjects admitted to using medication to help them cope. No subjects reported using alcohol to help them deal with feelings. Over two-thirds (69%) reported that they turned to family and friends for emotional support. Subjects also volunteered a number of other strategies they used to help them cope. Several coping techniques described by respondents might be considered to fall into a category of working through the experience via active processing on a cognitive or emotional level. Twenty percent of subjects reported using such an active coping technique, and

examples given of this were staying up late at night and talking about it, thinking about it and crying, reading about it, and helping other victims through their disaster-related problems. Another recurring theme in coping techniques was religious and/or philosophical, and examples of this were reading the Bible, reminding oneself to be grateful for what you have and for being alive, prayer, and going to church. A third, yet very different coping repertoire consisted of avoidance, such as trying not to think about it, avoiding reminders of it, keeping busy, and letting time pass to allow healing.

Respondents were asked if their degree of religious faith or their frequency of church attendance had changed after the tornado. Several individuals commented that they were not attending church as frequently as before because they were too busy rebuilding or helping others, and a few individuals reported that they had been inspired to attend church more often since the tornado. One person reported a decrease in religious faith as a result of the disaster, but 22 individuals acknowledged that the event had strengthened or "proven" their faith. There was a slight tendency for those individuals with one or more PTSD symptoms to report increased faith over those without symptoms. Perceived degree of upset, harm, and recovery did not vary with change of religious faith. Nor did amount of property damage, physical injury, or displacement show any relationship to reports of change of faith.

In spite of the extreme degree of destruction by the tornado, individuals frequently found positive things they felt had come about as a result of the disaster. They frequently stated that the event had made them consciously aware of their value system--that they valued their lives and their loved ones more than material goods, and that now they were much more aware and appreciative of how much they have. It was commonly reported that subjects felt closer to their family members and friends than before, and that they also

felt closer to God. For many, this closeness is what they perceived to be providing strength and speeding their recovery after the disaster.

Discussion

Rates of psychiatric disorder in survivors were very low one month after this tornado, and even rates of symptoms were not especially high. One explanation for this might be that tornadoes do not evoke psychiatric symptomatology, due to some intrinsic characteristic or characteristics. Although some other researchers have also reported low rates of psychopathology following tornadoes (Taylor et al. 1976; Penick et al. 1976) others have uncovered considerable emotional upset (Moore and Friedsam 1959; Parker 1975). A more severe tornado might have evoked higher rates of psychological distress in this population.

Another explanation for the low rates of psychopathology might lie with the pre-existing characteristics of the affected population, i.e. low rates of prior psychiatric history. It is well established that prior psychopathology is a strong predictor of post-disaster psychiatric difficulties (Bromet et al. 1980 and 1982; Lopez-Ibor et al. 1985), and a population largely free of past psychiatric problems might be expected to fare well after a disaster. Or perhaps these low rates speak to the basic natural resilience of human populations when faced with situations of extreme stress.

Yet another explanation for the relative paucity of psychological findings in these subjects could be the timing of the interviews. One month after a disaster, survivors might be expected to still be in a "honeymoon phase" characterized by positive, almost euphoric affect, heightened sense of community cohesion and support, optimism, and elevated confidence in personal ability to handle crisis (Tynhurst 1950). Had these individuals been studied at a later point in time the sense of optimism and support may have been lost as they entered the "disillusionment phase".

A final contributor to the lack of psychiatric findings could be that the strong supportive response of this small, close-knit community softened the psychiatric impact of the disaster. Warhelt (1985) and Bolin (1985) identified community response as an important element in mitigating disaster effects. From the findings in this single study of a tornado it is not possible to untangle the variables that contributed to the slight impact of this event. Addition of systematic data from other disaster studies and longitudinal perspectives may provide the statistical power and comparison information to provide the answers. But if the effect of the community response is what contributed most to the result, then it will be apparent that acute phase support is critical for the mental health of disaster victims.

In their diligent search for psychological disturbance and other negative consequences, disaster researchers have generally overlooked positive effects of these events. Although we had some initial concern that respondents might be offended by such questions, our experience proved that these concerns were unfounded. Subjects often gave well thought out answers and not only seemed to relate to this concept, but welcomed the opportunity to share positive aspects of their experience.

In contrast to most published disaster studies, this study found a population of disaster survivors who appeared relatively well adjusted in the acute post-disaster phase. The low rates of psychological distress in this population should prove at least as interesting to those who work with disaster victims as studies that report high rates of psychopathology. Studying well adjusted victims of disaster could potentially increase our understanding of effective coping strategies in the face of extreme stress and allow us to identify the most helpful community responses. Future studies should focus on individuals with positive outcomes as well as those with negative outcomes.

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