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The Impact of the 1995 Oklahoma City Bombing on the Partners of Firefighters

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ABSTRACT *This study explored the impact of the 1995 Oklahoma City, Oklahoma, bombing on the spouses and significant others of a volunteer sample of Oklahoma City firefighters who participated in the bombing rescue effort. Twenty-seven partners of Oklahoma City firefighters participated in this study, conducted 42 to 44 months after the bombing. These partners were assessed using a structured diagnostic interview and a companion interview to examine exposure, rates of psychiatric disorders and symptoms, functioning, health, and relationships. Coping and perception of the firefighter partner's response were also examined. Some of the women were exposed directly; most knew someone who had been involved in the disaster, and all reported exposure through the media. The rate of psychiatric disorders in the women following the disaster was 22%, essentially unchanged from before the incident. One developed bomb-related posttraumatic stress disorder (PTSD). Most were satisfied with their work performance; 15% reported that their health had worsened since the bombing, and more than one third reported permanent changes in relationships as a result of the bombing. Most coped by turning to friends or relatives, with less than 10% seeking professional help. Many described symptoms in their firefighter mate; all reported that their mate had been affected by the experience, and one half said their mate had fully recovered. The mates of these firefighters fared relatively well in terms of psychiatric disorders, symptoms, and ability to function. The prevalence of bomb-related posttraumatic stress disorder was considerably lower in this sample than in samples of individuals more directly exposed to the bombing, although some reported changes in relationships and health. The results suggest the need for further study of the impact of interpersonal exposure in those who provide support for rescue-and-recovery workers in major terrorist incidents.*

INTRODUCTION

A developing body of literature addresses psychological trauma associated with disaster work in rescue populations.[1–13] For direct victims, exposure may be sudden, unanticipated, and life threatening. For professional rescuers, on the other hand,

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exposure to traumatic events is an anticipated part of their job. They are trained and prepared for such events, and repeated exposure to trauma may either sensitize them or alternatively mitigate the effects through mastery and perspective. Their exposure is also likely to last longer than that of direct victims, require lengthy stretches of effort, and entail at least some danger. The impact of rescue work can be felt as well by those who live and work with these professionals.[14]

The 1995 bombing of the federal building in Oklahoma City, Oklahoma, resulted in 168 deaths and was, at the time, the deadliest act of terrorism on US soil. The dead included 19 young children and 1 nurse responder. Hundreds of direct victims were injured, and more than 100 injuries were reported among the rescuers. The rescue-and-recovery efforts lasted 16 days and were dramatic. Hours were long, and conditions remained unsafe for days.

North and colleagues[11] examined the psychiatric status of a volunteer sample of 181 Oklahoma City firefighters who participated in the rescue and recovery. They found good adjustment in the sample relative to prebombing status, with lower rates of posttraumatic stress disorder (PTSD) than in primary victims of the incident. Despite their apparent resilience, however, these rescuers had high rates of alcohol use disorders, which generally represented prior status and were largely independent of exposure to the bombing.

Oklahoma City firefighters who participated in studies related to the bombing identified their spouses, families, and significant others as the most valuable sources of emotional support following the incident.[9,10] Therefore, the exposure and emotional status of these significant others were of interest. The Oklahoma City Fire Department recognized the importance of significant others in the general well-being of the force and joined our efforts to explore the impact of the bombing in a volunteer sample of spouses and intimate partners of Oklahoma City firefighters who participated in the rescue. This study represented a first exploratory probe into the effects of vicarious exposure in a sample of firefighter partners.

METHODS

Participants

Participants in this study were 27 partners of Oklahoma City firefighters who served in the rescue and recovery following the Oklahoma City bombing; the study was conducted 42 to 44 months after the bombing. All participants were women recruited through their firefighter mate with the cooperation of the Oklahoma City Fire Department, which employs over 820 firefighters. Specifically, the partners of the 181 firefighters who had participated in a study of the effects of the bombing were invited to participate. All provided informed consent as required by the University of Oklahoma Health Sciences Center Institutional Review Board, which approved the study.

Instruments

The Diagnostic Interview Schedule (DIS) for the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition* (*DSM-III-R*),[15,16] was administered by trained interviewers to identify pre- and postdisaster diagnoses of PTSD, major depression, panic disorder, generalized anxiety disorder, alcohol use disorder, and drug use disorder. Onset and recency of symptoms were also documented to ascertain lifetime and current diagnoses. A companion interview, the Disaster Supple-

ment,[17] which has been used in studies of more than 2,000 survivors of 12 disasters, elicited information about participant demographics; disaster experience, including exposure to the event, perceptions of terror and horror, other subjective impressions, and physical injuries; level of functioning; and mental health treatment.

We also queried participants about their perceptions of their mate's reactions to the bombing, asking the degree to which their mate had been affected by the incident and the degree to which he had recovered and establishing the extent of psychiatric symptomatology in their mate and its impact on functioning. This was accomplished with specific questions about whether the participant felt her mate was "very upset," "somewhat upset," or "not very upset"; if he was harmed "a great deal" or "not much"; whether he was "very," "somewhat," "a little," or "not affected" by the disaster; whether he was "fully," "somewhat," or "not" recovered; and whether he had missed work after the bombing due to emotional or nervous symptoms.

In addition, each participant was provided a checklist of posttraumatic stress and depressive symptoms and asked to indicate whether her mate had experienced those symptoms after the disaster and, if so, to indicate whether they were new symptoms afterward or had been present prior to the disaster. Participants were also asked about excessive use of alcohol, both before and after the disaster, by their firefighter partner.

Data Analysis

Recognizing that study participants could have experienced PTSD in response to other traumatic events as well as to the bombing, diagnoses and symptoms of bombing-associated PTSD were tabulated separately from those associated with other traumatic events. Rates are reported as raw numbers and percentages; means are provided with standard deviations. To investigate associations between categorical variables, χ^2 tests were performed, substituting Fisher exact tests when expected cell sizes were less than 5. We used *t* tests for comparison of means between two groups, and linear regression analyses were used to examine associations between numeric variables. Statistical significance was set at the level of $P = .05$.

RESULTS

Sample Characteristics and Exposure to the Bombing

The women in this study were predominantly Anglo with an average age in the late thirties, and they had been married to or cohabitating with their firefighter partner for about 10 years. Most heard and felt the bomb blast, but none were injured. The majority were secondarily exposed by knowing others directly exposed to and/or killed by the bombing (see Table 1).

Mental Health

The lifetime rate of psychiatric disorders in the 27 women prior to the bombing was 26% (n = 7), with major depression in 7 (26%), panic disorder in 1 (4%), and generalized anxiety disorder in 1 (4%). The postbombing prevalence of psychiatric disorders was 22% (n = 6), with PTSD in 1 woman (4%), major depression in 5 (19%), and panic disorder in 1 (4%). The woman with PTSD also had major depression after the bombing. Of the 6 women with a postdisaster disorder, 5 met criteria for a disorder predating the bombing, and 5 of the 7 women with a predi-

TABLE 1. Demographic and exposure variables

Variable	% (n)	Range or M (SD)
Race		
Anglo	96 (26)	
African American	4 (1)	
Age, years		
Range		22–57
Mean (SD)		38.3 (9.0)
Currently cohabiting with firefighter	89 (24)	
Years of cohabitation with firefighter at time of bombing		
Range		1–25
Mean (SD)		10 (7.1)
Religion		
Protestant	81 (22)	
Catholic	11 (3)	
Jewish	0 (0)	
No preference	4 (1)	
Other	4 (1)	
Frequency of attendance at religious services		
More than weekly	30 (8)	
Weekly or less	56 (15)	
Rarely or never	15 (4)	
Exposure to bombing		
Heard explosion		
No	46 (12)	
Heard it loud	23 (6)	
Heard it very loud	31 (8)	
Felt explosion		
No	30 (8)	
Felt it some	52 (14)	
Felt it strong	19 (5)	
Family, friends, or companions involved	81 (22)	
Knew someone killed	33 (9)	
Exposed through media	100 (27)	

saster disorder met criteria for a postdisaster disorder. The 1 woman with a new disorder after the bombing developed both PTSD and major depression. The 2 cases of predisaster disorders that were nonrecurrent after the bombing occurred in 2 women with preexisting major depression.

More than one half (n = 14, 52%) of the women reported having one or more bombing-related PTSD symptom with a mean (SD) of 2.4 (2.9) symptoms. There were 12 (44%) women who met PTSD group B (intrusive reexperiencing) criteria, 1 (4%) met PTSD symptom group C (avoidance/numbing) criteria, and 9 (33%) met group D (hyperarousal) criteria after the bombing (see Table 2).

Before the bombing, 8 (30%) of the women had consulted a mental health

TABLE 2. Comparison of firefighters, firefighter partners, and direct victims

	Firefighter partners, %	Firefighters,* %	Female direct victims,† %
PTSD criteria met	4	13	45
One or more PTSD symptoms	52	81	100
Group B PTSD criteria met	44	64	90
Group C PTSD criteria met	4	20	45
Group D PTSD criteria met	33	37	94

*See North and colleagues.[11]
†See North and colleagues.[19]

professional, and another 7 (26%) had elected not to seek professional help at a time when they thought they needed it; 5 (19%) said someone else in their family had received mental health services before the bombing.

Impact on Functioning, Health, Relationships, and Perceptions

Overall, the 27 partners of the firefighters in this study were functioning relatively well and were not much affected in this regard by the bombing. Most (n = 18, 66%) of the women indicated that, in the last month, they were satisfied "all" or "almost all" the time with their job performance; 2 (7%) were satisfied "a good deal" of the time, and 1 (4%) "not much" of the time. Satisfaction with job performance was not related to presence or absence of a psychiatric diagnosis, meeting PTSD symptom group criteria, or number of PTSD symptoms. A minority (n = 6, 22%) of the women said the bombing affected their job satisfaction; for 2 (7%), it was affected in a positive direction, and for 4 (15%), it was in a negative direction. Job satisfaction was not related to presence or absence of a psychiatric diagnosis or with meeting PTSD symptom group criteria. A higher number of PTSD symptoms was associated with change in job satisfaction for the worse (6.8 [SD = 2.2] vs. 1.7 [SD = 2.3]; $t = 4.04$, $df = 25$, $P < .001$). Specifically, worsened job satisfaction was associated with the number of hyperarousal (PTSD group D) symptoms (3.3 [SD = 1.3] vs. 0.8 [SD = 1.2]; $t = 3.73$, $df = 25$, $P < .001$), but not with the other two PTSD symptom groups.

Four (15%) women reported their health had worsened since the bombing; 3 of the 27 (11%) said their health had improved. Changes in health were not related to presence or absence of a psychiatric diagnosis, meeting PTSD symptom group criteria, or number of PTSD symptoms.

More than one third (n = 10, 37%) of the women indicated that they had experienced some permanent change in their interpersonal relationships as a result of the bombing, and another 2 (7%) reported changes in relationships that were only temporary. Nearly one half (n = 13, 48%), however, noticed changes in their relationship with their firefighter mate. Specifically, communication in the relationship changed for the positive in 5 (19%) partnerships and for the negative in 2 (7%), intimacy was improved in 3 (11%) and worsened in none (0%), shared goals were improved in 4 (15%) and changed for the negative in 1 (4%), sexual relations improved in 2 (7%) and worsened for none (0%), and shared parenting improved for none (0%) and worsened in 2 (7%). No women described worsened relation-

ships with other household members, family outside the household, coworkers, or friends. Reported changes in relationships were not associated with presence or absence of psychiatric disorders, meeting PTSD symptom group criteria, or number of PTSD symptoms.

More than 3 years after the bombing, most (n = 23, 85%) of these women felt the bombing had done a great deal of harm to the community. Only one third (n = 9, 33%) felt the community had recovered from that harm, 3 (11%) felt it had not recovered, and 15 (56%) felt it had partially recovered. One fourth (n = 7, 26%) said they personally had been affected "very much" by the bombing, 18 (67%) were affected "somewhat," and 2 (7%) were affected "very little." The great majority (n = 23, 85%) of the women felt the disaster was very upsetting, and 4 (15%) felt it somewhat upsetting; no one reported no upset.

Most (n = 19, 70%) of the firefighter partners reported no change in frequency of church attendance, but 3 (11%) said they were attending more since the bombing, and 5 (19%) were attending less. Eight (30%) women said the bombing had affected their religious beliefs; 7 of these said it had strengthened their beliefs, and 1 said she started to question her beliefs.

Coping

Of the 27 women, 2 (7%) coped by seeking professional attention; 1 of these had no diagnosis pre- or postdisaster; the other had panic disorder predating the bombing and no other diagnosis pre- or postdisaster. One (4%) woman who had no psychiatric diagnosis reported coping by taking medication. Another woman (4%) with no psychiatric diagnosis coped by drinking alcohol. The majority (n = 17, 63%) coped by turning to friends or relatives, and 8 (30%) felt this was the most helpful coping strategy they used.

Perception of Firefighter Partner Response

There were 8 (30%) of the 27 women who felt the bombing had caused their firefighter partner a great deal of harm. The great majority (n = 22, 81%) described the bombing as very upsetting for their partner, 5 (19%) as somewhat upsetting, and not one as not upsetting. Eight (30%) felt their partner had been very affected by the bombing, another 12 (44%) felt the partner was somewhat affected, and 7 (26%) felt he was affected very little; none reported no effect. One half (n = 14, 52%) said their partner had fully recovered from the disaster, 12 (44%) felt he had partially recovered, and 1 (4%) felt he had not recovered.

According to their partners, many (n = 18, 67%) of the firefighters were sad or depressed, and only 2 (7%) indicated this predated the bombing. Sleep disturbance was also common (n = 17, 63%), although it predated the bombing in some (n = 6, 22%). Four (15%) stated their partners had flashbacks, 1 of whom had these before the bombing. One (4%) woman reported that her partner was using too much alcohol, although this was present before the bombing, and none reported postdisaster drug abuse in their partners. None reported that their partners could not work because of nervous or emotional problems after the bombing. One third (n = 9, 33%) of the women said they and their partners talked about the bombing "rarely" or "not at all," 7 (26%) talked about it "sometimes," 10 (37%) talked about it "frequently," and 1 (4%) talked about it "too much."

DISCUSSION

The magnitude of the explosion in the Oklahoma City bombing was so great that many in the community heard or felt it, and many knew direct victims.[18] These

women were no exception. Most of the women knew direct victims, and they also suffered vicarious exposure through their relationship to secondary victims—their firefighter partners. All of the participants in this study were exposed to media coverage, which was extensive. Therefore, while none of these women were direct victims, they were exposed through multiple means and were potentially susceptible to posttraumatic stress that could feasibly interfere with their ability to provide much needed emotional support to their firefighter mates.

The partners of firefighters fared relatively well postbombing diagnostically, symptomatically, and functionally. They had relatively low rates of postdisaster disorders, and most of this psychopathology pre-existed the bombing. Only 1 (4%) woman in the study developed bomb-related PTSD, and this woman also had major depression. As expected due to their less-direct exposure, this is considerably lower ($\chi^2 = 10.4$, $df = 1$, $P < .002$) than the 13% rate of developing PTSD in the firefighters[11] or the 45% rate in female direct victims[19] (see Table 2). Like direct victims,[19] despite having low rates of postdisaster psychiatric disorders, many met criteria for groups B and D, although only 1 (4%) woman met group C criteria. Far more prevalent were PTSD symptoms, although those affected (52%) were far fewer than the 100% of female direct victims reporting PTSD symptoms.[19] Some of the partners reported changes in their health, functioning, and relationships. While almost one half of the sample acknowledged changes in relationships with their partners, these changes were no more often negative than positive. Relatively few women described problems in their relationships with their firefighter mate as a result of the bombing, and none reported bomb-related problems in other relationships.

These women believed the bombing to be both upsetting and harmful to their firefighter mates and described high rates of depressive symptoms in them. None reported that her partner could not work because of the experience, however, suggesting that they also saw resilience in the firefighters. Only 1 (4%) woman reported excessive alcohol use in her partner, although North and colleagues[11] found high rates (24%) of alcohol use disorders in a volunteer firefighter sample after rescue work in this incident, suggesting that this partner sample may have included the mates of the best-adjusted firefighters, that they failed to recognize alcohol use as a problem, or that they were reluctant to admit this observation in this context.

North and colleagues[10] also examined coping responses among the firefighters. The most frequently reported coping measure employed was turning to friends or relatives, followed by use of alcohol. In a separate study of 325 Oklahoma City firefighters, using survey methodology, emotional support derived from spouses/significant others, coworkers, and faith were common coping strategies.[9] Like the firefighters,[9,10] most of these women coped by turning to family and friends. This suggests that efforts to support the firefighters should include attention to their interpersonal support networks, such as families and friends. This is especially important given their apparently infrequent utilization of formal mental health services.

Only 2 (7%) of the women in this sample sought professional attention, which was widely available through the federally funded Project Heartland and other professionals in the community.[20] Professional rescue and responder personnel are typically hesitant to use formal mental health services. The degree to which this extends to their partners and other family members awaits more comprehensive evaluation.

Our findings are limited by the small size and volunteer nature of the sample and by the lack of a control group. It is possible that women who experienced difficulties or those who experienced problems with their mates avoided participation in the study, accounting for the generally healthy profile of the women and

their relationships. There was also the possibility of recall bias, especially given the time interval between the bombing and the study. The use of a structured diagnostic assessment, however, was a major strength, allowing consideration of questions of greater depth than with survey instruments used in many disaster studies.

CONCLUSIONS

As expected, the partners of firefighters participating in the rescue-and-recovery effort following the 1995 Oklahoma City bombing had lower levels of postdisaster psychiatric disorders than their more intensely affected mates, but many experienced PTSD symptoms. The results suggest the importance of further study of the impact of exposure through interpersonal relationships with those who participate in the rescue and recovery following major terrorist incidents. This is especially important given the prevalence of coping by turning to friends and relatives among firefighters. With the recent terrorist events in the United States, such a focus is indicated to assist the partners of rescue workers, who are their main sources of support.

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