

# Extended Mental Health Service Utilization Among Survivors of the Oklahoma City Bombing

Phebe Tucker, M.D.

Betty Pfefferbaum, M.D., J.D.

Haekyung Jeon-Slaughter, Ph.D.

Theresa S. Garton, M.D.

Carol S. North, M.D., M.P.E.

**Objective:** The study assessed survivors of Oklahoma City's 1995 bombing seven years postdisaster to identify long-term mental health service use. **Methods:** Psychiatric disorders and disaster-related variables were assessed for 99 survivors at seven years postdisaster with the Diagnostic Interview Schedule for DSM-IV and its Disaster Supplement. **Results:** Of the 99 survivors, 86% received services during the seven years. Use was associated with female sex, injury or hospitalization, and posttraumatic stress disorder (PTSD) or major depression. Informal interventions were usually initiated in the first six months. Treatment by psychiatrists, other professionals, and family doctors increased after the first month. Half the survivors with PTSD or depression received treatment from a psychiatrist. Only 15% of survivors took psychotropic medications. Although 33% received treatment for more than one year, only 7% were receiving services at seven years.

**Conclusions:** Although service needs decreased over time, results support provision of diverse services adapted to changing needs. (*Psychiatric Services* 65:559–562, 2014; doi: 10.1176/appi.ps.201200579)

Mental health services proliferate in the aftermath of disasters. Federally supported services usually extend for 12 to 18 months, although directly exposed survivors, the bereaved, and others may need services for much longer. Few studies have examined mental health service use beyond the first year after a disaster and even fewer after a terrorist incident.

A very small number of disaster mental health studies have used full diagnostic assessments; these include a series of investigations by North and colleagues (1–3) of directly exposed survivors of the 1995 Oklahoma City bombing. Six months after the bombing, 69% of survivors had received some kind of mental health intervention (1). This index study found that 34% of the survivors in the sample (62 of 182) received a diagnosis of bombing-related posttraumatic stress disorder (PTSD) in the first six months after the disaster, and 60% of those with PTSD received diagnoses of comorbid mental disorders (1). At a 17-month follow-up, 31% had current, bombing-related PTSD (2); at a seven-year follow-up, 26% had current PTSD, and many others had PTSD symptoms (3).

Boscarino and colleagues (4,5) conducted a series of general-population telephone surveys related to the 2001 World Trade Center attacks. Their study found a short-term increase in mental health service utilization compared with the year before the attacks. Increases were associated with exposure-related variables (4), female gender, age of 45–64 years, exposure to prior stressors, and experiencing panic attacks during the disaster (5). Other 9/11 studies found a small but significant increase in use of psychotropic medication when they compared use during the month before and month after the disaster (6). Service logs of more than 450,000 mental health service encounters provided by Project Liberty after the 9/11 attacks showed that bereaved family members accounted for the largest percentage of visits in the first month, but uniformed service personnel used a proportionately larger percentage of services near the end of the second year. These findings suggest that the focus of counseling should be shifted to meet changing needs of different high-risk groups over time (7).

The study reported here addressed a gap in the research related to identifying long-term mental health service needs for highly exposed survivors of terrorism and characteristics of those using these services. The study drew from a sample of highly exposed survivors of the Oklahoma City bombing who were assessed at six months (1), 17 months (2), and seven years

---

Dr. Tucker, Dr. Pfefferbaum, and Dr. Garton are with the Department of Psychiatry and Behavioral Sciences, University of Oklahoma College of Medicine, Oklahoma City (e-mail: phebe-tucker@ouhsc.edu). Dr. Jeon-Slaughter and Dr. North are with the Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas, where Dr. North is also with the Department of Surgery, Division of Emergency Medicine.

postdisaster (3). Results of this study will provide a more complete picture of long-term service needs and specific patterns of use to augment the current disaster literature and will assist administrators in long-range service planning after disasters.

## Methods

Of 182 survivors first studied at six months (1), 99 who were directly exposed survivors of the Oklahoma City bombing responded to questions about mental health utilization at the seven-year assessment. There were no significant differences between the seven-year sample and the index study participants in gender, age, injuries, or psychiatric disorders. Additional details of the methods of the seven-year follow-up study are available in a previous publication (3).

The Washington University School of Medicine and University of Oklahoma Health Sciences Center Institutional Review Boards approved the index and follow-up studies. All participants provided written informed consent before participating and were offered \$50 for their time and effort in completing the comprehensive assessment.

Variables of interest to this analysis were demographic characteristics, bombing injuries, hospitalization for bombing injuries, postdisaster psychiatric disorders, utilization of mental health services, and psychotropic medication use. The Diagnostic Interview Schedule for DSM-IV (DIS-IV) (8) assessed psychiatric disorders, and the Disaster Supplement provided data on other variables of interest (9). Diagnoses considered in this study were bombing-related PTSD and postdisaster major depression occurring at any time in the seven years after the bombing.

Participants were asked if they had sought any of several types of mental health care for problems with drugs, alcohol, or emotions resulting from the bombing, including psychological debriefing (group and individual sessions), support groups such as cosurvivor support groups or other established support groups (for example, Alcoholics Anonymous), counseling services from religious leaders (pastors, ministers, chaplains, rabbis, or priests), and mental health treatment by psychiatrists, family doctors, and nonphysician mental

health professionals. Nonphysician mental health professionals were not identified by level of training or clinical experience. For each service received, the interval between the bombing and the time of first service receipt after the disaster and duration of the service were queried.

Descriptive statistics were reported, and chi square tests were used to explore associations among dichotomous variables of interest ( $2 \times 2$  contingency tables), with Fisher's exact test substituted for cases with expected cell sizes less than five. Statistical analysis was conducted with SAS, version 9.2. The significance level was set at  $p < .05$ .

Time-insensitive demographic variables—sex, and injury and hospitalization caused by the bombing—were taken from the index study assessment. Time-sensitive age and education variables were constructed from the seven-year follow-up assessment data. Bombing-related PTSD and major depression occurring at any time after the bombing were measured by combining diagnostic data from all three assessments.

To explore service utilization after the bombing, we examined the interval between the bombing and the time of first use of mental health services and the duration of those services. We calculated service use patterns adapting first-order forward and backward Markov chain methods with data from all three assessments. [These methods are described in an online data supplement to this report.]

## Results

The 99 respondents in the sample for this analysis included 47 women and 52 men, with mean age of  $49.3 \pm 9.8$  years (range 26–70 years). Of these 99 directly exposed survivors, 85 (86%) received mental health services during the seven-year postdisaster period. The 14 survivors who did not receive services identified the following reasons: thinking that they did not need services, wanting to handle problems themselves, not knowing where to get help, and taking other actions. Bombing-related injuries were sustained by 86 (86%), and 21 (21%) were hospitalized for injuries. Nineteen (19%) had a current PTSD diagnosis, and ten (10%) had a current diagnosis of depression. At any

time after the bombing, 42 (42%) had a diagnosis of bombing-related PTSD, and 42 (42%) had a diagnosis of major depression.

Of the 99 survivors who reported receiving some form of mental health services, the most common was psychological debriefing. Table 1 summarizes data on mental health service use patterns by survivors' demographic characteristics. [Two tables in the online data supplement provide summaries by injury status and by presence of psychiatric disorders.] Participation in debriefing was associated with being injured in the bombing. Compared with other diagnostic groups, a larger proportion of those with bombing-related PTSD or postdisaster major depression used support groups. Most survivors with bombing-related PTSD ( $N=41$ , 98%) and postdisaster major depression ( $N=40$ , 95%) received some type of mental health services.

Psychiatrists treated 50% ( $N=21$ ) of survivors with bombing-related PTSD and 48% ( $N=22$ ) of those with postdisaster major depression. Non-psychiatric mental health professionals treated 79% ( $N=33$ ) of survivors with bombing-related PTSD and 79% ( $N=33$ ) of those with postdisaster major depression. Survivors who received mental health treatment from any mental health professional or religious leader were more likely to be female and a college graduate and to have bombing-related injuries and PTSD or postdisaster major depression. Although 36% ( $N=36$ ) of the survivors received mental health treatment from a family physician, these services were associated with bombing-related injuries and not with postdisaster psychiatric disorders.

Most respondents who received mental health services first received these interventions within two weeks of the bombing, most commonly debriefing and support groups. Survivors received debriefing only within the first six months. Some individuals received more than one type of intervention. After the first two weeks, care by family doctors, psychiatrists, and other mental health professionals increased over time. Treatment initiation was delayed for more than a year by six individuals who eventually saw psychiatrists and two who eventually

**Table 1**

Service use patterns of 99 survivors of the 1995 Oklahoma City bombing, by demographic characteristics

Service	Total N	Sex				$\chi^{2a}$	Age			College graduate					
		Female (N=47)		Male (N=52)						Yes (N=24)		No (N=75)		$\chi^{2a}$	
		N	%	N	%		M	SD	t <sup>b</sup>	N	%	N	%		
Any service						2.34			1.12					1.17	
Yes	85	43	91	42	81		49.7	9.2		19	79	66	84		
No	14	4	9	10	19		46.5	13.1		5	21	9	16		
Debriefing						.77			1.38					2.55	
Yes	63	32	68	31	60		50.2	9.1		12	50	51	68		
No	36	15	32	21	40		47.4	10.8		12	50	24	32		
Support group						1.63			.82					.29	
Yes	46	25	53	21	40		50.1	9.0		10	42	36	48		
No	53	22	47	31	60		48.5	10.4		14	58	39	52		
Religious leader						4.14			1.03					4.61*	
Yes	19	13	28	6	12		45.0	7.3		1	4	18	24		
No	80	34	72	46	88		42.4	10.4		23	96	57	76		
Psychiatrist						5.18*			-.01					3.96*	
Yes	33	21	45	12	23		42.9	8.5		4	17	29	39		
No	66	26	55	40	77		42.9	10.7		20	83	46	61		
Other mental health professional						4.83*			-.32					1.23	
Yes	56	32	68	24	46		42.6	8.8		11	46	45	60		
No	43	15	32	28	54		43.3	11.4		13	54	30	40		
Family doctor						.14			1.55					1.23	
Yes	36	18	38	18	35		44.9	9.2		11	46	25	33		
No	63	29	62	34	65		41.7	10.2		13	54	50	67		

<sup>a</sup> df=1<sup>b</sup> df=97

\*p&lt;.05

consulted other mental health professionals. Duration of service use from various sources was longer than one year for 38% (N=33) of survivors who received services (N=87). Only 8% (N=7) of those receiving services reported that they were still receiving mental health treatment seven years after the bombing. [Tables in the online data supplement present additional data about time and duration of service use.]

Fifteen survivors reported taking psychotropic medications at some time during the seven-year follow-up period as a result of being upset by the bombing. These included selective serotonin reuptake-inhibitors for ten, an unknown antidepressant or other psychotropic for two, benzodiazepines for two, and sleeping pills for one. Use of an illicit drug was reported by one of the survivors.

## Discussion

In this sample of 99 directly exposed survivors of the Oklahoma City bombing, the vast majority (86%) received

mental health interventions during the seven years after the bombing, with service use declining and changing in type over time. Informal interventions (debriefings, support groups, and assistance from clergy) represented most of the services used in the first two weeks—before PTSD and major depression can be diagnosed—at a time when services were abundant and public and professional attention was heightened. Use of more formal treatments occurred later. Most mental health service use occurred in the first year and was usually of finite duration. Few survivors were still receiving services at seven years.

Over half the survivors received debriefing, all within the first six months, consistent with the popularity at the time of debriefing interventions after disasters. Debriefing appears to have been a generic crisis intervention, not preferentially used by those with bombing-related PTSD or major depression, for whom more formal mental health interventions may be warranted.

Many survivors also received formal treatment from psychiatrists, other mental health professionals, and family doctors, but these services tended to begin later than the crisis interventions and usually ended before seven years postdisaster. The vast majority of those with postdisaster major depression (95%) and bombing-related PTSD (98%) received some type of mental health service, consistent with research demonstrating that individuals with PTSD are likely to access general medical or mental health services (10). More than three-fourths of the individuals with psychiatric disorders received interventions from nonphysician mental health professionals, whose level of training was not identified and may have varied considerably.

Despite their high rates of mental health utilization, only about half the individuals with bombing-related PTSD or postdisaster major depression saw a psychiatrist. Although their reasons for not seeking treatment from a psychiatrist are unknown, other studies have

identified many factors associated with traumatized individuals' nonutilization of treatment from psychiatrists, such as avoidance symptoms of PTSD and resource constraints (11–13). Also, in this study, although 42% of survivors had bombing-related PTSD and 42% had postdisaster major depression during the seven-year follow-up period, only about half of either group saw a psychiatrist and only 15% of all respondents reported taking psychotropic medications for bombing-related problems at some time during the seven-year period. Both PTSD and major depression can be chronic and debilitating conditions (14), and given the chronicity of illness (3) and high rate of comorbid mental disorders (1) previously noted in our sample, treatment from a psychiatrist and psychotropic medication might have been appropriate for many more. The question raised by our study is how can disaster response efforts best identify the need for formal mental health treatments for people with mental disorders or who are most distressed? An empirically based disaster mental health training program developed by North and colleagues (15) addresses this issue, guiding professionals through disaster mental health assessment and the selection of interventions appropriate to identified needs.

In this study, receiving services of any kind was associated with female sex, injury and hospitalization for bombing injuries, and bombing-related PTSD and postdisaster major depression. Thus, in planning long-range mental health assistance after terrorism, resources will be disproportionately needed by women, the more severely exposed, and those with postdisaster psychiatric disorders. The data showed that in the short term, before disaster-related PTSD (four weeks) and incident cases of major depression (two weeks) can be diagnosed, informal interventions such as support or debriefing groups and religious counseling were highly utilized. Because a wide variety of mental health interventions was used by these survivors, future disaster planning should include diverse interventions with adjustments over time to accommodate the changing needs and preferences of survivors.

Limitations of this study include attrition: 182 individuals were in the

index sample, and 99 (54%) were in the seven-year follow-up sample. If attrition was based on psychopathology or service use, then attrition of approximately one-third of the original sample may have led to underestimation of psychopathology or of utilization of mental health services (3). We did not assess service needs associated with psychiatric disorders other than PTSD and major depression, and we did not assess timing, duration, or doses of psychotropic medication. Because more than five years passed between the 17-month and seven-year follow-ups, participants may not have accurately recalled all treatment received and its timing. Finally, we did not examine the effectiveness of mental health interventions received.

### Conclusions

Despite these limitations, our study is a unique, systematic investigation of long-term mental health needs and service utilization by individuals who were directly exposed to a major terrorist event. Results suggest that service needs are intense initially but that utilization may be expected to diminish over time (i.e., seven years). Reasons for this attrition are unclear; survivors may either improve with treatments or the passage of time or simply stop seeking help. In particular, survivors' use of various mental health interventions, including informal types such as crisis intervention and support groups, in the first year after disaster and their continued use of more formal interventions beyond one year suggest the need for diverse interventions. Ensuring mental health delivery systems that provide seamless access to long-term care is especially important for those most severely exposed, those diagnosed as having PTSD or major depression after a disaster, and women.

### Acknowledgments and disclosures

This work was supported by award MIPT106-113-2000-020 from the Oklahoma City National Memorial Institute for Prevention of Terrorism (MIPT) and the Office of Justice Programs, National Institute of Justice, U.S. Department of Justice (DOJ) to Dr. Pfefferbaum and by grants MH40025 and MH68853 from the National Institute of Mental Health (NIMH) awarded to Dr. North. The views expressed are those of the authors and do not necessarily represent the official position of the MIPT, DOJ, NIMH, U.S. Department of Veterans Affairs, or U.S. government.

The authors report no competing interests.

### References

1. North CS, Nixon SJ, Shariat S, et al: Psychiatric disorders among survivors of the Oklahoma City bombing. *JAMA* 282: 755–762, 1999
2. North CS, Pfefferbaum B, Tivis L, et al: The course of posttraumatic stress disorder in a follow-up study of survivors of the Oklahoma City bombing. *Annals of Clinical Psychiatry* 16:209–215, 2004
3. North CS, Pfefferbaum B, Kawasaki A, et al: Psychosocial adjustment of directly exposed survivors 7 years after the Oklahoma City bombing. *Comprehensive Psychiatry* 52:1–8, 2011
4. Boscarino JA, Adams RE, Figley CR: Mental health service use 1-year after the World Trade Center disaster: implications for mental health care. *General Hospital Psychiatry* 26:346–358, 2004
5. Boscarino JA, Galea S, Ahern J, et al: Utilization of mental health services following the September 11th terrorist attacks in Manhattan, New York City. *International Journal of Emergency Mental Health* 4:143–155, 2002
6. Boscarino JA, Galea S, Ahern J, et al: Psychiatric medication use among Manhattan residents following the World Trade Center disaster. *Journal of Traumatic Stress* 16:301–306, 2003
7. Covell NH, Donahue SA, Allen G, et al: Use of Project Liberty counseling services over time by individuals in various risk categories. *Psychiatric Services* 57:1268–1270, 2006
8. Robins L, Cottler L, Bucholz K, et al: The Diagnostic Interview Schedule for DSM-IV (DIS-IV). St Louis, Mo, Washington University, 2000
9. North CS, Pfefferbaum B, Robins LN, et al: The Diagnostic Interview Schedule/Disaster Supplement (DIS-IV/DS). St Louis, Washington University, 2001
10. Amaya-Jackson L, Davidson JR, Hughes DC, et al: Functional impairment and utilization of services associated with post-traumatic stress in the community. *Journal of Traumatic Stress* 12:709–724, 1999
11. Lindy JD, Grace MC, Green BL: Survivors: outreach to a reluctant population. *American Journal of Orthopsychiatry* 51: 468–478, 1981
12. Schwarz ED, Kowalski JM: Malignant memories: reluctance to utilize mental health services after a disaster. *Journal of Nervous and Mental Disease* 180:767–772, 1992
13. Koenen KC, Goodwin R, Struening E, et al: Posttraumatic stress disorder and treatment seeking in a national screening sample. *Journal of Traumatic Stress* 16:5–16, 2003
14. McFarlane AC: The longitudinal course of posttraumatic morbidity: the range of outcomes and their predictors. *Journal of Nervous and Mental Disease* 176:30–39, 1988
15. North CS, Hong BA, Pfefferbaum B: P-FLASH: development of an empirically-based post-9/11 disaster mental health training program. *Missouri Medicine* 105: 62–66, 2008