

Predictors of Help Seeking Among Connecticut Adults After September 11, 2001

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The unprecedented events of September 11, 2001, had widespread psychological and health effects in New York City as well as regionally and nationally. A study of 1008 Manhattan adults conducted a few weeks after September 11 showed that 7.5% of respondents had symptoms consistent with posttraumatic stress disorder (PTSD) and that 9.7% appeared to have major depression.¹ Approximately 75% of respondents who took part in a telephone survey of adult residents of New York State, New Jersey, and Connecticut reported 1 or more psychological or health problems as a result of September 11, with comparable results for all 3 states.² According to Schuster et al., 44% of a national sample of adults reported experiencing 1 or more of 5 psychological stress symptoms after September 11.³

Physical effects and behavioral changes were also reported in New York City and surrounding areas. Increases in symptom severity were found among respondents with asthma in lower Manhattan who reported difficulty breathing owing to smoke and debris.⁴ Vlahov et al. reported that 28.8% of all respondents in that same survey population increased their use of cigarettes, alcohol, or marijuana after September 11.⁵ More than 1 in 5 smokers (21%) reported increased smoking, and 3% of all respondents reported increased alcohol consumption, in a post-September 11 survey of Connecticut, New Jersey, and New York State adults.²

A key factor in recovery from the traumatic stress of disasters is timely receipt of appropriate support services.⁶ Wang et al. found that people in communities less affected by a major earthquake were more likely to develop PTSD and exhibited poorer recovery 3 to 6 months later than people in more severely affected communities who received sustained help, including health and mental health services.⁷ Receipt of help also was more strongly associated with postdisas-

Objectives. We conducted a population-based telephone survey in an attempt to determine correlates of formal and informal help seeking after September 11, 2001.

Methods. Between October 15 and December 31, 2001, 1774 Connecticut Behavioral Risk Factor Surveillance System respondents were asked questions directly related to their experiences of September 11.

Results. Multivariate logistic regression analyses showed that receipt of formal help was predicted by sleep problems, close association with a victim, reports of increased smoking or drinking, and receipt of informal help. Age, gender, reports of 1 or more problems, and formal help seeking predicted receipt of informal help.

Conclusions. Public health planning and bioterrorism preparedness should include programs addressing increased smoking and drinking, sleep problems, and bereavement in the wake of disasters. (*Am J Public Health.* 2004;94:1596–1602)

ter readjustment than extent of exposure to the earthquake.⁸ Despite the benefits of such services, Caldera et al.⁹ and Wang et al.⁸ found that most people in affected communities do not seek help for stress or psychological problems in the aftermath of disasters and that individuals with previous mental health problems are most likely to seek help.

Factors thought to play a role in seeking and receiving help for mental and behavioral health problems can be grouped into 3 categories, according to Andersen's model.¹⁰ "Predisposing characteristics," such as age, gender, cultural factors, and degree of exposure to trauma or proximity to victims,¹¹ have been shown to affect reporting of traumatic stress and inclination to seek help in the wake of disaster.^{11–13} "Enabling resources" such as health insurance coverage influence receipt of care by affecting social support or availability of services.¹⁴ "Perceived need" leads a person to actually decide to seek help and to follow through with health care. Stress-related problems, such as sleep disturbances, mental and physical health problems, and increased smoking or alcohol consumption, are associated with perceived need for help.^{11,15}

Our study was designed to investigate predictors of obtaining help after September 11, 2001, among Connecticut adults who were regionally proximate to New York City. In particular, we sought to learn more about the pa-

rameters that distinguished help seekers from those who did not seek help, examining all 3 categories of factors that have been shown to influence help seeking. We also saw this as an opportunity for public health practitioners, mental health practitioners, and members of academia to collaborate in an attempt to improve public health programs designed to respond to terrorism or other large-scale traumatic events or disasters.

METHODS

Data

Data were collected through the Behavioral Risk Factor Surveillance System (BRFSS), a state-based telephone survey of randomly selected noninstitutionalized adults coordinated by the Centers for Disease Control and Prevention.¹⁶ The sample of telephone numbers for each BRFSS state is updated quarterly to include newly connected phones, and each month a stratified subsample is drawn to ensure that results will accurately represent the full adult population. Connecticut decided to add questions in the fourth quarter of 2001 to address the effects of September 11, with a particular focus on the World Trade Center attacks. The 17 questions added to measure psychological and emotional effects of the attacks were modifications of questions used after an earlier disaster.¹⁷

In Connecticut, the monthly BRFSS sample was stratified by county ($n=8$) for 2001, and an annual total of 600 to 1500 interviews were conducted in each county, depending on population. A total of 7752 surveys were conducted in 2001; data derived from all 1774 interviews conducted between October 15 and December 31, 2001, were used in the present study. Twelve respondents who did not answer the question regarding receipt of help were removed from the analysis, resulting in a final sample size of 1762. Data were adjusted for number of adults and number of telephone lines in the household and for the different probabilities of selection in each stratum; data were further adjusted to be representative, in terms of age and gender, of the adult population of Connecticut. Missing values were excluded from our analyses.

Measures

In our analyses, we used 2 dependent variables based on type of help respondents reported receiving after September 11. Receipt of help was ascertained from a single question: "Did you get help with problems you have experienced since the attacks?" Type of help received was assessed with a single question focusing on sources of help. Those who received any formal support services (e.g., medical assistance, services provided by a psychologist, psychiatrist, social worker, other mental health professional, or religious counselor) were placed in the "formal help" group. The "informal help" group included those who reported obtaining help from family members, friends, neighbors, or any other source not identified as providing formal help. Twelve respondents who reported receiving both types of help were included in both groups.

Respondents were asked whether they, or anyone they knew personally (limited to family members, friends, coworkers, acquaintances, and members of their community), had been a victim of the attacks. A "victim" was defined as someone who witnessed the attacks, who was injured or killed in the attacks, or whose home or workplace was disrupted or damaged. In our analyses, we grouped responses into 3 categories: victims or family members of a victim, those with a personal relationship (other than family membership) to a victim, and those with no rela-

tionship to a victim. Respondents were asked how close they were in proximity to the World Trade Center attack, and responses were coded dichotomously as "in New York City" or "elsewhere." To assess access to support relevant to loss and grieving, we asked respondents whether they had attended funerals or memorial services for friends, acquaintances, or community members killed in the attacks. Presence of health insurance coverage was used as a general measure of health care accessibility.

As a means of assessing perceived problems subsequent to September 11, respondents were asked "Since the attacks, have you experienced any of the following feelings or problems?" (This question, the 12th in a series of items focusing on September 11, followed the question asking whether help was sought; however, it did not limit responses to problems directly resulting from the attacks.) Nervousness, worry, hopelessness, loss of control over external events, and worthlessness were grouped, and respondents were coded dichotomously as having reported none or 1 or more of these problems. Anger, reported by half of all respondents, was not included owing to its pervasiveness² and, potentially, short duration. Sleep problems were considered separately.

Information on only a few measures of interest was available before September 11, 2001. Physical and mental health status were obtained from questions asked over the entire year as part of the BRFSS core.¹⁸ Poor physical health days were measured via the following question: "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?" Poor mental health (measured as poor mental health days) was ascertained from the question "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" In most analyses, we were primarily interested in any indication of problems, so continuous variables were dichotomized (0 days vs 1 or more days).

Tobacco and alcohol prevalence rates were also measured throughout 2001. Smokers were defined as those who had smoked at

least 100 cigarettes in their lifetime and currently smoked on some days or every day. Respondents who reported that they had consumed at least 1 drink in the past 30 days were considered drinkers. Changes in smoking and drinking were measured only in October through December. Current smokers who increased their smoking, those who began smoking after September 11, and those reporting increased alcohol consumption since the attacks were considered to have increased their substance use.

Data on ethnicity were derived from several questions that permitted respondents to indicate more than one race/ethnicity. The result was the creation of 2 groups: White, limited to non-Hispanic Whites, and non-White, which included individuals of all other races and ethnicities, including multiracial respondents. Age was entered into the multivariate model as a continuous variable (although it is presented categorically in Table 1 to show representations of distinct age cohorts).

Statistical Analysis

Stata Version 8.0 (Stata Corp; College Station, Tex) was used in all statistical analyses to account for the complex sample design of the BRFSS. Characteristics of respondents receiving formal support services or informal help were examined and, via tests of independence based on the Pearson χ^2 statistic, compared with characteristics of respondents who did not receive such help. Multivariate logistic regression analyses were used to model receipt of (1) formal help and (2) informal help as a function of the predictor variables suggested by the Andersen model,¹⁰ along with potential confounders of current smoking and drinking. Odds ratios, 95% confidence intervals, and Wald F ratios were computed.

RESULTS

The response rate for the study period (completed interviews divided by sum of completed interviews, terminated interviews, and refusals) was 69%. Despite relatively low response rates, the quality of BRFSS data is high, and prevalence data have been shown to be valid and reliable.^{19,20} Table 1 presents characteristics of the study respondents according to type of help received. The figures

TABLE 1—Respondent Characteristics, by Type of Help Received After September 11: Behavioral Risk Factor Surveillance System, 2001

		Formal Help		Informal Help	
	Overall, no. (%)	Yes, %	No, %	Yes, %	No, %
Predisposing factors					
Gender					
Male	727 (48.8)	34.9	49.2	36.1	49.3
Female	1035 (51.2)	65.1	50.8	63.9	50.7
P		.115		.111	
Age, y					
18-39	600 (37.3)	31.7	37.5	57.3	36.5
40-64	813 (44.1)	60.5	43.5	39.7	44.2
≥ 65	328 (18.6)	7.9	19.0	3.1	19.2
P		.093		.002	
Race/ethnicity					
White	1498 (83.6)	82.2	83.6	78.5	83.8
Non-White	252 (16.4)	17.8	16.4	21.5	16.2
P		.814		.383	
Location on September 11					
New York	59 (4.2)	11.7	4.0	10.7	4.0
Elsewhere	1696 (95.8)	88.3	96.0	89.3	96.0
P		.059		.045	
Victim status					
Self or family member victim	128 (7.7)	22.4	7.2	11.6	7.5
Other relation to victim	411 (22.3)	34.7	21.9	25.8	22.2
No association with victim	1217 (70.0)	42.9	70.9	62.6	70.3
P		.0001		.459	
Smoking status					
Current smoker	365 (20.7)	34.1	20.3	20.1	20.7
Not current smoker	1391 (79.3)	65.9	79.7	79.9	79.3
P		.034		.914	
Alcohol use status					
Current drinker	1120 (65.3)	59.4	65.5	64.1	65.3
Not current drinker	621 (34.7)	40.6	34.5	35.9	34.7
P		.433		.862	
Enabling factors					
Health insurance coverage					
Yes	1638 (92.1)	88.6	92.3	93.4	92.1
No	121 (7.9)	11.4	7.7	6.6	7.9
P		.504		.735	
Attended funeral					
Yes	135 (8.3)	11.1	8.2	17.2	7.9
No	1622 (91.7)	88.9	91.8	82.8	92.1
P		.480		.056	
Perceived need for services					
No. of poor physical health days					
>0	571 (32.5)	56.2	31.7	38.5	32.3
0	1160 (67.5)	43.8	68.3	61.5	67.7
P		.002		.363	

Continued

in the first column reflect actual numbers of survey respondents; percentages are weighted and adjusted to be representative of all adults residing in the state. Results are grouped for convenience according to the 3 categories of Andersen's model,¹⁰ although some variables may reflect more than 1 category.

Most respondents (84%) were non-Hispanic White, and about half were male. More than 90% had health insurance coverage, and about 81% were aged younger than 65 years. Nearly two thirds had consumed alcohol in the preceding 30 days, and one fifth smoked. One third reported that there were 1 or more days in the past 30 days on which they would categorize their mental health as poor, the same percentage reporting poor physical health days in that time period. Approximately half reported 1 or more problems, 5% reported increased substance use, and 30% either were victims or personally knew someone who was a victim. About 8% had attended a funeral, and 4% were in New York City on September 11.

Overall, 6.4% (n=117) of the survey respondents indicated that they had received help for problems experienced subsequent to September 11; 3.3% reported receiving formal support (unweighted n=55), and 3.7% reported informal help (unweighted n=74). Twelve respondents reported receiving both formal and informal help, 43 respondents had received only formal help, and 62 had received only informal help. None of the respondents reported receipt of help from a social worker or emergency worker representing an organization such as the Red Cross.

Table 2 shows the results of the multiple logistic regression analysis that included all of the variables listed in Table 1. The following variables were significantly associated with receipt of formal help after adjustment for other variables: being a victim, being a family member of a victim or being involved in another relationship with a victim, reporting sleep problems, reporting increased substance use, and reporting receipt of informal help. Predictors of receipt of informal help included being female, being younger, reporting 1 or more problems, and receiving formal help.

Comparisons of respondents surveyed (in 2001) before and after September 11 did not reveal changes in tobacco or alcohol use

TABLE 1—Continued

No. of poor mental health days					
>0	603 (33.9)	66.5	32.8	51.0	33.3
0	1124 (66.1)	33.5	67.2	49.0	66.7
P		<.0001		.018	
No. of problems ^a reported					
1 or more	925 (51.2)	70.4	50.6	69.2	50.6
0	831 (48.8)	29.6	49.4	30.8	49.4
P		.025		.018	
Sleep problems					
Yes	275 (15.5)	43.7	14.6	22.4	15.3
No	1487 (84.5)	56.3	85.4	77.6	84.7
P		<.0001		.240	
Increased substance use ^b					
Yes	81 (5.0)	22.1	4.4	21.0	4.4
No	1681 (95.0)	77.9	95.6	79.0	95.6
P		<.0001		<.0001	
No. of respondents	1762	55	1707	74	1688

Note. Respondent numbers are unweighted; percentages were adjusted to be representative of the state adult population by age and gender. P values were derived from Pearson χ^2 tests of association.

^aIncluding worry, nervousness, worthlessness, hopelessness, and lack of control over external events.

^bTobacco or alcohol use, or both.

prevalence rates or in average number of drinks consumed per day. In addition, the percentage of respondents reporting any poor physical or poor mental health days in the preceding 30 days did not change after September 11. Finally, respondents interviewed before September 11 and those surveyed after September 11 did not exhibit differences in regard to mean numbers of poor mental or physical health days.

DISCUSSION

Despite the potential benefits of receiving assistance in the wake of a traumatic event,¹¹ our findings are consistent with previous reports^{8,9} indicating that most people affected by disaster do not receive help in the aftermath. Our results are also consistent with Andersen's¹⁰ behavioral model of health care utilization, showing that predisposing factors and perceived need for services influence receipt of help. Three predisposing factors for seeking some type of help after September 11 were being a victim or a family member of a victim, being female, and being a younger adult. These results mirror findings indicating

the potential effects of secondary traumatization²¹ or traumatic grief^{22,23} and suggest that not only direct exposure, but also secondary stress owing to a close relationship to a victim, can be a potential indicator of need for help in the wake of a disaster.

Although we did not directly assess perceived need for services, 3 variables likely to be associated with such perceived need were associated with receipt of some form of help. Reporting 1 or more problems, such as worry, nervousness, worthlessness, hopelessness, or lack of control over external events, was associated with receipt of informal but not formal help. Increased rates of smoking or drinking and sleep problems were associated only with receipt of formal support services.

Our results extend findings indicating that tobacco and alcohol use increased in New York City after September 11⁵ by demonstrating that increases in use of these substances were also associated with receipt of help in a geographically proximate population. Exposure to trauma and exposure to posttraumatic stress have been found to be associated with increased tobacco and alcohol use problems among adolescents^{24,25} and adults.^{26,27} How-

ever, it was the increase in use rather than smoking or alcohol consumption per se that distinguished respondents who received help: current smokers and drinkers were no more or less likely to receive help than nonsmokers and nondrinkers.

It is encouraging to learn that these potentially stress-related changes in substance use were associated with receipt of formal help. Screening people for increases in tobacco use, alcohol consumption, and sleep problems may be a better method of identifying individuals in need of formal help in the wake of disaster than asking general questions regarding whether people are experiencing mental and behavioral problems (reports of which were unrelated to receipt of formal help in the present multivariate analysis).

We were not able to systematically assess enabling factors, and those measured (i.e., attending a funeral and possessing health insurance coverage) had no effect on receipt of help. Other enabling factors may have been more relevant, or the magnitude of the event and relief efforts may have increased the relative effects of predisposing factors and perceived need or resulted in enabling resources being more widely available than usual.

We found that rates of receipt of formal and informal help were similar but that predictors of these types of help were different. We believe that our findings related to receipt of formal help have significant implications for disaster relief systems. Providers sought for formal help (primarily medical or mental health professionals or religious counselors) included individuals who may have little or no training in disaster response yet often play key roles in disaster relief. This finding underscores the importance of preparing medical and mental health professionals and religious counselors to assist disaster victims and their families. In particular, our findings suggest that such providers may need training to identify and assist affected individuals in obtaining services that will address problems related to increased tobacco and alcohol use.

Informal help received from family and friends may be a critical source of social support mitigating the impact of postdisaster stress¹⁴; however, this form of help is difficult to define, and respondents who in fact received such help may not have reported it.

TABLE 2—Results of Multivariate Logistic Regression Analysis: Predictors of Receipt of Help, by Type of Help Received: Behavioral Risk Factor Surveillance System, 2001.

	Formal Help		Informal Help	
	Adjusted Odds Ratio	95% Confidence Interval	Adjusted Odds Ratio	95% Confidence Interval
Predisposing factors				
Gender				
Male	1.00		1.00	
Female	1.27	0.58, 2.78	2.11	1.06, 4.19*
Age	1.01	1.00, 1.03	0.97	0.96, 0.99**
Race/ethnicity				
White	1.00		1.00	
Non-White	1.10	0.42, 2.87	0.88	0.39, 1.98
Location on September 11, 2001				
New York	2.40	0.66, 8.68	2.16	0.49, 9.55
Elsewhere	1.00		1.00	
Victim status				
No association with victim	1.00		1.00	
Some relation to victim	3.70	1.41, 9.72**	0.58	0.29, 1.19
Self or family member victim	5.40	1.88, 15.48**	0.80	0.24, 2.64
Smoking status				
Current smoker	1.24	0.51, 3.02	0.73	0.34, 1.54
Not current smoker	1.00		1.00	
Alcohol use status				
Current drinker	1.00		1.00	
Not current drinker	1.77	0.87, 3.61	0.91	0.48, 1.75
Enabling factors				
Health insurance coverage				
Yes	1.00		1.00	
No	1.24	0.32, 4.88	0.59	0.13, 2.74
Attended funeral				
Yes	1.00		1.00	
No	1.54	0.44, 5.39	0.50	0.20, 1.28
Perceived need for services				
No. of poor physical health days				
>0	1.99	0.93, 4.25	1.17	0.65, 2.09
0	1.00		1.00	
No. of poor mental health days				
>0	2.00	1.00, 4.04	1.09	0.61, 1.96
0	1.00		1.00	
No. of problems reported ^a				
1 or more	1.31	0.51, 3.39	1.99	1.02, 3.90*
0	1.00		1.00	
Sleep problems				
Yes	2.59	1.14, 5.91*	0.76	0.32, 1.80
No	1.00		1.00	
Increased substance use ^b				
Yes	3.46	1.11, 10.74*	2.62	0.61, 11.33
No	1.00		1.00	
Received alternate form of help				
Yes	6.52	2.55, 16.72***	6.13	2.24, 16.74***
No	1.00		1.00	

^aIncluding worry, nervousness, worthlessness, hopelessness, and lack of control over external events.

^bTobacco or alcohol use, or both.

* $P < .05$; ** $P < .01$; *** $P < .001$. P values represent the individual variables included in the model. In the case of each model, the overall P value for the Wald F test was $\leq .0001$.

For example, respondents may have viewed informal help not as "help" but simply as part of the ordinary support people provide to one another. Further research is needed to enhance our understanding of when, how, and from whom people seek and receive informal types of help following disasters.

That tobacco use, alcohol use, and poor mental and physical health days did not increase in the 3 months after September 11 provides some context for these results. Increases in substance use predicted receipt of help, but the increases observed were not sufficient, on a population basis, to affect survey results for smoking prevalence or alcohol consumption. Because recent changes in smoking and drinking are not normally measured on the BRFSS, we have no way of knowing whether, on a regular basis, 5% of adults exhibit increases in smoking or drinking (as shown by the present results) as part of fluctuating substance use patterns. This issue warrants further investigation.

More than half of the respondents reported nervousness, worry, feelings of worthlessness, or other stress-related problems, yet there was no increase in the number of poor mental (or physical) health days in the months immediately following September 11. We do not know the extent to which these reported poor mental health days might represent preexisting serious mental illness (which affects 5.4% of US adults²⁸) or how much of the help received was part of ongoing treatment. It has been estimated that 15% of the US population receives mental health services each year,^{28,29} while we found that 3.3% of our sample received formal help in a 3-month period. Given the limits of our data, we were not able to determine whether our figure represents an increase in use of services above that expected or whether this figure primarily represents treatment of individuals with pre-existing mental health problems.

The lack of an increase in poor mental health days in the months subsequent to September 11 suggests that many of the respondents who reported mental health problems (and receipt of help) may have had ongoing (perhaps subclinical) difficulties. This finding is consistent with the results of other studies^{8,9} indicating that individuals with preexisting mental health problems are more likely

than individuals without such problems to seek help after disasters.

The findings that stress-related problems such as worry, nervousness, and hopelessness were associated with receipt of informal but not formal help and that 2% of respondents who reported no such problems obtained formal help suggest that other factors should be considered in postdisaster screening. Experiences of poor mental or physical health days in the preceding month were not significant predictors of receiving help but may still warrant consideration as factors in early identification of individuals likely to need help in the wake of a disaster. Although gender and ethnocultural background were not related to receipt of formal help in the first 2 to 3 months postdisaster, these factors may play a greater role in the development of posttraumatic stress and the need for help at more distal time points (e.g., 1 or more years postdisaster). More detailed examination of the types of problems associated with receipt of different types of formal help (e.g., medical, psychological, or crisis debriefing) over extended time periods is warranted.

Our findings are subject to a number of limitations. The BRFSS excludes individuals without telephones and those who are unable or unwilling to participate in a telephone survey, thus potentially excluding those most affected by the impact of a disaster. In addition, the survey questions did not address severity or duration of symptoms, so actual need for help was not assessed. We did not distinguish between problems associated with the attacks and other problems that could have been ongoing or unrelated to September 11. Also, we did not address quality of help received, and we had no way of measuring whether sufficient resources were available to meet service needs.

We also do not know whether or not some of the respondents needed help but never sought it, whether others sought help unsuccessfully, or whether those who received help benefited from it. Moreover, it was impossible to isolate the effects of September 11 on the study population because of subsequent events that occurred during the time the survey was being conducted (e.g., the war on terrorism, deployment of troops abroad, anthrax threats and deaths, and a plunging stock market).

Patterns of help seeking and changes in substance and tobacco use among people affected by disasters have important implications for the design and implementation of disaster assistance response services. Findings such as those from this study should be considered in the development of service models and response systems for assisting communities in the aftermath of disasters. Public health professionals, physicians, mental health providers, and religious leaders should all be involved. Such plans also need to address ways to strengthen individual and community resilience and to respond to post-disaster behavioral health needs, which change over time. Finally, results of program evaluations should be used to develop interventions that provide the highest probability of success with the most efficient use of resources. ■

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Contributors

All of the authors were involved in the conception of the study, interpretation of data, and drafting and editing of the article. M.L. Adams was responsible for data collection and analyzed the data.

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Human Participation Protection

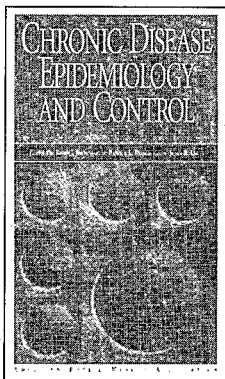
No protocol approval was needed for this study.

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