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BRIEF REPORT

Predictors of Responses to Psychotherapy Referral of WTC Utility Disaster Workers*

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This study examined male utility disaster workers' responses to referral for trauma-specific psychotherapy. Among 328 workers offered referral for symptoms related to the World Trade Center (WTC) attacks during psychological screening, approximately 48% chose to accept, 28% chose to consider only, and 24% chose to decline. Analyses examined predisposing factors, i.e., age, race/ethnicity, marital status, education, previous mental health treatment, and previous disorder; as well as illness level; i.e., posttraumatic stress disorder (PTSD), depression, and general psychiatric distress; current treatment; and time of referral as predictors of referral response. PTSD (specifically reexperiencing and hyperarousal symptoms), depressive symptoms, and previous mental health treatment were positively associated with workers' accepting referral. Implications and limitations of these findings are discussed.

This study examined utility disaster workers' responses to psychotherapy referral after work at the site of the World Trade Center (WTC) attacks of September 11, 2001. Disaster workers are at risk for posttraumatic stress disorder (PTSD) and other psychological sequelae of trauma (Raphael, Singh, Bradbury, & Lambert, 1983). Because PTSD is a potentially chronic condition that impacts physical health, relationships, and occupational functioning (Kessler, 2000), understanding factors that affect their responsiveness to treatment is important. Andersen and Newman (1973) proposed three kinds of individual characteristics that influence health service use: predisposing factors, which exist before the illness, including demographic characteristics (e.g., age, gender, marital status), social structure (e.g., education, race/ethnicity), past illness, and

beliefs; enabling factors, which reflect family/community characteristics that impact access to services (e.g., health insurance); and illness level, which relates to individual/family symptom recognition and clinician diagnosis. Such determinants predict psychotherapy seeking in the general population (Greenley, Mechanic, & Cleary, 1987) and treatment seeking of PTSD sufferers (Koenen, Goodwin, Struening, Hellman, & Guardino, 2003).

The model posits illness level as a proximal determinant of health service use. It is generally assumed that more severe symptoms are more likely to be recognized or diagnosed. Consistent with this line of reasoning, Solomon (1989) found that Israeli combat veterans who sought treatment had more severe PTSD than those who did not. Likewise, Kutter, Wolf, and McKeever (2004) found veterans

who enrolled in group treatment had more severe PTSD than those who did not. In contrast, one can argue that because avoidance of trauma-related thoughts, feelings, and situations is part of the criteria set for diagnosis of PTSD, people may refuse treatment because they expect it to be a trauma reminder. Indeed, one study indicated that staff exposed to a school shooting who participated in a follow-up interview had fewer PTSD symptoms than those who did not (Schwarz & Kowalski, 1992), while another study indicated that participants who dropped out of exposure therapy had more severe avoidance than those who did not (Brady, Dansky, Back, Foa, & Carroll, 2001). Yet another study suggested a curvilinear relation. Workers participating in early intervention after an industrial accident had moderate PTSD symptoms, but those who had mild or severe symptoms declined participation (Weisaeth, 2001). The present study examined illness level as a predictor of referral response for trauma-specific psychotherapy in the context of other predisposing variables.

METHOD

Participants

Participants were utility workers who were deployed during or in the aftermath of the WTC attacks to secure gas, steam, and electricity supplies. Workers were exposed to stressors such as working long hours, witnessing destruction, seeing human remains, and working in dangerous conditions. They were neither trained members of professional disaster teams nor first responders.

Procedure

The utility company scheduled all employees deployed to the WTC attack site for medical and psychological screenings at its Department of Occupational Health. Medical screenings were part of mandatory fitness-for-duty evaluations; each employee was scheduled when his or her annual physical exam was due. Psychological screenings were voluntary and confidential. The Committee on Human Rights in Research of Weill Medical College approved use of psychological screening records for research.

Approximately 3,500 workers were deployed to the WTC attack site; less than 2% refused psychological screening. This study examined records of workers screened from September 15, 2002, to June 15, 2003. Of 1,621 participants, 26% ($n = 419$) were offered referral for WTC-related symptoms. Because women constituted less than 4% percent of participants, the sample was restricted to men ($n = 403$). Means substitution was performed for individuals who had missing data on symptom measures and age ($n = 40$). Individuals who had other missing data ($n = 75$) were excluded to obtain the final study sample ($n = 328$). Missing data were the result of participants' omitting items on self-report questionnaires that required shading in circles and were reduced to less than 2% with response format changes. Missingness was not associated with referral response.

The psychological screening consisted of self-report and structured-interview measures administered by Program for Anxiety and Traumatic Stress Studies (PATSS) clinicians, who offered workers WTC-related treatment even if they were in current mental health treatment that was not trauma-focused. Clinicians explained psychotherapy would address WTC experiences with an individual therapist in the New York City area (at PATSS or through a psychotherapy research protocol), and that therapy would be confidential, free to the participant, and available either during or off work hours. The company contracted to release workers from duties if they attended during work hours. It funded the PATSS treatment, but referrals were confidential and funding was not contingent on workers' therapy choices. Participants who expressed interest and provided contact information for follow-up scheduling were deemed to have *accepted*. Those who asked to think over the referral were deemed to be *considering*. Those who rejected referral and any further follow up were deemed to have *declined*.

Measures

Clinician-Administered PTSD Scale. The Clinician-Administered PTSD Scale (CAPS) (Blake et al., 1990) is a structured PTSD interview that assesses the frequency and

intensity of 17 PTSD symptoms on separate 5-point rating scales (0–4). Frequency and intensity may be summed for each item to yield severity ratings, and severity ratings may be summed across items to yield severity scores for each of three PTSD symptom clusters: The reexperiencing cluster includes intrusive memories, nightmares, flashbacks, distress on reminders, and physiological response to reminders. The avoidance/numbing cluster includes avoidance of thoughts, emotions, and reminders of the trauma; anhedonia; feeling of distance from others; emotional numbness; and foreshortened sense of future. The hyperarousal cluster includes sleep disruption, irritability, concentration difficulty, hypervigilance, and jumpiness. The CAPS has excellent psychometric properties (Weathers, Keane, & Davidson, 2001). Participants responded to CAPS items in relation to the WTC attacks.

Structured Clinical Interview for DSM. The semistructured Structured Clinical Interview for DSM (SCID) diagnostic interview determines diagnoses according to *Diagnostic and Statistical Manual of Mental Disorders* (DSM) criteria (Spitzer & Williams, 1985). Its psychometric properties have been well established (Skre, Onstad, Torgersen, & Kringen, 1991). It was used to assess history of major depressive disorder (MDD), generalized anxiety disorder (GAD), and panic disorder (PD).

Beck Depression Inventory. The widely used Beck Depression Inventory (BDI) self-report measure of depression has well-established psychometric properties. Items are summed to yield a total depression score (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961).

Brief Symptom Inventory. The Brief Symptom Inventory, a widely used abbreviated version of the Symptom Checklist 90–Revised yields, among other results, a Global Severity Index (GSI; Derogatis & Melisaratos, 1983).

Additional measures. The interview included questions on sociodemographic background, mental health treatment (whether before or after 9/11/01), and current mental treatment.

RESULTS

Background Characteristics

The average age of participants was 45 years ($SD = 9$). Table 1 presents additional sociodemographic characteristics.

Responses to Psychotherapy Referral

Of the 328 participants offered a referral, 157 (47.9%) chose to accept, 92 (28.0%) chose to consider, and 79 (24.1%) chose to decline. Study variables were simultaneously entered into multinomial logistic regression to predict referral response. In the absence of an *a priori* hypothesis, each group was compared with the two others: consider versus accept, decline versus accept, and consider versus decline (see Table 2).

Predisposing variables in the model were age, race/ethnicity (white vs. minority), marital status (married/cohabitating vs. other), education (high school vs.

Table 1. Sociodemographic Characteristics

Background Characteristic	n	%
Race/ethnicity		
White	234	71.3
Black	40	12.2
Hispanic	45	13.7
Other	9	2.8
Education		
Did not complete high school	7	2.1
High school graduate	158	48.2
Some college	114	34.8
College graduate or more	49	14.9
Marital status		
Married/cohabitating	271	82.7
Separated/divorced	20	6.1
Single	35	10.7
Widowed	2	0.6
Psychiatric history		
Prior mental health treatment	67	20.4
Prior MDD, GAD, or PD	86	26.2
Current mental health treatment	27	8.2

Note. MDD = major depressive disorder; GAD = generalized anxiety disorder; PD = panic disorder.

Table 2. Predictors of Referral Response: Results From Multinomial Logistic Regression Analysis

	Decline vs. accept[a]		Decline vs. consider[a]		Accept vs. consider[b]	
Predictor	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
CAPS B	1.12**	1.04–1.21	1.15**	1.06–1.25	1.03	0.98–1.09
CAPS C	1.03	0.98–1.08	1.01	0.96–1.06	0.98	0.94–1.03
CAPS D	1.06*	1.00–1.12	1.06	0.99–1.12	0.99	0.95–1.04
BDI	1.07*	1.00–1.12	1.06	0.98–1.13	0.99	0.94–1.04
GSI	0.58	0.24–1.38	0.46	0.18–1.23	0.81	0.38–1.69
Age	0.97	0.94–1.01	0.98	0.94–1.01	1.00	0.97–1.03
Race/ethnicity	0.65	0.33–1.29	1.06	0.50–2.26	1.64	0.89–3.02
Marital status	1.16	0.50–2.70	0.73	0.30–1.76	0.63	0.31–1.29
Education	1.08	0.58–1.99	0.72	0.37–1.40	0.67	0.38–1.16
Prior MDD, GAD, or PD	0.95	0.44–2.05	1.25	0.55–2.83	1.32	0.70–2.48
Current treatment	0.77	0.27–2.20	0.47	0.14–1.62	0.62	0.20–1.88
Prior treatment	2.85*	1.16–7.03	1.60	0.59–4.31	0.56	0.28–1.13
Time	1.14	0.99–1.32	0.95	0.82–1.11	0.83**	0.74–.94

Note. CAPS = Clinician-Administered PTSD Scale; BDI = Beck Depression Inventory; GSI = Global Severity Index; MDD = major depressive disorder; GAD = generalized anxiety disorder; PD = panic disorder.
[a]Decline is the reference category. [b]Accept is the reference category.
*$p < .05$.** $p < .01$.

other), previous mental health treatment, and previous MDD, GAD, or PD. Illness-level variables were reexperiencing severity, avoidance/numbing severity, hyperarousal severity, BDI total, and GSI score. A variable representing the number of months the screening took place after 9/11/01 was included because PTSD severity varied over time,[1] so it was important to explore the temporality of symptom severity. Current mental health treatment was also included.

The model was a good fit for the data, $\mathcal{X}^2$ (28, $n = 328) = 78.06$, $p < .001$, accounting for 24% of variance in referral response. With respect to illness level variables, each 1-point increase in reexperiencing, hyperarousal, or BDI symptom severity was associated with increased odds that workers would accept rather than decline. Additionally, each 1-point increase in reexperiencing symptom severity was associated with increased odds that workers would consider rather than decline. Avoidance/numbing severity, counter to expectations, did not distinguish the three groups. Visual inspection of the distribution of symptom

severities did not suggest a curvilinear relation, so no further analyses were performed. With respect to predisposing variables, previous mental health treatment was associated with increased odds that workers' would accept rather than decline. Finally, as months passed, the odds of workers accepting rather than considering or declining referral increased.

DISCUSSION

The findings indicate that illness level, as suggested by Anderson and Newman's (1973) model of health service utilization, is an important predictor of psychotherapy referral response: Reexperiencing, hyperarousal, and depressive symptoms predicted response. Of predisposing variables available for study, only previous mental health treatment had predictive value; counter to the model, individual characteristics did not. Furthermore, the longer the interval since the WTC attacks, the greater the odds were of workers' accepting referral. Reexperiencing, hyperarousal, and depressive symptom severities may have prompted workers' problem recognition. Workers who had previous mental health treatment may have been less likely to decline

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[1] Rate of full/subsyndromal PTSD among workers screened 12–16.5 months post disaster was 24.6% compared to 19.5% among workers screened 16.5–21 months post, χ^2 (1, $n = 1621) = 6.13$, *ns*.

because they perceived psychotherapy as a viable coping resource or because familiarity with treatment reduced stigma concerns. Workers may have declined referrals less as time passed because of increases in perceived need for services with symptom chronicity or seasonal variation. It is also possible that clinicians made referrals differently when individuals had mild symptoms, when workers had previous mental health treatment, or as time passed.

A limitation of the study is the absence of follow-up data. Individual characteristics, avoidance, or other treatment barriers may have influenced whether participants followed through on referrals, completed treatment, or sought alternative care. Data on those who accepted referral suggest that race/ethnicity may play a role in follow through (Jayasinghe et al., 2005). Moreover, it is unclear whether results generalize to female utility disaster workers, workers in the acute aftermath of disaster exposure, professional disaster workers, or even untrained disaster workers in other professions (e.g., journalists, mental health workers, or sanitation workers).

Only a modest amount of variation in referral response was accounted for by predisposing factors and illness level. Future research should examine PTSD symptom severity in the context of enabling factors and beliefs (e.g., stigma concerns, interpersonal openness, confidence in psychotherapy) to account more fully for differences in referral response, especially differences between those who accept and those who consider referral. In addition, research should elucidate the importance of treatment history, for example, by examining potential differences between those who received treatment before September 11, 2001, and those who received treatment after that date. Furthermore, variations in the role of illness level and other factors should be assessed across pretreatment, beginning of treatment, and completion of treatment periods.

REFERENCES

Andersen, R., & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. Milbank Memorial Fund Quarterly: Health and Society, 51, 95–124.

Beck, A. T., Ward, C. H., Mendelsohn, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561–571.

Blake, D. D., Weathers, F., Nagy, L. M., Kaloupek, D., Klauminzer, G., Charney, D., & et al. (1990). Clinician Rating Scale for Assessing Current and Lifetime PTSD: The CAPS–1. Behavior Therapist, 18, 187–188.

Brady, K. T., Dansky, B. S., Back, S. E., Foa, E. B., & Carroll, K. M. (2001). Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: Preliminary findings. Journal of Substance Abuse Treatment, 21, 47–54.

Derogatis, L. R., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. Psychological Medicine, 13, 595–605.

Greenley, J. R., Mechanic, D., & Cleary, P. D. (1987). Seeking help for psychologic problems: A replication and extension. Medical Care, 25, 1113–1128.

Jayasinghe, N., Spielman, L., Cancellare, D., Difede, J., Klausner, E., & Giosan, C. (2005). Predictors of treatment utilization in World Trade Center attack disaster workers: Role of race/ethnicity and symptom severity. International Journal of Emergency Mental Health, 7, 91–100.

Kessler, R. C. (2000). Posttraumatic stress disorder: The burden to the individual and to society. Journal of Clinical Psychiatry, 61, 4–12.

Koenen, K. C., Goodwin, R., Struening, E., Hellman, F., & Guardino, M. (2003). Posttraumatic stress disorder and treatment in a national screening sample. Journal of Traumatic Stress, 16, 5–16.

Kutter, C. J., Wolf, E. J., & McKeever, V. M. (2004). Predictors of veterans' participation in cognitive-behavioral group treatment for PTSD. Journal of Traumatic Stress, 17, 157–162.

Raphael, B., Singh, B., Bradbury, L., & Lambert, F. (1983). Who helps the helpers? The effects of a disaster on the rescue workers. Omega, 14, 9–20.

Schwarz, E. D., & Kowalski, J. M. (1992). Malignant memories: Reluctance to utilize mental health services after a disaster. Journal of Nervous and Mental Disease, 180, 767–772.

Skre, I., Onstad, S., Torgersen, S., & Kringen, E. (1991). High interrater reliability for the Structured Clinical Interview for DSM-II-R Axis I (SCID-1). Acta Psychiatrica Scandinavia, 84, 167–173.

Solomon, Z. (1989). Untreated combat-related PTSD: Why some Israeli veterans do not seek help. Israeli Journal of Psychiatry and Related Sciences, 26, 111–123.

Spitzer, R. L., & Williams, J. B. W. (1985). Structured Clinical Interview for DSM-III-R (SCID). New York: New York State Psychiatric Institute, Biometrics Research.

Weathers, F. W., Keane, T. M., & Davidson, J. R. T. (2001). Clinician-Administered PTSD Scale: A review of the first

ten years of research. Depression and Anxiety, 13, 132–156.

Weisaeth, L. (2001). Acute posttraumatic stress: Nonacceptance of early intervention. Journal of Clinical Psychiatry, 62, 35–40.