FACTORS ASSOCIATED WITH OCCUPATIONAL IMPAIRMENT IN PEOPLE SEEKING TREATMENT FOR POSTTRAUMATIC STRESS DISORDER

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ABSTRACT

Predictors of occupational impairment were assessed in 60 people seeking cognitive-behavioural treatment for posttraumatic stress disorder (PTSD). It was hypothesized that symptoms of reexperiencing, hyperarousal, and depression would predict work impairment because these symptoms are characterized by features that should interfere with work functioning (e.g., concentration difficulties, reduced motivation). These symptoms, and not other symptoms associated with PTSD, predicted occupational impairment. Treatment-related reductions in reexperiencing, hyperarousal, and depression were also correlated with treatment-related improvements in occupational functioning. Results suggest that occupational functioning might be improved by developing ways of better treating reexperiencing, hyperarousal, and depression in patients with PTSD.

Posttraumatic stress disorder (PTSD) is a severe anxiety disorder that develops after exposure to a traumatic event involving an actual or perceived threat of death or serious injury. PTSD is associated with a range of symptoms that include vivid reexperiencing of the trauma (e.g., intrusive memories, nightmares, flashbacks), avoidance of trauma-related stimuli, emotional numbing (e.g., difficulty experiencing close emotional bonds to other people), and hyperarousal (e.g., hypervigilance, sleep difficulties; American Psychiatric Association [APA], 2000).

The lifetime prevalence of PTSD in the general population is 8% (APA, 2000). The disorder can arise from any of a variety of traumatic events, such as serious road traffic collisions and other accidents, natural and technological disasters, criminal victimization, military combat, or terrorism (Breslau, 2001). PTSD typically follows a chronic course and is frequently associated with an increased risk of other psychiatric disorders, including other anxiety disorders, mood disorders, and personality disorders (APA, 2000).

Few studies have investigated occupational impairment in people with PTSD. The available research suggests that PTSD tends to be associated with occupational difficulties, including inability to

return to work or difficulty adjusting to reemployment (Breslau, 2001; Hull, Alexander, & Klein, 2002). To illustrate, in a 10-year follow-up of workers involved in an oil rig disaster, Hull et al. found that workers who met diagnostic criteria for PTSD at follow-up, compared to workers who did not, had significantly greater impairment in occupational functioning, along with impaired social functioning. In a community survey, Breslau, Lucia, and Davis (2004) found that for people with PTSD, a mean of 11.4 days of work were lost over a 30-day period specifically because of PTSD. Population surveys have also shown that people with subthreshold PTSD (e.g., having one or more PTSD symptoms but not meeting full diagnostic criteria) are also at risk of occupational problems, albeit to a lesser degree than those with full PTSD (Amaya-Jackson et al., 1999; Breslau et al., 2004; Stein, Walker, Hazen, & Ford, 1997).

Impaired occupational functioning incurs substantial personal costs (e.g., role loss associated with having a productive work life, financial hardship[1]), as well as economic costs to society at large, such as reduced workplace productivity (e.g., through work absences) and medical and disability expenditures (Greenberg et al., 1999; Kessler & Frank, 1997; Solomon & Davidson, 1997). The exact nature of how PTSD affects occupational functioning has not yet been determined, and the factors contributing to occupational impairment in PTSD, and their interrelationships, remains unclear.

Most of the previous studies have found that PTSD symptom severity is positively correlated with occupational impairment, even after controlling for the effects of comorbid disorders (e.g., co-occurring major depression) on work impairment (Breslau et al., 2004; Ciechanowski, Walker, Russo, Newman, & Katon 2004; Momartin, Silove, Manicavasagar, & Steel, 2004; Stein et al., 1997; Zatzick, Marmar, & Weiss, 1997; but cf. Neal, Green, & Turner, 2004, for the sole exception). Little is known about which features of PTSD are most strongly related to impaired work functioning, and whether work impairment is predicted by the same variables that predict impairment in other spheres of functioning. The present study aimed to identify the symptom predictors of occupational and social impairment in 60 people seeking cognitive-behavioural treatment for PTSD. Identification of these variables may eventually lead to a better understanding of the causes of occupational impairment, which in turn may suggest ways of overcoming this problem.

It was predicted that PTSD reexperiencing and hyperarousal symptoms would be significantly related to work impairment. These symptoms include impairments in attention and concentration, along with irritability and insomnia, all of which can interfere with the performance of work-related tasks. It was also expected that depression, which is a commonly associated feature of PTSD, would interfere with work functioning due to the associated features of low motivation to perform occupational tasks as well as attentional and concentration difficulties. PTSD symptoms of avoidance and numbing may be related to occupational impairment under certain circumstances (e.g., in jobs requiring warm interpersonal relations, such as sales or marketing, or jobs requiring that one return to work in trauma-related situations, such as combat situations). However, reexperiencing and hyperarousal symptoms were expected to be relevant to a broader range of occupational tasks. These symptoms were expected to interfere with functioning even when the job did not require interpersonal interactions or exposure to trauma-related situations. Although numbing and depression overlap to some degree in their features, we expected that occupational impairment would be more strongly related to depression than numbing, because depression is associated with low motivation for goal attainment and impairments

in attention and concentration, whereas numbing is defined by a reduced capacity to experience positive emotions, largely in the context of interpersonal interactions. Therefore, emotional numbing may be less relevant to work functioning, especially in those jobs that do not require the person to establish warm interpersonal relationships with others.

Traits of personality disorders are common associated features of PTSD (APA, 2000). In fact, features of these disorders have been used to define various forms of "complex PTSD" (Allen, Huntoon, & Evans,1999; Taylor, Asmundson, & Carleton, 2006). As part of our investigation into the relationship between occupational impairment and the elements of psychopathology commonly associated with PTSD, we therefore examined personality pathology. It was predicted that the severity of personality pathology would be positively correlated with the degree of occupational impairment. This is because personality-disordered traits, such as those characterized by impulsive behaviour or excessive dependency, may be expressed in work settings, thereby interfering with occupational functioning.

A further aim was to investigate whether treatment-related reductions in particular symptoms associated with PTSD are correlated with treatment-related improvements in the various domains of functional impairment. It is noteworthy that this study represents a secondary analysis of an outcome study by Taylor et al. (2003), comparing exposure therapy, relaxation training, and eye movement desensitization and reprocessing (EMDR). That study found that exposure tended to be most effective, and that EMDR and relaxation did not differ in efficacy; however, all three treatments were associated with symptom reduction, even though all patients had chronic PTSD. The findings of the present study focus on functional impairment, which was not examined in the main outcome study.

METHOD

Design

The relationship between functional impairment and the other variables was examined by using two different methods. First, a dimensional measure of pretreatment work impairment (along with dimensional pretreatment measures of social/leisure and family/home impairment) was correlated, using Pearson's r, with demographic and pretreatment clinical variables. Instead of correlating the impairment scores with a global measure of PTSD symptom severity, we performed a more fine-grained analysis by investigating whether the various forms of impairment were correlated with specific features associated with PTSD.

The relationship between impairment and treatment outcome was examined by computing residual gain scores on measures of PTSD symptoms (i.e., treatment-related reductions in symptoms) and gain scores for measures of impairment (i.e., treatment-related improvements in occupational or social functioning). Symptom gain scores were then correlated with impairment gain scores. Gain scores represented changes in scores from pretreatment to follow-up 4 months after the end of treatment. Only follow-up was examined here, because scores were generally stable from posttreatment to follow-up (Taylor et al., 2003).

The second method for investigating work impairment focused on a subset of patients. The sample was divided into those who were either full-time employed or on disability benefits at pretreatment,

and these groups were compared on demographic variables, pretreatment clinical variables, and treatment outcome.

Participants

Participants were recruited from physician referrals and from advertisements in the local media. Inclusion criteria were (a) DSM-IV diagnosis of PTSD as the primary (most severe) presenting problem, (b) over 18 years of age and able to provide written informed consent, and (c) willingness to suspend any concomitant psychological treatment and to keep doses of any psychotropic medication constant throughout the course of the study. Exclusion criteria were mental retardation, current psychotic disorder, and commencement or change in dose of psychotropic medication within the past 3 months.

A total of 299 prospective participants contacted our clinic and received a telephone screening interview, in which they were screened for inclusion and exclusion criteria. Of these, 164 passed the preliminary screen and were invited to the clinic for a more detailed evaluation. Sixty participants attended the assessment interview, met the inclusion/exclusion criteria, and entered treatment. Forty-five completed treatment. Dropouts and completers did not differ in demographics or psychopathology, as assessed prior to treatment. For the 60 people entering the study, the mean age was 37 years (SD = 10 years) and 75% were female. Most (77%) were Caucasian and most (78%) had completed some form of college education. For the analyses reported in this article, the participants' level of education was scored on the following scale, according to the highest level attained: 1 = grade 6 or less, 2 = grades 7-12 without completing high school, 3 = high school or equivalent, 4 = partial college or university, 5 = 2-year college or university degree, 6 = 3- or 4-year college or university degree, 7 = partial graduate or professional training, and 8 = completed graduate or professional training. Forty-two percent of participants were married or cohabiting, 32% were single, and 27% were separated or divorced. Forty-two percent were employed full-time or part-time outside of the home, 15% were students, 5% were full-time homemakers, 13% were unemployed, and 25% were supported by some form of disability assistance.

The mean duration of PTSD was 8.7 years (SD = 10.8). Sixty-five percent had experienced more than one type of traumatic event. The most common forms were sexual assault (e.g., childhood or adult rape, 45%), physical assault (e.g., mugging, 43%), transportation accidents (e.g., car crash, 43%), and being exposed to a sudden death (e.g., witnessing a homicide, 22%). The most common coexisting mental disorders were major depression (42%), panic disorder (31%), and social anxiety disorder (12%). Forty-eight percent of participants were taking some form of psychotropic medication. All participants were asked to suspend any other psychosocial treatments during the course of the study, and to keep all doses of psychotropic medication constant. Results indicated that this goal was largely attained (see Taylor et al., 2003, for details). For example, doses remained stable for most participants during treatment (87%) and during the follow-up interval (77%). The three treatment conditions did not differ in medication stability during treatment (p > .1). Covarying out changes in medication did not alter the pattern of treatment outcome results.

For the comparison of people full-time employed (n = 17) and those on disability (n = 15) described later in this article, the two groups were also compared in terms of their occupations (i.e.,

occupations currently held for the employed participants, and occupations held before going on disability for the other participants). Occupations were classified according to the National Occupational Classification Matrix from Human Resources Development Canada (2001). Each participant was allocated to one of five occupational groups: (a) management occupations (e.g., sales manager), (b) occupations usually requiring university education (e.g., nurse), (c) occupations usually requiring college education or apprenticeship training (e.g., insurance agent), (d) occupations usually requiring secondary school and/or occupation-specific training (e.g., heavy equipment operator), or (e) occupations in which on-the-job training is all that is required (e.g., cashier). The full-time employed and disability groups did not significantly differ in the proportion of participants assigned to each category, $\chi^2(4) = 5.07$, $p > .1$. For the full-time employed group, the percentage of participants in each of the five categories was as follows: 6, 18, 47, 6, and 24. For the disability group, the corresponding percentages were: 0, 0, 47, 20, and 33.

Measures

Intake diagnoses for Axis I disorders were assessed using the Structured Clinical Interview for DSM-IV (SCID-IV; First, Spitzer, Gibbon, & Williams, 1996), which was also used to assess demographic variables (including occupational status), and PTSD duration. PTSD symptom severity (past week) was assessed using the Clinician Administered PTSD Scale (CAPS; Blake et al., 1997). Following from our previous research (Asmundson, Stapleton, & Taylor, 2004), the CAPS was decomposed into four factor-analytically distinct scales: reexperiencing, avoidance, numbing, and hyperarousal.

The SCID-IV and CAPS interviews were audiotaped to assess inter-rater reliability of the ratings made by the clinic staff. A doctoral-level psychologist independently rated audiotapes of 12 SCID-IV interviews and 12 CAPS interviews. The SCID-IV interviews consisted of a random sample of participants included or excluded from the study. CAPS interviews were a random sample of pre- or post-treatment interviews (12 different participants). The inter-rater agreement for the diagnosis of PTSD was 92% ($\kappa = .80$). Ratings on the CAPS scales were compared by computing intraclass correlations. The results indicated a high degree of inter-rater reliability: reexperiencing .93, avoidance .84, numbing .85, and hyperarousal .80.

Severity of depression over the past week was measured by the Beck Depression Inventory (Beck & Steer, 1987), which has been shown to have good reliability and validity (Beck, Steer, & Garbin, 1988). The Personality Diagnostic Questionnaire for DSM-IV (PDQ-4; Hyler, 1994) was used to assess the severity of personality pathology. Three scales were derived from PDQ-4, assessing the overall severity of each of the three clusters of personality disorders: cluster A ("odd or eccentric"), cluster B ("dramatic, emotional, or erratic"), and cluster C ("anxious or fearful"). The PDQ-4 has acceptable psychometric properties as a screening instrument for personality pathology (Mihura, Meyer, Bel-Bahar, & Gunderson, 2003).

Participants also completed the Sheehan Disability Scale (Sheehan, 1983), which consists of three items, each assessing a domain of functioning: (a) work, (b) social life and leisure activities, and (c) family life and home responsibilities. Each item is rated on an 11-point scale, ranging from 0 = *not at all* to 10 = *very severely*. The scale provides examples of the various domains (e.g., dating, outings,

paying bills, shopping, cleaning) to assist participants in making their ratings. For students, the work impairment scale referred to impairments in school work. For people who were retired, unemployed and seeking work, or full-time homemakers, their ratings on the work scale referred to whatever gainful activities they were currently engaged in (e.g., volunteer work, searching for jobs). Previous studies indicate that the Sheehan Disability Scale has good reliability and validity (e.g., Hambrick, Turk, Heimberg, Scheier, & Liebowitz, 2004; Leon, Shear, Portera, & Klerman, 1992).

Treatments

Participants were randomized to eight 90-min individual weekly sessions of either exposure therapy, EMDR, or relaxation training (*n* =15 completers per condition). Exposure therapy involved 4 sessions of imaginal exposure to traumatic events followed by 4 sessions of in vivo exposure to harmless but distressing trauma-related stimuli. Relaxation training involved the systematic practice of progressive muscle- and imagery-based relaxation. These treatments are described in detail elsewhere (Taylor, 2006; Taylor et al., 2003). EMDR followed the procedures described in Shapiro (1995).

Procedure

Potential participants contacting the clinic were given a description of the study and screened for entry criteria during a telephone screening interview. Those passing the screen were invited to the clinic for an evaluation consisting of the SCID-IV, CAPS, and other measures. Written informed consent was obtained beforehand. All interviews were conducted by clinic staff, trained and supervised by a doctoral-level psychologist. Two therapists, who were trained in each of the three treatments, were randomly assigned patients from the three treatment conditions. Treatment sessions were videotaped for weekly supervision and to ensure treatment integrity. The posttreatment assessment was conducted 1 month after the last treatment session, and the follow-up assessment was conducted 3 months later.

RESULTS

Correlates of Functional Impairment

Table 1 shows the correlations between the three measures of impairment and the demographic and clinical variables. Here it can be seen that reexperiencing, hyperarousal, and depressive symptoms were all significant predictors (correlates) of work impairment, but were not significantly correlated with other forms of impairment. Conversely, emotional numbing was significantly correlated with family/home impairment but not with work or social/leisure impairment. Contrary to expectation, personality pathology was unrelated to impairments in functioning.

Overall, the table suggests that the correlates of work impairment are different from those of social/leisure and family/home impairment. Work functioning often involves a higher level of cognitive processing than social, leisure, family, or home activities. In other words, work-related activities are often more cognitively taxing, especially for occupational activities requiring concentration and other forms of mental effort. Therefore, it is not surprising that reexperiencing and hyperarousal were correlated with work-related impairment.

Table 1

Correlations Between Pretreatment Impairment (Work, Social/Leisure, Family/Home) and Pretreatment Demographic and Clinical Variables, and Treatment Dropout

	Work	Social/leisure	Family/home
Demographics			
Age	.08	.18	-.08
Gender (1 = female, 2 = male)	.11	-.05	.12
Education level	-.14	-.08	.03
Race (1 = Caucasian, 2 = other)	.14	.07	.31*
Marital status (1 = married or cohabiting, 2 = other)	-.04	.07	.07
Pretreatment clinical variables			
PTSD – reexperiencing	.39***	.17	.07
PTSD – avoidance	.12	.17	.13
PTSD – numbing	.12	.21	.38***
PTSD – hyperarousal	.46****	.13	.02
PTSD duration (years)	-.04	.06	-.18
Depression	.33*	.25	.23
Personality disorder – cluster A	.10	-.18	-.20
Personality disorder – cluster B	.14	.05	-.25
Personality disorder – cluster C	.08	.01	-.09
Treatment dropout (1 = no, 2 = yes)	.04	-.36***	.03

Note. *$p < .05$. **$p < .01$. ***$p < .005$. ****$p < .001$.

These conclusions are consistent with the results of multiple regression analyses. Three regression analyses were conducted, with the dependent variable being one of the three pretreatment impairment measures (work, social/leisure, or family/home). In each case the predictor variables were scores on the three pretreatment symptom variables—reexperiencing, hyperarousal, and depression—all entered simultaneously into the regression analysis. The main results were as follows: work impairment, $R^2 = .27$, $F(3, 52) = 6.25$, $p < .001$; social/leisure impairment, $R^2 = .07$, $F(3, 52) = 1.25$, $p > .1$; family/home impairment, $R^2 = .06$, $F(3, 52) = 1.01$, $p > .1$. These results show that the combined effects of the three symptoms accounted for more than a quarter of the variance in the severity of work impairment. In comparison, the three symptoms accounted for a very small, and nonsignificant, proportion of variance (6–7%) in the severity of impairment in social/leisure and family/home function.

Table 2 shows that treatment-related reductions in symptoms were positively correlated with improvements in occupational and other forms of functioning. As expected, reductions in reexperiencing, hyperarousal, and depressive symptoms were correlated with improvements in occupational functioning. The table also shows that some of these variables were correlated with improvements in other domains of functioning. To assess the combined effects of the three symptom variables, multiple regression analyses were conducted, similar to those described above. The only difference was that residual gain scores were used as dependent variables and predictors. The main results were as follows:

work impairment, $R^2 = .29$, $F(3, 25) = 3.37$, $p < .05$; social/leisure impairment, $R^2 = .33$, $F(3, 25) = 4.16$, $p < .05$; family/home impairment, $R^2 = .29$, $F(3, 25) = 3.32$, $p < .05$. (Degrees of freedom were reduced due to missing data.) These results show that treatment-related reductions in the three symptoms accounted for almost a third of the variance associated with improvements in occupational functioning and with improvements in other realms of functioning.

Table 2
Correlations Between Treatment-Related Reductions in Symptoms and Improvements in Functioning. All Variables Were Change Scores (Residual Gains) From Pretreatment to Follow-up, Which Was 4 Months After the End of Treatment.

	Work	Social/leisure	Family/home
PTSD – reexperiencing	.48***	.49*	.51***
PTSD – avoidance	.25	.39*	.22
PTSD – numbing	.38*	.34	.16
PTSD – hyperarousal	.40*	.28	.31
Depression	.41*	.47*	.34

Note. *$p < .05$. **$p < .01$. ***$p < .005$. ****$p < .001$.

Group Comparisons: Full-Time Employment Versus Disability Assistance

Patients for these analyses consisted of two groups, as classified at pretreatment: those who were full-time employed, and those on disability. Table 3 shows the comparison of the groups on the pretreatment demographic and clinical variables. The disability group had significantly more severe reexperiencing and hyperarousal symptoms, and the groups did not differ on the other variables. When pretreatment reexperiencing and hyperarousal were entered into a discriminant analysis to predict the employment groups, the proportion of correctly classified cases was 75%. For the variables that failed to significantly discriminate between groups, the corresponding effect sizes were generally quite small ($\eta^2 \leq .12$; see Table 3), which suggests that the pattern of results would be unlikely to change appreciably if a larger sample was used.

The treatment main effects for this study have been reported elsewhere (Taylor et al., 2003). In the present study we report the employment group main effects (full-time employed vs. disability) and their interactions with the type of treatment (exposure, EMDR, and relaxation), as assessed by analyses of covariance (ANCOVAs). Four ANCOVAs were conducted, one for each of the four PTSD symptom dimensions (reexperiencing, avoidance, numbing, and hyperarousal). The dependent variable was the follow-up score, and the covariate was the pretreatment score for the same variable. All of the employment group main effects and interactions with treatment type were nonsignificant; $F < 2.09$, $p > .1$, $\eta^2 < .03$. Thus, despite being occupationally impaired, the patients on disability assistance were equally able as full-time employed patients to benefit from the therapies. This finding runs counter to

Table 3

Comparison of Patients Who Were Either Full-Time Employed or Receiving Disability Benefits

	Employed (*n* = 17) M (*SD*) or %	Disability (*n* = 15) M (*SD*) or %	*t* or χ^2	*df*	η^2
Demographics					
Age	37.3 (7.0)	39.7 (11.1)	0.75	30	.02
Women (%)	71	53	1.01	1	.18
Education level	4.9 (2.0)	4.3 (1.7)	0.94	30	.03
Caucasian (%)	88	80	0.41	1	.11
Married or cohabiting (%)	59	47	0.47	1	.12
Pretreatment clinical variables					
PTSD – reexperiencing	4.3 (1.3)	5.4 (1.3)	2.30*	30	.15
PTSD – avoidance	5.3 (1.9)	6.1 (1.5)	1.34	30	.06
PTSD – numbing	3.9 (1.2)	3.9 (1.7)	1.56	30	.00
PTSD – hyperarousal	4.7 (1.2)	5.7 (0.8)	2.73**	30	.20
PTSD duration (years)	4.9 (5.8)	6.6 (10.8)	0.57	30	.01
Depression	24.3 (8.3)	26.1 (12.3)	0.49	30	.01
Personality disorder – cluster A	38.2 (5.0)	38.3 (3.8)	0.09	30	.00
Personality disorder – cluster B	55.7 (5.7)	57.2 (4.4)	0.82	30	.02
Personality disorder – cluster C	37.2 (4.2)	37.4 (4.0)	0.18	30	.00
Treatment dropout (%)	41	36	0.74	1	.15

Note. *p < .05. **p < .011.

the view that people on disability assistance are unlikely to improve with treatment because they run the risk of being cut off from their disability payments if they recover.

DISCUSSION

Previous studies have shown that PTSD is associated with impaired occupational functioning and with high economic costs related to lost productivity, medical expenditures, and disability compensation (e.g., Greenberg et al., 1999; Stein et al., 1997, 2002). The findings of the present study suggest that some symptoms associated with PTSD are more important than others in predicting occupational impairment. Results supported the prediction that reexperiencing, hyperarousal, and depression symptoms are associated with work impairment. Treatment-related reductions in these symptoms were also positively correlated with improvement in occupational functioning. Comparisons between patients who were full-time employed versus on disability at pretreatment revealed that the latter were characterized by more severe reexperiencing and hyperarousal symptoms but did not differ on other variables.

Collectively these findings suggest that the PTSD symptoms of reexperiencing and hyperarousal— symptom clusters closely associated with mental alertness and concentration—and depression may be

important factors in work impairment. However, given the correlational nature of the findings, future verification is required. Notwithstanding, it may be useful for clinicians to focus intervention efforts on reexperiencing, hyperarousal, and depression symptoms in PTSD patients with occupational impairment and where return-to-work is a high priority. By itself, however, this approach would likely be insufficient because various other factors are involved in work-related performance, such as job demands, work satisfaction, and the social climate of the workplace, including the way that coworkers or supervisors interact with the individual (Amick et al., 2000; Gates, 2000; Pransky, Gatchel, Linton, & Loisel, 2005; Strauser & Lustig, 2001). In some cases the person's functional limitations may require either a modification of duties performed in a given job or a change in occupation.

An unexpected finding was that personality pathology was uncorrelated with occupational and social functioning. One possible explanation has to do with the range of severity of personality disturbances examined in this study. Patients were included in the study only if PTSD was their primary (most severe) disorder. Patients were excluded if some other disorder, such as a personality disorder, was their main problem. This meant that people with severe personality disorders were excluded. Such people are quite likely to have significant impairments in occupational and social functioning (APA, 2000).

There are several caveats and limitations to the present study that warrant mention. It is important to note that, although not reported here due to space limitations, type of trauma and occurrence of more than one trauma were unrelated to impairment in work or other forms of functioning ($p > .01$). This suggests that it is the symptoms associated with PTSD, and not the type or frequency of trauma, that are associated with impaired functioning. However, it remains to be determined whether people who experience work-related trauma are more likely to experience occupational impairment than those whose trauma is not related to work. While our sample included some patients who had job-related PTSD (e.g., death threats at work) there were too few cases to formally analyze. In cases of work-related trauma, avoidance symptoms may be important predictors of occupational impairment because trauma-related avoidance would, by definition, involve the avoidance of work-related activities. A question for further investigation is whether reexperiencing and hyperarousal symptoms remain the most powerful predictors of impairment in cases of work-related trauma.

There are other potential predictors of work impairment in PTSD that were not examined in this study that require investigation. Such factors include the role of particular job demands (e.g., physical vs. cognitively demanding tasks), other occupational issues (e.g., job satisfaction, degree of support from coworkers and supervisors, safety issues), as well as other posttrauma emotional factors (e.g., trauma-related guilt or anger).

In the present study, we did not assess the effects of perceived trauma separately from objectively defined (i.e., medically documented) physical injury. This was because objectively defined injury is a poorer predictor of PTSD symptoms than perceived injury (Taylor & Koch, 1995). In fact, medically minor injuries that are perceived by the person as life threatening (e.g., a scalp laceration in which the person's face is covered in blood) tend to be more traumatizing than medically severe injuries (e.g., internal injuries) that the person does not recognize to be life threatening (Parker, 1977).

Finally, although our sample size ($N = 60$) was large by the standards of treatment-outcome studies, it is small by the standards of community or epidemiologic research. With this sample size, only the most robust predictors (i.e., those associated with the largest effect sizes) would reach statistical significance. Moreover, our sample consisted of treatment-seeking individuals, and so it remains to be determined whether the results apply to people with PTSD in general, regardless of whether or not they are seeking treatment for this disorder. Accordingly, the conclusions of this study remain tentative, pending replication with other samples, such as samples of participants from epidemiologic surveys.

Further investigation is needed to establish how specific components of PTSD are related to particular aspects of occupational impairment. Future research is also required to determine whether the findings of the present study generalize to different samples (e.g., samples recruited from different cultures) and different treatments (e.g., pharmacotherapies).

In summary, the results of this study indicate that (a) reexperiencing, hyperarousal, and depression are associated with work impairment, (b) patients on disability at pretreatment have significantly greater reexperiencing and hyperarousal symptoms but do not differ on other variables compared to those who are full-time employed, (c) treatment-related reductions in reexperiencing, hyperarousal, and depression are associated with treatment-related improvements in occupational functioning, and (d) occupational impairment differs from other forms of functional impairment in terms of its predictors. The findings raise the possibility that one way to remediate trauma-related occupational impairment is to use interventions that specifically target reexperiencing, hyperarousal, and depression symptoms.

NOTE

1. To our knowledge there is no empirical research indicating that PTSD directly affects a person's spending habits, such as the propensity to engage in shopping sprees or other forms of impulsive buying. The personal financial costs associated with PTSD appear to be primarily associated with (a) reduced income as a result of occupational impairment, and (b) out-of-pocket expenditures related to health care (e.g., costs associated with receiving treatment from a counsellor or psychologist in private practice). For the subgroup of PTSD patients who abuse substances such as alcohol or marijuana in an attempt to cope with their symptoms, PTSD would have an indirect effect on spending; that is, PTSD symptoms could motivate the person to procure illicit drugs in order to ameliorate symptoms, and this in turn would be associated with drug-related financial expenditures.

RÉSUMÉ

Nous avons examiné des variables explicatives d'invalidité professionnelle chez 60 personnes souffrant d'un trouble de stress post-traumatiques (TSPT) et suivant une thérapie cognitivo-comportementale. Nous avons posé l'hypothèse que certains symptômes—de reviviscence, d'hyperéveil et de dépression—étaient associés à l'invalidité professionnelle, parce qu'ils empêchent un fonctionnement normal au travail (difficultés de concentration, baisse de motivation, etc.). Nous avons en effet pu relier ces symptômes (et pas d'autres symptômes associés au TSPT) à l'invalidité professionnelle. De même, nous avons pu établir, chez les personnes suivies, une corrélation entre l'amélioration de ces symptômes due à la thérapie, et l'amélioration du fonctionnement professionnel engendrée par la thérapie. Les résultats suggèrent donc que l'on peut améliorer le fonctionnement

professionnel en concevant des moyens de mieux traiter la reviviscence, l'hyperéveil et la dépression chez les gens souffrant de TSPT.

REFERENCES

Allen, J.G., Huntoon, J., & Evans, R.B. (1999). Complexities in complex posttraumatic stress disorder in inpatient women: Evidence from cluster analysis of MCMI-III personality disorder scales. *Journal of Personality Assessment, 73,* 449-471.

Amaya-Jackson, L., Davidson, J.R., Hughes, D.S., Swartz, M., Reynolds, V., George, L.K., et al., (1999). Functional impairment and utilization of services associated with posttraumatic stress in the community. *Journal of Traumatic Stress, 12,* 709-724.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

Amick, B.C., III, Habeck, R.V., Hunt, A., Fossel, A.H., Chapin, A., Keller, R.B., et al. (2000). Measuring the impact of organizational behaviors on work disability management and prevention. *Journal of Occupational Rehabilitation, 10,* 21-38.

Asmundson, G.J.G., Stapleton, J.A., & Taylor, S. (2004). Are avoidance and numbing distinct PTSD symptom clusters? *Journal of Traumatic Stress, 17,* 467-475.

Beck, A.T., & Steer, R.A. (1987). *Manual for the revised Beck Depression Inventory*. San Antonio, TX: Psychological Corporation.

Beck, A.T., Steer, R.A., & Garbin, M.G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8,* 77-100.

Blake, D., Weathers, F.W., Nagy, L.M., Kaloupek, D.G., Charney, D.S., & Keane, T.M. (1997). *Clinician administered PTSD scale* (Revised). Boston: Boston National Center for Posttraumatic Stress Disorder, Behavioral Science Division.

Breslau, N. (2001). Outcomes of posttraumatic stress disorder. *Journal of Clinical Psychiatry, 62* (Suppl. 17), 55-59.

Breslau, N., Lucia, V.C., & Davis, G.C. (2004). Partial PTSD versus full PTSD: An empirical examination of associated impairment. *Psychological Medicine, 34,* 1205-1214.

Ciechanowski, P.S., Walker, E.A., Russo, J.E., Newman, E., & Katon, W.J. (2004). Adult health status of women HMO members with posttraumatic stress disorder symptoms. *General Hospital Psychiatry, 26*, 261-268.

First, M.B., Spitzer, R.L., Gibbon, M., & Williams, J.B.W. (1996). *Structured clinical interview for Axis I DSM-IV disorders* (Patient edition). New York: New York State Psychiatric Institute, Biometrics Research Department.

Gates, L.B. (2000). Workplace accommodation as a social process. *Journal of Occupational Rehabilitation, 10,* 85-98.

Greenberg, P.E., Stiglin, T., Kessler, R.C., Finkelstein, S.N., Berndt, E.R., Davidson, J.R., et al. (1999). The economic burden of anxiety disorders in the 1990s. *Journal of Clinical Psychiatry, 60,* 427-435.

Hambrick, J.P., Turk, C.L., Heimberg, R.G., Scheier, F.R., & Liebowitz, M.R. (2004). Psychometric properties of disability measures among patients with social anxiety disorder. *Journal of Anxiety Disorders, 18,* 825-839.

Hull, A.M., Alexander, D.A., & Klein, S. (2002). Survivors of the Piper Alpha oil platform disaster: Long-term follow-up study. *British Journal of Psychiatry, 181,* 433-438.

Human Resources Development Canada. (2001). National Occupational Classification Matrix. Retrieved December 12, 2005, from http://www.23.hrdc-drhc.gc.ca/2001/e/generic/matrix.pdf

Hyler, S.E. (1994). *Personality Diagnostic Questionnaire-4*. New York: New York State Psychiatric Institute.

Kessler, R.C., & Frank, R.G. (1997). The impact on psychiatric disorders on work loss days. *Psychological Medicine, 27,* 861-873.

Leon, A.C., Shear, M.K., Portera, L., & Klerman, G.L. (1992). Assessing impairment in patients with panic disorder: The Sheehan Disability Scale. *Social Psychiatry and Psychiatric Epidemiology, 27,* 78-82.

Mihura, J.L., Meyer, G.J., Bel-Bahar, T., & Gunderson, J. (2003). Correspondence among observer ratings of Rorschach, Big Five model, and DSM-IV personality disorder constructs. *Journal of Personality Assessment, 81*, 20-39.

Momartin, S., Silove, D., Manicavasagar, V., & Steel, Z. (2004). Comorbidity of PTSD and depression: Associations with trauma exposure, symptom severity, and functional impairment in Bosnian refugees resettled in Australia. *Journal of Affective Disorders, 80,* 231-238.

Neal, L.A., Green, G., & Turner, M.A. (2004). Post-traumatic stress and disability. *British Journal of Psychiatry, 184,* 247-250.

Parker, N. (1977). Accident litigants with neurotic symptoms. *Medical Journal of Australia, 2*, 318-322.

Pransky, G., Gatchel, R., Linton, S.J., & Loisel, P. (2005). Improving return to work research. *Journal of Occupational Rehabilitation, 15,* 453-457.

Shapiro, F. (1995). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures*. New York: Guilford.

Sheehan, D.V. (1983). *The anxiety disease*. New York: Scribners.

Solomon, S.D., & Davidson, J.R.T. (1997). Trauma prevalence, impairment, service use, and cost. *Journal of Clinical Psychiatry, 58* (Suppl. 9), 5-11.

Stein, M.B., McQuaid, J.R., Pedrelli, P., Lennox, R., & MacCahill, M.E. (2002). Posttraumatic stress disorder in the primary care medical setting. *General Hospital Psychiatry, 22,* 261-269.

Stein, M.B., Walker, J.R., Hazen, A.L., & Forde, D.R. (1997). Full and partial posttraumatic stress disorder: Findings from a community survey. *American Journal of Psychiatry,* 1114-1119.

Strauser, D.R., & Lustig, D.C. (2001). The implications of posttraumatic stress disorder on vocational behavior and rehabilitation planning. *Journal of Rehabilitation, 67,* 26-30.

Taylor, S. (2006). *Clinician's guide to PTSD: A cognitive-behavioral approach*. New York: Guilford.

Taylor, S., Asmundson, G.J.G., & Carleton, R.N. (2006). Simple versus complex PTSD: A cluster analytic investigation. *Journal of Anxiety Disorders, 20,* 459-472.

Taylor, S., & Koch, W.J. (1995). Anxiety disorders due to motor vehicle accidents: Nature and treatment. *Clinical Psychology Review, 15,* 721-738.

Taylor, S., Thordarson, D.S., Maxfield, L., Fedoroff, I.C., Lovell, K., & Ogrodniczuk, J. (2003). Comparative efficacy, speed, and adverse effects of three treatments for PTSD: Exposure therapy, EMDR, and relaxation training. *Journal of Consulting and Clinical Psychology, 71,* 330-338.

Zatzick, D.F., Marmar, C.R., & Weiss, D.S. (1997). PTSD and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. *American Journal of Psychiatry, 154*, 1690-1695.