POSTTRAUMATIC STRESS DISORDER IN EMERGENCY ROOM PROFESSIONALS: CONTRIBUTION OF COGNITIVE FACTORS

by

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Abstract

Little empirical work has been conducted on posttraumatic stress disorder (PTSD) in emergency room workers. This study examined appraisal and peritraumatic dissociation, factors highlighted in cognitive models of PTSD. Fifty-one emergency room personnel completed questionnaires measuring posttraumatic stress symptoms, peritraumatic dissociation, interpretations of traumatic events experienced while working in the emergency room, and subsequent intrusive recollections. Twelve percent of participants met formal diagnostic criteria for PTSD, and 20% met PTSD symptom criteria. As predicted, both negative appraisal of the trauma and in response to intrusions were associated with increased PTSD severity. Peritraumatic dissociation did not correlate with PTSD severity, although it did predict the reexperiencing symptom cluster. Discussion focuses on the factors that predict PTSD in emergency room professionals and implications for intervention.
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Introduction

Posttraumatic stress disorder (PTSD) is a condition marked by reexperiencing, avoidance and emotional numbing, and arousal (American Psychiatric Association, 1994). Most studies on PTSD have focused on the primary victims of traumatic events, for example the woman who was raped, or the man who survived a terrible motor vehicle accident. Comparatively few studies have addressed the secondary victims of traumatic events, the crisis helpers. This is surprising in light of the fact that, "emergency services personnel often have higher levels of exposure than civilian victims to the experiences that are implicated in the development of PTSD and other posttrauma psychological difficulties" (Weiss, Marmar, Metzler, & Ronfeldt, 1995, p. 361). In addition, little work has been done on the cognitive processes that may contribute to PTSD. This study explores two such processes, appraisal and peritraumatic dissociation, which may be related to PTSD in secondary trauma victims.

The recently published text revision of DSM-IV reports an eight percent lifetime PTSD prevalence for adults in North America (APA, 2000) and epidemiological studies investigating past week to six month rates in the general population have found prevalences ranging from 0.4% to 4.6% (Bernat, Rondfelt, Calhoun & Arias, 1998; Davidson, Hughes, Blazer, & George, 1991; Kessler, Sonnega, Bromet, Hughes & Nelson, 1995; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). However, investigations on emergency service personnel have reported rates of PTSD far exceeding those of the general population. Direct exposure to a major disaster is not necessary for emergency workers to be at risk of developing PTSD and other distress symptoms (Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996b). The impact of life-threatening situations, massive material destruction, exposure to severely mutilated bodies and physically demanding activities can all cause traumatic stress (Wagner, Heinrichs, & Ehlert, 1998). The idea that individuals may develop posttraumatic stress after witnessing a traumatic
event has recently been included in the DSM as part of criterion A for PTSD. However, at present the notion of secondary PTSD remains controversial.

PTSD and Emergency Service Workers

Estimates of PTSD in emergency service workers have varied from 2-32%. The most commonly studied population is disaster workers, typically a combination of paramedics, police officers, and firefighters. Prevalence rates in this group range from 2-17% (Anderson, Christensen, & Petersen, 1991; Durham, McCammon & Allison, 1985; Ersland, Weisaeth & Sund, 1989; McCammon, Durham, Allison & Williamson, 1988; Ursano, Fullerton, Kao & Bhartiya, 1995; Weiss et al., 1995). For ambulance attendants it has been reported at 15-22% (Clohessy & Ehlers, 1999; Grevin, 1996; Rentoul & Ravenscroft, 1993) and 17-32% for firefighters alone (Corneil, Beaton, Murphy, Johnson & Pike, 1999; DeAngelis, 1995; McFarlane, 1989; Wagner et al., 1998). The discrepant higher upper percentage for firefighters should be interpreted with caution; however, as this result was from one study where the firefighters were personally affected by the disaster, making most of them victims, not just helpers.

Another group of individuals who routinely witness life-threatening situations are hospital emergency room personnel. These workers also witness horrible events; however, there are some differences between this group and the rescue workers that have been studied. Emergency room professionals work in a more controlled environment than disaster workers, ambulance attendants and firefighters, and have more plentiful resources. They do not face the added external physical challenges such as bad weather or burning, collapsing buildings. In addition, emergency room professionals are equipped to deal with a wider variety of medical difficulties, having at their disposal a broader array of diagnostic tools as well as experts, specialists and advanced facilities on site. It remains to be determined whether secondary PTSD
can develop in this context or whether these distinct features of the workplace exert a protective effect.

Despite these differences, no empirical studies of PTSD in emergency room professionals have been conducted. In fact, the only studies on PTSD in hospital staff involved a cross section of hospital personnel, and comparisons between this group and on-scene rescue workers yielded inconsistent results (Durham et al., 1985; McCammon et al., 1998). As emergency room professionals routinely deal with trauma, yet are potentially in a more protective work environment than on-scene rescue staff, they are in a unique position to provide information into the conditions that lead to secondary PTSD.

Cognitive Models of PTSD

PTSD is classified as an anxiety disorder, and typically with anxiety the person fears an impending threat. With PTSD, however, the distressing event has already occurred. One ongoing puzzle with this condition is why patients continue to behave as though a past event is an impending event. To explain this phenomenon, Ehlers and Clark (2000) proposed a cognitive model in which they assert that persistent PTSD occurs when people process the traumatic event in ways that lead to a sense of current, serious threat. According to these writers, this sense of threat arises as a result of a) inordinately negative appraisals of the trauma and/or its sequelae, and b) disturbances in autobiographical memory.

Two types of negative appraisals have been implicated. In the first type, appraisal of the traumatic event, individuals may believe that the event has a high probability of recurring, that there are global negative implications for their present and future lives, or that there are long-term threatening implications stemming from the way that they either felt or acted during the traumatic event. They may overgeneralize from the event, and as a result, normal activities may be viewed as more dangerous than they are in reality. For example, individuals who have been
sexually assaulted may then severely restrict their social life due to an unrealistic belief about the future probability of such an event happening again (Ehlers & Clark, 2000).

Some studies have shown support for the importance of trauma appraisal. Dunmore, Clark and Ehlers (1997) found that persistent PTSD in assault victims was correlated with excessively negative appraisals of the traumatic events. In a study on assault and motor vehicle accident victims, persistent PTSD was predicted by negative appraisals of the initial PTSD symptoms (Ehlers, Mayou & Bryant, 1998). Feelings of alienation and perceived negative and permanent change as a result of the trauma have also been found to correlate with PTSD measures and impeded PTSD recovery (Dunmore et al., 1997; Ehlers, Clark, Dunmore, Jaycox, Meadows & Foa, 1998; Ehlers, Maercker & Boos, 2000). However, these studies have come from populations other than emergency service workers, and do not address appraisals in the context of secondary PTSD.

The second appraisal process is the person’s interpretation of intrusive thoughts or images that occur subsequent to the traumatic event. Ehlers and Steil (1995) argued that negative appraisal of such intrusions determines the severity of PTSD as well as how distressing the recollections are and the extent to which maladaptive strategies (e.g. rumination, suppression and dissociation) are used to control the intrusive recollections. Many emergency service workers report intrusive memories of work-related traumatic events (Thompson & Suzuki, 1991). For example, Durham et al. (1985) reported that among the rescue personnel in their study, intrusive thoughts about the disaster were the most frequently endorsed PTSD symptom. Similarly, Genest, Levine, Ramsden and Swanson (1990) found that in volunteer ambulance attendants involved in unsuccessful cardiopulmonary resuscitation attempts, fewer than 5% reported never thinking about the experience again. Moreover, for most of the participants, their recollections were not voluntary.
Not realizing that initial intrusive recollections are common after trauma, victims may interpret them as indications that they are going crazy or that they are inadequate and cannot cope. Clohessy and Ehlers (1999) reported that one of the most important predictors of PTSD was negative appraisal of intrusive memories about the traumatic event. Similarly, among motor vehicle accident survivors, Ehlers, Mayou, et al. (1998) reported moderately high correlations between PTSD severity and negative appraisal of intrusive recollections, and Steil and Ehlers (2000) reported that negative appraisal of posttraumatic intrusions was highly correlated with posttraumatic symptom severity, even after partialing out accident severity, intrusion frequency or general anxiety-related cognitions. The use of dysfunctional cognitive strategies to control these spontaneous intrusions, such as dissociation, rumination and suppression, have been linked to more severe PTSD symptomology and to negative appraisals of the intrusions even when controlling for intrusion frequency (Clohessy & Ehlers, 1999; Ehlers, Mayou, et al. 1998, Steil & Ehlers, 2000). However, few studies have examined this topic.

Another cognitive process implicated in PTSD is dissociation. Researchers have suggested that dissociation during the trauma may explicate why traumatic memories are frequently fragmented (Spiegel, 1991; van der Kolk & Fisler, 1995). Dissociation has been measured at both the trait and the state level; namely, as general dissociative tendencies and as a situational response to the traumatic event. General dissociative tendencies have been linked to PTSD and to poorer later functioning (e.g. Dancu, Riggs, Hearst-Ikeda, Shoyer & Foa, 1996; Feeny, Zoellner & Foa, 2000). Dissociation during the event, or peritraumatic dissociation, refers to derealization, memory disturbances, depersonalization, and altered body image experiences and time sense experienced at the time of the trauma (Marmar et al., 1996b). Peritraumatic dissociation in rescue workers may be especially important because it correlates with symptomatic stress and/or PTSD (Marmar et al., 1996b; Marmar, Weiss, Metzler, Delucchi, Best, & Wentworth, 1999; Weiss et al., 1995). In addition, it has been shown to remain strongly
predictive even after controlling for other factors (Marmar et al., 1999; Weiss et al., 1995). Furthermore, Ursano et al. (1999) reported that those who experienced peritraumatic dissociation were more than four times as likely to develop PTSD than those who did not. However, this observation was made in a sample of motor vehicle accident survivors, who directly experienced a traumatic event. Further elaboration of the contribution of the role of dissociation is provided by Ehlers and Clark (2000). These writers posit that dissociation may contribute to the poor contextualism and elaboration that characterize the autobiographical memory disturbance seen in people with PTSD. If so, one would hypothesize that peritraumatic dissociation would be positively correlated with PTSD severity. However, this relationship has not been independently studied for secondary PTSD.

Our study also addresses a phenomenon that has yielded conflicting evidence, namely the relationship between years of experience and PTSD symptom severity. Hodgkinson and Shepherd (1994), Corneil (1995), Wagner et al., (1998), and Moran and Britton (1994) found positive relationships wherein more experienced staff experienced more symptomatology. Conversely, Marmar et al. (1999), Hytten and Hasle (1989) and Weiss et al. (1995) found negative relationships. Others have found no relationship between these variables (Beaton, Murphy, Johnson, Pike & Corneil, 1999; Clohessy & Ehlers, 1999; Grevin 1996; Marmar et al. 1996b; Thompson & Suzuki, 1991; Ursano et al. 1995). In light of this very mixed evidence this study does not hypothesize the direction of the relationship between years of experience and PTSD severity, rather, it uses the present data to address this issue.

Assessment of PTSD

One important limitation of previous studies of emergency workers is the failure to measure full PTSD. None of the studies discussed above on secondary PTSD have measured criterion A, which refers to witnessing or experiencing an event involving actual or threatened death or serious injury, where the individual experienced intense fear, helplessness or horror.
There is reason to believe that due to their training, emergency service workers may not be as likely to have a subjective response of intense fear, helplessness or horror. If so, previous work may have overestimated the prevalence of PTSD in this population. Furthermore, no one has assessed criterion F, i.e. whether the event causes significant impairment in life functioning, as required by DSM-IV. Several studies based PTSD prevalence rates on measures such as the Impact of Event Scale (IES), which only addresses 2 out of the 3 symptom clusters, or the Posttraumatic Stress Symptom Scale (PSS), which only measures the three symptom clusters. While researchers have found that high scores on scales such as these are good predictors of PTSD (e.g. Perry, Difede, Musngi, Frances & Jacobsberg, 1992; Foa, Riggs, Dancu & Rothbaum, 1993) neither the IES nor PSS assess all the criteria necessary to warrant a diagnosis of PTSD. Again, such practices may mean that current PTSD prevalence estimates are overestimated. Assessing prevalence using full diagnostic criteria is especially important in secondary PTSD, where the individual witnessed rather than experienced the traumatic event.

Another minor methodological limitation in prior research is that the vast majority of subjects across the studies were Caucasian males. Some have argued that this is in fact quite representative of emergency personnel as a whole. For example, Thompson and Suzuki (1991) report that among ambulance service workers the male to female ratio is 25:1. However, it is unclear whether the results from previous studies are generalizable to women and to non-Caucasian populations.

The investigation of secondary PTSD is relatively new and has not yet been extended to emergency room professionals. Important questions relating to cognitive variables have begun to be asked in primary PTSD victims; however, many of these questions have not yet been asked in the context of secondary PTSD. Furthermore, the extant literature on secondary PTSD has lacked the same methodological rigor seen in studies with primary victims. The Ehlers and Clark (2000) model is an important theoretical advance and preliminary support for some of its tenets.
has emerged. However, independent studies of it are needed. The current study addresses these issues by determining the prevalence of DSM-IV diagnoses of PTSD in emergency room professionals and the types of traumatic events in the emergency room that are most distressing, examining three specific cognitive processes implicated in the Ehlers and Clark model, appraisal of the trauma, appraisal of intrusive recollections, and peritraumatic dissociation, and including a larger proportion of women and a more ethnically diverse population. Our specific hypotheses were:

1. emergency room professionals would exhibit a higher incidence of PTSD than in the general population
2. negative appraisals of the trauma and/or its sequelae would be associated with increased PTSD symptom severity
3. negative responses to intrusive recollections of the trauma would be associated with increased PTSD symptom severity, and negative interpretation of the intrusions would correlate with dissociation, suppression and rumination in response to the intrusions independent of intrusion frequency
4. peritraumatic dissociation would be associated with increased PTSD symptom severity.

Method

Participants

Participants consisted of 53 emergency room workers at a major hospital in a large urban center in British Columbia. These participants were recruited at staff meetings and by word of mouth. Of the 79 people who picked up a questionnaire package, 53 (67%) completed it, which represents approximately 44% of people who have extensive contact with patients in the emergency room. Table 1 shows the demographic breakdown of the sample. Respondents were primarily single, women, nurses, and of European Canadian background. The average age was 36.5, with a range of 23-51 years. Participants had been working in the emergency department of
this hospital for an average of 7.5 years, and in the health services profession for an average of 12.5 years.

Procedure

All staff members in the emergency department were invited to voluntarily participate in the study. Questionnaires were completed at home and returned to a secure depository box. In order to ensure confidentiality and anonymity, participants were asked not to put their names on any of the questionnaires. Upon completion of the questionnaire participants received $20.00.

Measures

Posttraumatic Diagnostic Scale. PTSD was assessed with the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995), which measures symptom presence on a four-point scale where 0 = not at all or only once, and 3 = five or more times per week, or almost always. The PDS measures all six DSM-IV criteria for PTSD (criteria A-F). This scale also produces a symptom severity score where 1-10 is mild, 11-20 is moderate, 21-35 is moderate to severe, and 36-51 is severe. Foa (1995) reports a Cronbach's alpha of 0.92 for the severity score; in our sample it was 0.83. The scale has good diagnostic agreement with the Structured Clinical Interview for DSM-IV and has been shown to have good test-retest reliability (Foa, Cashman, Jaycox, & Perry, 1997).

For the purposes of this study the items listed under criterion A were changed. The original criterion A section included a cross section of life events such as sexual assault, military combat, torture, etc. To ensure that participants would only answer the questionnaires in the context of the emergency room setting this list was replaced by 12 potentially traumatic work-related events that emergency room nurses ranked as critical incidents they experienced while on the job (Burns & Harm, 1993). In addition, three events referring to actual or threatened physical assault were included because such events have been shown to occur frequently in emergency rooms and to create emotional stress (Fernandes et al., 1999). Participants were asked to check
each event they had ever experienced on the job and to report how many times they had
experienced the event in the past year. As part of the PDS, participants are asked to choose the
event that bothered them the most. The Posttraumatic Cognitions Inventory, Response to
Intrusions Questionnaire and Peritraumatic Dissociation Experienced Questionnaire were
completed with reference to this one event. The list of traumatic life events from the original
PDS was included at the end of the questionnaire package.

**Posttraumatic Cognitions Inventory.** Appraisal of the trauma and/or its sequelae were
assessed with the Posttraumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo
1999), a 33-item inventory where items are rated on seven point scales. The PTCI measures
three factors: 1) negative cognitions about the self (21 items), 2) negative cognitions about the
world (7 items), and 3) self blame for the trauma (5 items). Subscale totals are summed to get an
overall total score. The Cronbach’s alphas for the total score and the three factors in the
standardized sample were reported as 0.97, 0.97, 0.88, and 0.86, respectively. In our sample they
were 0.93, 0.93, 0.89, and 0.90, respectively. The PTCI has been shown to discriminate between
traumatized participants with and without PTSD. Furthermore, endorsement of cognitions
assessed by the PTCI has been found to be associated with PTSD symptomology (Foa et al.,
1999).

**Response to Intrusions Questionnaire.** The Response to Intrusions Questionnaire (RIQ;
Clohessy & Ehlers, 1999) is a 19-item inventory that assesses negative and positive
interpretation of intrusions, and rumination, suppression and dissociation in response to the
intrusive memories. The internal consistency of the variables was reported as follows: negative
interpretation 0.75, positive interpretation 0.75, rumination 0.31, suppression 0.72, and
dissociation 0.40. In our sample, the Cronbach alphas were 0.76, 0.74, 0.38, 0.73, and 0.82,
respectively. As the alpha for the rumination subscale was low, caution should be used in
interpreting results based on this subscale. The RIQ also asks respondents to rate the frequency of their intrusive memories, and how distressing they find them.

**Peritraumatic Dissociation Experiences Scale.** The Peritraumatic Dissociation Experiences Questionnaire, self-report (PDEQ-SR; Marmar, Weiss & Metzler, 1997) consists of ten items measuring depersonalization, derealization, altered time sense, and other related dissociative responses that occurred during the critical incident. The ten items are rated on a five point Likert-like scale (1 = not at all, 5 = extremely). Factor analysis of this scale indicated that it provides a single factor representing peritraumatic dissociation. Participants’ ratings are averaged to obtain a mean response across the ten items. Participants scoring on average more than 1.5 are considered to have clinically meaningful levels of peritraumatic dissociation (Marmar, Weiss, Metzler & Delucchi, 1996a). Several studies have shown the PDEQ to be internally consistent and reliable, with a Cronbach alpha of 0.81 (Marmar et al., 1996b). The PDEQ has also been shown to have good discriminant, divergent and predictive validity (Marmar, Weiss & Metzler, 1997). PDEQ scores are strongly associated with measures of general dissociative tendencies and traumatic stress responses (Marmar et al., 1997). Cronbach’s alpha for our sample was 0.91.

**Results**

This study examined psychological difficulties in a normal population. Therefore, as expected, scores on most measures in this study were significantly non-normally distributed. Log transformations were completed to normalize the data; however, the differences in results between the transformed and untransformed data were not large enough to warrant transformation of all variables. Consequently, the results reported below are based on untransformed data and these results are thus conservatively biased estimates of the parameter due to differing shapes of the marginal distributions.
Prevalence of PTSD Symptoms

Our first hypothesis was that emergency room workers would exhibit a higher incidence of PTSD than in the general population. One hundred percent of participants endorsed experiencing (directly dealing with the situation) or witnessing (watching a co-worker deal with the situation) at least one of the traumatic work-related events listed in the PDS. A comparison of these two groups showed no significant differences of PTSD severity, \( F(1,46) = 0.01, p > .1 \), therefore the groups were combined for subsequent analyses. Results showed that 12% of participants met full DSM-IV criteria for PTSD. To address our first hypothesis, a test of proportions was carried out. The proportion of individuals with PTSD in this study, .118, was compared to the proportion derived from the highest point-prevalence in the general population discussed previously, .046. As these two proportions are both less than .2, and the sample size in this study is small, the confidence interval was constructed using the Ghosh (1979) method, which is robust in cases of small proportions and sample sizes. The resulting .95 confidence interval set around the proportion of individuals with PTSD in this study extended from .055 to .234. As this confidence interval excludes the estimated population proportion, .046, one can conclude that the proportion of emergency room workers with PTSD was significantly greater than the proportion of individuals in the general population with PTSD.

The prevalence of PTSD in the general population used above was based on structured telephone interviews, not the PDS. To further explore our first hypothesis, we compared PDS severity scores in our sample to those of a group of non-traumatized individuals reported in Foa et al.'s 1999 study. Participants in the current study displayed significantly higher severity scores than Foa et al.'s non-traumatized group (\( \bar{M}s = 6.9 \) and 3.6, \( SDs = 5.6 \) and 4.2 for the current and the Foa et al. samples, respectively, \( t^* (69) = 3.88, p < .001 \)). Again, this is consistent with the conclusion that the current sample is at increased risk for PTSD. We also compared our sample with the group of ambulance attendants studied by Clohessy and Ehlers.
(1999) and found no significant difference on PDS severity scores ($M_s = 6.9$ and $7.1$, $SD_s = 5.6$ and 7.6, for the current and the Clohessy and Ehlers samples, respectively, $t' (101) = 0.16, p > .05$). This suggests that the current sample displayed PTSD symptom levels consistent with those found in another group of emergency service workers.

Although all participants had witnessed or experienced a traumatic event while on the job, 59% met criterion A1, i.e. perceived the event as involving actual or threatened death or serious injury, and 88% met criterion A2, i.e. reported intense fear or helplessness. In total, 51% met criterion A. The percentage of people with PTSD increases from 12% to 20% if one includes those who meet criteria for all three symptom clusters (re-experiencing, avoidance and hyperarousal), disregarding criteria A, E and F. Eighteen percent met all three symptom cluster criteria plus the impairment criteria.

The most frequently endorsed symptoms were: feeling emotionally upset when you were reminded of the event (80%), trying not to think about, talk about, or have feelings about the event (56%), and having upsetting thoughts or images about the event that came into your head when you didn’t want them to (52%). As per Foa’s (1995) classification, 6% of participants reported no PTSD symptoms, and 71% had mild, 20% had moderate, and 2% had moderate to severe symptoms. Importantly, 37% met criteria F (impairment in life functioning) and 27% reported that their symptoms of posttraumatic stress had impaired their work functioning in the past month.

Investigation of the frequency of different types of traumatic events experienced in the emergency room revealed that in the past year the top three most frequently experienced traumatic events all involved dealing with multiple casualties, either at the same time, within a short time period, or involving massive bleeding or dismemberment. Frequencies of the one event chosen as most upsetting are provided in Table 2.
Appraisal of the Trauma and/or its Sequelae

Our second hypothesis was that negative appraisals of the trauma and/or its sequelae would be associated with PTSD symptom severity. To examine this, we computed Pearson correlation coefficients between the three PTCI factor scores, the PTCI total score and PDS severity scores. The results can be seen in Table 3. All results were consistent with the hypothesis. Negative cognitions about the self, negative cognitions about the world, self blame for the trauma, and total PTCI scores were all significantly correlated with PTSD severity. Intercorrelations between all dependent variables are shown in Table 4.

Responses to Intrusive Recollections

Our third hypothesis was that negative responses to intrusive recollections of the trauma would be associated with PTSD symptom severity. Ninety-four percent reported intrusive recollections of the traumatic event. While the majority of participants (53%) experienced these intrusions at a frequency of less than several times a year, 15% reported their frequency to be several times a year, 17% about once a month, 4% several times a month, 6% about once a week, and 4% every day.

To examine our hypothesis we computed Pearson correlation coefficients between the five RIQ scales and PDS severity scores. These correlations are given in Table 3. Consistent with our hypotheses, negative appraisals of intrusive memories, rumination, and suppression of intrusions all correlated with PTSD symptom severity; however, dissociation in response to intrusions was not significantly correlated with severity. To determine whether rumination and suppression were significantly associated with PTSD symptom severity beyond frequency of intrusions, two separate blockwise regressions were performed where frequency of intrusions was entered as the first block. Rumination predicted PTSD severity above and beyond frequency of intrusions, $F$ change = 8.18, $p < .01$, $R^2$ change = .13, as did suppression, $F$ change = 18.33, $p < .001$, $R^2$ change = .24.
A central tenet of cognitive theories is that negative appraisals of intrusive thoughts and images increase the severity of PTSD symptoms beyond the frequency of intrusions. As frequency of intrusions also correlated with severity, \( r = .44, p < .01 \), a blockwise regression was performed to determine whether negative appraisal of the intrusions explained severity over and above intrusion frequency. Frequency of intrusions was entered as the first block, followed by negative appraisal in the second. Negative appraisal predicted severity of PTSD symptoms over and above frequency of intrusions, \( F \text{ change} = 6.17, p < .05, R^2 \text{ change} = .10 \). A second analysis was conducted using the same predictors, but with emotional distress caused by the intrusions as the dependent variable. The blockwise regression indicated that negative appraisal predicted how distressing the intrusions were over and above frequency of intrusions, \( F \text{ change} = 8.64, p < .01, R^2 \text{ change} = .15 \).

Ehlers and Steil (1995) posited that negative appraisals of the intrusions motivate people to use maladaptive strategies such as dissociation, rumination and suppression to try to control the intrusions. To test this prediction, negative appraisal was correlated with dissociation, rumination and suppression scores. Negative appraisal of the intrusions correlated with dissociation and rumination, \( r = .29, p < .05 \) and \( r = .35, p < .05 \) respectively. However, these relationships did not hold up when frequency of intrusions was controlled.

Peritraumatic Dissociation

Our fourth hypothesis was that peritraumatic dissociation would be associated with PTSD symptom severity. According to the PDEQ cutoff proposed by Marmar et al. (1996a), 44% of participants exhibited clinically meaningful levels of dissociation. At least half of the respondents endorsed to some degree blanking out, going on automatic pilot, and feeling unreal, like in a movie/dream at the time of the traumatic incident. Furthermore, at least 18% of the sample endorsed each item of the PDEQ. To examine our hypothesis, we computed Pearson correlation coefficients between the PDS severity and average PDEQ scores. The correlation
between PDEQ and PDS severity scores failed to reach significance. To determine whether the PDEQ was associated with some symptoms of PTSD, Pearson correlation coefficients were computed between the PDEQ and scores on the three PTSD symptom clusters. Peritraumatic dissociation correlated with the reexperiencing cluster only, \( r = .31, p < .05 \).

**Influence of Demographic Variables**

Gender, marital status, cultural background, education, and occupation were not significantly related to PTSD severity. However, due to the gender and occupation imbalances in our sample there would not have been enough power to detect meaningful differences. Years of experience showed no significant relationship to PTSD severity, neither as years working in the emergency department at the participating hospital, nor as years working in the health services profession.

**Discussion**

The results suggest that hospital emergency room workers are at risk for developing PTSD. These health care professionals displayed a significantly higher prevalence of PTSD whether the disorder was diagnosed on the basis of core symptom clusters alone or full PTSD criteria. The findings also revealed that cognitive processes play a key role in the disorder. How the individual appraises the traumatic event and its sequelae, including intrusive recollections of the event, and peritraumatic dissociation predicted more severe symptoms. These results provide independent confirmation of key elements of the Ehlers and Clark (2000) cognitive model of PTSD.

These findings indicate that it is possible to have secondary PTSD, even when working in a controlled environment. Studies examining groups involved in crisis work have assumed that their participants both witnessed a life threatening event and responded to it with intense fear, helplessness or horror. Furthermore, previous research on these populations has disregarded whether the symptoms of PTSD cause significant impairment in important areas of functioning,
such as occupational and social functioning. Thus, only symptoms of PTSD, and not criteria A or F have been measured. Our study addressed this limitation by using a validated self-report PTSD measure concordant with DSM-IV criteria which allows for independent measurement of full PTSD criteria.

We found that a significant proportion of emergency room professionals exhibited patterns of symptoms consistent with a full DSM-IV diagnosis of PTSD. This prevalence of PTSD makes sense in light of the types of traumatic events experienced by this group of individuals. For example, participants described events such as treating multiple victims with 90% of their bodies burned, and working with a young motor vehicle accident victim who was so severely injured that all she could do was blink her eyes. One can see how events such as these may lead to traumatic stress.

Our finding of a 12% PTSD prevalence is higher than that of the general population, even when the basis of comparison was the highest point prevalence reported. This comparison was limited in that there is no reported data on the PDS from a general population sample. However, this result converges with findings that the PDS scores in our sample were greater than those of a nontraumatized group (Foa et al, 1999) and were similar to those of an ambulance services group (Chlossey & Ehlers, 1999). Considered together, these findings suggest that emergency room professionals are at increased risk for PTSD.

When one defines PTSD on the basis of symptom criteria alone, as previous studies have, the percentage increases to 20%. This percentage is very similar to that found with ambulance attendants, somewhat higher than the majority of studies on disaster workers, and somewhat lower than the majority of studies on firefighters. Not surprisingly, our prevalence of those meeting PTSD symptom criteria is consistent with the extant literature on ambulance attendants. Out of the types of emergency service workers previously discussed this group would have duties most similar to emergency room professionals. In contrast, it may be that firefighters are
in more physical danger when doing their job, placing them at greater risk of being primary
victims while doing their job and rendering them more susceptible to PTSD. Nonetheless, it is
important to note that the percentage of participants classified as having PTSD in our study
drops to 12% when full PTSD criteria were accounted for, indicating that prior findings based
solely on the symptom cluster criteria may be overestimates of the full diagnostic prevalence of
PTSD in emergency workers. Future research would benefit from using structured interviews to
evaluate the prevalence of PTSD.

Our results support the role of several distinct cognitive processes in the development of
PTSD. In particular, negative appraisals of the event and of intrusive thoughts are associated
with more intense PTSD symptoms. Believing one has been permanently changed as a result of
the trauma, that the world is a dangerous place, or that the event happened because of the way
one acted, does seem to worsen PTSD. These results are consistent with other findings on
negative appraisals of the trauma and/or its sequelae in earlier studies of primary PTSD

These emergency room professionals experienced many intrusive recollections of the
upsetting event and here again, the way the person interpreted these intrusions had implications
for symptom severity. Appraising the intrusions as meaning that there is something wrong with
them, or that they may out of their mind, seems to exacerbate symptoms of PTSD. Interestingly,
the importance of negative appraisal of the intrusions remains even when one controls for
frequency of intrusions. In addition, the severity of PTSD symptoms is associated with
ruminating and trying to suppress intrusive recollections. Both of these coping strategies may
unwittingly maintain PTSD by actually producing symptoms of posttraumatic stress, and
preventing change in negative appraisals and in the trauma memory (Ehlers & Clark, 2000).

Researchers have suggested that negative appraisals of the intrusions may produce
negative emotions that impel people to use dysfunctional coping strategies that may control the
intrusions, but inadvertently prevent changes in the interpretation of the intrusions. We found modest relations between negative appraisal and rumination and dissociation; however, there was no support for this relationship over and above frequency of intrusions. Thus, further work is needed to see when these relationships do exist, and if these dysfunctional strategies then further relate to the maintenance of PTSD.

These results on the importance of cognitive appraisal parallel similar findings with other anxiety disorders. For example, individuals with panic disorder negatively appraise bodily sensations as indicating that they are in immediate physical danger (Clark, 1986). In PTSD, the content of the appraisal is different, for example, that the event “has permanently changed me” and “I will never be the same”. However, the base of excessively negative appraisal is equivalent and is related to current threat. There are also parallels to obsessive compulsive disorder (OCD). Rachman (1997, 1998) asserts that OCD is perpetuated by individuals appraising the intrusive thoughts as having significant personal meaning, usually that they are mad, bad or dangerous. In PTSD the flavour of negative appraisals of the intrusions often has a similar sense of “madness”. For example, such individuals often appraise the intrusions as signifying that they have a psychological disorder, and that they may go crazy. The RIQ captures these negative appraisals of “madness”, but not the other potential dimensions of badness or dangerousness. Future work is needed to address whether these latter dimensions of negative appraisal of intrusions occur in individuals with PTSD as well. Thus while individuals with PTSD are appraising different external and internal events, the same pattern emerges in the link between negative appraisal on the one hand and disorder severity and possibly maintenance on the other.

Interestingly, 44% of our sample exhibited clinically meaningful levels of peritraumatic dissociation. This is higher than the finding of Marmar et al. (1996a), who found that 25% of their emergency service personnel participants met this classification. Peritraumatic dissociation did not explain overall PTSD severity, but it did predict the reexperiencing symptom cluster.
One interpretation of this specific link is that peritraumatic dissociation leads to a different type of encoding where information about an event is not stored as a typical autobiographical memory. Those who dissociated during the event may have encoded the event at a very sensory level, resulting in the unique sensory cued intrusions that are the hallmark of PTSD. Sensory cues may trigger recall of the event in a primitive way that makes it seem like the event is occurring again today instead of just in the past. Furthermore, facets of dissociative symptomology such as depersonalization, emotional numbing and derealization could hinder both trauma memory elaboration and its integration into autobiographical memory (e.g. Clohessy & Ehlers, 1999; Ehlers & Clark, 2000; Foa & Hearst-Ikeda, 1996), thus accounting for memory disturbances seen in individuals with PTSD. Peritraumatic dissociation may also lead to other responses to intrusive memories such as dissociation and suppression, whereby the individual does not have to think about the recollections. These responses in turn may disrupt emotional processing of the trauma, which is seen as necessary to resolve the event (Rachman, 1990).

Previous research on the relationship between years of experience and PTSD has yielded quite mixed findings. Firm answers on the direction of this relationship would aid in the development of interventions for PTSD whose application would be timed for maximum benefit. This study found no significant relationship between years of experience and PTSD symptom severity. It may be that years of experience is neither a protective nor a risk factor for PTSD, rather, other variables are more important in determining who goes on to develop posttraumatic stress.

The results of this study must be tempered with a reminder that the study had some limitations. First, the response rate was approximately 44%, and it was not possible to obtain data on the non-responders. Consequently, the results may be under or over estimates of the phenomena at hand. However, the response rate we obtained is not uncommon for survey research. Second, the study consisted largely of female nurses, thus the findings may not be
generalizable to males and other professional groups who work in the emergency room. However, this data does support earlier work on men. Future research would benefit from pursuing a more balanced sample of gender and occupation.

A broader issue resulting from this study is how to define PTSD in a secondary context. The shift to examining PTSD in secondary victims has been relatively recent. Interestingly, although every participant in this study had experienced a traumatic event while on the job, just over half endorsed both that the event involved serious injury or someone’s life being in danger, and that they responded with fear or helplessness. Perhaps the issue of criteria A needs to be reconsidered with respect to secondary victims, particularly with respect to emergency service workers. As emergency room professionals routinely encounter traumatic events on the job, they may not consider certain events as life threatening as the lay person would, and emergency room professionals may not be as emotionally affected by traumatic events in comparison to someone who does not encounter these events on a daily basis.

The results of this study have several implications. First, emergency room personnel are at risk for developing PTSD as a result of their job experiences, and 27% reported that their symptoms of posttraumatic stress interfered with their work during the past month. The importance of targeting symptoms early is highlighted by the finding that rescue workers reporting moderate to high levels of trauma-related distress at initial assessments continued to report it at follow-up one and a half years later (Marmar et al., 1999). Persistent symptoms of posttraumatic stress may lead to work absenteeism, reduced job satisfaction, and/or early retirement (Cudmore, 1996; Wagner et al., 1998). This suggests the need to educate and treat emergency room workers with respect to PTSD, and that a subgroup of emergency room workers may need extra support from their administration to cope with the traumatic events they experience. Second, the findings imply that treatment for PTSD may benefit from addressing cognitive processes. In particular, appraisal of the trauma, its sequelae, and intrusive memories
may need to be targeted. A true test of the Ehlers and Clark model will be to see if modification of these appraisals leads to decreases in PTSD severity.
References


Footnotes

1 Two participants were dropped from the analyses; one participant had extensive missing data and the other was currently and had been on leave from the emergency room for the past two years.

2 Total number of traumatic work events experienced on the job during the past year correlated with PSTD severity, r = .35, p < .05. However, all significant relationships to PTSD severity remained so when this was partialed out. Comparing those who had ever experienced or witnessed a non-work related traumatic event and those who had not revealed no significant differences on all dependant variables.
Table 1

Demographic Breakdown of Participants

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>90</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
</tr>
<tr>
<td>Ethnic background</td>
<td></td>
</tr>
<tr>
<td>European Canadian</td>
<td>57</td>
</tr>
<tr>
<td>Asian Canadian</td>
<td>14</td>
</tr>
<tr>
<td>Indo Canadian</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>25</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>47</td>
</tr>
<tr>
<td>Married/common-law</td>
<td>43</td>
</tr>
<tr>
<td>Separated/divorced/widowed</td>
<td>10</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>6</td>
</tr>
<tr>
<td>Some college/university</td>
<td>12</td>
</tr>
<tr>
<td>College/university degree</td>
<td>61</td>
</tr>
<tr>
<td>Graduate/professional degree</td>
<td>20</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Direct patient care (e.g. nurses, physicians)</td>
<td>73</td>
</tr>
<tr>
<td>Administrative clerks (e.g. nursing unit clerks)</td>
<td>21</td>
</tr>
<tr>
<td>Indirect support (e.g. technicians, housekeeping)</td>
<td>6</td>
</tr>
<tr>
<td>Event</td>
<td>Percentage</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Providing care to a patient who is a relative or close friend and is dying or in serious condition</td>
<td>15</td>
</tr>
<tr>
<td>Threatened physical assault of self</td>
<td>15</td>
</tr>
<tr>
<td>Multiple trauma with massive bleeding or dismemberment</td>
<td>13</td>
</tr>
<tr>
<td>Death of a child</td>
<td>13</td>
</tr>
<tr>
<td>Providing care to traumatized patient who resembles yourself or family members in age or appearance</td>
<td>8</td>
</tr>
<tr>
<td>Caring for severely burned patient</td>
<td>8</td>
</tr>
<tr>
<td>Death after prolonged resuscitation</td>
<td>6</td>
</tr>
<tr>
<td>Witnessed physical threat/assault of co-worker</td>
<td>6</td>
</tr>
<tr>
<td>Dealing with multiple traumatic events in a short time period</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 3

Correlations Between PTSD Severity, Posttraumatic Cognitions Inventory and Response to Intrusions Questionnaire

<table>
<thead>
<tr>
<th>Variable</th>
<th>M (SD)</th>
<th>Correlation with PTSD Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttraumatic Cognitions Inventory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative cognitions about the self</td>
<td>1.50 (0.72)</td>
<td>0.66**</td>
</tr>
<tr>
<td>Negative cognitions about the world</td>
<td>2.79 (1.54)</td>
<td>0.49**</td>
</tr>
<tr>
<td>Self blame for the trauma</td>
<td>1.43 (0.91)</td>
<td>0.37**</td>
</tr>
<tr>
<td>Total score</td>
<td>58.32 (25.13)</td>
<td>0.68**</td>
</tr>
<tr>
<td>Response to Intrusions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative interpretation</td>
<td>1.44 (0.72)</td>
<td>0.52**</td>
</tr>
<tr>
<td>Positive interpretation</td>
<td>5.94 (1.09)</td>
<td>-0.28</td>
</tr>
<tr>
<td>Rumination</td>
<td>3.13 (1.33)</td>
<td>0.49**</td>
</tr>
<tr>
<td>Suppression</td>
<td>3.43 (1.41)</td>
<td>0.54**</td>
</tr>
<tr>
<td>Dissociation</td>
<td>2.83 (1.73)</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Note. PTSD = posttraumatic stress disorder.

*p < .05, two-tailed. **p < .01, two tailed.
Table 4

**Correlations Between All Dependent Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PDS PTSD Severity</td>
<td>--</td>
<td>.19</td>
<td>.66**</td>
<td>.49**</td>
<td>.37**</td>
<td>.68**</td>
<td>.52**</td>
<td>-.28</td>
<td>.49**</td>
<td>.54**</td>
<td>.23</td>
</tr>
<tr>
<td>2. PDEQ</td>
<td>--</td>
<td>.29*</td>
<td>.15</td>
<td>.41**</td>
<td>.31*</td>
<td>.30*</td>
<td>-.15</td>
<td>.23</td>
<td>.34*</td>
<td>.43**</td>
<td></td>
</tr>
<tr>
<td>3. PTCI Negative cognitions about the self</td>
<td>--</td>
<td>.50**</td>
<td>.56**</td>
<td>.92**</td>
<td>.78**</td>
<td>-.11</td>
<td>.42**</td>
<td>.40**</td>
<td>.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. PTCI Negative cognitions about the world</td>
<td>--</td>
<td>.24</td>
<td>.78**</td>
<td>.26</td>
<td>-.15</td>
<td>.58**</td>
<td>.31*</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. PTCI Self blame for the trauma</td>
<td>--</td>
<td>.62**</td>
<td>.49**</td>
<td>-.10</td>
<td>.29*</td>
<td>.20</td>
<td>.21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. PTCI Total score</td>
<td>--</td>
<td>.68**</td>
<td>-.15</td>
<td>.55**</td>
<td>.41**</td>
<td>.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. RIQ Negative interpretation</td>
<td>--</td>
<td>-.10</td>
<td>.35*</td>
<td>.23</td>
<td>.29*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. RIQ Positive interpretation</td>
<td>--</td>
<td>-.09</td>
<td>-.08</td>
<td>-.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. RIQ Rumination</td>
<td>--</td>
<td></td>
<td>.49**</td>
<td>.42**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10. RIQ Suppression</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td>.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. RIQ Dissociation</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
Note. PDS = posttraumatic diagnostic scale; PTSD = posttraumatic stress disorder; PDEQ = peritraumatic dissociation experiences questionnaire; PTCI = posttraumatic cognitions inventory; RIQ = response to intrusions questionnaire.

*p < .05, two-tailed. **p < .01, two tailed.