The Moderating Impact of Interacting With Distressed Families of Decedents on Trauma Exposure in Medical Examiner Personnel

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Objectives: Prior research has examined the incidence of posttraumatic stress stemming from either direct or indirect trauma exposure in employees of high-risk occupations. However, few studies have examined the contribution of both direct and indirect trauma exposure in high-risk groups. One particularly salient indirect trauma often endorsed as the most stressful by many occupational groups is interacting with distressed family members of victims of crime, illness, or accidents. The present study examined the extent to which interacting with distressed families moderated the impact of cumulative potentially traumatic event (PTE) exposure on depression and posttraumatic stress disorder (PTSD) symptoms in 245 employees of medical examiner (ME) offices. *Method:* Employees from 9 ME office sites in the United States participated in an online survey investigating the frequency of work place PTE exposures (direct and indirect) and mental health outcomes. *Results:* Results revealed that cumulative PTE exposure was associated with higher PTSD symptoms (PTSS) for employees who had higher frequency of exposure to distressed family members. After controlling for cumulative and direct PTE exposure, gender, and office site, exposure to distressed families was significantly associated with depressive symptoms, but not PTSS. *Conclusions:* Findings of our research underscore the need for training employees in high-risk occupations to manage their reactions to exposure to distraught family members. Employee training may buffer risk for developing PTSD and depression.

Keywords: medical examiner, depression, posttraumatic stress, trauma exposure

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Many occupational groups face exposure to PTEs in the course of their workday. In general, research on members of these high-risk occupation groups has either examined the impact of direct (Carlier & Gersons, 1995; Dworznik, 2008; Feinstein, 2006), or indirect exposure to PTEs (Palm, Polusny, & Follette, 2004), but

not both. Examples of direct trauma exposures include witnessing or experiencing violence, a natural disaster, or physical threat. Indirect trauma exposure may include reading disturbing case files, witnessing the aftermath of disaster, or interacting with distressed victims and families. Both direct and indirect exposure to PTEs can carry mental health risks (e.g., PTSD and depression: Fullerton, Ursano, & Wang, 2004). Although prior research has largely examined the impact of either direct or indirect trauma exposures, many occupational groups face both types of exposure on a regular basis. Little is known about the degree to which direct and indirect exposures to PTEs interact to increase risk for persistent distress and mental health consequences in high-risk occupations.

One potential outcome of exposure to a PTE (either direct or indirect) is the development of PTSD. The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., *DSM–5*) identifies PTSD as a disorder consisting of four classes of symptoms including intrusive recollection or reexperiencing of trauma memories, avoidance of trauma-related stimuli, negative alterations in cognitions or mood, and hyperarousal symptoms (American Psychiatric Association [APA], 2013). Several terms have been used to identify traumatic stress symptoms after indirect trauma exposure including secondary traumatic stress or compassion fatigue (Palm et al., 2004; Ahern, Galea, Resnick, & Vlahov, 2004; Pfefferbaum et al., 1999; Pfefferbaum et al., 2001). Secondary traumatic stress

has been conceptualized as the development of PTSS as a result of indirect trauma exposure (Bride, Robinson, Yegidis, & Figley, 2004). Although there is debate as to the differences between these concepts, for the purposes of this paper, the term posttraumatic stress symptoms (PTSS) will be used to refer to PTSD symptoms experienced by individuals indirectly and/or directly exposed to a traumatic event (Palm et al., 2004).

PTSD is characterized by comorbidity, with depression and substance use disorders being the most common disorders comorbid with PTSD (Pietrzak, Goldstein, Southwick, & Grant, 2011). In particular, PTSD and major depression often co-occur together after exposure to a traumatic event (O'Donnell, Creamer, & Pattison, 2004). This relationship has also been found to be prevalent in first responders and other occupations (Haugen, Evces, & Weiss, 2012). For instance, a recent study of workplace trauma exposure in industrial and occupational workers found that almost half of the workers exposed to occupational accidents developed clinically significant PTSD and depressive symptoms (Buodo, Novara, Ghisi, & Palomba, 2012). Although significant overlap exists with symptomatology in both disorders, research suggests that depression is a separate and distinct vulnerability in the context of the PTSD-major depression comorbidity (Rytwinski, Scur, Feeny, & Youngstrom, 2013; Stander, Thomsen, & Highfill-McRoy, 2014). As such, the present study examined the impact of direct and indirect trauma exposures on both PTSD and depression symptoms.

Previous studies examining rates of PTSD in high-risk employee groups provide wide variations both within and across occupations in their estimates of those affected, ranging from 7–19% of active duty police officers (Carlier & Gersons, 1995; Maia et al., 2007), 5–36% of active duty fire fighters (Del Ben, Scotti, Chen, & Fortson, 2006), 15–22% of ambulance personnel (Clohessy & Ehlers, 1999; Rentoul & Ravenscroft, 1993), 2–31% of search and rescue personnel (McFarlane & Papay, 1992; van der Velden, van Loon, Benight, & Eckhardt, 2012), and 4–7% of journalists (Dworznik, 2008; Feinstein, 2006; Pyevich, Newman, & Daleiden, 2003). Rates of PTSD stemming from different types of indirect trauma exposure range from 33% in a sample of emergency room nurses (Dominguez-Gomez & Rutledge, 2009) to 25% in a group of sexual assault nursing examiners who routinely conducted rape examinations (Townsend & Campbell, 2009) to 11% of attorneys and 1% of support staff working in a public defender's office (Levin et al., 2011).

Although there are several theoretical explanations for the development in PTSD in high-risk occupational groups (see Brewin & Holmes, 2003), all theories underscore the importance of factors affecting cognitive appraisals of the event, coping style, alterations in memory coding, and beliefs before trauma exposure in the development of PTSD. In addition, specific to first responder groups, some researchers have speculated that the cumulative nature of traumatic stressor exposure characteristic of these occupations may lead to the development of PTSD (Haugen et al., 2012; Tolin & Foa, 1999).

Variations among and between employee groups in the rates of PTSS may be a function of differences in the frequency of PTE exposure. Frequent exposure to PTEs may provide opportunities to develop the technical and coping skills necessary to manage emotional demands of PTEs (Pyevich et al., 2003; Levin et al., 2011). However, high frequency exposure may also limit the time available to recover from PTEs (MacRitchie & Liebowitz, 2010; Ortlepp & Friedman, 2002). The bulk of the research on PTSD in employee samples has documented the intensity of symptoms among groups of employees exposed, either directly or indirectly, to a specific work-related traumatic event. There is less evidence on the degree to which the frequency of exposure to these events is associated with increased mental health risk, and the available evidence is mixed. Two studies, one in a sample of journalists and the other in a sample of attorneys (Pyevich et al., 2003; Levin et al., 2011) reported a positive relationship of caseload to stress symptoms, but two other studies of trauma workers did not find this relationship (MacRitchie & Liebowitz, 2010; Ortlepp & Friedman, 2002).

Additionally, variations in the rates of PTSS in high-risk occupational groups may be a function of the degree to which employees experience both direct and/or indirect PTE exposure. Indirect trauma exposures, particularly those associated with interacting with distressed victims and their family members often co-occur with exposure to direct trauma (Baum, 2014). Previous research has not explicitly differentiated between the effects of indirect versus direct exposures or tested whether the effects of direct trauma on PTSS are exacerbated when employees also face additional indirect exposures.

ME personnel can serve as an effective model system for testing the effects of different types of PTE exposures in high-risk occupations. ME personnel are involved in identifying the deceased, determining cause of death, and communicating this information to relevant parties including law enforcement, public health authorities, and families of victims (Brondolo, Wellington, Brondolo, Brondolo, & Delahanty, 2012; Hanzlick & Combs, 1998). All employees in ME offices, including pathologists, investigators, administrators, and autopsy and laboratory technicians are frequently exposed to PTEs, although employees may vary in the frequency and type of PTE exposure. Some employees experience direct exposures to PTEs on a daily basis as their casework involves working at the scene of a death or handling human remains that may have disturbing characteristics (e.g., display signs of severe violence). Other employees have job responsibilities which involve indirect exposure to PTEs through the preparation or review of case reports. Some employees may experience indirect trauma through their work with the families of the decedent while others have more limited or no contact with these families.

Interacting with distressed family members of injured or deceased victims has been cited as one of the most anxiety provoking indirect PTEs on the job, and is endorsed as one of the most anxiety provoking job responsibilities even when compared to direct trauma exposures (Brondolo et al., 2012; Clohessy & Ehlers, 1999; Piotrkowski & Telesco, 2011). Prior qualitative research examining ME personnel found that interacting with highly distressed/grieving/angry families was common and that these interactions served as a highly salient stressor (Brondolo et al., 2012). A wealth of research examining therapist trauma reactions to working with grief victims provides support for the lasting effects of indirect trauma exposure. Up to 20% of therapists have been found to develop PTSD symptoms as a result of working with bereavement clients, with therapists being more likely to become symptomatic if they judge the event to be unfair (e.g., loss of a

child; Cieslak et al., 2013; Najjar, Davis, Beck-Coon, & Carney Doebbeling, 2009; Thieleman & Cacciatore, 2014).

Interactions with family members place great demands on employees' capacities for emotion regulation. ME personnel reported they did not always feel competent or skilled in responding to the intensity of the family members' emotions (i.e., anger, grief; Brondolo et al., 2012). They also had concerns about the strategies they used for regulating their own emotional reactions to the disturbing cases or the family members' distress, citing concerns about the consequences of detachment as well as concerns about overempathizing with the families. The negative effects of working with distressed family members have been documented in other work groups such as World Trade Center police officers; New York City Police Deprtment officers who worked with families of victims were more likely to experience extreme psychological distress and PTSS than officers who did not interact with families of victims (Piotrkowski & Telesco, 2011). Many of these police officers also had responsibilities that included exposure to direct trauma. As such, the frequency of interactions with distressed family members may have exacerbated the effects of direct trauma exposure on posttraumatic stress outcomes. However, this was not directly examined, and to our knowledge, no prior studies of mental health outcomes in high-risk occupations have systematically compared the differences in direct and indirect exposures or examined the interaction of direct and indirect PTE exposures on subsequent PTSD and depression.

The present study examined the degree to which variations in frequency and type of PTE exposure (direct vs. indirect exposure vs. contact with distressed family members) were differentially associated with PTSS and depression in ME personnel. We operationalized cumulative PTE exposure as the frequency of exposure to highly disturbing cases, and also examined direct versus indirect PTE exposure separately. In addition, we examined a specific form of indirect exposure, contact with distressed family members, as prior work demonstrated that interacting with family members was a particularly poignant indirect stressor. We hypothesized that greater frequency of cumulative PTE exposure would be associated with higher PTSS. We also hypothesized that the effects of PTE exposures on PTSS and depressive symptoms would be larger for individuals reporting direct versus indirect trauma exposure. Finally, we hypothesized that exposure to distressed family members would moderate the relationship between cumulative PTE exposure and PTSS/depression such that higher levels of exposure to distressed families would be associated with higher levels of PTSS and depression for employees with more cumulative PTE exposure.

Method

Participants

A total of 357 employees from nine ME offices in six states were invited to participate, and 245 (69%) provided consent and sufficient data to be included in the analysis.[1] The offices were responsible for serving either a particular county or the state as a whole and ranged in size from 16 to 87 employees. The sample included 85 men and 156 women. To preserve confidentiality, participants were asked to indicate their age within a range: 15.5% ($n = 38$) were less than 30 years of age, 51.0% ($n = 125$) were

between 30 and 50 years of age, and 33.5% ($n = 82$) were above 50 years of age. The majority of the sample was White (69%, $n = 169$), with other ethnicities represented as follows: Latino (13.1%, $n = 32$), Black (10.6%, $n = 26$), American Indian (3% $n = 8$), Asian (2.0%, $n = 5$), and Native Hawaiian (1%, $n = 3$). Participants represented seven different job categories, including ME/pathologists (14.7%, $n = 36$), investigators (26.5%, $n = 65$), autopsy technicians (18.8%, $n = 46$), management (7.4%, $n = 18$), clerical administration (16.7%, $n = 41$), laboratory and research personnel (14.3%, $n = 35$) and four others in related professions (law, clergy, facilities, etc.). The proportion of participants in each employee group roughly corresponded to their representation in each ME office, supporting the generalizability of the data.

Procedure

The principal investigator (EB) visited each participating location and discussed the program with employees. All willing employees received an email with an invitation to complete a survey via Survey Monkey; five email reminders to complete the survey were sent to each potential participant. When the information was gathered by Survey Monkey, all identifying information from the data file was deleted. A separate password-protected roster was used to keep track of completion of the surveys. All data files used for analyses were deidentified. All procedures were approved by the Human Subjects Review Boards of St. John's University and Kent State University.

Measures

Sociodemographic data. A standard questionnaire was used to assess age, gender, race/ethnicity, sex, marital status, highest level of education completed, and job category.

Trauma exposure. The Case Exposure Scale assesses the frequency of direct and indirect exposure to 12 different types of PTEs (i.e., 7 types of disturbing deaths and 5 types of disturbing human remains). The items on the scale were chosen following focus group discussions and key informant interviews with ME employees (Brondolo et al., 2012). Frequency of case exposure was rated on a 4-point scale with points including *never*, *rarely (several times a year, but less than once a month)*, *about once a month*, and *several times a month*. The scale demonstrated very good internal consistency ($\alpha = .85$) in the present study.

Direct versus indirect exposure. Two items inquired about the frequency with which employees had direct and/or indirect exposure to potentially traumatic cases. Direct exposure was assessed by having the participant rate on a 4-point scale how often they had "direct contact with the victim." Indirect exposure was assessed on a similar scale by assessing how often the participant had "indirect contact with the victim or case by preparing reports or other materials."

Exposure to distressed families. The Exposure to Distressed Family Members Scale was developed specifically for this study and was used to assess the frequency of exposure to family members of the deceased. The scale consists of two items concerning the frequency with which the employee had: "face-to-face

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[1] Seventy-eight of the 245 subjects participated in an earlier study of stress and mental health symptoms (Brondolo et al., 2012).

contact with families of the deceased" or contact "through phone calls." Responses were rated on a 4-point scale from *never* to *very often*. This scale had a Cronbach's alpha of .82. As a preliminary measure of construct validity, the Exposure to Distressed Families Scale was positively associated with the Family Stress Scale ($r(188) = .20$, $p < .01$). The Family Stress Scale is a previously published measure of the degree to which employees experience stress from dealing with the families (Brondolo et al., 2012).

Depressive symptoms. Depressive symptoms were assessed with the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a 21-item self-report measure intended to assess severity of depressive symptoms. We eliminated the item inquiring about suicidal ideation. In the present sample the BDI-II had good internal consistency ($\alpha = .88$). As recommended, participants were classified as mildly depressed if their scores on the BDI were 14 through 19; they were classified as moderately to severely depressed if their BDI-II score was 20 or greater.

PTSS. PTSS were assessed with the Posttraumatic Stress Diagnostic Scale (PDS, Foa, Cashman, Jaycox, & Perry, 1997). The PDS is a self-report measure that assesses diagnostic levels of PTSD and also allows for the calculation of a continuous measure of PTSD symptom severity (Foa, 1995). In this sample, the total symptom severity score had very good internal consistency ($\alpha = .92$). Likely diagnostic levels of PTSD were calculated according to criteria explicated by Foa et al. (1997). Participants who endorsed at least one reexperiencing symptom, three avoidance symptoms, and two hyperarousal symptoms were classified as having probable PTSD. The PDS assesses PTSD according to the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM–IV–TR*) criteria (APA, 2000). This study was conducted prior to the dissemination of *DSM–5*, thus our assessment of PTSD does include changes to the PTSD diagnostic criteria implemented in *DSM–5*, namely, separate criteria assessing alterations in cognition or mood.

Data Analysis

Preliminary analyses examined types of PTE exposure and interrelations among the measures of PTEs (i.e., cumulative PTE exposure, frequency of direct PTE exposure, frequency of contact with distressed family members). Next, the relationship between potential confounding factors and study variables were examined using bivariate correlations and analysis of variance (as appropriate) to determine covariates for analyses. To test hypotheses about the relationship of PTE exposure to PTSS and depressive symptoms, a series of hierarchical multiple regression analyses were conducted, with the analyses repeated for PTSS and depression as outcome variables. Covariates were entered first, followed by PTE exposure. Since we tested each hypothesis twice, (once for depressive symptoms and once for PTSS), Bonferroni corrections were applied to the outcomes; an alpha value of .025 was required for statistical significance. Finally, we examined moderators of the effects of the relationship of PTE exposure to PTSS and depressive symptoms. Specifically, first we tested the degree to which frequency of direct exposure moderated the relationship of cumulative PTE exposure to PTSS/depression symptoms and then we examined the degree to which exposure to distressed family members moderated the effects of cumulative PTE exposure on PTSS and depressive symptoms. In tests of moderation the main effects

and moderators were centered prior to the analysis, and the interaction term was computed as the cross product of the centered variables. Cumulative PTE exposure was included as a covariate in all analyses of the effects of exposure to distressed family members to permit evaluation of the effects of exposure to distressed family members above and beyond the contributions of cumulative PTE exposure to PTSS or depressive symptoms. PTSS and depression symptoms were not normally distributed. Therefore, all scores were subject to log transformation, which improved skewedness. We report only results which were significant both in analyses employing transformed and untransformed analyses unless noted. For ease of interpretation, we present estimates only from untransformed analyses.

Results

Exposure to PTEs (Case Exposures and Exposure to Distressed Family Members)

As shown in Table 1 (available online as supplemental material), the most common types of PTE exposures included exposure to decomposed remains, infant accidental deaths, and remains with evidence that the victim had suffered. In all, 88% of employees were exposed to decomposed remains once a month or more, 76.6% of employees reported exposure to infant accidental death cases once a month or more, and more than 63% of employees were exposed to remains in which there was evidence that the victim had suffered at least once a month. A total of 189 of the 245 participants (77.1%) reported that they regularly interacted with distressed family members.

Interrelations Among Types of Exposure

Intercorrelations among types of exposure are presented in Table 2 (available online as supplemental material). Scores on the Case Exposure Scale were not correlated with scores on the Family Contact Scale suggesting these scales measure independent aspects of exposure. As shown in Table 2, the frequency of PTE exposure was positively correlated with levels of both direct and indirect exposure.

Analyses of Covariates

Consistent with our attempt to recruit a representative sample of ME offices across the U.S., there were differences among the offices in the number of employees and the number of autopsies performed per year. In four of the participating sites, the ME offices completed over 2,000 autopsies per year, either in one primary office or across several offices. In the two other sites, the ME offices completed fewer than 1,000 autopsies per year.

There were significant between-location differences in cumulative PTE exposure, $F(5, 239) = 5.90$, $p = .001$. The employees of two office sites with large numbers of employees were exposed to cases more frequently in comparison to the four offices with relatively small numbers of employees. The ME office sites also varied in the frequency of exposure to distressed family members, $F(5, 237) = 2.27$, $p = .05$. However, differences in exposure to distressed families did not simply reflect differences in the size of

the ME office. One smaller office had employees who had more frequent contact than did employees of most of the larger offices.

There were no differences among age groups in cumulative PTE exposure ($p = .73$), depressive symptoms ($p = .47$), or PTSS ($p = .45$), but there were age differences in exposure to distressed families, $F(2, 240) = 3.82$, $p = .01$. Individuals under 30 ($M = 2.22$, $SD = 1.07$) had significantly less contact with family members of the deceased than those aged 30–50 ($M = 2.72$, $SD = 1.10$) or those over 50 ($M = 2.79$, $SD = 1.08$).

Although men and women did not differ in cumulative PTE exposure ($p = .85$), frequency of exposure to distressed families ($p = .71$) or frequency of indirect PTE exposure ($p = .75$), there were significant gender differences in direct exposure, with men ($M = 3.55$, $SD = 0.93$) reporting higher levels of direct exposure than women ($M = 2.93$, $SD = 1.30$, $F(1, 241) = 15.21$, $p = .001$). Women ($M = 8.75$, $SD = 9.75$) reported marginally more symptoms of depression ($M = 6.45$, $SD = 7.58$, $F(1, 234) = 3.49$, $p = .07$) and significantly more PTSS ($M = 4.63$, $SD = 7.31$ vs. $M = 2.83$, $SD = 5.27$, $F(1, 242) = 4.15$, $p = .04$) than men. Therefore, analyses were conducted controlling for both ME office location and gender, as these variables were associated with outcomes. Although results did not differ whether or not these variables were included as covariates, we present the results with covariates included.

Frequency of Exposure to PTEs and Symptoms of Depression and PTSD

Hierarchical regression analyses, controlling for gender and ME office location, indicated that the frequency of PTE exposure was positively related to both depressive symptoms ($\beta = 3.14$, $t(228) = 2.60$, $p = .01$) and PTSS ($\beta = 2.68$, $t(236) = 3.20$, $p = .001$). Across the sample, 17.37% ($n = 41$) met criteria for mild to moderate depression and 9.54% of the sample ($n = 23$) met criteria for probable PTSD (according to *DSM–IV* criteria). Each one point increase in score on the Case Exposure Scale (reflecting increases in the frequency of PTE exposure) was associated with more than twice the risk of meeting criteria for depression (*OR* = 2.52, Wald's 95% CI: 1.18–5.40) and three times the risk of meeting criteria for PTSD (*OR*: 3.01, Wald's 95% CI: 1.15–8.11, $p = .03$).

Effects of Direct/Indirect Exposure

Neither scores on the measure of the frequency of direct exposure nor scores on the measure of the frequency of indirect exposure were significantly independently correlated with PTSS or depressive symptoms, when controlling for cumulative PTE exposure, gender, and site. To determine if the effects of cumulative PTE exposure on mental health symptoms varied depending on the degree to which individuals had direct PTE exposure, we examined the interaction of cumulative PTE exposure and direct exposure. As shown in Tables 3 and 4 (available online as supplemental material), this interaction was not significant for analyses of depressive symptoms ($\beta = -0.07$, $t(225) = -.07$, $p = .94$), but was significant for PTSS ($\beta = 1.67$, $t(233) = 2.73$, $p = .01$). Figure 1 (available online as supplemental material) presents the decomposition of this interaction using estimated scores (one standard deviation above and below the mean PTE exposure scores). At low levels of direct exposure, the frequency of PTE exposure was

unrelated to PTSS. In contrast, at high levels of direct PTE exposure, the higher the frequency of PTE exposure, the higher PTSS scores.

Exposure to Distressed Family Members

Controlling for cumulative PTE exposure, direct PTE exposure, gender, and office site, exposure to distressed family members was significantly associated with depressive symptoms ($\beta = 1.42$, $t(225) = 2.50$, $p = .01$), but not PTSS ($\beta = 0.74$, $t(233) = 1.84$, $p = .07$). To determine if the effects of cumulative PTE exposure on PTSS or depressive symptoms varied depending on the level of exposure to distressed families, we examined the interaction of exposure to distressed families (centered) and cumulative PTE exposure (centered). The interaction was not significant for depressive symptoms ($\beta = -0.28$, $t(225) = -0.25$, $p = .80$), but was significant for PTSS ($\beta = 1.77$, $t(233) = 2.27$, $p = .02$) as shown in Table 5 (available online as supplemental material). The effects of cumulative PTE exposure on PTSS were stronger for those with greater exposure to distressed family members (Figure 2) (available online as supplemental material).

Discussion

It is well documented that employees of occupations requiring exposure to PTEs are at risk for the development of depression and PTSS; however, the majority of employees do not develop persistent symptoms (Kaysen, Atkins, Moore, Lindgren, Dillworth, & Simpson, 2011). The aim of the present study was to evaluate factors which might explain variations in reports of PTSS and depressive symptoms among employees in a high risk sample. We examined these issues in an understudied high-risk sample: ME personnel. MEs serve as a good model system for studying questions about workplace trauma exposure, since employees are routinely exposed to PTEs, although they vary in the type and frequency of trauma exposure. Our prior studies suggest that a substantial minority of employees in this high-risk occupation meet criteria for depression and/or PTSD (Brondolo et al., 2012).

The use of ME personnel permitted us to examine three potential sources of variation in the development of mental health symptoms among high-risk employees. We examine the degree to which the frequency of exposure was associated with the degree of symptomatology. We also tested the hypotheses that the degree to which employees were directly exposed to PTEs and the degree to which the employees were exposed to distressed family members would exacerbate the effects of PTE exposure.

Results revealed that PTEs were associated with risk for the development of depressive symptoms and PTSS. Specifically, the frequency of PTE exposure (both direct and indirect) was significantly positively associated with symptoms of depression and PTSS. As frequency of PTE exposure increased, it was associated with increased risk of meeting criteria for depression and PTSD. This finding is consistent with prior literature suggesting that repeated, multiple trauma exposures place individuals at increased risk for developing PTSS post PTE exposure (Breslau, Chilcoat, Kessler, & Davis, 1999).

Additionally, our results revealed that relatively high levels of PTE exposure led to increases in PTSS, but not depression, pri-

marily for those who had direct PTE exposure. These findings are in agreement with other studies in nonemployee samples suggesting that direct trauma exposure is more closely associated with PTSS than indirect exposure (Kar, Krishnaraaj, & Rameshraj, 2013). Given that direct trauma exposure in this sample included visualization of gruesome remains, the visual cues associated with direct victim contact may serve as triggers of intrusive thoughts and other symptoms of PTSD (Kleim, Ehring, & Ehlers, 2012). Numerous studies of police officers and emergency service personnel suggest that direct PTE exposures that most likely to lead to PTSS include the experiencing or witnessing the gruesome death of others, or exposure to violence and life-threatening events (Greene, 2001; Regehr & Bober, 2005; Regehr & LeBlanc, 2011).

The relationship of PTE exposure and exposure to distressed family members to depression may be partly a function of the effects of these PTEs on negative cognitions. Negative cognitions about the self and the world are well-documented risk factors for depression (Shahar, Noyman, Schnidel-Allon, & Gilboa-Schechtman, 2013; Lilly & Pierce, 2013). Persistent exposure to highly disturbing or terribly sad events may change the way employees think about themselves and about the world at large. ME employees witness the aftermath of terrible accidents and heinous crimes and are often confronted by family members who are sometimes inconsolable about their loss. These employees perform a service that is essential to preserve public health and promote justice. But the knowledge of their vital function may not always be sufficient to overcome some of the negative thoughts which may occur when they are repeatedly confronted with loss and horror. More frequent exposure to PTEs may limit the employee's ability to recover from these events. Future research should attempt to assess employee's cognitions about the self and the world around them as a mediator of the effects of workplace trauma exposure to mental health outcomes.

In addition, our findings indicated that exposure to distressed family members exacerbated the effects of PTE exposure on PTSS. These findings are consistent with those of Clohessy and Ehlers (1999), in which they examined trauma exposure and posttraumatic stress reactions in paramedics and ambulance workers and found that workers reported that contact with victims families' was a significant stressor. This finding is not surprising, given that prior research has suggested that background stressors heightens stress reactivity to new events (Gump & Matthews, 1999). The difficult interpersonal stress associated with exposure to distressed family members may increase reactivity to other case information as contact with distressed families may shift the employee's attention from the technical details of the case to an awareness of the decedent as an individual. The intense feelings of the family members may arouse empathy and intensify the employees' awareness of emotions. The distress of others may make it more difficult to maintain clinical detachment. Mental health counselors and others who receive training in working with distressed individuals develop skills in maintaining a clinical focus and empathy when faced with others' distress. However, ME personnel typically do not receive training in emotion regulation.

Without training, ME personnel may have difficulty organizing their perceptions of the interactions with families and their own affective and cognitive reactions. Limitations in the ability to organize their experiences during distressing interactions with families may leave ME and other high-risk personnel more vulnerable to mental health consequences of these PTEs. Prior research on employees with training in managing interactions with highly traumatized populations suggests that appropriate training may attenuate the effects of exposure on symptom development (MacRitchie & Liebowitz, 2010; Ortlepp & Friedman, 2002). Such trainings may include self-directed web based interventions (Brondolo et al., 2014) or psychoeducation about stress responses in the work environment (Hourani, Council, Hubal, & Strange, 2011). We have implemented a pilot study of web based self-directed interventions which include specific training in emotion regulation, including skills in cognitive restructuring, values affirmation, and exercises involving exposure to high intensity emotions. Preliminary data from our web based interventions suggest that these interventions are effective in reducing depressive symptoms (Brondolo et al., 2014).

The present results highlight the importance of providing training to employees in high-risk groups on how to manage their reactions to dealing with distressed family members. In high-risk occupational settings, employees are likely to face repeated exposure to both direct and indirect PTEs. Although employees and their supervisors may expect to habituate to the types of PTE exposure inherent in working in ME offices, there is evidence from military and civilian samples that prior trauma can sensitize individuals to the effects of further trauma exposure and can be an important individual-level predictor of PTSD (Andrykowski & Cordova, 1998; Dougall et al., 2000). Overall, the results of this study suggest that there is a cumulative effect of PTE exposure on the development of PTSS and depressive symptoms. Exposures to distressed family members make an additional and independent contribution to the risk for depressive symptoms, and exacerbate the effects of PTE exposure on PTSS. All types of employees in the offices faced these risks, even employees in administrative and clerical roles, whose job responsibilities do not typically involve direct case contact.

Results of the present study should be viewed in light of a number of limitations. Participants consisted of a convenience sample from ME offices across the United States. Although we included offices drawn from different regions of the U.S. and urban, rural, and suburban areas, future studies would benefit from randomly selected or more comprehensive samples. The cross-sectional nature of the research limits the predictive ability of the findings. Although questionnaires were worded to assess symptoms stemming from events that occurred prior to symptom reporting, it is important to prospectively investigate trauma exposure and changes in symptomatology in ME personnel over time. In addition, the study utilized *DSM–IV–TR* PTSD criteria which omit negative alterations in mood state as a symptom cluster and have a larger focus on posttraumatic cognitions. It is possible that results may differ when taking into account *DSM–5* diagnostic criteria for PTSD. Despite these limitations, the present study was the first to examine the type, frequency, and cumulative impact of trauma in a high-risk occupation sample. Findings illustrated that PTE exposure (direct and indirect) was associated with increased mental health symptoms and underscore the need to for employee training in managing reactions to interacting with distressed family members. Further research is needed to examine interactions of individual- and organizational-level factors that contribute to the development of PTSS and depressive symptoms. These data can guide the development of future preventive interventions that can prevent health consequences for employees serving the public good.

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