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# Posttraumatic Stress Disorder in United States Corrections Professionals: Prevalence and Impact on Health and Functioning

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## Abstract

The purpose of this study was to estimate current posttraumatic stress disorder (PTSD) prevalence rates among United States' corrections professionals, and explore indices of psychological, physical, and occupational status and functioning in relation to PTSD. Using a secure online application, a nationwide sample of corrections professionals ( $N=3599$ ) completed the PTSD Checklist-Civilian Version (PCL-C), the Depression, Anxiety, Stress Scale-21 (DASS-21), the Impact on Functioning Scale (IOFS), and the Satisfaction with Life Scale (SWLS). Participants responded to questions indicating the degree to which they witnessed or experienced incidents of workplace violence, injury and death (VID) and related emotions. Participants also responded to questions about health-related behaviors and conditions, and functioning. Results indicated an overall PTSD prevalence rate of 27% for symptoms experienced over the past 30 days. Analysis of subgroups indicated that males and security/custody personnel had significantly higher PTSD rates than females and non-security staff, respectively. In reference to the entire sample, PTSD-positive participants reported significantly 1) more exposure to workplace VID and negative VID-related emotions, 2) higher levels of depression, anxiety, and stress, 3) more absenteeism, health services utilization, health conditions, and substance use, and 4) lower levels of pro-health behaviors, life functioning, and life satisfaction. Implications and future areas of research are discussed.

## Introduction

In the course of fulfilling their mandate to maintain the safety and security of their work environments, corrections professionals are routinely exposed to potentially traumatic incidents that put them at risk for harm (Schlosser, Safran, and Sbarratta, 2010). Individuals employed in facilities such as prisons and jails, and those who serve in community settings, such as probation and parole, witness or directly experience diverse types of events involving violence, injury or death (VID). Common examples include being physically assaulted, encountering dead or mutilated bodies, being threatened with physical harm or death, and witnessing riots, arson, and other potentially life-threatening, and thus traumatic, experiences.

Corrections professionals are often unarmed, despite the fact that inmates have a well-known capacity to arm themselves, such as by creatively fashioning weapons from commonly available items and materials. For example, according to a study funded by the United States Department of Justice, inmates across 101 state corrections facilities had used brooms, tooth brushes, and razors as weapons (Biermann, 2007). Compounding these circumstances, budget deficits have limited the resources of federal and state corrections facilities, resulting in staff cuts (Scott-Hayward, 2009) and higher offender to staff ratios.

Considering all of the above working conditions, corrections environments represent uniquely unsafe workplaces due to repeated exposure to trauma, compared to most occupations. While not widely recognized, corrections professionals are exposed to the same types of VID-related events as are emergency responders and war-time military personnel, and they are potentially exposed to even more life-threatening experiences than law enforcement personnel over time (Finn, Talucci, & Wood, 2000). The effects of VID experiences upon emergency responders and military personnel have been frequently investigated and well documented in research, while such experiences among corrections professionals have been rarely explored. In a similar vein, there has been substantial research on posttraumatic stress disorder (PTSD) in emergency responders and military personnel, but virtually none on PTSD in corrections professionals.

The National Comorbidity Study established that approximately 60.7% of men and 51.2% of women in the general population are estimated to experience at least one traumatic event in their lifetimes (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), but only 9.2% of exposed adults develop PTSD in their lifetime (Breslau, Davis, Andreski, & Peterson, 1991). PTSD prevalence rates reveal substantial gender differences (Olf, Langeland, Draijer, & Gersons, 2007; Tolin & Foa, 2006). The most recent National Comorbidity Survey Replication (Kessler, et al., 2005) showed a current PTSD prevalence rate of 3.5% for the general population, with the rate being 1.8% for men and 5.2% for women. A lifetime prevalence rate of 12.3% was reported for PTSD in a nationally representative sample of women in the National Women's Study (Resnick, Kilpatrick,

Dansky, Saunders, & Best, 1993), and 7.8% in the National Comorbidity Study (Kessler et al., 1995). The lifetime prevalence for women in the NCS was twice that for men (10.4% vs. 5.0%).

In regard to emergency responders, reported PTSD prevalence rates have been: 13.2% for emergency management personnel (Schutt & Marotta, 2011), 14.1% for New York post September 11, 2001 (i.e., post-9/11) emergency medical professionals (Perrin, et al., 2007), 14.3% for post-9/11 New York fire fighters (Perrin, et al., 2007), 18.2% for German firefighters (Wagner, Heinrichs, and Ehler, 1998), 12-20% for Operation Iraqi Freedom/Enduring Freedom soldiers (as reported in Meis et al., 2010), and 7.2 % for post-9/11 New York police officers (Perrin, et al., 2007). At the time of writing this paper, only one study was located, estimating PTSD rates in Canadian corrections officers (Standyk, 2003). In that study, a rate of 26% was reported, 16% of which was attributed to work-related incidents, and 10% to non-work-related trauma.

Beyond the issue of PTSD, the work demands unique to corrections professionals have been found to contribute to depression (Obidoa, Reeves, Warren, Reisine, & Cherniack, 2011), lower physical health (Standyk, 2003), more work-home conflict (Obidoa et al., 2011), increased negative affectivity and emotion-focused coping (Dollard & Winefield, 1998), burnout (Schaufeli & Peeters, 2000; Senter, Morgan, Serna-McDonald, & Bewley, 2010), decreased life satisfaction (Standyk, 2003), decreased job satisfaction (Flanagan, Johnson, & Bennett, 1996; Schaufeli & Peeters, 2000), and most serious of all—elevated suicide rates (New Jersey Police Task Force Report, 2009; Stack & Tsoudis, 1997).

The primary purpose of this study was to obtain reasonable estimates of the current prevalence of PTSD in United States corrections professionals. Due to the fact that PTSD can be comorbid with other mental health disorders, conditions, states, and levels of functioning, this study also sought to determine the degree to which depression, generalized anxiety, stress, health conditions, satisfaction with life, and day-to-day functioning were present in PTSD-affected individuals, with the aid of a variety of concurrently administered and self-administrable assessment tools.

## **Method**

### **Participants**

The study's participants consisted of  $N=3599$  corrections professionals currently working in the field of corrections at any of numerous types of corrections facilities, in a wide variety of corrections disciplines, and at a broad variety of locations around the United States. Prior to data collection, the plan for the study was screened by an independent human subjects review agency and granted an exemption status due to the

determination of minimal risk to participants. Participation in the study was offered as voluntary and with no incentives provided. The offer of participation was made through direct communications to jails, prisons, corrections professional associations, corrections departments, and corrections unions, and through advertising in online corrections publications, based on professional contacts and networking. The researchers communicated with department administrators, association managers, and union leaders who, in turn, passed on participation requests to their bodies of constituent employees/members via bulk email distributions. All participants were required to electronically certify their status as active/employed corrections professionals and electronically agree to an informed consent to participate. The formal presentation of the study (i.e., its purpose, required certification and consents, and its assessment components) was identical for all participants, using a secure, web-based application.

Participants came from a total of 49 different U.S. states and 3 U.S. territories, and with the highest concentrations from Missouri (40.3%), Ohio (21.2%), and Kansas (9.7%), and the remaining states and territories (28.8% in aggregate). Participants included 54.9% men and 45.1% women, mostly White (89.4%), and with 4.4% being African-American, 2.1% Latino/a, 1.2% Native American, .3% Asian, and 2.6% multiple-ethnicity/other. An average age of 40.1 was reported, and 71.5% of the participants indicated that they were either married or cohabiting.

The four largest subsets of participants indicated being employed as security/custody personnel (43.2%), followed by managerial/supervisory staff (10.8%), parole/probation personnel (10.6%), and clerical staff (6.6%). Participants reported having been employed in one or more of the following types of corrections settings during the course of their corrections careers: Community Corrections (44.5%), Corrections Diagnostic Center (42.7%), Jail (30.9%), Youth Corrections Facility (18.1%), Federal Maximum Security Prison (14.3%), Federal Medium Security Prison (13.2%), Federal Minimum Security Prison (12.0%), State Maximum Security Prison (10.6%), State Medium Security Prison (7.8%), Private Minimum Security Prison (7.2%), and 10 other specifically named facility types (.8 to 3.7% per type). Participants averaged 12.7 years of work experience in the field of corrections at the time of participation, with an average of 2.3 different corrections-related positions held, past and present.

## **Measures**

Data for this study were collected anonymously via a secure web application with built-in error correction functions to ensure the collection of permissible response values only. Demographic information was collected, along with measures to assess PTSD, depression, anxiety, stress, impact on functioning, and satisfaction with life. Additional assessment items pertained to work-related VID experiences, sick days, Worker Compensation

days, doctor visits, health conditions, substance use, and coping strategies. The total number of assessment items covering all of the above was 74.

### **Posttraumatic Stress Disorder Checklist-Civilian Version (PCL-C)**

The PCL-C is a 17-item questionnaire (Weathers, Litz, Herman, Huska, & Keane, 1994) based on the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria for PTSD (American Psychiatric Association, 1994). The PCL-C utilizes a Likert-type rating scale for each item, where respondents indicate the extent of symptoms experienced during the past 30 days along a continuum spanning from one to five. Item ratings of 3 or higher are considered symptomatic or clinically substantial.

The PCL-C can be scored in two ways, using either (1) a total score cut-off method, where a summation of all item scores greater than or equal to 44 defines someone as PTSD-positive, or (2) a symptom cluster method (SCM), where DSM-IV criteria for PTSD are met based on DSM-IV criteria B, C, and D: at least one cluster B item (questions 1-5) with a score of three or higher, plus at least three cluster C items (questions 6-12) with a score of three or higher, plus at least two cluster D items (questions 13-17) with a score of three or higher. While more complicated to score, the SCM method was selected to be used in this study because results arrived at by this method ensure that DSM-IV criteria B, C, and D are met

The quality of measurement characteristics of the PCL-C (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996; Orsillo, 2001; Ruggiero, Del Ben, Scotti, & Rabalais, 2003) and its diagnostic utility (Bertelson, Brasel, & deRoon, 2011; Gardner, Knittel-Keren, & Gomez, 2012; Keen, Kutter, Niles, & Krinsley, 2008; McDonald & Calhoun, 2010) are well substantiated. The PCL-C is among the most widely used PTSD screening devices in clinical and research settings (Elhai, Gray, Kashdan, & Franklin, 2005). Results from the PCL-C have been found to compare favorably with clinician-performed diagnostic approaches, such as the Clinician Administered PTSD Scale (CAPS) (Bollinger, Cuevas, Vielhauer, Morgan, & Keane, 2008; Forbes, Creamer, & Biddle, 2001). The PCL-C is particularly amenable to screening of large populations, due to its self-administrable format. Internal consistency reliability for the entire scale has been estimated at .96, and from .89 to .91 for individual symptom clusters (Weathers, et al., 1994). Evidence of convergent validity with the Minnesota Multiphasic Personality Inventory PTSD scale has been documented (Weathers, et al., 1994). In addition, many assessments of the PCL-C's psychometric properties have been found to replicate across multiple samples (Blanchard, et al., 1996; Ruggiero, et al., 2003).

### **Depression, Anxiety, Stress Scale-21 (DASS-21)**

The DASS-21 is a shortened but psychometrically sound version (Henry & Crawford, 2005) of an original 42-item DASS questionnaire (Lovibond & Lovibond, 1995). The DASS-21 generates three seven-item scales,



targeting depression, anxiety, and stress. Assessment items consist of statements to be evaluated for the extent to which they apply to the person assessed over the past week, using a four-point rating scale (0 to 3).

The DASS-21 Depression, Stress, and Anxiety scales have been found to demonstrate adequate internal consistency reliability, with  $\alpha$  estimates ranging from .82 to .93. The factor structure of the DASS-21 has been assessed through factor analysis and measurement model comparisons, with results supporting the convergent and discriminant validity of the DASS items (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005; Lovibond & Lovibond, 1995). DASS-21 scales have also been found to tap a global “general psychological distress” construct (Henry & Crawford, 2005). The DASS-21 is widely used for clinical and research purposes.

### **Satisfaction With Life Scale (SWLS)**

The SWLS was developed to measure perceptions of life satisfaction (Diener, Emmons, Larsen, & Griffen, 1995). It is a five-item scale that requires respondents to assess various dimensions of satisfaction with life, using a seven-point response scale. Respondents are presented with statements pertaining to life satisfaction and asked to indicate the extent to which they agree with each statement. The scores for each item are aggregated to produce a satisfaction with life total score, ranging from 5 to 35, where a higher total score indicates a higher sense of life satisfaction.

The SWLS has been translated into several languages and researched using a variety of populations including outpatient counseling clients, prisoners, and college students. The psychometric properties of the SWLS include: internal consistency reliability ( $\alpha$ ) estimates ranging from .79-.89, test-retest reliabilities ranging from .5 (10 months) to .83 (two weeks), evidence of convergent and criterion-related validity (Pavot & Diener, 1993), and factorial validity (Shevlin, Brunsten & Miles, 1998).

### **Impact on Functioning Scale (IOFS)**

The IOFS consists of a set of five items created by the authors as measures of the degree to which exposure to work-related events in a corrections setting (over the past month) have negatively impacted key areas of life functioning. The scale consists of five items targeting one’s ability to: function on the job, maintain family or personal relationships, enjoy leisure time, care for dependents, and carry out personal responsibilities. Respondents rate each item using a five-point scale, to indicate the extent of impact on functioning in each area, if any. The average of the five item scores represents an overall measure of impact on functioning. Individual item scores can be used to discern where potential dysfunctions are most concentrated.

The internal consistency reliability ( $\alpha$ ) of the IOFS was calculated to be .90 based on the current study’s sample ( $N=3599$ ). The Statistical Package for the Social Sciences’ (SPSS Version 20.0) random case selection

function was used to generate seven additional random subsamples ( $n=500$  per subsample) to assess replicability of the original  $\alpha$  estimate. The resulting estimates ranged from .88 to .91, and averaged .89 across the seven subsamples, supporting the accuracy of the original estimate to within .1.

Substantial support was found in the current study for the convergent and discriminant validity of IOFS items through factor analysis and group comparisons of scores according to PTSD status (i.e., positive vs. negative, as determined by the PCL-C). Item-level exploratory factor analyses were performed using concurrently collected response data from the IOFS items, PCL-C items, and SWLS items ( $N=3599$ ). Variability patterns among items from all three assessments (simultaneously analyzed) revealed the emergence of a distinctive factor consisting of IOFS items, and providing support for discriminant and convergent validity of the IOFS items. Subsequent factor analyses were run, based on randomly selected subsamples ( $n=500$  each), and demonstrated the above finding to be robust and replicable. An additional analysis of differences was performed comparing mean IOFS scores across PTSD-positive and PTSD-negative grouping variables. Results provided additional support for the convergent and discriminant validity of IOFS items, in this case based on conceptually expected/appropriate patterns of relation to the grouping variables. (Details are provided in Table 4 of the Results section of this paper.)

## Results

### Data Screening

All analyses were based on complete data, with the exception of one variable assessing frequency of daily tobacco use. The response scale for this variable was adjusted after 508 participants had begun or completed participation. The adjustment was prompted by the authors' observation that the original range of this item's response options might be too narrow (i.e., limiting responses to a maximum of seven tobacco uses per day). The 1-7-item response scale was replaced with a 1-100+ uses per day scale, and the original 508 responses to the original scale were deleted. The discarded data were expected to be inconsequential, as a large number of additional participants were anticipated, and more than enough for accurate parameter estimates.

### Statistical Assumptions

The main analysis strategy employed numerous two-group comparisons of means and frequencies, according to PTSD status (positive vs. negative). The distributional characteristics of variables were assessed both visually through histograms and statistically through Kolmogorov-Smirnov and Shapiro-Wilk tests. Levene's test was also employed to assess for homogeneity of variance prior to assessing for the significance of differences in means.

Departures from normality were found to be fairly prevalent, based on visual inspection and statistical estimators. This finding was not unexpected given that many variables were clinical in nature and often targeted relatively rare events. Lack of variance homogeneity was also frequently detected among pairs of variables. Nevertheless, significance testing was expected to be robust given the unusually large sample size ultimately obtained in this study. Despite the lack of variance homogeneity, standard t-test and robust Welch t-tests were found to provide nearly identical  $p$ -values. In light of this, only standard t-test results are reported. While there were general expectations about the direction of results in this study, there were still many exploratory comparisons, and therefore two-tailed tests were used throughout.

All significance tests in this study were performed using both a standard  $p$ -value criterion of at least  $p < .05$  as well as Bonferroni-corrected  $p$ -value criteria (i.e., a more conservative  $p$ -value criterion that is .05 divided by the number of comparisons in a given set of comparisons), to deter spurious findings. Because Bonferroni-corrected  $p$ -values made no difference in the determination of significance for any comparisons in this study (i.e., significant findings always involved actual  $p$ -value less than the Bonferroni-corrected minimum criterion), standard  $p$ -value information is reported. All tests for significant differences were also assessed using distribution-free bootstrap sampling, with specifications of simple random sampling, a 95% confidence level, and 1000 samples. Bootstrap sampling consistently gave estimates that were very close to original parameter estimates, supporting the validity of the original estimates, and despite the observed departures from normality among many variables analyzed. Given the equivalency of results from standard and bootstrap estimates, only the standard results are reported in this study.

Effect sizes are included for all analyses, to assist with gauging the practical significance of findings. Analyses involving t-tests are accompanied by Cohen's  $d$  which provides researchers with a kind of reference point approach to interpret the magnitude of observed effects, with guidelines of .2 reflecting a small effect, .5 moderate, and .8 large. However, it needs to be understood that what constitutes a small, medium, or large effect is ultimately determined by researchers and the area under study. A small effect in one area of research can be considered large in another. Further, even small effects can have high practical significance, depending on what subject matter is involved (e.g., suicide rate, disease, high financial costs). Analyses of event rates in this study include a relative risk statistic, which is another type of effect. Relative risk indicates the probability of an event occurrence (e.g., presence of a particular health condition, or exposure to a particular VID event), based upon group membership, such as PTSD diagnostic status (positive versus negative). Risk estimates in this study indicate how much more likely an event occurrence is for PTSD-positive individuals, compared to PTSD-negative individuals.

## PTSD Prevalence

The diagnostic symptom cluster method (SCM) was chosen to score the PCL-C in this study because it is most closely aligned with DSM-IV diagnostic criteria. Using this method, PTSD prevalence rates (for symptoms experienced during the past 30 days) were calculated for the total sample, and for particular subgroups. As illustrated in Figure 1, the PTSD rate for the total sample was calculated to be 27%. PTSD rates calculated for males and females were 31% and 22%, respectively. Among security personnel, a higher PTSD rate of 34% was found, compared to a 23% rate for all other personnel types in aggregate. Combinations of gender and job type groupings indicated a PTSD rate of 36% for male security staff and 30% for female security staff.

While all analyses reported throughout this paper involve PTSD status as determined using the SCM method, the PTSD rate for the total sample was also calculated using the total score cut-off method, and found to give the same rate as the SCM method (27%, with rounding).

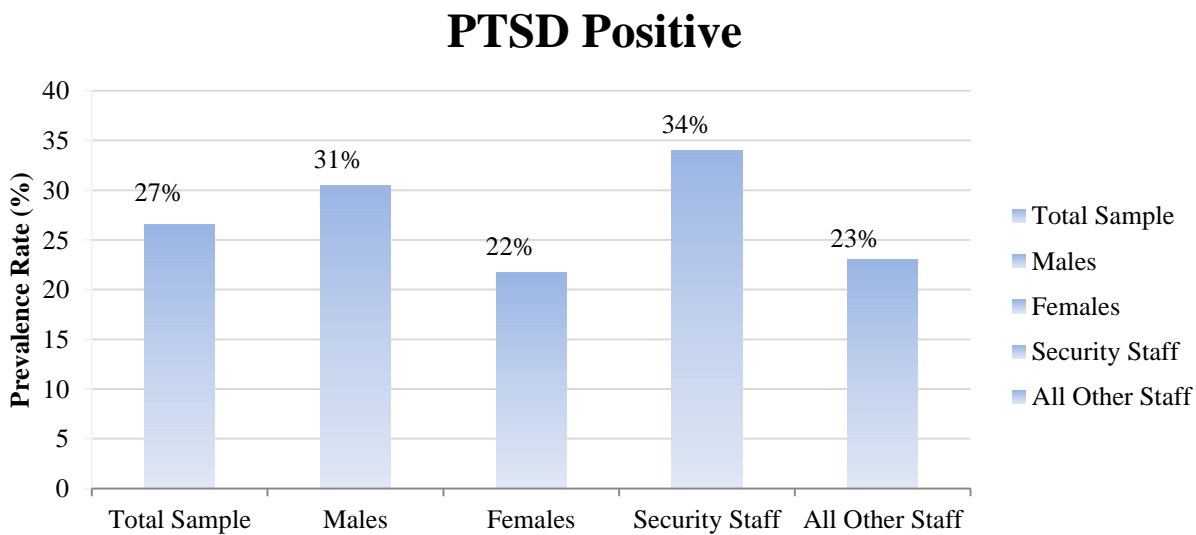


Figure 1. Rates of PTSD-positive corrections professionals (SCM method).  
Notes: Total N=3599; PTSD-positive n=956; PTSD-negative n=2643.

## VID Experiences

Participants were asked to respond to a variety of questions about their experience of VID events during their work in the field of corrections. One-hundred percent of participants (i.e., all 3599) confirmed exposure to one or more VID events, through affirmative responses to at least one of several questions pertaining to VID events. Mean numbers of VID events, types of VID events, assaults experienced, and VID-related emotions/feeling states were all calculated and are summarized in Table 1.

Table 1

*Mean VID Exposure Variable Properties and Differences by PTSD Status*

Variable	PTSD Positive ( <i>n</i> =956)		PTSD Negative ( <i>n</i> =2643)		<i>t</i>	<i>df</i>	<i>M</i> <sub>diff</sub>	Effect <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Number of VID-Related Emotions	4.54	2.58	2.73	2.26	20.40	3597	1.81**	.77
Number of Different VID Types	6.33	3.97	4.18	3.68	15.15	3597	2.15*	.57
Number of VID Events	38.44	54.54	24.14	43.23	8.15	3597	14.30**	.31
Number of Assaults	3.73	13.13	1.41	4.50	7.92	3597	2.33**	.30

\*Statistically significant at  $p<.01$ ; \*\*Statistically significant at  $p<.001$ .

The pattern of results shown in Table 1 indicates that, compared to PTSD-negative participants, PTSD-positive individuals reported experiencing significantly ( $p<.01$  or better): (1) more VID-related emotions, (2) more types of VID events, (3) more VID events in total., and (4) more physical assaults. The average effect size of these variables, based on Cohen's *d*, was found to be moderately large ( $d=.49$ ).

Within the total sample (i.e., regardless of PTSD status;  $N=3599$ ), individuals reported being exposed to an average of approximately: 28 VID events over their careers ( $M=27.94$ ;  $SD=46.92$ ), 2 assaults experienced over their careers ( $M=2.03$ ;  $SD=7.85$ ), 5 different types/categories of VID events ( $M=4.75$ ;  $SD=3.88$ ), and 3 different types of VID-related emotions ( $M=3.21$ ;  $SD=2.48$ ).

Additional descriptive statistics based on gender groupings within the total sample ( $N=3599$ ), revealed that male corrections professionals reported, on average, experiencing approximately: twice as many VID events ( $M=37.58$ ;  $SD=53.19$ ) as females ( $M=16.21$ ;  $SD=34.48$ ), four times as many assaults ( $M=3.12$ ;  $SD=10.20$ ) as females ( $M=.69$ ;  $SD=2.81$ ), twice as many distinct types (see Table 2 for additional detail on types) of VID events ( $M=6.02$ ;  $SD=3.86$ ) as did females ( $M=3.21$ ;  $SD=3.30$ ), and slightly more VID-related emotions ( $M=3.35$ ;  $SD=2.46$ ) than females ( $M=3.04$ ;  $SD=2.50$ ) during their careers.

Comparing results from same variables according to job category (security staff versus non-security staff;  $N=3599$ ), revealed that security staff reported, on average, experiencing approximately: twice as many VID events ( $M=38.45$ ;  $SD=53.32$ ) as non-security staff ( $M=20.81$ ;  $SD=40.51$ ), twice as many assaults ( $M=2.73$ ;  $SD=7.97$ ) as non-security staff ( $M=1.55$ ;  $SD=7.74$ ), 2 more distinct types of VID events ( $M=6.11$ ;  $SD=3.76$ ) than non-security staff ( $M=3.83$ ;  $SD=3.68$ ), and slightly more VID-related emotions ( $M=3.46$ ;  $SD=2.50$ ) than non-security staff ( $M=3.03$ ;  $SD=2.45$ ) during their careers.

Two additional questions were posed to participants regarding their potential experience of either an assault or a VID event (Yes/No) during the last 30 days. Based on the total sample, 29% reported the experience of a VID event and 1% reported having been assaulted. Among PTSD-positive participants, 41% reported

experiencing a VID event during the last 30 days and 2% an assault. Among PTSD-negative participants, 24% reported the experience of a VID event and less than 1% an assault during the last 30 days. These figures likely include some overlap, as an assault represents one of many possible examples of a VID event.

Table 2

*Frequency and Risk of Specific VID Experiences According to PTSD Status*

	% of Participants Indicating “Yes” to the Event		Effect Relative Risk	Confidence Interval (95%)	
	PTSD Positive (n=956)	PTSD Negative (n=2643)		Lower	Upper
You witnessed a sexual assault on another person	9.7%	3.3%	2.92*	2.20	3.87
A family member of yours was killed by an offender	1.9%	0.8%	2.37*	1.27	4.43
A hit was placed on one or more of your family members	4.4%	2.1%	2.07*	1.40	3.07
A hit was placed on you by an offender	14.2%	7.5%	1.91*	1.55	2.34
Someone threatened to sexually assault you	27.1%	14.3%	1.89*	1.64	2.17
A death threat was made toward a family member	47.2%	25.7%	1.83*	1.67	2.01
You witnessed a sexual assault threat against someone else	17.8%	9.8%	1.82*	1.52	2.18
Someone inflicted physical harm on you	33.3%	19.7%	1.69*	1.50	1.90
You witnessed a fire resulting from arson	28.7%	17.1%	1.68*	1.47	1.91
A threat of physical harm was made toward a family member	44.6%	27.1%	1.65*	1.50	1.81
You witnessed a riot	25.1%	16.4%	1.53*	1.33	1.76
A death threat was made toward you	67.1%	44.1%	1.52*	1.43	1.62
You witnessed a suicide attempt	55.6%	37.2%	1.50*	1.39	1.62
You witnessed a completed suicide	28.9%	19.9%	1.45*	1.28	1.65
You witnessed physical harm being inflicted on someone else	73.2%	54.9%	1.34*	1.27	1.41
You observed someone being threatened with physical harm	71.3%	54.4% <sub>b</sub>	1.31*	1.24	1.38
A threat of physical harm was made toward you	82.2%	63.2%	1.30*	1.25	1.36
A sexual assault was inflicted on you	1.0%	0.9%	1.20	.57	2.52

\*Statistically significant at  $p < .05$ .

### Specific Types of VID Experiences

Participants were asked to indicate whether or not they had experienced certain types of potentially traumatic VID-related events in the work setting. Table 2 summarizes percentages of individuals who affirmed experiencing specific VID events across PTSD-positive and PTSD-negative groupings.

Results indicated that the PTSD-positive group experienced all VID events at proportionately higher rates than did PTSD-negative individuals. Relative risk ratios were calculated for each event by PTSD status, to indicate how much more likely it was that a participant would affirm a particular VID event, according to their assessed PTSD status. The average relative risk ratio across all VID-related events was found to be 1.75,

showing PTSD-positive participants to be approximately 75% more likely, on average, to report exposure to the various VID-related events, compared to PTSD-negative participants. The proportion of affirmed event occurrences across PTSD-positive and PTSD-negative groups were in all cases significantly different at  $p < .05$ , with the exception of the last item listed in the table, sexual assaults experienced, which is a particularly low base rate event.

Table 3

*VID-related Emotion/Feeling States and Risk According to PTSD Status*

Emotion	% of Participants Indicating “Yes” to the Event		Effect Relative Risk	Confidence Interval (95%)	
	PTSD Positive (n=956)	PTSD Negative (n=2643)		Lower	Upper
Shame	15.3%	4.6%	3.34*	2.65	4.20
Guilt	24.9%	9.8%	2.55*	2.17	2.99
Horror	22.1%	14.3%	2.42*	2.04	2.87
Numbness	60.4%	25.6%	2.36*	2.17	2.56
Helplessness	51.0%	9.1%	1.97*	1.80	2.15
Fear	57.9%	27.1%	1.67*	1.54	1.80
Indifference	50.0%	32.3%	1.55*	1.42	1.69
Anger	82.0%	59.3%	1.38*	1.33	1.45
Sadness	49.1%	37.5%	1.31*	1.21	1.42
Empathy	40.9%	34.8%	1.20*	1.10	1.32

\*Statistically significant at  $p < .05$ .

**VID-Related Emotion/Feeling States Experienced**

Participants were asked to identify which, if any, of 10 VID-related emotion/feeling states they may have experienced in relation to VID events in the corrections workplace. Table 3 summarizes the percentages of participants’ affirmative responses to each of the emotion/feeling states, in descending order by effect size.

As indicated in Table 3, individuals with PTSD-positive status reported experiencing all 10 VID-related emotion/feeling states a higher percentage of the time than did individuals in the PTSD-negative group. The average risk ratio was calculated to be 1.97 for the PTSD-positive group, indicating the PTSD-positive group to be, on average, approximately 100% more likely than the PTSD-negative participants to report experiencing the listed VID-related emotion/feeling states. All risk ratios were found to be statistically significant.



## Psychological Health Measures, Impact on Functioning, and Life Satisfaction

Table 4 displays the mean scores for the DASS-21 scales, the IOFS scales, and the SWLS, in descending order by effect size. Mean differences across PTSD status groups were found to be statistically significant for all variables measured, at  $p < .001$ . Mean differences (as absolute values) ranged from .91 to 12.11. Cohen's  $d$  values were very large, averaging 1.41.

Table 4

### Mean Levels of Clinical Symptoms, Functioning, and Life Satisfaction Compared Across PTSD Status Groups

Variable	PTSD Positive ( $n=956$ )		PTSD Negative ( $n=2643$ )		$t$	$df$	Effect	
	$M$	$SD$	$M$	$SD$			$M_{diff}$	$d$
IOFS - Overall	2.51	0.90	1.40	0.54	44.73	3597	1.11*	1.69
DASS 21 Stress	20.62	8.68	8.51	6.61	44.45	3597	12.11*	1.68
DASS 21 Depression	17.17	9.06	5.66	6.13	43.42	3597	11.51*	1.64
IOFS – Enjoy Leisure	2.80	1.13	1.50	0.76	39.50	3597	1.30*	1.49
IOFS - Relationships	2.72	1.13	1.48	0.72	38.69	3597	1.24*	1.46
DASS 21 Anxiety	10.94	8.08	3.22	4.21	37.16	3597	7.72*	1.40
IOFS - Responsibilities	2.42	1.13	1.35	0.64	35.26	3597	1.06*	1.33
IOFS - Caregiving	2.20	1.09	1.30	0.60	31.71	3597	0.91*	1.20
IOFS – Job Performance	2.41	1.18	1.39	0.73	30.81	3597	1.02*	1.16
Life Satisfaction (SWLS)	16.11	6.94	23.32	7.05	-27.22	3597	-7.22*	1.03

Notes: Higher scores are indicative of higher clinical pathology/functional impairment for all measures except for the SWLS, where higher scores indicate more positive functioning; \* $p < .001$ .

## Health Condition Measures

Participants were asked to indicate whether or not they had experienced any of seven health conditions during their work as corrections professionals. A summary of participant responses is indicated in Table 5, in descending order by effect size.

The PTSD-positive group reported proportionately higher frequencies of experiencing all health conditions that were assessed. All proportions were found to be significantly different, at  $p < .05$  or better. Relative risk ratios were calculated for each condition, as an indication of the probability of its occurrence. The average relative risk ratio across all conditions was 2.04, indicating that PTSD-positive participants tended to be over 100% more likely to experience the various health conditions than were PTSD-negative participants. All risk ratios were statistically significant ( $p < .05$ ).



Table 5.

*Reported Health Conditions and Risk According to PTSD Status*

Condition	% of Participants Indicating "Yes" to the Event		Effect Relative Risk	Confidence Interval (95%)	
	PTSD Positive ( <i>n</i> =956)	PTSD Negative ( <i>n</i> =2643)		Lower	Upper
Memory Impairment	22.7%	6.4%	3.55*	2.94	4.28
Depression	53.8%	21.4%	2.51*	2.29	2.76
Sleep Difficulty	40.9%	34.8%	1.92*	1.79	2.05
Digestive Problems	35.3%	20.3%	1.74*	1.55	1.95
Heart Disease	13.7%	8.1%	1.69*	1.37	2.07
Skin Conditions	15.9%	10.4%	1.53*	1.27	1.84
Obesity	36.0%	27.0%	1.33*	1.20	1.48

\*Statistically significant at  $p < .05$ .

**Other Health/Functioning-Related Indices**

Participants were asked to indicate the number of alcoholic drinks consumed per week, tobacco uses per day, total number of health conditions experienced of any type, number of physician visits during the past 12 months, number of work days missed during the past 12 months (not including holidays or vacation days off), and the number of work days missed due to Worker Compensation during the past 12 months. Summary information is indicated in Table 6.

As illustrated in Table 6, all variables assessed indicated higher mean numbers for individuals in the PTSD-positive category. All mean differences were found to be statistically significant at  $p < .001$ . Cohen's  $d$  averaged .37, which is approximately moderate in size.

Table 6

*Mean Negative Coping Behaviors and Other Health Indicator Properties and Differences by PTSD Status*

Variable	PTSD Positive ( <i>n</i> =956)		PTSD Negative ( <i>n</i> =2643)		(3597) <i>t</i>	<i>M</i> <sub>diff</sub>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Absenteeism: Missed Work Days/Yr	15.21	29.36	8.47	17.68	8.34	6.74*	0.31
Number of Physician Visits/Yr	7.24	7.60	4.60	5.38	11.55	2.64*	0.44
Absenteeism: WC Days/Yr	4.15	25.88	1.19	15.35	4.12	2.95*	0.16
Alcoholic Drinks/Week	5.24	9.98	3.21	7.30	6.64	2.03*	0.25
Tobacco Uses/Day <sup>†</sup>	5.26	10.18	3.28	7.01	6.11	1.98*	0.23
Number of Health Conditions	2.44	1.57	1.28	1.30	22.23	1.16*	0.84

Notes: WC Days=Worker Compensation Days;  $p < .001$ ; <sup>†</sup>PTSD-Positive  $n=824$  and Negative  $n=2267$ .

## Health Maintenance/Positive Coping Behaviors

In order to explore the potential health promoting effects of a few particular behaviors and activities (i.e., for their potential ability to counter or offset the effects of negative work experiences), participants were asked to indicate their extent of engagement in physical exercise, social activities, and spiritual/religious activities.

Table 7

### *Differences and Effects for Pro-health Behaviors in Corrections Professionals*

No. of Engagements per Week	PTSD Positive (n=956)		PTSD Negative (n=2643)		(3597) <i>t</i>	<i>M</i> <sub>diff</sub>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Physical/Athletic Exercise	2.99	3.69	3.20	3.09	-1.67	-.21	0.06
Social Activities	1.44	3.57	2.03	2.02	-6.28	-.60*	0.24
Spiritual/Religious Activities	.72	1.53	1.06	2.71	-3.77	.35*	0.14

\* $p < .001$ .

The mean frequency of reported social, spiritual/religious, and physical exercise activities were all lower for the PTSD-positive group, with the mean frequency of social activity showing the largest difference between PTSD status groups. Mean differences were found to be statistically significant for both spiritual/religious activity and social activity, at  $p < .001$ . The difference in frequency of physical exercise across the two groups was not statistically significant ( $p = .09$ ). The average effect size for the three measures was found to be small ( $d = .15$ ).

## Discussion

### PTSD Prevalence

This study represents the first assessment of PTSD rates and related health indicators in United States corrections professionals. The estimated PTSD prevalence rate of 27% (for symptoms experienced over the past 30 days) was based upon a large, nationwide sample of corrections professionals, and a well-established and leading PTSD screening tool. This finding is arguably the single most important result of the study, as it strongly supports a view of PTSD as an occupational hazard in the field of corrections. Even a rate 10% lower would be a significant problem. The PTSD estimate determined in this study rivals PTSD rates previously reported for emergency medical professionals, post-9/11 fire fighters, post-9/11 police officers, and wartime military personnel.

While PTSD prevalence was found to be highly elevated for both male and female corrections professionals, male corrections professionals demonstrated a significantly higher rate than did females in this study. This

pattern is atypical relative to rates in the general population, where females typically demonstrate more PTSD (Olf, et al., 2007; Tolin & Foa, 2006). This difference may follow from an occupation-specific preference or tendency within the corrections ranks to more often assign males to intervention or management tasks involving offenders or situations with higher potential for aggression or volatility. Consistent with this possibility, in the current study, males reported experiencing significantly more VID events than females. In addition, anecdotal reports from corrections professionals suggest the potential role of an additional factor, which is the possibility that female corrections professionals more often make effective use of verbal de-escalation techniques, compared to males. Greater or more effective use of de-escalation techniques might result in less sustained exposure of female corrections professionals to emotionally intense interactions with offenders and/or deter violent behaviors that might otherwise occur.

### **PTSD-Positive vs. PTSD-Negative Comparisons Overall**

The consistency and direction of findings, organized by PTSD-positive and PTSD-negative groupings, were fairly remarkable in this study. Among the many measures of health status (e.g., depression, anxiety, stress, health conditions, life satisfaction, functioning) and their correlates (e.g., absences, Worker Compensation days, doctor visits), participants in the PTSD-positive group demonstrated a broad range of more negative symptoms, conditions, levels, frequencies, and indications of lower health and functioning. The vast majority of measured differences between the PTSD-positive and PTSD-negative groups were statistically significant and with substantive effect sizes.

### **VID**

The mean number of VID events and related emotion/feeling states experienced during corrections work were found to be higher for the PTSD-positive group. The relationship between PTSD status and VID-related exposure variables supports an understanding of PTSD etiology as being rooted in exposure to VID events. It is also consistent with the findings of other studies (e.g., Christopoulos, 2002) supporting a cumulative effect of traumatic exposure on the development of PTSD. Similar evidence has been published on the relationship between PTSD status and breadth of exposure to VID incidents of varying types (Kolassa, et al., 2010). That is, as exposure to *different types* of traumatic events increases, so does the prevalence, severity and chronicity of PTSD symptoms.

### **VID-related Emotions/Feeling States**

A list of different VID-related emotions/feeling states were presented to participants in this study. This was done so that they could identify which of 10 emotions (e.g., anger, fear, guilt, sadness, etc.) they had experienced in relation to VID incidents (if any). Results indicated that the frequency of reported negative

emotion/feeling states occurred at a proportionally higher rate for PTSD-positive individuals than PTSD-negative participants. This finding is consistent with results of previously published studies on emotions that occur during or immediately after traumatic exposure. DSM-IV criteria for the diagnosis of PTSD require that the experience of a traumatic event includes intense fear, helplessness, or horror. On average, in this study these three emotions were approximately 100% more likely to be reported by PTSD positive-participants than PTSD-negative, based on risk ratio estimates. However, additional emotions have been identified in non-corrections populations as being even stronger predictors and risk factors of PTSD than fear, helplessness and horror—emotions such as anger, sadness, guilt, shame, and disgust (Bovin & Marx, 2011; Lancaster, Melka & Rodriguez., 2011; Ozer, Best, Lipsey, & Weiss, 2003). The largest effect in the current study was observed for the experience of shame, which, based on relative risk estimates, was found to be 165 to 320% more likely to occur for PTSD-positive individuals than PTSD-negative. The next three strongest effects were observed for the emotions/feeling states of guilt, horror and numbness. Emotional numbing, which could potentially have as its source some combination of PTSD, depression, and/or dissociative symptoms, has also been identified by other researchers as an independent predictor of PTSD (Feeny, Zoellner, Fitzgibbons, & Foa, 2000), suggesting a non-trivial relationship between PTSD and the emotional numbing frequently experienced by corrections professionals, especially over time on the job.

### **Health and Well-being**

A variety of scale-level and item-level assessments of mental health were completed by participants, including the DASS-21 assessment of depression, anxiety, and stress; the IOFS assessment of level of functioning in several key life context areas; and the SWLS assessment of satisfaction with life. Resulting scores from each of these assessment tools revealed a clear pattern of more negative and detrimental conditions for PTSD-positive participants, further illustrating the magnitude of mental health and functioning impairments suffered by PTSD-positive corrections professionals. The finding of significantly higher depression is consistent with findings published elsewhere (Obidoa et al., 2011) on PTSD comorbidity. Scores from IOFS items suggested the pervasiveness of the effects experienced by PTSD-positive individuals, as they reported significantly lower levels of life functioning in each context assessed, including job functioning, relationship functioning, ability to enjoy leisure time, caregiver functioning, and ability to manage personal responsibilities. The lower SWLS scores for the PTSD-positive individuals are in agreement with Standyk's (2003) finding of lower life satisfaction for PTSD-positive corrections officers compared to PTSD-negative corrections officers.

Comparing the magnitude of mean differences to the multi-point response scales associated with each of the health/functioning-related measures showed that mean differences equaled or exceeded the distance between any two descriptive anchors on the multi-point response scales used to collect ratings. Mean differences

exceeding half the distance between scaled anchor points are generally considered clinically meaningful. All of the health/functioning-related measures far exceeded this threshold and all but one demonstrated distances that were two or more times as large as the specified minimal criterion for substantive mean differences.

### **Health Conditions**

Participants were presented with a list of items labeled as health conditions, including specifically sleep difficulty, memory impairment, digestive problems, heart disease, obesity, and skin conditions. They were asked to indicate which ones (if any) they had experienced during their work in corrections. Results indicated that PTSD-positive participants experienced each of these conditions at a proportionately higher rate than did PTSD-negative participants. The strongest effects were observed, in descending order, for memory impairment, depression, sleep difficulty, and digestive problems. These findings suggest an increased risk for a variety of health consequences co-occurring with PTSD, and highlight the extent of comorbidity that can be involved. In addition, these findings are consistent with those from studies of PTSD in other populations, such that higher rates of physical ill-health, memory impairment and depression are found to be associated with PTSD (e.g., Golier & Yehuda, 1998; Kendall-Tackett, 2009; Sareen et al., 2007).

### **Other Consequential Circumstances and Events**

Additional exploratory variables representing potential responses to trauma exposure or reflecting coping strategies were assessed, including frequency of alcohol and tobacco use, missed work days, Worker Compensation days, number of physician visits, and the total number of health conditions reported per participant. The frequency of alcohol and tobacco has been described by other researchers (Hruska, et al., 2011) as a potentially negative, avoidance-based coping mechanism. Individuals with PTSD-positive status were found to demonstrate significantly more frequent alcohol and tobacco use, workday absences, Worker Compensation days, concurrent health conditions, and physician visits. These findings are consistent with an abundance of published literature outside the specific context of corrections work, on the high costs of PTSD (Greenberg et al., 1999; Hidalgo & Davidson, 2000). Standyk's (2003) research, performed in Canada, described similar findings of more missed work days, doctor visits, and alcohol consumption for PTSD-positive corrections officers.

### **Pro-health Behaviors**

In contrast to potentially negative coping activities, such as alcohol and tobacco use, three measures that can be understood as potentially positive coping activities (Curling & Simmons, 2010) were examined: frequency of physical exercise, social activity, and spiritual/religious activity. While the magnitude of these findings was subtle, the number of times participants reported engaging in weekly social and spiritual/religious activities was

found to be significantly lower for the PTSD-positive group. These findings suggests that the PTSD-positive group may benefit less from the stress-reducing effects of positive social interaction than do most individuals, possibly due to avoidance behaviors associated with PTSD. The number of times participants reported engaging in athletic/physical exercise per week did not differ to a statistically significant degree between PTSD-positive and PTSD-negative participants. The lack of differences detected in this case might be due to the impact of participants' professional training, which, in the case of corrections work, places high value on employee physical conditioning, given its contribution to individual and group safety in the workplace.

### **Study Limitations**

Response rate is a statistic often calculated in studies involving the collection of data in a survey type of format, often through a method of sending out participation requests and assessment materials to a large number of potential participants. Response rate can be expressed as the proportion of individuals who *actually* participated in a study to all *offered* participation. It serves as a form of evidence bearing on the possibility of bias in participants and generalizability of results. For example, if a very low percentage of individuals respond to a participation offer, then it could be argued that there might be something unique about those few who did respond, making results potentially biased in relation to those individuals. While a high response rate certainly does not guarantee a bias-free sample, just as a low rate does not guarantee a biased one, the ability to report a high response rate supports and promotes confidence about the absence of sampling bias.

Inviting numerous corrections agencies nationwide to participate in an internet-based survey anonymously, as was done in this study, did not allow for the calculation of response rate, as it was not possible to determine how many corrections professionals saw the invitation. Nevertheless, this approach arguably involved more advantages than disadvantages, as it allowed for the collection of scarcely available data and allowed for the collection of an unusually large and rich sample of corrections professionals—well represented across gender and age categories, job roles, professional settings, security levels, and numerous U.S. states and territories. Broad and large samples are well known for their benefit to generalizability of results and for robust and accurate statistical calculations. Thus while information on response rate was unavailable given the study's design, the same design included other, even more compelling indicators of sample quality than a simple response rate statistic.

Considering the serious implications of the reported PTSD rates in this study, concerns about the stability of the 27% PTSD rate across geographic locations might be of concern to some readers. While data were contributed by participants from most of the U.S. states and territories, there were also particularly high

concentrations of participants from some Midwestern region states, including Missouri, Ohio, and Kansas. To shed additional light on the stability of the reported high PTSD rate, PTSD rates were calculated separately for each well-represented state (defined as individual states with at least  $n=300$  participants), and with data from the remaining states pooled into an aggregate subsample group. Based on the above criteria, significance testing was performed, to compare data from Missouri, Ohio, Kansas, and all other states in aggregate, with the latter including 49 U.S. states or territories, and averaging 22 participants per State/territory.

The Pearson Chi-square test was used to compare the proportion of PTSD-positive to PTSD-negative participants across the four comparison groups. Results indicated PTSD rates of 24.3% (Missouri), 25.4% (Kansas), 28.9% (Ohio), and 27.8% for all other states and territories in aggregate. Significance testing did not support the presence of genuine differences (Chi-square =6.9;  $df=3$ ;  $p=.08$ ). It should be noted that even if there were some variability in rates by region, even the lowest rate observed (24.3%) would still be an alarmingly high PTSD rate.

Another potential concern that could be raised in regard to reported results, and PTSD rates in particular, is the possibility that the high PTSD rates discovered in this study might be due to, or bolstered, pre-existing PTSD within participants that entered the corrections field after prior exposure/s to traumatic events experienced within other high-stress occupations they held. Hiring practices in the field of corrections would naturally favor candidates with similar work experience, and military service in particular. This possibility was anticipated by the researchers and a question was added to the assessment battery to address it. Specifically, participants were asked if they had engaged previously in non-corrections occupations that exposed them to life-threatening situations or violence, such as emergency medical work, firefighting, military service, police or Sheriff's deputy work. Data from this question allowed separate estimates of PTSD rate to be calculated for individuals from both groups (i.e., those with and without non-corrections prior occupational exposure).

It was found that a substantial proportion of corrections professionals reported having worked previously in non-corrections occupations involving exposure to potentially traumatic incidents (43%). While significance testing also confirmed a significantly higher PTSD rate of 29.3% for this group (Chi-square=10.59;  $df=1$ ;  $p<.001$ ), the remaining participants still demonstrated a disturbingly high PTSD rate of 24.5%. Thus these analyses help clarify that (1) a substantial proportion of corrections professionals brought occupationally-related traumatic exposure with them upon entering the corrections field, (2) having been exposed prior to corrections work is associated with a PTSD rate that is, on average, 4.8% higher, and (3) the plausible conclusion is that while prior non-corrections-related work experience involving traumatic exposure likely contributes to PTSD rate, the contribution is relatively modest in relation to an already high corrections-specific PTSD rate.



A third issue of possible concern for some readers of this study, is the possibility that some percentage of participants in the sample intentionally distorted their responses in a negative direction, perhaps due to being disgruntled or motivated to make their work conditions appear less favorable than they really are—potentially inflating the PTSD rate estimates reported in this paper. While this possibility certainly exists, in theory, for any assessment tool utilizing self-reported information, it is, again, important to consider its plausibility.

There are many method-related reasons to expect that results are reasonably accurate. First, the bulk of assessment items come from widely used clinical and research assessment tools, with good and well-established psychometric properties. Second, the notion that a substantial percentage of individuals working in a high-responsibility profession would behave in such a petty and irresponsible way, such as to attempt to sabotage the results of a healthcare-related research project which involved the completion of a fairly extensive and time consuming assessment battery, seems unlikely. Third, and perhaps most noteworthy, is the widely recognized and virtually self-evident fact that within the culture of corrections work (e.g., sometimes referred to as a “John Wayne” culture), there exists a value system that tends to reward and promote employee characteristics of toughness, along with a disavowal of characteristics of weakness, vulnerability, or the expression of emotions associated with the latter (Schaufeli & Peeters, 2000). Unusual resistance among corrections professionals to even participate in research activities has been reported (Dollard & Winefield, 1998). Thus, given that the current study’s participants were all active corrections professionals, fully immersed in the corrections work culture, it would seem most plausible to expect not over-reported symptoms, but rather under-reported symptoms, and therefore under-estimated PTSD rates.

A final area of potential concern worth addressing is that of possible concerns about the accuracy of self-administrable, diagnostic screening tools. McDonald and Calhoun (2010), for example, recently published an article on the topic of the diagnostic accuracy of the PCL. Their most fundamental conclusions were that the diagnostic accuracy of the PCL can vary, depending on a variety of factors such as the population being assessed, the demographics of the participants, comorbidity, aspects of the research method/procedures, and other sources. They go on to recommend that researchers should therefore use caution when using the PCL to make diagnoses or to estimate the prevalence of PTSD in a population, and preferably follow up PCL administrations with clinical interviews. Upon closer examination, however, these researchers’ conclusions and recommendations appear overstated and potentially misleading.

First, McDonald et al.(2010) make a fundamental yet unfounded assumption that largely determines their results and conclusions. Their assumption is that clinical interview-based approaches give accurate diagnostic results and represent a fair basis with which to judge the accuracy of all other types of assessment approaches.



This assumption is unwarranted, as there exists substantial research supporting the superiority of diagnostic results derived from high quality and statistically-driven assessment instruments compared to clinical interviews. Nevertheless, McDonald et al.(2010) proceed to critique the PCL based upon the extent to which it departs from clinical-interview-based results, even though the departures could be due to inaccuracies inherent to or associated with the interview-based diagnostics.

The seminal works of Meehl (1954; 1986), for example, and subsequent meta-analyses of findings from large numbers of published empirical studies support the general view that “mechanical” prediction techniques (i.e., developed using multiple and combined statistical criteria), on average, give more accurate results, than do clinical judgments (Grove, Zald, Lebow, Snitz, and Nelson, 2000). In addition, a recent meta-analysis of numerous studies on the topic of the diagnostic accuracy of interview-based approaches revealed substantial variability even within the confines of the interview-based diagnostic assessment method itself. For instance, the most highly structured variants/forms of interview-based assessments (i.e., Standardized Diagnostic Interviews; SDIs) were found to give diagnostic results that differed significantly from less structured and more traditional “clinical” interview assessment methods (Rettew, Lynch, Achenbach, Dumenci, and Ivanova, 2009).

A second way McDonald et al.(2010) criticize the PCL is by highlighting several general vulnerabilities and weaknesses that actually apply similarly or equally well to most assessment tools and methods, including interview-based approaches. Taking into account the title of their paper, “The Diagnostic Accuracy of the PTSD Checklist: A Critical Review”, these types of warnings and cautions are potentially misleading. A reader of the McDonald et al.(2010) study might easily get the impression that the PCL is uniquely associated with a large number of potential weaknesses, when in fact that is not the case.

Researchers or clinicians facing important assessment tasks should not be making assumptions about the superiority or inferiority of one instrument or method versus another. Instead they should look to available research literature and choose an approach or tool based on the adequacy of its published psychometric properties. The American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education (AEA, APA, & NCME, 2002) recommend that, at minimum, assessment instruments intended for wide scale use should have some combination of content, construct, and criterion-related validity as a foundation. In cases where multiple similar tools are available for the same purpose, with roughly equivalent research support in terms of quantity, clinicians or researchers should choose the one that has the best psychometric properties, as indicated in research studies. In the case of the PCL-C, there is no shortage of research support for its diagnostic utility or the quality of its psychometric properties. It is among the most widely used, easy to administer, and well-regarded screening tools for PTSD. It may well be

the best available instrument at the present time, especially when an assessment task requires estimating PTSD prevalence in a large population, and when efficient administration is necessary. To estimate the prevalence of PTSD in a high-stress occupation, such as corrections, where employees are routinely exposed to traumatic incidents, the best use of available resources needs to be made. In sum, researchers and clinicians should focus on using the best assessment resources available and not be deterred because a given approach is imperfect, as all assessment methods are imperfect.

### **Future Directions**

The results of this study call for increased attention to the impact of PTSD and comorbid conditions on corrections professionals related to traumatic exposure inherent to corrections environments. To the extent that PTSD is not adequately recognized as a disorder with substantial penetration in corrections environments, a large number of corrections professionals are unlikely to receive needed treatment, with inescapable adverse consequences on employee performance, health and functioning. Continued lack of attention to this issue also deters administrator interest in the development of prevention, intervention and treatment programs designed to lower rates of PTSD and other related and comorbid conditions.

Consequences of such lack of attention are not only health-related, but also organizational. Impaired health and functioning of corrections professionals, as highlighted in the results of this study, are likely to have a significant degree of systemic organizational impact, since impaired individuals represent gears in a larger clockwork of work groups and communities. The affected individual employee can also be understood as the source for a contagion effect, whereby the impaired health status and functioning of one employee has the ability to negatively affect many others.

Also worthy of mention is how the systemic effects of PTSD and other comorbid conditions can be both direct and indirect. As stated already, corrections professionals are directly impacted in regards to health, functioning, and well-being. These consequences, however, can also have indirect but still substantial fiscal impact on corrections organizations. An example was recently highlighted by a colleague of the authors, based upon his observation of a particular finding in the current study—that PTSD-positive individuals reported an average of seven more sick days per year than did PTSD-negative individuals. Simple math reveals the significant financial consequences of this finding, in light of a few other known figures and common practices in corrections settings. To illustrate, if one takes the finding of seven sick days per year and translates it into hours, this amounts to approximately 56 hours per year of payment to employees for unperformed work. Add to this the common practice of paying fill-in staff time and a half for overtime work performed and the number

of missed hours becomes the equivalent of 140. Assuming an average salary of \$22.00 per hour, a facility with 1000 employees, and 27% affected, then  $140 \times 22 \times .27 \times 1000$  gives an annual result of \$831,600.00.(Gregory Morton, personal communication, October 25, 2012).

In addition to routine organizational and operational stressors associated with offender management in institutions and in the community (Finn, 2000; Shaufeli & Peeters, 2000), corrections professionals are also faced with the existence of some combination of the following circumstances: (1) workplace values and practices that discourage acknowledgement and treatment of occupation-specific psychological ailments, (2) repetitive and ongoing VID exposure over time, (3) elevated adverse impact on mental health, and (4) relative paucity of specialized mental health intervention and prevention programs for this population. Even varying subsets of these factors in combination have clear destructive potential on the health and functioning of corrections professionals.

The development of health-promoting workplace interventions or preemptive prevention programs to address PTSD and/or related psychological disorders, as well as research into their effectiveness, all represent areas with a pressing need for attention. Given the scarcity of currently available corrections-specific solutions, we encourage innovative program development coupled with controlled pre-intervention and post-intervention assessments of program impact to guide development and improvement over time. Simple pre/post outcome assessment designs are particularly recommended, using objective, quantitative criterion variables such as: (1) average scores from psychometrically sound, self-administrable, and anonymously completed assessments of employee observations of workplace conditions, experiences and interventions, (2) similarly structured assessments of employee health and well-being, (3) sick day utilization measures over specified periods of time, (4) group indices of employee policy violation incidents or error rates, (5) indices of offender rule violation rates—being to some extent associated with the quality and functioning of the total workplace climate and culture, and (6) instances of attempted and completed corrections professionals' suicides, or other quantitative indicators that can be appropriated for the purpose of monitoring program impact.

Other recommended areas of inquiry include research into the potential of newly emerging and affordable web-based assessment and analytical programs that allow efficient, anonymous, and duress-free input/feedback from all members of the workplace culture, on a periodic basis. The convenient collection of data from web-based systems can make feasible systematic tracking and status assessment of key information pertaining to employee health or workplace climate/conditions, as well as generation of data-driven analytical reports to help guide users toward optimal health and functioning or toward optimized work conditions. Such emerging technologies are capable of appropriating scientific criteria and nationwide baseline information to generate

objective and useful evaluations of a given facility's or department's current status and functioning in particular areas. With this type of information at their disposal, administrators are better equipped to make effective management decisions, to optimize employee job performance, and to help improve the overall workplace conditions to the benefit of individuals and groups within corrections organizations.

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