



DESERT WATERS CORRECTIONAL OUTREACH

DATA-DRIVEN WORKPLACE CULTURE ASSESSMENT AND IMPROVEMENT SERVICES



Prevalence of Trauma-related Health Conditions in Correctional Officers: A Profile of Michigan Corrections Organization Members

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Executive Summary

A formal research inquiry was performed into the prevalence of various health status conditions among Michigan Corrections Organization (MCO) members, primarily white male Corrections Officers, working in prison environments. The relationship between magnitude of exposure to work-related events involving violence, injury and death (VID), and several health conditions was examined. Differences in rates based on Security Level, Gender, Military status, and Years Corrections Experience were also explored. Using established and psychometrically sound assessment instruments, rates of Post-traumatic Stress Disorder, Depression, Co-occurring Post-traumatic Stress Disorder and Depression, and Suicide Risk were estimated. Health condition rates were found to be substantially elevated relative to rates typical in the general population and for other public safety professions. Statistically significant relationships were found between level of work-related exposure to violence, injury, and death (VID) events and mental health condition scores. Security Level and Years of Corrections Experience were found to moderate health condition rates significantly, with more years of corrections experience and higher security levels being associated with higher mental health condition rates. Pre-corrections Military Experience and Gender demonstrated little to no effect upon mental health condition rates. These findings reinforce a growing perspective among researchers that Corrections Officers suffer health detriments due to high stress and potentially traumatic occupational experiences comparable to those more widely known to occur for police officers, firefighters, and combat military personnel.

INTRODUCTION

In the course of performing their work duties, corrections staff are often exposed, directly and indirectly, to incidents involving violence, injury or death (Bureau of Labor Statistics, 2015; Konda, Tiesman, Reichard, & Hartley, 2013; Schlosser, Safran, & Sbarratta, 2010; Spinaris, Denhof & Kellaway, 2012). Common examples include being physically assaulted, encountering dead or mutilated bodies, witnessing attempted or completed suicides, being threatened with physical harm or death, witnessing assaults, riots, or arson, or learning about, second hand, any of the above, on a fairly recurrent basis.

Direct exposure to events involving violence injury, or death (VID), as well as repetitive indirect exposure as part of one's job role, can have cumulative and deleterious effects upon the health and functioning of corrections workforce cultures and their staff member constituents (American Psychiatric Association, 2013; Bureau of Labor Statistics, 2015; Denhof & Spinaris, 2013; Denhof, Morton & Spinaris, 2014; Konda et al., 2013; Spinaris et al., 2012; Stadnyk, 2003).

While corrections work has not received the extent of research attention as other similar job roles, it remains the case that corrections staff are exposed to many of the same types of work-related traumatic events as are police officers (Perrin et al., 2007), firefighters (Corneil, Beaton, Murphy, Johnson, & Pike, 1999), combat military personnel (Fulton et al., 2015; Gates et al., 2012), and other law enforcement positions (Bureau of Labor Statistics, 2015).

For example, Spinaris et al. (2012) reported that United States corrections professionals experience an average of 28 exposures to VID events and involving events of five different types, on average. As another example, Bureau of Labor Statistics (2015), correctional officers and jailers, in 2014, sustained 53.5 work-related intentional injuries by another person per 10,000 FTEs^a. This is much higher than the equivalent rate for all types of workers (2.9 per 10,000 FTEs), and even higher than that for police and sheriffs' patrol officers (42.5 per 10,000 FTEs).

^a An FTE represents the equivalent of hours worked by one full-time employee.

From 1999 to 2008, there were 113 confirmed work-related fatalities among corrections officers (COs)—a rate of 2.7 per 100,000 FTEs (Konda et al., 2013), 25% of which were found to be due to homicides. Of the non-fatal work-related injuries due to assaults and violent acts, 37% were found to occur while restraining or otherwise interacting with an inmate during an altercation.

Given the high levels of exposure to VID events suffered by corrections staff, it logically follows, and would seem plausible, that this population would also face similarly elevated rates of stress-related health conditions, such as post-traumatic stress disorder (PTSD) and/or depression. Several recent studies do, in fact, support a linkage between VID event exposure and corrections professionals' mental and physical health status of various types (Denhof & Spinaris, 2013; Spinaris et al., 2012; Stadnyk, 2003), such that more exposure is frequently associated with decreased health status.

This relationship has been found to hold particularly true for COs, who tend to play the most front line and high exposure work roles in corrections environments (Denhof & Spinaris, 2013; Obidoa, Reeves, Warren, & 2011; Spinaris et al., 2012; Stadnyk, 2003). To illustrate, researchers have discovered that, within a given correctional staff population, a substantial percentage of COs demonstrate moderate to severe levels of depression, stress, or anxiety disorder symptoms at a higher rate than corrections professionals with different job roles (Denhof & Spinaris, 2013).

In the most severe cases, full criteria for mental health conditions such as Major Depressive Disorder (Obidoa et al., 2011; Denhof & Spinaris, 2013; Samak, 2003), PTSD (Spinaris et al., 2012; Stadnyk, 2003), or comorbid (i.e., concurrent) conditions (Denhof & Spinaris, 2013) are potentially met. Evidence of deleterious effects of corrections work and VID event exposure upon physical health, such as high blood pressure, digestive disorders, sleep difficulties, and memory impairment, have been documented as well (Denhof & Spinaris, 2013; Morse, Dussetschleger, Warren, & Cherniack, 2011; Spinaris et al., 2012).

A noteworthy and recent development in the latest (fifth) iteration of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric

Association, 2013), is that the definition of what constitutes PTSD-related traumatic exposure was expanded to include not only direct exposure, but also cases of indirect exposure *that are repetitive or extreme, and occur as part of one's work role*. This expansion of the definition of traumatic exposure makes clear that the events COs are routinely exposed to, whether directly or indirectly, do, in fact, constitute potentially traumatic events.

While a variety of health-related consequences have been linked to traumatic exposure in corrections settings, Denhof and Spinaris (2013) have highlighted that the presence of comorbid depression and PTSD appears to be particularly consequential compared to either depression or PTSD. They showed that corrections staff with comorbid status demonstrated significantly worse scores on a spectrum of related negative health conditions and measures of life functioning than did corrections staff with either PTSD or depression^b alone.

Related studies of military personnel, 9/11 clean-up crews, and other groups (Campbell et al., 2007; Cukor et al., 2011; Dobie et al., 2006; Erickson, Wolfe, King, King, & Sharkansky, 2001; Oquendo et al., 2005; Shalev et al., 1998) have estimated comorbidity levels ranging from 30-75%, depending on the population. These high rates are particularly important, as both PTSD and depression have been found to be independently associated with suicidal behavior, and their combination even more strongly associated with suicidal behavior (Davidson, Hughes, Blazer, & George, 1991; Freeman, Roca & Moore, 2000; Marshall et al., 2001; Oquendo et al., 2003; Sareen et al., 2005; Sareen et al., 2007).

The main purpose of the present study was to estimate the prevalence of PTSD, depression, PTSD and depression comorbidity, suicide risk, and levels of exposure to violence, injury and death (VID) events among members of the Michigan Corrections Organization (MCO), primarily COs, using psychometrically sound clinical assessment instruments. A secondary purpose of the study was to highlight the relationship between VID event exposure and mental health status, and to help demonstrate that the widely acknowledged relationship between trauma

^b "Depression" was operationally defined as cases of Moderate to Severe Depression Symptom Severity based DASS-21's Depression scale total scores or 14 and above (Henry & Crawford, 2005; Lovibond & Lovibond, 1995).

and disorder for combat military personnel, police officers, and other high stress occupations, applies similarly in corrections work. Additional comparisons were made based on demographic variables of Gender, Prior Military Status, and Years of Corrections Work.

METHOD

A web-hosted clinical assessment battery was administered to MCO members, consisting of COs and Forensic Security Assistants, primarily white (84%) males (81.3%), working in a prison setting (95.5%). See Appendix A for full demographic and participant characteristic statistics. For the sake of simplicity, all participants will be referred to in this paper as COs.

Voluntary participation was advertised to members in multiple ways, including through an organization newsletter, facility bulletin board postings by Chapter presidents, and direct emails to approximately 3400 COs.

Using a provided password, participants accessed a set of self-administrable online assessment instruments by internet or smartphone. Participation was anonymous and did not require provision of identifying information. Anonymous participation was considered important as it has been the experience of this study's researchers that corrections staff populations tend to be particularly apprehensive about the possibility of their employer becoming privy to their assessment results. All participants were required to read and agree to an informed consent form that described the nature, details, and risks involved in participation.

Participation consisted of responding to lists of either statements or questions that comprise various psychometrically sound clinical assessment tools, including the Post-traumatic Checklist Version 5 (PCL-5, Weathers et al., 2013), the Patient Health Questionnaire (PHQ-9, Spitzer, Kroenke, & Williams, 1999; Kroenke, Spitzer & Williams, 2001), the Violence, Injury, and Death Exposure Scale (VIDES, Denhof & Spinaris, 2014), and the Depression Danger Scale (DDS, Denhof, 2014).

The format of responding required each participant to choose a best answer from among sets of multiple choice scaled-response options, such as: FALSE, SLIGHTLY TRUE, MOSTLY TRUE, VERY TRUE. Response options varied from instrument to instrument, but had a similar structure.

Among 1295 members who began the online survey, 304 discontinued prematurely and their incomplete data were discarded. Ultimately 991 members

participated fully, providing complete data and a substantial total sample size for analysis and representation of the MCO member population.

Analysis of data from the 991 participants' fully completed assessments provided the basis for estimating the prevalence of PTSD status (positive/negative), Depression status (positive/negative)^c, different levels of exposure to VID events occurring in the corrections workplace, and elevated suicide risk. See Appendix B for supplemental information on the nature and psychometric properties of clinical assessment instruments used for estimation in this study.

^c Depression Positive was defined as a PHQ-9 total score falling into the Moderate Depression interpretive category, based on a PHQ-9 score of 10 or higher.

RESULTS

Violence, Injury, and Death Event Exposure for Corrections Staff

The level of exposure to violence, injury and death events among staff was assessed using the VIDES. Results indicated that a substantial percentage (68.7%) of participating COs are subject to Moderate to Extreme levels of exposure. The chart in Figure 1 indicates the percentage of COs who scored in four different categories of exposure magnitude.

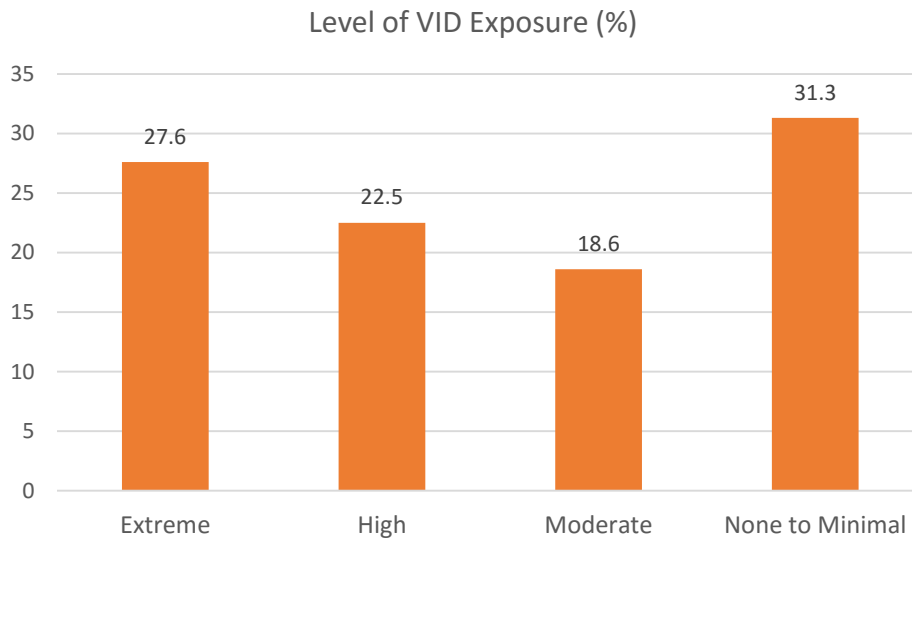


Figure 1. Percent VID Event Exposure Levels for Corrections Officers

The strength of relationships between traumatic exposure and various mental health conditions was assessed through Pearson correlations. Substantial and statistically significant correlations were found between the VIDES total score and total scores from the PHQ-9, DDS, PCL-5, and each of the PCL-5's individual symptom clusters. As illustrated in Figure 2, correlations with the VIDES total score ranged from $r=.33$ to $.45$. All correlations were found to be statistically significant at $p<.01$, $N=991$.

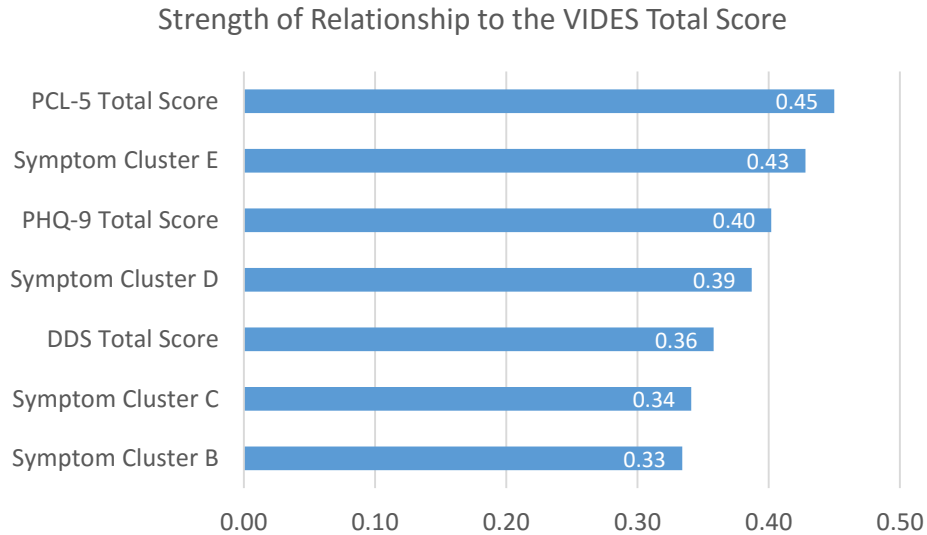


Figure 2. VIDES Correlations to Multiple Health Status Indicators

Note: PCL-5 Cluster E represents alterations in arousal and reactivity; PCL-5 Cluster D represents negative alterations in cognitions and mood; PCL-5 Cluster C represents avoidance (of distressing stimuli associated with a traumatic event); and PCL-5 Cluster B represents intrusion symptoms (i.e., involuntary and distressing re-experiencing of aspects of a traumatic event).

To assess the relationship between VID exposure and security level of participating CO work environments, mean VIDES total scores were plotted across four security levels^d. The plot shown in Figure 3 reveals an upward trend, where higher security levels are accompanied by higher levels of VID exposure. The difference between security levels one and two, and between levels four and five, was relatively small compared to the difference between levels two and four.

Levels one and two, and levels four and five were collapsed to produce Low and High Security subgroups for remaining analyses. This was done for the benefit of simplifying illustrations and to permit calculation of relative risk ratios that require 2 x 2 contingency tables. The VIDES mean total scores for COs in High (M=4.28, SD=1.43) versus Low (M=3.51, SD=1.49) Security subgroups were confirmed to differ to a statistically significant degree ($t=8.09$, $df=947$, $p<.000$).

^d Note: Within the population sampled, there were 4 security levels: 1, 2, 4, and 5. No level 3 exists.

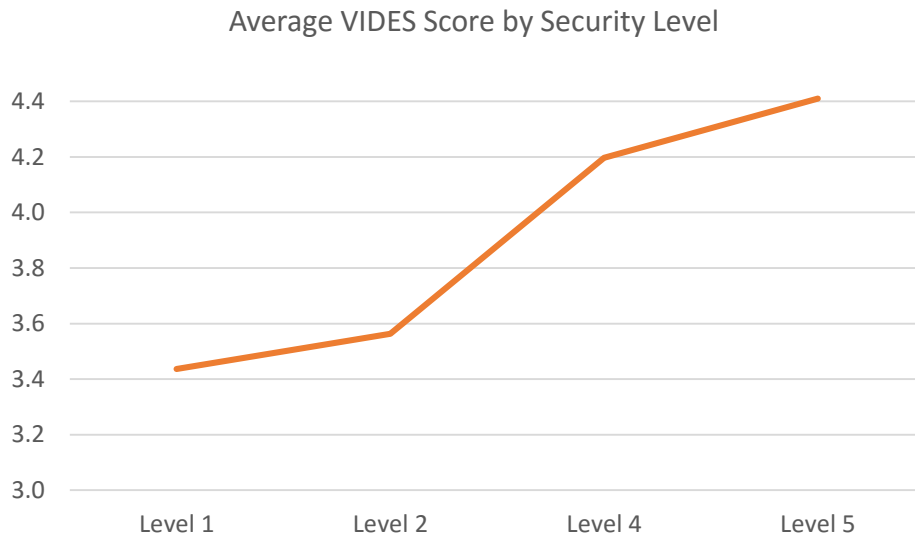


Figure 3. Average VIDES Exposure Levels for Corrections Officers by Security Level

Mental Health Condition Prevalence Overall and by Low vs. High Security Levels

PTSD

The prevalence of PTSD within CO participants was estimated using the PCL-5 and the symptom cluster method, which aligns with the criteria for diagnosing PTSD as defined in the DSM-5. Under this method, individuals need to concurrently meet one or more Cluster B criteria, one or more Cluster C criteria, two or more Cluster D criteria, and two or more Cluster E criteria.

It was found that 33.7% of COs were estimated to be PTSD Positive, and 43-64% met criteria for individual diagnostic symptom clusters, as illustrated in Figure 4. Comparing estimated rates within High and Low Security subgroups revealed that COs working in high security areas met criteria for PTSD at a substantially higher rate than those working in low security areas. COs in the High Security subgroup showed a PTSD Positive rate of 39.3% while COs in the Low Security

subgroup showed a PTSD Positive rate of 28.8%. The difference in proportions of PTSD Positive to PTSD Negative cases, across security levels, was found to be statistically significant ($\chi^2=11.65$, $df=1$, $p<.000$).

A relative risk ratio statistic was generated to convey the effect size. COs working in high security areas were found to be at 37% greater risk of PTSD Positive status than were COs working in low security areas, $RR=1.37$, 95% CI [1.14-1.63].

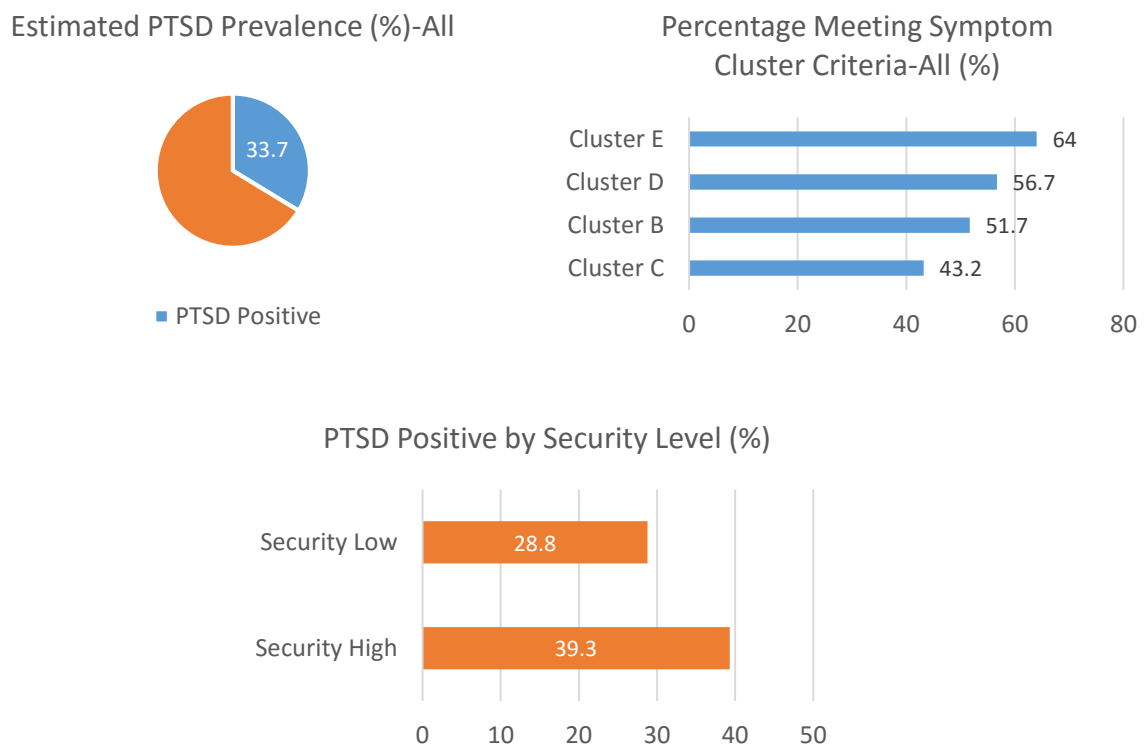


Figure 4. PTSD and Symptom Cluster Prevalence for All COs and Security Level Subgroups

Depression

The prevalence of Depression was estimated by defining Depression Positive in terms of PHQ-9 scores falling in the Moderate Depression (or higher) range. Pie charts in Figure 5 indicate the percentage of COs falling into each of several PHQ-9

depression level categories, as well as the percentage estimated to be Depression Positive.

As indicated in Figure 5, the prevalence of Depression Positive cases for all COs was found to be 36.3%. The rates for High and Low Security subgroups were 41.8% and 31.5%, respectively, reflecting a statistically significant difference between groups ($\chi^2=11.01$, $df=1$, $p=.001$). Calculation of relative risk indicated that COs in the High Security subgroup were at 33% greater risk of Depression Positive status than COs in the Low Security subgroup, $RR=1.33$, $CI [1.12-1.58]$.

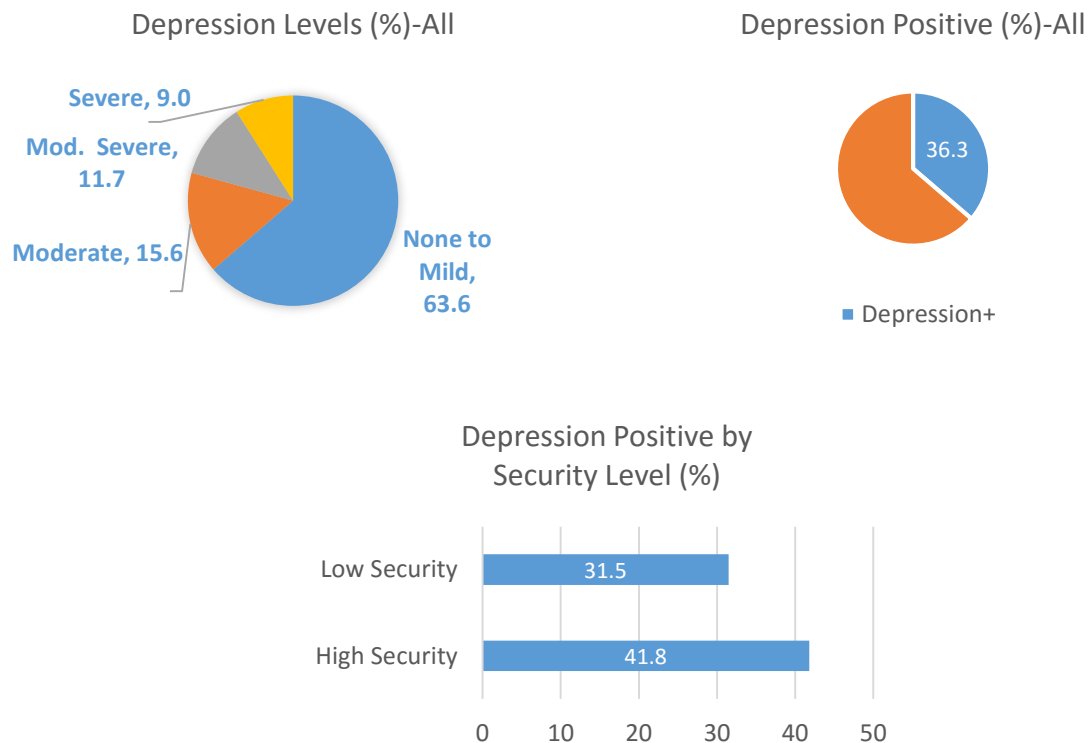


Figure 5. Depression Prevalence among All COs and Security Level Subgroups

Comorbidity

Comorbid Positive status was defined as cases where a CO was estimated to be concurrently PTSD Positive and Depression Positive. The prevalence of COs who

met criteria for both PTSD Positive and Depression Positive was found to be 24.9%. The prevalence of Comorbid Positive status for COs in High and Low Security level subgroups was 30.7% and 19.3%, respectively. See Figure 6 for graphic illustrations.

The difference in Comorbid Positive rates between COs in different security level subgroups was determined to be statistically significant ($\chi^2=16.59$, $df=1$, $p=.000$). Relative risk was calculated, indicating that COs in the High Security subgroup were at 59% greater risk of Comorbid Positive status than those in the Low Security subgroup, $RR=1.59$, $CI [1.27-2.00]$.

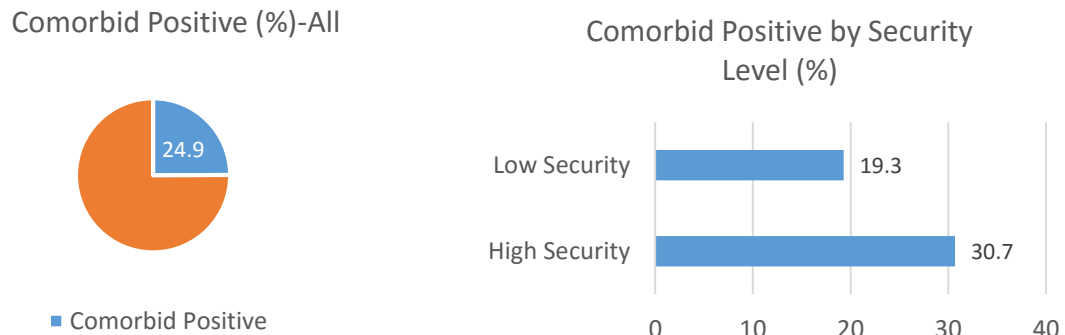


Figure 6. Prevalence of Comorbid PTSD and Depression among Corrections Officers

Suicide Risk

The prevalence of suicide risk was estimated using the DDS. Scores falling in the High Risk range defined suicide risk as being substantially elevated. As indicated in Figure 7, 4.6% of COs scored in the High Risk interpretive category, among possible categories None, Slight, Moderate, and High.

Comparing the prevalence of High Risk scores for COs working in high versus low security areas revealed rates of 5.8% and 3.1%, respectively. This difference in proportions was determined to be statistically significant ($\chi^2=4.05$, $df=1$, $p=.04$).

Calculation of relative risk indicated that the individuals in the High Security subgroup were found to be at 87% more likely to score in the High suicide risk category, compared to individuals in the Low Security subgroup, RR=1.87, CI [1.01-3.46].

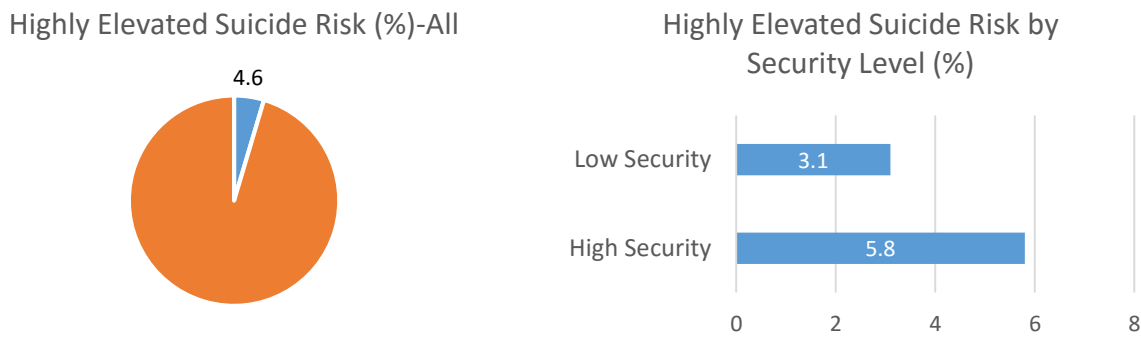


Figure 7. Estimated Percentage of Highly Elevated Corrections Officer Suicide Risk Cases

Gender Differences for Corrections Staff

To illuminate the potential influence of gender on mental health condition prevalence, rates of PTSD Positive, Depression Positive, Comorbid Positive, and Highly Elevated suicide risk were plotted by gender subgroups. As can be seen in Figure 8, rates were fairly similar though male COs most often tended to score slightly higher than females, and with the largest differences occurring for suicide risk and PTSD status.

The proportion of positive versus negative cases was compared across Gender subgroups to determine whether differences were large enough to be statistically significant. Given multiple comparisons, a Bonferroni correction was implemented to reduce the chances of increased Type I error (i.e., false positives). Thus the default p-value of .05 was reduced to .0125 for each of multiple comparisons. Using this approach, no statistically significant differences were found, although the pre-corrected p-value for suicide risk did approach statistical significance ($\chi^2=3.16$, $df=1$, $p=.075$).

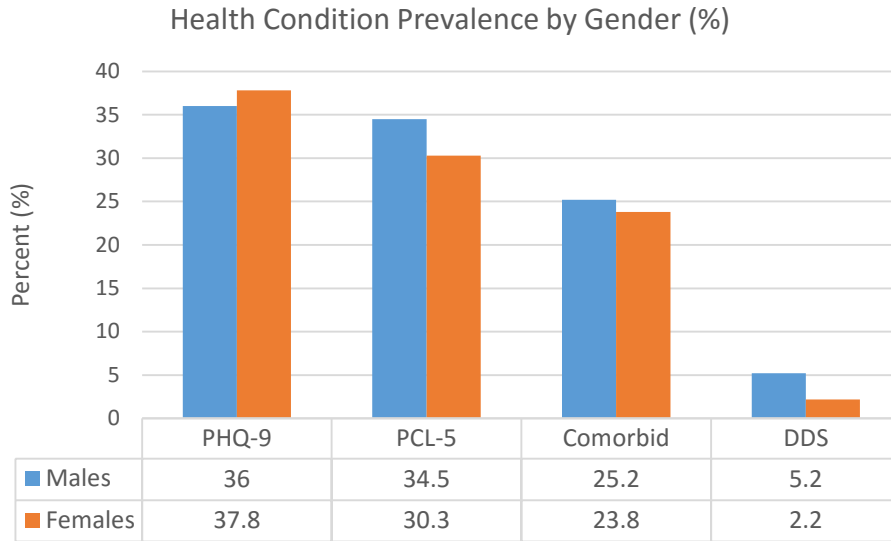


Figure 8. Health Condition Prevalence for Male and Female Corrections Officers

Prior Military Experience

To illuminate the potential influence of prior military experience, mental health condition rates were compared for subgroups of COs who reported having or not having prior military experience. As can be seen in Figure 9, health condition rates were quite close across subgroups, with the biggest difference occurring for cases of High Suicide Risk. Individuals who reported pre-corrections military service demonstrated a slightly higher rate of elevated suicide risk (6.5%), compared to non-military (4%).

The observed differences were assessed for potential statistical significance using a Bonferroni-corrected p-value (.0125) criterion. None of the differences were found to be statistically significant.

Years of Corrections Work Experience

To illuminate the potential influence of accrued years of corrections work, mental health condition rates were compared for subgroups of COs with less than

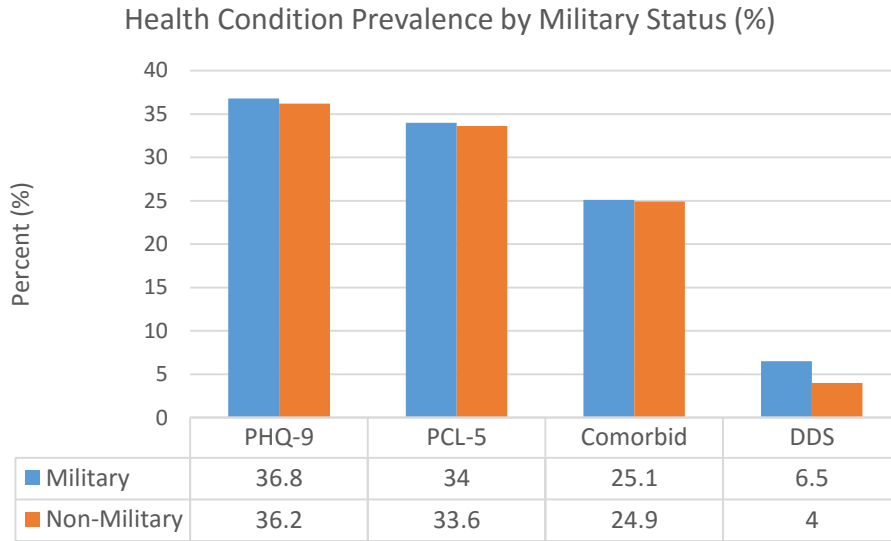


Figure 9. Health Condition Prevalence for Military and Non-Military Corrections Officers

or equal to 10 years' experience versus those with more than 10 years' experience. As shown in Figure 10, there was substantial variability in health condition rates according to the number of years spent working in corrections. Individuals with more than 10 years' experience demonstrated higher rates for all health condition measures.

Each health condition's prevalence, as reflected by status positive versus negative, was compared across the two Years' Experience subgroups. Using a Bonferroni-corrected p-value (.0125), two health condition rate differences were found to be statistically significant: the PTSD Positive rate ($\chi^2=27.25$, $df=1$, $p=.000$) and the Comorbid Positive rate ($\chi^2=7.38$, $df=1$, $p=.007$). Rates for Depression Positive and High Suicide Risk did not quite reach significance under the more conservative corrected p-value criterion. Both of these rates, however, were statistically significant with uncorrected p-values, at $p=.03$ and $p=.04$, respectively.

Health Condition Prevalence - Less Than or Equal to 10 Years vs. Greater than 10 Years Experience (%)

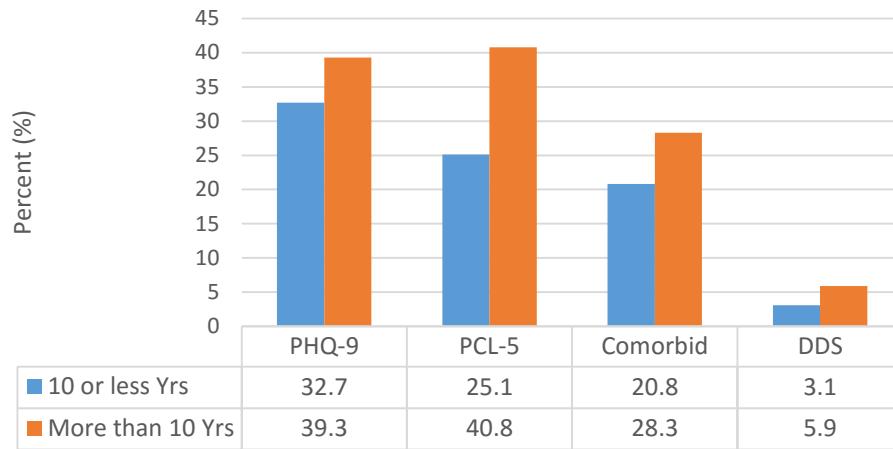


Figure 10. Health Condition Prevalence for Years' Experience Subgroups

DISCUSSION

Violence, Injury, and Death Exposure

The data collected in this study of MCO members' experiences, involving exposure to VID events, confirmed that a large proportion of MCO COs experience very substantial rates of VID exposure during the course of their job functions. Study participants completed the VIDES assessment, which measures overall exposure magnitude, based on combined information about types, frequency, and recency of both direct and indirect exposures to work-related events involving VID. Results indicated that more than 50% of staff had experienced high to extreme levels of exposure.

To assess the strength of relationship between VID exposure and various health status conditions, Pearson correlations were calculated between (1) VIDES total scores and (2) the PHQ-9 total score (measuring depression), the DDS total score (measuring suicide risk), the PCL-5 total score (measuring PTSD), and individual PCL-5 symptom cluster scores B, C, D, and E, which reflect different sets of PTSD symptoms.

The correlations between the VIDES total score and seven different health condition scores ranged from $r=.33$ to $.45$. All correlations were found to be statistically significant, confirming the presence of substantive and real relationships. Not unexpectedly, and given the vast literature supporting the relationship between traumatic exposure and PTSD, the magnitude of the relationship between VID exposure as measured by the VIDES, and PTSD as measured by the PCL-5, was found to be strongest ($r=.45$).

A comparison of mean VIDES score differences for COs working in Low Security and High Security subgroups was completed to discern an expected difference in average VID exposure levels. Means for COs working in High and Low Security areas were found to be significantly different, confirming the expectation that COs working in high security areas would experience a higher magnitude of VID events compared to those working in low security areas.

Estimated Mental Health Condition Rates

Of primary interest in this study was estimation of mental health condition rates for COs, with the expectation, based on previous research, that they experience various health detriments, including especially PTSD and Depression, due to the high stress nature of the job—in a way similar to other public safety occupations that are more widely known for their health-related occupational hazards. Of secondary interest was demonstration of a moderating effect of VID exposure upon mental health condition rates for High versus Low Security COs.

PTSD

The prevalence of PTSD among MCO member participants was estimated using the latest iteration of the Post-traumatic Checklist (PCL-5)—a widely used PTSD assessment/screening tool—recently updated to align with the most recent diagnostic criteria published in the DSM-5. Results from the PCL-5 also confirmed the percentage of case in which criteria were met for particular PCL-5 symptom clusters.

The overall PTSD rate was estimated to be 33.7%, far exceeding the rate that is typical in the general population (Kessler et al., 2005), and also exceeding, but to a lesser degree, rates published for other public safety jobs involving high exposure to traumatic events, such as police officers, firefighters, and combat military (Corneil et al., 1999; Fulton et al., 2015; Gates et al., 2012; Perrin et al., 2007). The PTSD Positive rate found in this study is virtually identical to that reported for correctional security/custody staff (34.1%), in a large sample study (N=3,599) of corrections staff working in numerous states (Denhof and Spinaris, 2013).

The percentages of cases where criteria were met for specific diagnostic symptom clusters was substantial, ranging from 43.2% to 64% across the four clusters assessed by the PCL-5: B, C, D and E. Diagnostic cluster E was met at the highest rate, of 64%, suggesting that Cluster E symptoms, involving alterations in arousal and reactivity, are a primary issue of concern for COs. According to the DSM-5, Cluster E reflects increased behavioral tendencies in areas including irritable behavior, angry outbursts, reckless or self-destructive behavior,

hypervigilance, exaggerated startle response, problems with concentration, and sleep disturbance. Several of these characteristics, including especially issues of anger and sleep difficulty, have been documented previously for their prevalence among COs (Spinaris et al., 2012).

The second most frequently met symptom cluster criterion was cluster D (56.7%), which reflects alterations in cognition and mood. According to the DSM-5, Cluster D is exemplified by impaired recall of traumatic events, negatively skewed perspective and expectations, exaggerated sense of blame upon self or others for traumatic events or their consequences, trauma-related emotions such as fear, horror, anger, guilt, or shame; diminished interest in previously enjoyed activities; feelings of detachment or social isolation, and difficulty experiencing positive emotions.

As was the case with Cluster E, many of Cluster D's stand out attributes have been identified previously, including: memory impairment; depression, which includes aspects of negative outlook, diminished interest in activities previously enjoyed, and difficulty experiencing pleasure; and emotions of fear, horror, guilt, and shame (Spinaris et al., 2012). Thus, the symptom cluster results provided by MCO member participants in relation to PTSD is consistent with previous research profiling corrections staff populations.

The prevalence of PTSD was also estimated separately for MCO member participants working in high and low security environments. MCO participants in the High Security subgroup were confirmed for demonstrating significantly higher VID exposure magnitude, and therefore were expected to show respectively higher rates of negative health statuses. This expectation was supported, as COs working in high security environments showed a significantly higher rate of PTSD Positive (39.3%), compared to those working in low security environments (28.8%). While participants in both High and Low Security subgroups demonstrated substantial and concerning PTSD rates, high security COs were estimated to be at 37% greater risk for PTSD Positive, compared to low security COs.

Depression

The prevalence of MCO member participants demonstrating a Moderate or higher level of depression, based on results from the PHQ-9 depression measure, were defined as Depression Positive. The percentage estimated to be Depression Positive was 36.3% for all MCO member participants. This rate is slightly higher than a previously estimated rate (31.0%) for COs nationwide (Denhof & Spinaris, 2013; Obidoa et al. 2011). The rate of 36.3% far exceeds what has been found typical in the general population, ranging from approximately 8 to 10% (United States Center for Disease Control and Prevention (US-CDC; 2010).

Notably, depression in the workplace has been found to be among the costliest of health conditions. According to the World Health Organization (2012), depression is the leading cause of disability worldwide in terms of total years lost due to disability. Depression has been associated with reduced productivity, increased disability claims, absenteeism (Kessler & Frank, 1997), and premature retirement (Wang, 2004).

The rate of Depression Positive in the current study was also estimated for MCO member participants working in low versus high security environments, which, as discussed, manifest significantly different levels of VID event exposure. As was found to be the case with PTSD rates, the estimated number of Depression Positive cases was found to be significantly higher for participants constituting the High Security subgroup (41.8%) compared to the Low Security subgroup (31.5%). Estimation of relative risk indicated that individuals working in high security areas were at 33% greater risk of being determined Depression Positive, compared to those working in low security areas.

Comorbidity

The prevalence of Comorbid Depression Positive and PTSD Positive cases was estimated. The importance of this combination has been highlighted in previous research into the health profile characteristics of United States corrections professionals (Denhof & Spinaris, 2013). Denhof and Spinaris reported that,

compared to individuals meeting criteria for either PTSD alone or Depression alone, individuals meeting criteria for both conditions concurrently tended to also show significantly higher scores and effect sizes across a whole spectrum of related health status measures, including: measures of stress, anxiety, and life satisfaction; reported number of absences from work and doctor visits; substance use; total number of reported health conditions of various types; and reported levels of impaired functioning in relationship, leisure time, caregiver, and personal responsibility contexts.

The rate of Comorbidity among MCO members in the current study was estimated to be 24.9%. Not unexpectedly, the current study's estimated Comorbidity rate for high security COs (30.7%) was significantly higher than the rate for low security COs (19.3%). COs in the High Security subgroup were estimated to be at 59% greater risk of Comorbid Positive status than individuals in the Low Security subgroup. The prevalence of Comorbid Positive status in the current study is slightly higher and in the ballpark of Denhof and Spinaris' previous Comorbidity rate estimate of 21.9%, based on nationwide sample data from corrections security/custody staff (Denhof & Spinaris, 2013).

Suicide Risk

The DDS was designed as a measure of both group-level and individual level suicide risk, and validated for use with corrections staff populations (Denhof, 2014). It consists of assessment items associated with severe depression and suicidal behavior. The DDS provides a useful approach to monitoring staff suicide risk within corrections workplace cultures, which is important, given the high rates of corrections staff suicide that have been documented (New Jersey Police Suicide Task Force Report, 2009; Stack and Tsoudis, 1997; Violanti, Robinson, & Shen, 2013).

Using the DDS, the percentage of MCO COs scoring in the High range of suicide risk was estimated to be 4.6%. While on the face of it, a percentage like this may seem small, when considering the seriousness and consequence of staff suicides, the importance of even small percentages of High risk becomes clear. Stated

another way, if an organization's workforce has a true rate of 4.6% COs in the highly elevated suicide risk category, this means that about 5 of every 100 staff are at a dangerous level of risk of death by suicide.

The percentage of individuals scoring in the High Suicide Risk interpretive category of the DDS was also calculated independently for COs working in high and low security environments. Individuals in the High Security subgroup demonstrated a significantly higher rate of High Suicide Risk (5.8%) and an 87% greater risk of scoring in the High Suicide Risk category, compared to individuals in the Low Security subgroup (3.1%).

Gender Differences for Corrections Staff

Gender differences are often reported in social science research, including studies of corrections staff populations, out of theoretical or pragmatic interest. Most often differences are reported in terms of statistically significant mean differences in scores on continuous quantitative variables. However, mean differences alone can be difficult to interpret for their practical implications—especially if interpreted without regard for whether or not clinical or diagnostic thresholds were exceeded.

One of the advantages of the current study is that virtually all results are presented in the form of individuals who either met or did not meet clinically meaningful thresholds or diagnostic criteria. This approach helps reduce ambiguity about gender differences that are just theoretically interesting versus those that have practical consequence. For example, if male versus female subgroups of COs were found to score, respectively, above and below, a diagnostic cut-point for a serious condition, that difference would obviously have clear practical implications since one group is considered disordered or manifesting a debilitating condition and the other group is not.

In the current study of MCO COs, Gender was not found to be a particularly important factor in relation to prevalence of deleterious mental health conditions. Both males and females demonstrated rates of conditions that far exceeded

estimates of what is typical in the general population and therefore to a “practically significant” extent within the corrections population. While female COs demonstrated a pattern of slightly lower rates on most conditions measured, the magnitudes of these differences were not statistically significant, and thus neither real or meaningful gender differences were supported.

The general finding of minimal differences between male and female COs on key health condition status rates, highlights how, when differences are constrained to clinically meaningful margins or thresholds, gender differences do not always appear. The implication here is that programs designed to address prevalent and problematic health conditions need not be structured much differently, if at all, for male versus female COs.

Prior Military Experience

Mental health condition rates for MCO member participants, with and without prior military experience, were nearly identical for PTSD Positive, Depression Positive, and Comorbidity Positive statuses, though rates tended to be slightly lower for COs not having served previously in the military. While the percentage of COs in the Past Military Experience subgroup did demonstrate a somewhat higher rate of scores falling in the High Suicide Risk category of DDS results, the difference was not found to be statistically significant.

Previous research has documented relatively small but significantly different rates for individuals with pre-corrections military experience, where those with pre-corrections military activity showed an approximately 5% higher rate of Depression Positive and a 7% higher rate of PTSD Positive cases (Denhof and Spinaris, 2013). This prior research utilized similar but not identical estimation instruments, however, including an older version of the Post-traumatic Checklist (PCL-C) and the DASS-21 Depression scale (Henry, & Crawford, 2005; Lovibond & Lovibond, 1995).

While all mental health condition rate differences between COs with and without pre-corrections military service were found to be statistically insignificant, the pattern of slightly lower mental health condition rates for non-military COs is

consistent with previous findings and likely due to lifetime cumulative exposure to VID events. It is plausible to expect that the observed differences would have been substantively larger had the pre-corrections military service group been defined more narrowly to include only individuals who actually *engaged in* combat during their military service.

Years of Corrections Experience

While demographic variables of Gender and Pre-corrections Military Service demonstrated little to no effect upon the various mental health conditions assessed, one demographic variable did show a larger impact—Years Experience in the field of corrections. Large and statistically significant differences in health condition rates were observed for COs having 10 or less years' experience compared to those having greater than 10 years' experience.

Individuals with more than 10 years' experience showed rates of Depression Positive, PTSD Positive, Comorbid Positive, and High Suicide Risk level that exceeded less experienced COs' rates by 6.6, 15.7, 7.5, and 2.8 percentage points, respectively. Two of the four rate comparisons were found to be statistically significant after applying a more conservative Bonferonni-corrected p-value criterion—namely, the difference in rates for PTSD Positive and Comorbid Positive. Notably, all of the various health status comparisons across Years' Experience subgroups were statistically significant using a standard significance criterion of $p < .05$.

The observed effect of Years' Experience on health condition rates is plausibly due, at least to some extent, to the impact of cumulative exposure to VID events in the corrections setting. It has been hypothesized previously (Spinaris et al., 2012), that corrections staff, and COs especially, may suffer an even greater toll from VID exposure than other individuals working other law enforcement positions or combat military roles, given the more repetitive and sustained course of exposures COs face in their day to day routines. COs exposure to VID events take place within a

confined space and involving regular contact with often volatile offender populations.

Study Limitations, Generalizability, and Implications

Generalization of results from studies utilizing convenience samples and volunteer participation, including the current study, is always recommended with caution. The results from the present study, however, are quite consistent with prior and similar investigations into mental health condition rates for United States corrections professionals (Spinaris et al., 2012; Denhof and Spinaris, 2013; Obidoa et al. 2011).

It is prudent to highlight that the study's design incorporated the use of self-report-based assessment instruments, which, it can be argued, are more vulnerable to biased responding than other assessment methods, such as structured or semi-structured interviews. However, highly structured questionnaire-based assessment tools have the advantage of respectively high reliability and consistency, and they are less vulnerable to variability in clinical judgments that may take place during interview-based assessment. Thus, the assessment approach utilized can be seen as on par with alternative approaches, given the reality that all approaches include some combination of strengths and weaknesses in terms of their structure, form of administration, and psychometric properties.

An important fact is that all of the assessment instruments utilized in the current study have been confirmed for having strong and replicable psychometric properties across independent samples, including features of high reliability and multiple forms of validity support, despite utilization of self-report. In addition, all of the assessment tools used in this study have proved useful and effective for clinical and research applications. They continue to be widely used for estimating exposure, risk level, and health conditions rates, and are considered especially useful under circumstances in which large groups require evaluation.

The results from this study, therefore, can be considered defensible estimates of exposure levels, condition rates, and risk levels. This study's results provide a

useful starting point and guide for understanding key facets of the health profile of MCO COs. The identified health and risk statuses can be seen as a justification for resources and programming that target the reduction of symptoms and risks within the workforce, and that increase resilience and wellness.

Due to the chronic nature of VID exposure in corrections settings, and high security settings in particular, corrections staff health maintenance is best seen as an ongoing process of assessing and monitoring the status of corrections workforce health. When problems are detected or movement in problematic directions discovered, administrations can intervene as needed with trainings and education focused on understanding the nature of trauma, its effects upon health and functioning, and techniques for promoting resilience and wellness on both individual and workplace culture levels. Results from this study reinforce the potential benefits of staff rotations by security level as a means of “padding” the intensity of VID exposure that accrues for COs over time on the job.

A suggestion for future research focused on the influence of pre-corrections military status, given its bearing on level of prior VID exposure, is to make the further distinction between COs who actually engaged in military combat versus those who did not. This adjustment is likely to reveal at least somewhat higher rates of mental health conditions for the subgroup that engaged in combat military activity prior to their corrections work.

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Appendix A

Participant Characteristics

Gender		(%)	Job Title	(%)
	Males	81.3	Corrections Medical Officer 8	2.3
	Females	18.7	Corrections Medical Officer E9	13.0
			Corrections Med. Unit Officer E10	.2
Ethnicity			Corrections Officer 8	10.4
	Asian	.1	Corrections Officer E9	69.2
	Black	8.3	Corrections Resident Rep. E10	.8
	Latino/a	2.0	Corrections Security Rep. E10	.3
	Mixed	2.3	Corrections Transport. Officer E10	.8
	Native Amer.	3.3	Forensic Security Assistant 8	.2
	White	84	Forensic Security Assistant 9	.3
			Forensic Security Assistant E10	1.6
Age			Special Alternative Incarc. Officer 9	.8
	18-29	15.5		
	30-41	30.3	Primary	
	42-53	43.5	Work	Corr. Military Facility .3
	54-65	10.6	Setting	Corr. Psychiatric Facility 2.8
	66+	.1		Jail/Detention Center .9
				Prison 95.5
Years				
Corrections	<6 mo.	3.7	Past	
Employment	6 mo. – 5 yrs.	30.5	Military	Yes 24.9
	>5 yrs.	10.9	Experience	
	>10 yrs.	8.0		
	>15 yrs.	23.2		
	>20 yrs.	23.7		

Appendix B

Assessment Instrument Psychometric Property Overviews

The Depression Danger Scale (DDS; Denhof, 2014): The DDS is psychometrically sound self-report-based assessment instrument that estimates level of suicide risk for individuals and groups. It is based on 13 items associated with severe depression and suicidal ideation. Psychometric properties were assessed using corrections staff populations. The DDS demonstrates a high level of internal consistency reliability ($\alpha = .93$). Concurrent validity of the DDS has been demonstrated through statistically significant and substantial correlations with other conceptually and theoretically related measures. Correlations with the DASS-21 Depression Scale=.83; PCL-C=.70; CFSA-v5 =.55; SWLS=-.35. DDS total scores of 39 and above indicate highly elevated risk. Detailed psychometric property information on this instrument is available at http://desertwaters.com/wp-content/uploads/2014/01/DDS_Data_Sheet.pdf.

The Patient Health Questionnaire Depression Scale (PHQ-9): The PHQ-9 is a psychometrically sound self-report-based assessment instrument that utilizes a Likert-type rating scale for each item. Respondents indicate the extent of depression symptoms experienced over the past 2 weeks along a continuum spanning from 0 ("Not at all") to 4 ("Nearly every day"). The recommended screening cut-point for the PHQ-9 is a score of 10 or higher, which begins the Moderate Depression interpretive category. This cut-point has a sensitivity for major depressive disorder of 88%, a specificity of 88%, and a positive likelihood ratio of 7.1, meaning that individuals suffering from major depressive disorder are seven times more likely to have a PHQ-9 score of 10 or greater than patients without major depressive disorder. The operating characteristics of the PHQ-9 compare favorably to nine other case-finding instruments for depression in primary care (Kroenke and Spitzer, 2002).

The Posttraumatic Stress Disorder Checklist-Civilian Version (PCL-C): The quality of measurement characteristics of the PCL-C (Orsillo, 2001; Ruggiero, Del Ben, Scotti, & Rabalais, 2003) and its diagnostic utility (Bertelson, Brasel, & deRoos, 2011; Gardner, Knittel-Keren, & Gomez, 2012; Keen) are well

substantiated. Results from the PCL-C have been found to compare favorably with clinician-performed diagnostic approaches, such as the Clinician Administered PTSD Scale (CAPS). 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). 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).

The PTSD Checklist for DSM-5 (PCL-5): The PCL-5 is the latest iteration of the PCL-C (described above) and rests upon the foundation of psychometric property information from the PCL-C. The PCL-5 uses either of two alternate methods for predicting PTSD status: (1) a total score cut-off method (with total symptom severity score ranging from 0-80), where a summation of all item scores greater than or equal to 34 defines someone as PTSD-positive, or (2) a symptom cluster method, where DSM-5 criteria for PTSD are met following the DSM-5 diagnostic rule which requires several concurrently met criteria: 1 symptom cluster B item (questions 1-5), 1 C item (questions 6-7), 2 D items (questions 8-14), and 2 E items (questions 15-20), and by treating each item rated as 2 (i.e., "Moderately") or higher on the response scale as a symptom endorsed.

The Violence, Injury, and Death Exposure Scale (VIDES): The VIDES was designed to provide a quantitative index of individuals' or groups' magnitude of exposure to events involving violence, injury, or death. Magnitude is a function of the number, range of both direct and indirect types of exposure, and recency of VID events experienced. The VIDES serves as an effective tool for estimating average exposure magnitudes for corrections workforces, and it was developed with corrections staff populations. The VIDES is psychometrically sound and demonstrates excellent measurement characteristics (Denhof & Spinaris, 2014). Internal consistency reliability has been estimated to be .92, based on Crobach's Alpha (α). The VIDES total score has been found to correlate substantially and

significantly with conceptually related clinical measures, including the Post-traumatic Checklist-Civilian version's (PCL-C) total score ($r=.41$), the DASS-21 Depression Scale's total score ($r=.33$), and the Corrections Fatigue Status Assessment's (CFSA-v5) global score ($r=.31$). Additional VIDES psychometric property information is available at: http://desertwaters.com/wp-content/uploads/2014/01/VIDES_Data_Sheet.pdf.