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SUICIDE IDEATION PREVALENCE AND RISK FACTORS AMONG
CORRECTIONAL OFFICERS

by

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A THESIS

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SUICIDE IDEATION PREVALENCE AND RISK FACTORS AMONG CORRECTIONAL OFFICERS

LOGAN LAVENDER

CRIMINAL JUSTICE

ABSTRACT

The correctional work environment is detrimental to correctional officers' (COs) health and wellness. While research shows that COs experience high rates of stress, PTSD, and other mental and physical health problems, relatively little research has examined the issue of CO suicide. The current study addresses this knowledge gap by drawing on a survey of COs from Washington state ($N=420$). Utilizing a Structural Equation Modeling (SEM) framework, this study examines the prevalence of critical incidents (CIs), work stress, PTSD, and suicide ideation, estimates the degree to which exposure to CIs predicts suicide ideation, and assesses how work stress and PTSD moderate the association between CI exposure and suicide ideation. Findings underscore the devastating impact of the correctional work environment as COs in this sample had some of the highest rates of various health and wellness problems, such as suicide ideation (17%). While CIs are a driving force behind suicide ideation, this relationship manifests through their association with work stress and PTSD. However, observations indicate that additional forces contribute to the high rate of PTSD that extend beyond CIs. Overall, findings illustrate the need for additional mental health resources provided to COs and more empirical focus to better understand the traumatic impact of CIs and risk factors contributing to the high PTSD rates.

Keywords: suicide ideation, critical incidents, PTSD, stress, health and wellness

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INTRODUCTION

Corrections work is highly challenging and often traumatic, as correctional officers (COs) face numerous work-related stressors and threats. For example, facilities across the nation face financial crises, limiting resources which hinder the ability of COs to safely and effectively carry out their responsibilities (Brower, 2013; Summerlin et al., 2010). Further, many facilities face staffing shortages, adding more complications such as decreased staff-to-person in custody (PIC) ratio, mandatory overtime policies, and various physical and mental health problems (see Finn, 2000; James et al., 2017; Lahm, 2009; Vila et al., 2000). COs also face an elevated risk of exposure to violence. Spending much of their time in contact with PICs, COs are consistently at risk of witnessing or being a victim of a traumatic event. These traumatic events, also called critical incidents in the literature, contribute to various health and wellness problems that plague the CO population (James & Todak, 2018; Lavender & Todak, 2021; Rocheleau, 2014; Spinaris et al., 2012).

For example, previous literature demonstrates that COs are significantly at-risk for PTSD, with prevalence rates ranging from 19-27% (James & Todak, 2018; Lavender & Todak, 2021). Further, common stressors associated with corrections work (e.g., shiftwork, critical incidents, perception of violence) are linked to higher rates of sleep issues, including insomnia, depression, physical pain, and injury (Bierie, 2012; James et al., 2017; Şenol-Durak et al., 2006). Although the health and wellness issues negatively affecting COs are increasingly gaining empirical attention, they do not seem to improve.

Rather, stress, occupational burnout, poor health, and psychological distress rates are worsening (Armstrong et al., 2015; Brough & Williams, 2007; Gould et al., 2013; Griffin et al., 2010).

The high rate of suicide among police officers is well-documented. However, despite sharing comparable risk factors, suicide among COs has not garnered nearly the same amount of empirical attention. In the course of their duties, police officers also risk frequent exposure to violence and trauma, which carry detrimental effects on health and wellness (Stanley et al., 2016; Violanti et al., 2008). These adverse effects (e.g., feelings of hopelessness, depression, and sleep problems) are correlated with suicide ideation (active contemplation of suicide) and death by suicide among police officers (LeardMann et al., 2013; Violanti & Steege, 2020). Considering that the CO population has demonstrated an equivalent and even, in some studies, exceeding prevalence of risk factors (such as PTSD and stress; see Lavender & Todak 2021), it is surprising that suicide among COs has not received much empirical focus. Nonetheless, suicide is a prevalent and concerning outcome of the mental health crisis that COs face requiring further attention and study (Frost & Monteiro, 2020; Stanley et al., 2016).

LITERATURE REVIEW

The Correctional Work Environment

Among the many stressors COs face daily, organizational factors (e.g., lack of resources, staff-to-inmate ratio, shiftwork) are some of the most problematic.

Correctional facilities nationwide have been plagued with financial restrictions forcing COs to take on more responsibilities, work with outdated equipment, and receive limited training (Summerlin et al., 2010). In a literature review of CO safety and wellness, for example, Brower (2013) found that these financial restrictions added strain on COs and increased occupational burnout.

Although the research focused on the consequences of shiftwork in a correctional environment is limited, understanding the implications and potential risks of organizational risk factors is essential. Caruso and colleagues (2006) observed that unpredictable and long working hours are linked to adverse effects, including the risk of cardiovascular disease, insomnia, and mental health issues (see also James et al., 2017). Due to the financial burdens plaguing correctional facilities across the country, there is also a widespread shortage of COs, leading to excessive work hours and mandatory overtime policies that contribute to an increased risk of stress and burnout (Finn, 2000), sleep problems (James et al., 2017), and declines in cognitive abilities such as rational decision making (Vila et al., 2000) among remaining staff. Additionally, CO shortages result in decreased staff-to-PIC ratios, which is linked to an increased risk of COs being assaulted (Lahm, 2009).

As previously discussed, corrections work is particularly stressful and often dangerous as the potential for violence is an everyday reality, and the threat of injury and death loom. Common risks, such as being bitten, spit on, or beaten, contribute to a perception among COs that they are in constant danger (James & Todak, 2018). Spinaris (2012) found that the correctional work environment involves some of the highest traumatic exposure rates across all occupations, as COs are exposed to approximately 28 acts of violence during their careers. Often, these acts of violence directly involve PICs, including witnessing or being a victim of physical or sexual assault, which can include murder, suicide, and rape (Rocheleau, 2014). The American Psychiatric Association (2013) has noted that exposures (direct or vicarious) to traumatic events, or critical incidents, are strongly associated with adverse mental health outcomes like PTSD and suicidal behaviors. Within the context of their work environment, COs are uniquely at-risk for these detrimental effects (Brower, 2013). Finally, while correctional facilities and COs lack adequate resources and training to address their needs, there has been, at the same time, a rise in the number of PICs with mental illnesses, adding to the complicated and unpredictable nature of the correctional work environment (McLearn & Ryba, 2003).

Health and Wellness Risk Factors for COs

In their study examining organizational risk factors for health and wellness issues in COs, Lavender and Todak (2021) found that COs report high levels of stress compared to the general population, which have been associated with adverse effects on corrections organizationally (Finney et al., 2013; Trounson et al., 2019) and adverse health outcomes for COs (VanItallie, 2002). Stress experienced by COs stems from role conflict (unclear

and/or contradictory expectations), low job satisfaction, heightened perception of danger, lack of supervisory support, and exposure to critical incidents (Brough & Williams, 2007). In turn, high stress among COs can contribute to unsafe practices, poor job performance, and increased staff turnover (Brower, 2013). High stress levels in COs have also been linked to severe, debilitating physical health concerns, such as cardiovascular disease, diabetes, hypertension, chronic pain, and gastrointestinal problems (Bierie, 2012; Dowden & Tellier, 2004; Viotti, 2016). Further, James and Todak (2017) found that these stressors – particularly workplace critical incidents – are associated with poor sleep habits, including insomnia.

The most significant threat that COs face to their health appears to stem from direct or indirect interactions with PICs. For example, extensive contact with PICs increases a CO's susceptibility to potentially life-threatening diseases as they may be exposed to contaminated sharp objects and bodily fluids (Alarid & Marquart, 2009). Regular exposure to incidents involving violence, injury, and death can have a cumulative, traumatic effect on COs' mental health and well-being (James & Todak, 2018; Lavender & Todak, 2021; Spinaris et al., 2012). Of particular concern, a body of literature indicates that COs experience some of the highest rates of work-related injuries and fatalities, enhancing their risk for chronic, stress-related conditions (e.g., depression, anxiety, PTSD; see Carleton et al., 2020; Konda et al., 2013). For instance, 27% of Lavender and Todak's (2021) sample of 420 COs working in Washington state met the criteria for diagnosable PTSD. This finding exceeded the rates found in previous studies (see James & Todak, 2018) and surpassed what has been found in police officers and combat-experienced veterans who served in Iraq and Afghanistan (see Tanielian, 2008).

Further, exposure to critical incidents (James & Todak, 2018) and spending more time with PICs during one's workday (Lavender & Todak, 2021) are correlated with higher PTSD symptomology. Without research and targeted interventions, poor health and wellness outcomes, like PTSD, appear to worsen (Lavender & Todak, 2021).

Suicide in Law Enforcement and Corrections

Given the stressful and traumatic nature of the work, it is unsurprising that law enforcement officers face a heightened risk of suicide (Chopko et al., 2014; Frost & Monteiro, 2020; Stanley et al., 2016; Violanti & Steege, 2020). While the rate of suicide among police officers varies (Schweitzer Dixon, 2021), previous literature has consistently found that they are significantly more likely to die by suicide than in the line of duty (Bishopp & Boots, 2014; Bogle, 2018; Schweitzer Dixon, 2021). In their assessment of national occupational data, Violanti and Steege (2020) found that law enforcement personnel were 54 percent more likely to die of suicide compared to personnel in *all* other occupations. Klinoff and colleagues (2015) found an even higher risk of suicide among officers in smaller departments, possibly due to an increased workload and lack of mental health resources. Unfortunately, the stigma surrounding mental health issues and suicide in police culture exacerbates the problem. This is evidenced by the fact that many police officers who die by suicide are not buried with honor, where the department formally assists in organizing a military-style funeral, such as providing honor and color guards for officers who die by other means (Heyman et al., 2018).

Exposure to critical incidents is linked to suicidal risk factors among police officers, such as depressive symptoms (Violanti et al., 2008) and hopelessness

(LeardMann et al., 2013). In their systematic review of suicide among police officers and other first responders, Stanley and colleagues (2016) noted multiple risk factors for suicide, including occupational hazards and exposures, access to lethal means (e.g., possessing a service firearm), capability for suicide (often described as when self-injury and dangerous experiences become routine through repeated direct or vicarious exposure to pain and violence; see Joiner, 2005), erratic work shifts, and stigma preventing the seeking of treatment. Further, a systematic review of police suicide by Chae and Boyle (2013) also found that occupational stress, critical incident trauma, shiftwork, relationship problems, and substance abuse are significant risk factors. Using the National Violent Death Reporting System (NVDRS), Roberts (2019) explored and compared correlates of suicide among law enforcement officers, firefighters, and members of the U.S. Army. They found intimate partner problems were the most prevalent suicide correlate among law enforcement officers, followed by role problems, treatment for mental health problems, and substance abuse, respectively. Comparatively, the results showed that intimate partner problems were the most common suicide correlate among all populations; however, role problems were more common among law enforcement officers, treatment for mental health problems was more common among the army, and substance abuse was relatively the same across all populations. Thus, the precursors and risk factors for suicide may differ based on one's profession and role.

A body of literature has also observed significant relationships between PTSD and suicidality (i.e., the risk of suicide, including passive or active ideation, intent with or without a plan, and other suicidal thoughts or gestures; Chopko et al., 2014; Maia et al., 2007; Stanley et al., 2016). Maia and colleagues (2007) found that, of the police officers

that met the criteria for PTSD, almost 36% reported lifetime suicide ideation compared to 5% of officers who did not meet the criteria for PTSD. Likewise, in their meta-analysis examining the association between PTSD and suicide, Panagioti and colleagues (2012) found a strong, positive correlation between PTSD and suicidality, although they did not find a relationship between PTSD and death by suicide.

Based on repeated direct contact with PICs, heightened perceptions of danger, and vulnerability to harm or violence, it is possible that the suicide risk among the CO population is comparable to or higher than other law enforcement personnel and first responders. For example, a study by Stack and Tsoudis (1997) found that the risk of suicide among COs is 39% higher compared to the general working-age population. Further, the New Jersey Police Suicide Taskforce (2009) found that the rate of suicide is twice as high among COs compared to police officers. Violanti and Steege (2020) observed that COs were 34% more likely to die by suicide than employees in other U.S. occupations. Konda and colleagues (2013) similarly found 38% of CO deaths between 1999-2008 resulted from suicide. In their study examining trauma and mental disorders among COs, Fusco and colleagues (2021) found that about 7% of COs reported past-year suicide ideation. Following a cluster of at least 20 CO suicides in the Massachusetts Department of Corrections between 2010 and 2015, Frost and Monteiro (2020) examined the personal and work lives of the COs who had died. They concluded that COs are at an increased capability for suicide "by virtue of their occupation" (p. 1295). They argued that the stigma attached to seeking mental health help and the cultural expectation that COs "suck it up and deal with" the challenging and traumatic aspects of their jobs significantly contribute to the problem of suicide deaths in this population.

METHODS

As the previous literature review demonstrates, the correctional work environment is detrimental to COs' mental and physical health. Unfortunately, this topic has not garnered much empirical attention. Still, fewer studies have examined the issue of CO suicide, while much of the current literature lumps COs together with all law enforcement officers, so they seldom get reviewed independently. Accordingly, the purpose of this thesis is to examine the topic of suicide ideation among COs. Based on data from an online Qualtrics survey completed by 420 COs in Washington state, the study aims to answer the following questions:

1. What is the prevalence of work stress, critical incidents, PTSD, and suicide ideation in the sample?
2. What is the relationship between critical incidents and suicide ideation among COs?
3. What is the role of work stress and PTSD as mediators in the relationship between critical incidents and suicide ideation among COs?

Population and Setting

Participants were recruited through the King County Corrections Guild (KCCG) and South Correctional Entity (SCORE) jail. KCCG serves as the collective bargaining representative for all COs and sergeants of the King County (Seattle) Department of Adult and Juvenile Detention, representing approximately 1,200 employees. SCORE jail is regionally owned and located in Des Moines, WA, serving the confinement needs of six member cities and several contract agencies. As of May 2021, the Bureau of Labor Statistics (BLS) reported 6,860 total correctional officers and jailers employed in Washington state (Bureau of Labor Statistics, 2022). At this time, just over half of the

COs in WA were male, 70 percent were White, about 21 percent had a college degree (Associate's or higher), and the median age was 43.

Recruitment and Sample

To recruit individuals for this study, purposive sampling was used, where participants who meet specific characteristics (individuals who have worked as a CO in this case) are selected. Contacts at KCCG and SCORE jail sent emails to COs represented by these organizations via their work email addresses in the Fall of 2020 and Spring of 2021. The content of these emails included the information required for informed consent and a link to complete the survey in Qualtrics. Ultimately, 420 COs responded to the survey. Given that recruitment was done by agency contacts, how many COs received the emails is unknown, so it is impossible to calculate and report a response rate. Nix and colleagues (2017), in their examination of response rates for policing surveys, found that the average response rate was approximately 64 percent. While they did not report an average response rate for web-based surveys, they argued that online surveys generally receive a lower response rate compared to face-to-face recruitment and data collection methods. In their meta-analysis comparing response rates, Manfreda and colleagues (2008) found that web-based surveys received, on average, an 11% lower response rate than other modes. On the other hand, the response rate for web-based or emailed surveys is higher if the email (or invite) is received from a person or email address that participants recognize (Saleh & Bista, 2017). Although it is not possible to calculate a response rate here, it is likely low considering that a web-based, emailed survey was used. However, contacts familiar to the participants were used to distribute the survey, which may have improved the response rate. While the response rate cannot

be known, the quantity of responses is comparable to, and even better than, much of the CO surveys in criminal justice literature (Fox et al., 2013). Further, the quantity of responses is also comparable to responses from psychology literature related to supervisors in mental health while treating vulnerable populations (Carleton et al., 2020).

Data Collection and Human Subjects Protection

Given the sensitive nature of the study topics and questions, the survey instrument was designed to maintain respect for participants' agency and privacy and to protect individuals from harm as best as possible. All procedures were approved by the Office of the Institutional Review Board at the University of Alabama at Birmingham (IRB-300004250).

First, the survey began with a page for informed consent which emphasized the voluntary nature of the study, offered a detailed explanation of what was included in the proceeding sections, and detailed how the data would be used. The survey was concluded if the participant did not consent to the terms. Further, the survey instrument only included three required items individuals needed to answer to proceed. These were the informed consent, a question ensuring the participant was over the age of 18, and current employment status to ensure all participants presently or previously worked as a CO. All remaining survey items were optional and could be skipped.

While basic demographic and career information was obtained, identifying information such as name, IP address, facility, city/town, and others were not collected to protect participant privacy and anonymity. Resources for formal crisis support were also provided and read as follows:

If you would like more formal crisis support, you can call the National Suicide Prevention Lifeline at 800-273-8255, Trans Lifeline at 877-565-

8860 (U.S.) or 877-330-6366 (Canada), or The Trevor Project at 866-488-7386. If you don't like talking on the phone, you can text HOME to 741741 to get to Crisis Text Line. If you would like to talk to a peer, warmline.org contains links to warmlines in the United States. If you're not in the US, [click here](#) for a connection to crisis centers around the world. NOTE: Many of these resources could utilize restrictive interventions, like active rescues (wellness or welfare checks) involving law enforcement or emergency services. A warmline is least likely to do this but still might have these policies. You can ask if this is a possibility at any point in your conversation if this is a concern for you. Neither Peerly Human online support groups nor Trans Lifeline implements any restrictive interventions for people considering suicide.

Finally, thesis committee member Dr. Frances P. Abderhalden specializes in research on mental health problems, such as suicide, and was asked to help oversee this project to ensure the most up-to-date knowledge regarding working with participants in studies on suicide was considered in each element of the project.

Survey Instrument and Variables

The full survey questionnaire included six sections: 1) demographics, 2) work history, assignment, and organization, 3) health and wellness, 4) sleep, 5) stress, and 6) trauma and critical incidents and is modified from past research by James and colleagues (2017; 2018). The current study draws from the demographics, stress, and trauma and critical incidents sections. See Appendix A for the complete set of study variables and measures.

Dependent Variable

Suicide Ideation. A dichotomous indicator of past year *suicide ideation* was based on participants' responses to the question, "How often have you thought about killing yourself in the past year?" Response categories included never, rarely, sometimes, often, and very often. Responses were recoded to reflect any past year suicide ideation (1 = sometimes, often, or very often; 0 = never or rarely).

Independent Variables

Critical Incidents. A modified version of the Critical Incident History Questionnaire (CIHQ) was used to estimate the rate of exposure to critical incidents among the sample. The full CIHQ indexes exposure to various and potentially traumatic incidents (such as being seriously injured, witnessing a dead body, and having to use lethal force) that are commonly experienced in the line of duty of police officers (Weiss et al., 2010). The CIHQ-C is a modified version of the CIHQ addressing the potential critical incidents that can happen in a correctional setting.

The questionnaire consists of 12 items where participants provide a self-reported frequency for how many times they experienced each critical incident within the last six months. (i.e., "Being injured intentionally (e.g., by a suspect) in the line of duty," "Being involved in a use of lethal force encounter"; see Appendix A for the full set of items). Some self-reported responses received included extreme frequencies (e.g., thousands of reported experiences), which introduced validity issues and skewed the data. To avoid these validity issues and normalize the distribution, the frequency responses in each of the 12 items were recoded dichotomously to instead indicate whether a particular critical incident was ever experienced (responses > 0 were recoded to 1) or not experienced (0 responses were kept as 0). The variety index approach was then used, where the total score was summed to indicate the volume of critical incidents experienced. Sweeten (2012) evaluated the merits of this approach and found that it was less sensitive to high-frequency items, much less skewed, and had high concurrent and predictive validity.

Work Stress. Work stress was included as a mediator variable and was measured using the Correctional Officer Work Stress Scale (COWSS). The 6-item COWSS scale,

derived from Cullen and colleagues' (1985) work stress scale, measured how anxious COs feel on duty. Participants responded to statements such as "when I'm at work, I often feel tense or uptight" on a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree (see Appendix A for the full set of items). Scores on these 6 items were summed, with higher scores indicating higher on-duty stress levels.

PTSD. PTSD was included as a mediator variable, measured using the PTSD Checklist for DSM-V (PCL-5) to estimate the prevalence of PTSD among the COs in the sample. The PCL-5 questionnaire consists of 20 items where participants rate their level of experience with various PTSD symptoms in the past month on a scale of "Not at All = 0" to "Extremely = 4" (i.e., "Repeated, disturbing, and unwanted memories of the stressful experience?"; Weathers et al., 2013, 2014; see Appendix A for the full set of questions). Scores on the PCL-5 are summed and range from 0-80, where higher scores indicate higher PTSD symptomology. The clinically determined cutoff score for diagnosable PTSD is 38 (Weathers et al., 2013).

Control Variables

Control variables included *age*, which was measured continuously in years. *Gender* is measured as a dummy variable where 1=man and 2=woman. *Race* is a categorical variable where participants indicated whether they were White, Black, Asian, or Other. Ethnicity was measured as a dummy variable where individuals reported whether they were *Hispanic*. Lastly, education was measured as a dummy variable indicating whether the individual had a *college degree* (1=Bachelor's or higher; 0=Associates degree or less).

Analysis

After reporting descriptive statistics for all study variables, the impact of critical incidents on suicide ideation was measured using a Structural Equation Modeling (SEM) framework that also assessed the mediating roles of correctional officer work stress and PTSD through a series of Ordinary Least Squares (OLS) and logistic regression models. The first regression model estimated the total effect of critical incidents on suicide ideation. To calculate direct effects, the impact of critical incidents on suicide ideation was then estimated while accounting for correctional officer work stress and PTSD. Further, the indirect impact of critical incidents on suicide ideation was examined by assessing the relationship with the inclusion of the mediating mental health variables. The Sobel z test tested the significance of the indirect effects of correctional officer work stress and PTSD. The final step involved calculating the proportion of the total impact of critical incidents on suicide ideation that was mediated by the mental health mediator variables.

RESULTS

As Table 1 shows, most of the sample is White (58%) and consists of men (82%) between the ages of 41 and 60 years old (66%). Most worked in a prison (59%) and had an Associate’s degree or no college degree (75%). This sample closely matches the national averages of COs in the United States based on age, race, and gender. According to the Bureau of Labor Statistics (2022), nearly 70% of COs in the United States are men, about 64% are White, and nearly 62% are aged 35 or older. However, this sample slightly differs from the previously discussed averages from Washington state as the sample is made up of more men officers and fewer white officers.

Table 1. Sample Demographics (*N* = 420)

Variables	#	%
Gender		
Man	304	82
Woman	67	18
Race/Ethnicity		
White	244	67
Black	22	6
Hispanic	88	25
Other	45	12
Age		
24-30	14	4
31-40	71	18
41-50	118	36
51-60	106	30
61+	43	12
Education		
≤ Associate’s	280	75
≥ Bachelors Degree	92	25
Facility Type		
Prison	247	59
Jail	155	37
Other	17	4

As seen in Table 2, PCL-5 scores measuring PTSD symptomology ranged from 0-80 (note that 38 is the cutoff score for diagnosable PTSD). In this sample, the average PCL-5 score was 26.68, with 27.2% meeting the criteria for PTSD. Scores from COWSS, measuring work stress, ranged from 0-1, with higher scores indicating higher work stress. The average score on the COWSS was 0.72, showing high rates of work stress in the sample. The variety index scores measuring exposure to critical incidents on the job ranged from 0-7, with higher scores signifying more exposure to critical incidents. The average number of critical incidents experienced within the past six months was 2.35. Finally, almost 17% of the sample reported experiencing suicide ideation within the past year.

Table 2. Study Variable Descriptives ($N = 420$).

Variables	Mean/%	SD	Min	Max
Critical Incidents	2.35	2.00	0	7
Suicide Ideation	16.58%			
Work Stress	0.72	0.31	0	1
PCL-5	26.68	18.26	0	78

Table 3 reports the results of all the models in the SEM framework. Models 1 through 3 report the relationship between critical incident exposure and suicide ideation, with work stress included as the mediating variable in model 3. Model 1 was a logistic regression estimating the total effect of critical incident exposure on suicide ideation. This model indicated a strong, positive association between the number of critical incidents experienced and past year suicide ideation ($b = .11$, $RSE = .03$, $p < .001$). For every critical incident experienced, there was an 11% increase in the likelihood of past year suicide ideation.

Model 2 was an OLS regression estimating the impact of critical incidents on work stress. This model shows that higher critical incident exposure predicted higher work stress ($b = .04$, $RSE = .00$, $p < .01$). Model 3, a logistic regression estimating the direct effect of critical incidents on suicide ideation while controlling for work stress, indicated a strong, positive association between work stress and past year suicide ideation ($b = 1.25$, $RSE = .22$, $p < .001$), while the direct effect of critical incident exposure on suicide ideation approached significance ($b = .06$, $RSE = .03$, $p < .10$). This model denotes that each point increase in the work stress scale was associated with a 250% increase in the likelihood of past-year suicide ideation.

Model 4 was an OLS regression estimating the impact of critical incident exposure on PTSD, showing that critical incident exposure significantly predicted higher PTSD symptomology ($b = 2.59$, $RSE = .23$, $p < .01$). Model 5 was a logistic regression estimating the direct effect of critical incident exposure on suicide ideation while controlling for PTSD. This model indicated that higher PTSD symptomology significantly predicted a greater likelihood of suicide ideation ($b = .05$, $RSE = .00$, $p < .001$). In this model, every point increase on the PCL-5 was associated with a 5% higher likelihood of past-year suicide ideation. The direct effect of critical incident exposure on suicide ideation was no longer significant when PTSD was controlled for.

Variables	Model 1 ^a		Model 2 ^b		Model 3 ^a		Model 4 ^c		Model 5 ^a	
	b(RSE)	OR	b(RSE)	b(RSE)	OR	b(RSE)	b(RSE)	OR		
Critical Incidents	.11(.03)*	1.11	.04(.00)*	.06(.03)†	1.07	2.59(.23)**	-.03(.04)	.97		
Work Stress	-	-	-	1.25(.22)**	3.50	-	-	-		
PTSD	-	-	-	-	-	-	.05(.00)***	1.05		
Black	-.08(.20)	.92	-.00(.01)	.06(.19)	.94	3.93(2.33)	-.84(.79)	.43		
Asian	.60(.48)	1.83	-.14(.02)	.77(.48)	2.16	6.13(7.34)	.79(1.16)	2.19		
Other Race	.13(.23)	1.14	-.10(.04)	.22(.26)	1.25	-6.32(2.54)	.16(.27)	1.18		
Hispanic	-.11(.10)	.90	.07(.03)	-.20(.06)**	.82	5.62(2.85)	-.28(.03)***	.76		
Age	-.02(.03)	.98	-.00(.00)	-.02(.03)	.98	.01(.08)	-.02(.03)	.98		
Gender	-.09(.54)	.91	-.01(.07)	-.08(.48)	.92	-2.32(.87)	-.06(.67)	.94		
Education	-.07(.09)	.93	-.00(.00)	-.06(.10)	.94	-.35(.69)	-.09(.04)*	.92		
Intercept	-.74(.72)	.48	.70(.22)†	-1.66(1.14)	.19	42.11(5.66)	-	.06		
						*	2.86(.65)***			

Note. b = coefficient in log odds; RSE = robust standard error; OR = odds ratio. All models adjust for clustering by facility type. ^aLogistic regression predicting suicidality. ^bOLS regression predicting work stress. ^cOLS regression predicting PTSD. **p* < .05. ***p* < .01. ****p* < .001. †*p* < .10. White was left out of models as race reference group.

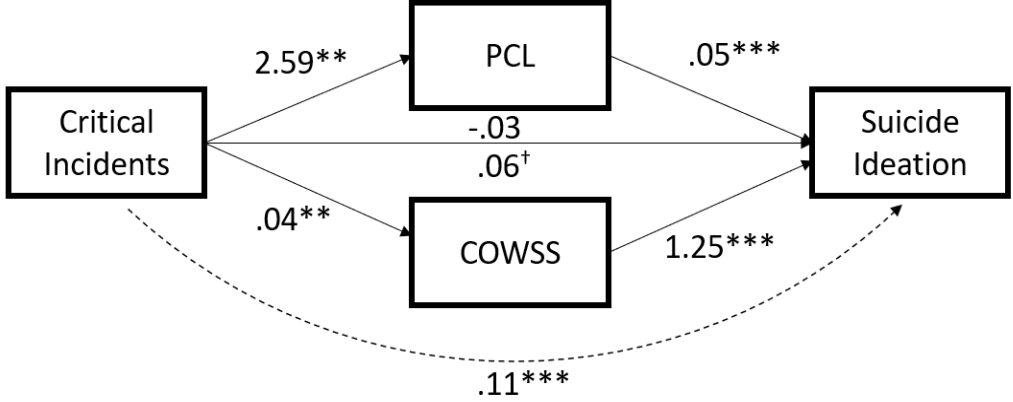


Figure 1 shows the visualization of the relationship between critical incidents and suicide ideation with PTSD and work stress mediating variables. The dashed line represents the total effect.

The Karlson, Holm, and Breen (KHB) method was used to estimate the indirect effect of mental health mediators, PTSD and work stress, on the relationship between

critical incidents and past-year suicide ideation (Karlson et al., 2012; Kohler et al., 2011). This model indicates a strong, significant indirect effect of work stress ($b = .05, p < .001$) and suggests that 43.38% of the relationship between critical incidents and suicide ideation was mediated by work stress. The model also indicates a strong, significant indirect effect of PTSD symptomology ($b = .13, p < .001$), showing that PTSD mediated 129.78% of the relationship.

Table 4. Indirect Effects of Mental Health Mediators ($N = 420$)

	b(RSE)	Proportion Mediated
Work Stress	.05(.01) ^{***}	43.38%
PTSD	.13(.02) ^{***}	129.78%

Note. b = coefficient in log odds. RSE = robust standard error.

^{***} $p < .001$. ^{**} $p < .01$. ^{*} $p < .05$. [†] $p < .10$.

DISCUSSION

The goal of this study was to estimate the prevalence of health and wellness outcomes (i.e., critical incidents, stress, PTSD, and suicide ideation), investigate the relationship between critical incidents and suicide ideation, and estimate the role of mental health variables (stress and PTSD) on this relationship. Research continues to demonstrate that COs experience poor health and wellness outcomes, so the current study sought evidence to help identify the mechanism in which COs face these poor outcomes and, therefore, help inform target intervention and prevention strategies to improve these problems. In this manner, the rate of COs who die by suicide could be reduced. Further, intervention strategies could also reduce adverse events associated with these outcomes, such as the use of force, workplace mistakes, injuries, and death, thereby improving health and wellness outcomes for COs and those in custody. Findings illustrate high rates of mental health problems in this sample of COs. Additionally, all models showed significant relationships between critical incident exposure and mental health indicators. These findings and their implications are discussed in more detail below.

Strikingly, high rates of mental health issues were observed within this sample. As noted in previous studies using this data set (Lavender & Todak, 2021), PTSD symptomology was very high, as 27% of the sample met the criteria for diagnosable PTSD. The current study shows that the rate of suicide ideation among this sample is also extremely high at 17%. This is over three times the average observed within the general population (about 5.5%, see Lee et al., 2010) and more than double what has been

previously reported in the CO population (about 7%, see Fusco et al., 2021). Consistent with existing literature, high rates of stress were also observed within this sample (Brough & Williams, 2007; Finney et al., 2013; Trounson et al., 2019). These findings continue to illustrate the incredibly stressful, detrimental nature of the correctional work environment. As empirical evidence increases, the degree of these poor outcomes continues to appear more extensive, indicating a dire need for evidence-based intervention strategies that protect the mental and physical health of COs.

The current study also found that critical incident exposure significantly predicts suicide ideation among COs. This finding is consistent with previous literature, as multiple studies have noted that critical incident exposures are linked to increased risk for suicide (LeardMann et al., 2013; Stanley et al., 2016; Violanti et al., 2008). The traumatic nature of critical incidents has a devastating, deleterious impact on the mental health of COs. As evidenced by this model, each critical incident that COs experienced denoted an 11% increase in the likelihood that COs reported suicide ideation within the past year. Unfortunately, this observation further demonstrates the mental burden many COs are forced to experience in their everyday work environment. All too often, these distressing experiences have led to increased consideration among COs to take their own life. This finding alone justifies the need for additional mental health resources to be provided to COs and underscores the importance of future empirical focus on the traumatic impacts of critical incidents.

Evidence continues to show that critical incidents are a driving force behind poor health and wellness outcomes. Work stress and PTSD explain the relationship between critical incidents and suicide ideation; that is, critical incidents predict work stress and

PTSD, which in turn contribute to higher rates of suicide ideation among COs. While previous literature has noted some of these associations, this observation expands upon that prior knowledge by contextualizing how these outcomes manifest. However, critical incident exposure is not the only factor significantly contributing to these poor outcomes. Interestingly, nearly 130% of the relationship between critical incidents and suicide ideation was mediated by PTSD, indicating that PTSD not only explains the effect of critical incidents on suicide ideation but also that PTSD exerts an additional impact on suicide ideation above and beyond critical incidents. Not only does this observation imply that additional forces are contributing to the high rate of PTSD, but it also suggests that if PTSD is addressed through treatment and intervention, the effect of critical incident exposures and suicide ideation can potentially be negated. Nonetheless, this finding echoes previous literature that found PTSD was associated with higher suicidality (Maia et al., 2007; Panagioti et al., 2012). Based on these findings, future research should focus on examining which critical incidents carry the most traumatic consequences, and future interventions should prioritize developing solutions to limit critical incident exposure. Additionally, more investigation is needed to examine factors outside of critical incident exposure contributing to the high rate of PTSD observed.

Overall, the findings in this study echo and expand upon existing literature and provide various policy and practice implications. The prevalence rates of many of the poor outcomes discussed (i.e., PTSD and stress) resemble existing literature, while some exceed previous observations (i.e., suicide ideation). The relationships between critical incidents, work stress, PTSD, and suicide ideation also closely align with previous literature. However, the current study adds to the existing literature by providing context

on how these relationships manifest. While critical incidents are a leading factor in suicide ideation among COs, this relationship manifests through its association with higher work stress and PTSD. Examining methods to limit exposure to critical incidents could dramatically improve health and wellness outcomes for COs. However, these findings also suggest that providing additional resources for COs to help combat work stress and PTSD could also be successful in improving outcomes and mitigating the rate of suicide ideation.

There are some limitations to this study. First, the study is comprised of a non-random sample, limiting the generalizability of the results. Non-random samples can introduce bias as participants are selected based on factors such as availability and willingness to participate, which could result in certain groups or characteristics being over or underrepresented. Since the data was collected before the COVID-19 pandemic, the results could be different, and even worse, than what would be observed today as economic hardship that has become synonymous with the pandemic likely increased the financial burden and strain correctional facilities face. The dataset did not include a measure of the staff-to-PIC ratio, so it is unknown how different staffing situations could affect the outcomes that this study tests. Further, only a few health and wellness-related variables were included in these models. Other variables such as substance use and abuse, work-life conflict, and others were not included and could alter the results. Additionally, all responses are self-reported; therefore, results do not represent actual clinical diagnoses of mental health disorders such as PTSD within the sample. Lastly, the highly sensitive nature of this study could influence the responses as participants may be reluctant to report traumatic experiences or their mental health issues.

In conclusion, critical incidents play an integral role in the poor health and wellness outcomes that COs experience. However, these observations imply that other factors contribute to these distressing results. Further research is needed to investigate other risk factors contributing to PTSD among the CO population. Nonetheless, intervention strategies designed to limit critical incident exposure and provide mental health resources focusing on stress, PTSD, and suicide prevention are vital. The lives and livelihoods of COs are at stake.

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APPENDIX A
INDEPENDENT VARIABLE SCALES

Correctional Officer Work Stress Scale (Cullen et al., 1985)

This set of questions measures the extent to which you experience stress at work. If you have left or retired from your job as a correctional officer, please answer these questions about the position you held the longest.

1. When I'm at work, I often feel tense or uptight.
2. A lot of times, my job makes me very frustrated or angry.
3. Most of the time at work, I don't feel that I have much to worry about.
4. I am usually calm and at ease when I am working.
5. I usually feel that I am under a lot of pressure when I am at work.
6. There are a lot of aspects about my job that can make me pretty upset about things.

Critical Incident Questionnaire (Weiss et al., 2010)

This set of questions measures the extent to which you experience common stressors of corrections work. If you have left or retired from your job as a correctional officer, please answer these questions about the position you held the longest.

Please indicate how many times you have experienced each incident over the past six months. If you have not experienced a particular incident, please write 0.

1. Being injured intentionally (e.g., by a suspect) in the line of duty ____
2. Being injured accidentally (e.g., by a fall) in the line of duty ____
3. Being present when a fellow officer was injured intentionally (e.g., by a suspect) in the line of duty ____
4. Being present when a fellow officer was injured accidentally (e.g., by a fall) in the line of duty ____
5. Receiving serious threats towards your loved ones as retaliation for your work
6. Being involved in a use of lethal force encounter ____
7. Being involved in a use of force (less than lethal) encounter ____
8. Having your life threatened in the line of duty ____
9. Making a mistake that led to serious injury or death ____
10. Being involved in a car accident in the line of duty ____
11. Being involved in a car accident while off duty ____
12. Falling asleep at the wheel of a car ____

Posttraumatic Stress Disorder Checklist (PCL-5; Weathers et al., 2013)

Response options: 0 = Not at all; 1 = A little bit; 2 = Moderately; 3 = Quite a bit; 4 = Extremely

In the past month, how much were you bothered by:

1. Repeated, disturbing, and unwanted memories of the stressful experience?
2. Repeated, disturbing dreams of the stressful experience?
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?
4. Feeling very upset when something reminded you of the stressful experience?
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?
6. Avoiding memories, thoughts, or feelings related to the stressful experience?
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?
8. Trouble remembering important parts of the stressful experience?
9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?
10. Blaming yourself or someone else for the stressful experience or what happened after it?
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?
12. Loss of interest in activities that you used to enjoy?
13. Feeling distant or cut off from other people?
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?
15. Irritable behavior, angry outbursts, or acting aggressively?
16. Taking too many risks or doing things that could cause you harm?
17. Being "super alert" or watchful or on guard?
18. Feeling jumpy or easily startled?
19. Having difficulty concentrating?
20. Trouble falling or staying asleep?