

CORRECTIONAL OFFICERS WITH MORE SERVICE TIME ARE MORE LIKELY TO EXPERIENCE PERSISTENT MENTAL HEALTH PROBLEMS

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Correctional officers (COs) are known to have differentially high prevalence rates of mental health problems, but little is known about persistent mental health problems among COs. Using a longitudinal sample of COs from the Minnesota Department of Corrections (MnDOC) ($n = 343$), the current study examines the probability of persistent clinically severe post-traumatic stress disorder (PTSD), depression, and anxiety across levels of service time. The stability of clinically severe PTSD was moderated by service time. The probability of clinically severe depression increased across levels of service time for COs with a history of depression. Finally, the probability of clinically severe anxiety was not statistically different, regardless of anxiety history, after approximately 20 years of service time. Results indicate that the association of service time and persistent mental health problems is unique to each mental health outcome. Institutions should prioritize specific mental health interventions across the range of CO service time.

Keywords: correctional officers; mental health; service time; PTSD; anxiety; depression

INTRODUCTION

The United States is currently experiencing massive correctional worker shortages with full-time state correctional employees (i.e., correctional and parole/probation officers) declining by an average of 10% from 2019 to 2022 (Heffernan & Li, 2024). This drop has been met with a 2% increase in state prison populations from 2021 to 2022, the first increase

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in almost 10 years (Heffernan & Li, 2024). Increased housing demands and correctional officer (CO) shortages within correctional settings, such as state-run prisons, have been found to result in greater reliance on punitive policies, such as lockdowns, to maintain order and safety (Santo & Neff, 2020). Occupational stressors have been identified as a key contributor to staffing shortages, driving COs' intent to quit (Griffin et al., 2014) and staff turnover (Lambert, 2001).

At the same time, these occupational stressors can also result in negative mental health outcomes, ultimately driving some COs out of the corrections workforce and limiting interested and qualified applicants. For example, COs self-report higher rates of mental health disorders such as post-traumatic stress disorder (PTSD), anxiety, and depression relative to the general population (Schwartz et al., 2024; St. Louis et al., 2023). COs have also been found to differentially experience emotional burnout (Lambert et al., 2015), work family conflict (Jaegers et al., 2021) and high levels of job stress (Schaufeli & Peeters, 2000). For example, emotional burnout among COs has been found to directly influence absenteeism, increase turnover intent, and result in decreased perceptions of work satisfaction (Lambert et al., 2015).

Despite these findings, less is known regarding the factors that ultimately contribute to increased mental health problems among COs. For example, the amount of time an officer spends on the force (i.e., service time) has not been examined as a potential contributor to mental health outcomes. Similarly, despite the differential concentration of mental health problems among COs, little is known about the persistence of such problems—that is, reoccurring and significant symptoms. The current study employs a longitudinal sample of COs to examine the potential relationship between service time and experiencing persistent clinically severe levels of PTSD, depression, and anxiety over 12 months. The primary aim of the current study is to illuminate the possible effects of service time on COs' mental health.

PERSISTENT MENTAL HEALTH PROBLEMS AND SERVICE TIME IN THE CONTEXT OF THE RESILIENCY-FATIGUE MODEL

Within state-run prison systems, COs disproportionately experience mental health problems (Jaegers et al., 2021; Ricciardelli et al., 2022; St. Louis et al., 2023), with work-related trauma exposures serving as a potent source of influence. One possible theoretical explanation for these widespread mental health problems is that COs respond to occupational stressors through resilience followed by fatigue. This phenomenon, previously referred to as the *resiliency-fatigue model* (Schwartz et al., 2024), hypothesizes individuals can be resilient to stressors up to a threshold, and once stressors accumulate past that threshold, individuals can no longer effectively cope, increasing the likelihood of experiencing subsequent mental health problems. While previously unexplored, the resiliency-fatigue model may also provide insights into factors that contribute to the persistence of mental health problems among COs. More specifically, occupational stressors may accumulate over time including exposure to traumatic experiences. If occupational stressors accumulate after an officer has already developed a given mental health problem, it is possible that effective coping resources will remain unavailable and such problems may be more likely to persist for an extended period of time.

The resiliency-fatigue model may also provide insights into the role of service time on mental health outcomes. For example, newly employed officers undergo an acclimation to their workplace environment, which can facilitate resilience to workplace stressors when

officers are immersed in supportive organizational structures (Schwartz et al., 2024). However, as service time increases, COs are expected to become more independent, which may result in psychological stress stemming from accumulating stressor exposures (Schaufeli & Peeters, 2000), eventually leading to emotional fatigue and mental health problems (Steiner & Wooldredge, 2015).

Previous research has yet to fully examine the potential impact of service time on persistent mental health outcomes for currently employed COs. However, research has identified factors that pushed COs to leave the force, including job stress, burnout (Lambert, 2001), and emotional dissonance (Ferdik et al., 2014). Previous work into COs and service time has found that workplace stressors differentially impact officers at different points of service time. For example, when career stage theory was applied to a sample of COs, job stress was found to increase turnover intent among officers with less than 5 years of service time, but not among officers with five or more years of service time (Griffin et al., 2014). While Griffin and colleagues (2014) did not include mental health measures in their application of career stage theory among COs, their work highlights the possibility that COs are impacted by and experience occupational stressors differently across the range of service time.

In this way, the role of service time may offer greater insight into factors that contribute to CO mental health problems. Specific research investigating the impact of service time on negative outcomes among COs has mixed results. In some cases, service time has been thought to be a protective factor, where more years of service time is hypothesized to increase organizational commitment and job satisfaction (Lambert, 2001). This hypothesis was supported by Jaegers and colleagues (2021) who found that less time on the job, not more, was a significant predictor of burnout among jail COs. In direct contrast, Clemente and colleagues (2015) found that more years of service time was a risk factor for increased burnout rates among COs in Peru. Research on the role of service time on mental health problems among COs is needed as turnover is a focal concern of the prison CO workforce, with 38% of COs working within state-run prisons leaving within their first year and 48% leaving in their first 5 years of employment (Gondles et al., 2023).

Taken as a whole, the current body of literature offers two possibilities regarding the relationship between service time and CO mental health. The first is that service time is a protective factor where COs learn coping strategies and build organizational commitment which helps them to successfully navigate workplace stressors. The second possibility is that service time is a risk factor resulting in accumulating occupational stressors and exhausting coping resources. Such accumulations can result in downstream persistent mental health problems.

CURRENT STUDY

The current study examines two main research questions. First, employing a two-cohort, longitudinal design, the current study examines the odds of clinically severe persistence of PTSD, depression, and anxiety among a sample of COs over an approximately 12-month period. While recent research has reported that COs have a higher risk of experiencing clinically severe self-reported levels of mental disorders than the general population (Ricciardelli et al., 2024), such studies employ cross-sectional study designs that prevent the assessment of persistent mental health problems over time. Longitudinal research into CO mental health is the minority of the literature (for a notable exception, see Jaegers et al., 2021). The current study employs longitudinal data which allows for the assessment of the persistence of

PTSD, depression, and anxiety over time, providing greater insights into the extent to which these issues become entrenched once developed.

Second, the current study examines whether persistent clinically severe levels of PTSD, anxiety, and depression vary across years of CO service time. This approach acknowledges that the odds of experiencing negative mental health outcomes can vary at different points during a CO's career (as seen in Clemente et al., 2015; Jaegers et al., 2021). While mental health symptomatology has been described as relatively stable over time (Diagnostic and Statistical Manual of Mental Disorders (5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013)), the patterns of persistent mental health problems are not expected to be the same for all officers across years of service time. The current study addresses this issue by assessing clinically severe levels of PTSD, depression, and anxiety at two time points approximately 12 months apart. Similarly, the current study examines whether patterns of mental health symptoms vary across service time. This approach allows for the potential identification of critical periods in which COs may be susceptible to persistent mental health problems, allowing for the development of targeted and time-specific interventions.

METHOD

DATA

Data for this study were collected from COs employed at three different correctional facilities within the Minnesota Department of Corrections (MnDOC) (Schwartz & Steiner, 2024). The three facilities were selected with guidance from MnDOC to obtain a sample that reflects COs employed statewide. Collectively, the three selected study sites included different security types, female and male populations, and constituted approximately 45% of Minnesota's total prison population, with a similar proportion of total state employed COs (Schwartz et al., 2024).

The first facility is the largest closed-security institution in the state which houses approximately 1,600 male individuals. The second facility is the largest correctional institution in the state that houses approximately 2,000 male individuals at medium-security. The third facility, the only female institution in the state, houses approximately 650 individuals across all security levels. The study employed a two-cohort, longitudinal design, with four data collection periods resulting in three waves of survey data for each study site. The first data collection was completed in July 2018 (Cohort 1: Time 1, Wave 1) with subsequent data collection periods in January 2019 (Cohort 1: Time 2, Wave 2; Cohort 2: Time 2, Wave 1), July 2019 (Cohort 1: Time 3, Wave 3; Cohort 2, Time 3, Wave 2) and January 2020 (Cohort 2: Time 4, Wave 3).

Using scheduling rosters provided by MnDOC, a total of 703 officers were present during Wave 1 recruitment and were eligible for inclusion. During the recruitment period, all eligible COs were sent an email with information on the research goals and methods of data collection. After the initial onboarding email, participating COs provided informed consent, in person, to a research team member from an on-site briefing room. The current study prioritized in-person interactions with COs during the recruitment and data collection period with the goal of increasing CO retention and survey completion. At the end of the recruitment period, 488 COs agreed to participate, resulting in a response rate of approximately 69% and a retention rate greater than 70% across subsequent waves. Site-specific response rates and survey administration procedures are detailed further in the

supplemental materials (available in the online version of this article). Wave 1 of data collection included a self-report survey containing items tapping a wide variety of topics including workplace experiences, family dynamics, demographics, and indicators of mental health problems. A similar survey was completed again at Wave 3, with a shortened self-report survey administered at Wave 2.

In addition to the self-report data, administrative data pertaining to COs' exposures to incarcerated individuals' disciplinary incidents were also collected. Data for documented disciplinary incidents that occurred within each study site was provided by MnDOC at two time periods: (1) approximately 9 months (about 272 days) before Wave 1; and (2) starting the day after Wave 1 data collection and ending the day before Wave 3 data collection (about 338 days). These data included details of each incident including the date and time each incident occurred and the nature of the incident (Schwartz et al., 2024). These data allow for the identification of COs who were involved in each incident (including responding COs). The use of administrative data, as opposed to self-reports, is also expected to limit recall bias. The current study examines disciplinary incidents that occurred between Wave 1 and Wave 3 of data collection as the examined mental health outcomes were assessed at Waves 1 and 3. Responses from Wave 2 were not included in the analyses, as Wave 2 utilized a shortened survey that did not include mental health measures. All data collection procedures were reviewed and approved by the Institutional Review Boards at the University of Nebraska Medical Center and Florida State University.

MEASURES

MENTAL HEALTH MEASURES

The current study used a binary measure to indicate clinically severe levels of three mental health outcomes. The use of binary measures allows for the identification of COs who specifically experience the persistence of clinically severe symptoms. The use of an alternative measurement strategy (e.g., a count of symptoms) would still allow for the identification of persistent symptoms, but not those that are clinically severe. As a result, binary indicator variables were best aligned with the examined research questions and employed in the current study.

Post-Traumatic Stress Disorder

The presence of clinically severe PTSD was assessed using the PTSD Checklist from the Diagnostic and Statistical Manual Fifth Edition (PCL-5). The PCL-5 is a 20-item self-report instrument which has found to be reliable and valid (Blevins et al., 2015) and is used regularly to assess PTSD symptomatology among COs (Ellison & Jaegers, 2022; Ricciardelli et al., 2022). Scores were summed separately at Wave 1 ($\alpha = .96$) and Wave 3 ($\alpha = .96$) to assess levels of PTSD at each wave. Individual measures of PTSD ranged from 0 to 80 with scores of 33 or greater indicating the presence of clinically severe PTSD (Bovin et al., 2016). Descriptive statistics for PTSD across Waves 1 and 3, along with all other study variables, are presented in Table 1.

Depression

The presence of clinically severe depression was assessed using the 10-item short-form from the Center for Epidemiologic Studies-Depression (CES-D), a previously validated

TABLE 1: Descriptive Statistics

Study Variables	Mean/%	SD/n	Min	Max
Service Time (Years)	8.827	6.949	0.083	30.5
PTSD				
Wave 1 No PTSD	59.06	202		
Wave 1 PTSD	40.94	140		
Wave 3 No PTSD	65.01	223		
Wave 3 PTSD	34.99	120		
Depression				
Wave 1 No Depression	78.43	269		
Wave 1 Depression	21.57	74		
Wave 3 No Depression	76.68	263		
Wave 3 Depression	23.32	80		
Anxiety				
Wave 1 No Anxiety	66.47	228		
Wave 1 Anxiety	33.53	115		
Wave 3 No Anxiety	68.23	234		
Wave 3 Anxiety	31.78	109		
Statistical Covariates				
Disciplinary Incident Exposure	56.977	71.381	0	456
Job Control	9.312	2.244	4	16
Job Demands	11.012	2.016	5	16
Role Ambiguity	8.688	2.257	4	16
Role Conflict	12.933	3.248	5	20
1st Watch	11.37	39		
2nd Watch	42.57	146		
3rd Watch (Reference)	39.07	134		
Other Watch	7	24		
Facility Site 1	42.27	145		
Facility Site 2 (Reference)	41.69	143		
Facility Site 3	16.03	55		
Violence Exposure Outside the Workplace	2.172	1.801	0	6
Age (Years)	37.878	10.064	19	67
Female (Reference)	31.49	105		
Male	68.51	235		
Not Married with No Children (Reference)	32.94	113		
Married with No Children	11.08	38		
Married with Children	43.44	149		
Not Married with Children	12.54	43		
White (Reference)	89.21	306		
African American	3.5	12		
Latino(a)	2.62	9		
Other Race	4.66	16		

self-report instrument (Radloff, 1977). Responses were summed separately at Waves 1 ($\alpha = .88$) and 3 ($\alpha = .87$) for each respondent, with the resulting measure ranging from 0 to 30. In line with previous research (Radloff, 1977), scores of 16 or greater indicated clinically severe depression (coded as 1) and scores less than 16 indicated less than clinically severe levels of depression (coded as 0).

Anxiety

Clinically severe anxiety was measured using the validated short-form (eight-item) version of the Patient Reported Outcomes Measurement Information System (PROMIS) Anxiety Scale (Cella et al., 2010). Responses were summed separately at Waves 1 ($\alpha = .96$) and 3 ($\alpha = .96$). The summed scores were then converted to T-scores using the National Institutes of Health T-score map (Rothrock et al., 2020). T-scores greater than 60 provide an indicated clinically severe anxiety (coded as 1) and T-scores of 60 or less indicated clinically severe anxiety was not present (coded as 0).

SERVICE TIME

COs were asked to self-report how long they had been employed by MnDOC in years and months during Wave 1. The resulting measure ranged from officers being on the job for less than a month (0.08 years) to more than 30 years ($M = 8.827$, $SD = 6.949$).

STATISTICAL COVARIATES

Statistical covariates were assessed at the same wave as the examined mental health outcomes (i.e., Wave 3) apart from demographic variables of (i.e., sex, race, family dynamics, and age) which were collected at Wave 1. In total, 12 covariates were included in all multivariate models. All measures tapping workplace perceptions utilize previously developed additive Likert-type self-report scales with responses ranging from strongly disagree to strongly agree. First, job control was measured by using a four-item index ($\alpha = .73$) which assesses COs' perceptions of their ability to make decisions while on shift (Steiner & Wooldredge, 2015) with greater scores indicating increased perceptions of job control ($M = 9.361$, $SD = 2.253$). Second, job demands ($\alpha = .70$) were assessed using a four-item index previously used to assess COs' perceptions of the safety and staffing environment of their workplace (Steiner & Wooldredge, 2015) with higher scores indicating greater individual perceptions of job demands ($M = 9.361$, $SD = 2.253$). Third, role ambiguity was measured using a four-item index ($\alpha = .78$) tapping COs' perceptions of how they perceive their roles (Şenol-Durak et al., 2006) such that greater values indicated greater role ambiguity at work ($M = 8.648$, $SD = 2.258$). Fourth, role conflict was measured using a five-item index ($\alpha = .86$) to assess COs' perceptions of their alignment between rules and policies and what is required to complete their work responsibilities (Şenol-Durak et al., 2006) with higher scores indicating greater individual perceptions of role conflict ($M = 12.887$, $SD = 3.227$).

Fifth, violence exposure outside of the workplace was measured using a six-item index asking officers to self-report their exposure to violence outside of work within the past 12 months at Wave 3. Responses were coded dichotomously as 1 = *did occur in the past year* and 0 = *did not occur in the past year* and then summed ($\alpha = .73$) for each officer with values ranging from 0 to 6 ($M = 2.172$, $SD = 1.801$). Sixth, officers were asked to report their marital status and if they had children living with them in their primary residence. Responses were coded into four categories: 1 = *not married/no children* (32.94%) which served as the reference category, 2 = *married/no children* (11.08%), 3 = *married/children* (43.44%), and 4 = *not married/children* (12.54%). Seventh, each CO was asked to report which shift they worked most frequently at Wave 3. Responses were coded such

that 1 = *first watch* (10 p.m. to 5 a.m.; 11.37%), 2 = *second watch* (5 a.m. to 2 p.m.; 42.57%); 3 = *third watch* (2 p.m. to 10 p.m.; 39.07%) which served as the reference category, and 4 = *any other shift* (7.00%). Eighth, officers were asked to report their employment site at Wave 3. Responses were coded into three categories such that 1 = site 1 (42.27%), 2 = site 2 (41.69%), which served as the reference category, and 3 = site 3 (16.03%). The study site was introduced to each model as a control variable to account for operational differences across study sites. Ninth, officers were asked to report their age, in years, at Wave 1 of data collection ($M = 37.878$, $SD = 10.064$). Tenth, officer sex was reported at Wave 1 and was dichotomized into a dummy variable with values of 0 for females (31.49%) and 1 for males (68.51%). Eleventh, officer race was reported at Wave 1 and was coded such that 1 = *White* (89.21%) which served as the reference category, 2 = *African American* (3.5%), 3 = *Latino(a)* (2.62%), and 4 = *Other* (4.66%). Twelfth, disciplinary incident exposure was measured using the data provided by MnDOC. The disciplinary incident exposure measure was comprised of exposures from the day after Wave 1 data collection until the day before Wave 3 (approximately 338 days). A disciplinary incident exposure is any event where an officer's response to the misbehavior of an incarcerated individual is required (i.e., an assault on an officer or other incarcerated individual). Disciplinary exposure data were used to create a count measure of overall incidents for each CO ($M = 56.977$, $SD = 71.381$).

PLAN OF ANALYSIS

The first step of the analysis involved the estimation of a series of logistic regression models. The first pair of models examined the odds of persistent clinically severe PTSD at Wave 3. The first model regressed the Wave 3 clinically severe PTSD indicator on service time, the Wave 1 clinically severe PTSD indicator, and all covariates. The inclusion of the clinically severe PTSD indicator at Wave 1 allows for the assessment of the extent to which mental health problems observed at Wave 1 persist to Wave 3. The second model added a multiplicative interaction term between service time and the Wave 1 clinically severe PTSD indicator. The purpose of the interaction is to determine whether COs with more or less years of service time are differentially susceptible to PTSD persistence. When interpreting the interaction effect, the coefficient of the interaction term itself has been found to be an inappropriate indicator of the size, magnitude, or significance of moderating effects when using a nonlinear estimator, as is the case with logistic regression (Mize, 2019). This observation has led many to conclude that "the interaction effect . . . cannot be evaluated simply by looking at the sign, magnitude, or statistical significance on the interaction term when the model is nonlinear" (Mize, 2019, p. 94).

Given these limitations, alternative approaches better suited for assessing moderating effects when examining binary outcomes have been identified (McCabe et al., 2018; Mize, 2019). More specifically, marginal effects represented in the metric of predicted probabilities, can be used to estimate what have been previously referred to as tests of first and second differences (McCabe et al., 2018; Mize, 2019). The first difference test assesses if the marginal effects between two groups are equal across levels of the hypothesized moderator. When marginal effects across groups are not equal, there are significant group differences. However, a significant first difference does not indicate a significant moderating effect, merely a significant group difference of marginal effects. Group differences in marginal effects indicate that the discrete change of one group is not equal to the discrete change of

the other group across the same range of the independent variable (Mize, 2019). Alternatively, the second difference test measures if the rate of change in marginal effects for one group across levels of the moderator is statistically different from the rate of change in marginal effects for the second group. A significant second difference test indicates if a significant interaction effect (i.e., moderating effect) is present across levels of the moderator.

Tests of first and second differences were calculated to assess whether the effect of clinically severe PTSD at Wave 1 on the persistence of clinically severe PTSD at Wave 3 was moderated by years of service time. The first difference test was calculated by finding the difference of marginal effects of COs who experienced clinically severe PTSD at Wave 1 and COs who did not have clinically severe PTSD at Wave 1 across the range of service time in 5-year intervals. Marginal effects using intervals of 1, 3, 5, and 9.5 years of service time were also tested with no substantive differences in the resulting marginal effects. As such, 5-year intervals with seven total timepoints were selected. The significance of group differences is assessed at each of the seven-time intervals across service time by comparing 95% confidence intervals of COs who had clinically severe PTSD at Wave 1 and COs who did not have clinically severe PTSD at Wave 1 at each 5-year interval. When 95% confidence intervals do not overlap, then there is a statistically significant difference in the predicted probability of experiencing clinically severe PTSD at Wave 3 between COs with and without a history of clinically severe PTSD at Wave 1. When 95% confidence intervals do overlap, there is no significant difference. First differences across a continuous variable (i.e., years of service time) are likely to have regions of significance across the range of the measure where significant and nonsignificant first differences can be present at different levels of service time.

From calculated first differences, a second difference test is used to assess if there is a statistically significant moderating effect of service time on the persistence of clinically severe PTSD at Wave 3 among COs with and without a history of PTSD at Wave 1. The second difference test assesses if the rate of change in predicted probabilities of experiencing clinically severe PTSD at Wave 3 across levels of service time are equal between COs with and without a history of clinically severe PTSD at Wave 1. A significant second difference test indicates there is a significant moderating effect (Mize, 2019) of service time on the observed persistence in clinically severe PTSD between Waves 1 and 3.

A second set of models were identical to the first but examined clinically severe depression rather than PTSD. The third set of models examined clinically severe anxiety. As the current study is focused on examining the persistence of clinically severe mental health problems across service time, predicted probabilities and marginal effects were estimated and presented graphically. However, in the interest of disclosure, full results from all estimated regression models including odds ratios and their accompanying confidence intervals are presented in the supplemental materials. To estimate a possible moderating effect, marginal effects and predicted probabilities were estimated with all covariates set to their means. All analyses were performed using Stata 18 (StataCorp, 2023).

RESULTS

PERSISTENCE OF CLINICALLY SEVERE PTSD

The first set of logistic regression models regressed the Wave 3 clinically severe PTSD indicator on service time, Wave 1 clinically severe PTSD indicator, and all covariates.

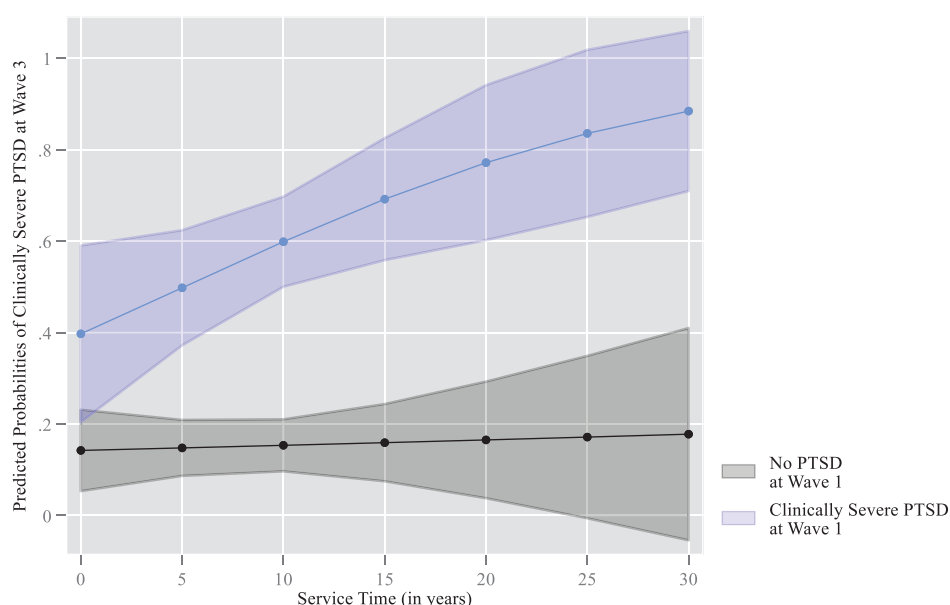


Figure 1: Predicted Probabilities of Clinically Severe PTSD Persistence Across Service Time

Note. Each point represents the predicted probability of clinically severe PTSD at Wave 3 for COs with a history of PTSD at Wave 1 (top points and trendline) and without a history of PTSD at Wave 1 (bottom points and trendline). The shaded regions represent 95% confidence intervals of the predicted probabilities for each group. Overlapping confidence intervals indicate nonsignificant group differences in the probability of clinically severe PTSD at Wave 3 of COs with and without a history of PTSD at Wave 1 at that specific level of service time. A comparison of the second derivatives of each group was calculated. The interaction of service time and clinically severe PTSD at Wave 1 was found to be significant (*coefficient* = -0.085 , $p = .027$). When calculating for a possible moderating effect, statistical covariates (disciplinary incident exposure, job control, job demands, role ambiguity, role conflict, shift, facility, violence exposure outside the workplace, age, biological sex, family dynamics, and race) were all held at their means.

The results are presented in accompanying supplemental materials (Supplemental Table S1, available in the online version of this article). Model 1 examines the association between service time and the odds of clinically severe PTSD at Wave 3 as well as the persistence of PTSD between Waves 1 and 3. As indicated by the large odds ratio for the Wave 1 PTSD clinically severe indicator ($OR = 7.317$, $95\% CI = 4.063\text{--}13.176$), officers who experienced clinically severe levels of PTSD at Wave 1 were significantly more likely to experience similar levels of PTSD at Wave 3 compared to their counterparts. Interestingly, service time ($OR = 1.040$, $95\% CI = 0.981\text{--}1.103$) did not display a significant independent influence on the odds of clinically severe PTSD at Wave 3.

Model 2 included an interaction term between clinically severe PTSD at Wave 1 and service time on the odds of experiencing clinically severe PTSD at Wave 3. The corresponding coefficient for the interaction term was nonsignificant ($OR = 1.076$, $95\% CI = 0.985\text{--}1.174$). In line with Mize (2019), the nonsignificant odds ratio does not provide sufficient evidence of a nonsignificant moderating effect. To more directly examine the potential moderating effect of service time on the persistence of clinically severe PTSD between Waves 1 and 3, tests of first and second differences were calculated. The results for the test of first differences (i.e., the assessment of equal marginal effects) are presented in Figure 1.

Outside of differences between officers with less than one year of service, the estimated group differences in the predicted probabilities of clinically severe PTSD at Wave 3 for COs with and without a history of PTSD at Wave 1 were significant—as evidenced by the non-overlapping confidence interval bands—across the examined levels of service time. However, first differences are insufficient in determining a significant moderating effect, as such, a test of second differences was calculated.

To assess second differences (i.e., the rate of change in marginal effects for each group across the range of service time), a comparison of the second derivatives of each group was calculated. The interaction of service time and clinically severe PTSD at Wave 1 was found to be significant (*coefficient* = -0.085 , $p = .027$), suggesting that the probability of persistent clinically severe PTSD is dependent on the level of service time. This moderating relationship is also displayed in Figure 1 as the slope of the trendline for COs who had clinically severe PTSD at Wave 1 is changing at an increased rate (i.e., greater second derivative) across levels of service time compared with the trendline of COs who did not have clinically severe PTSD at Wave 1.

PERSISTENCE OF CLINICALLY SEVERE DEPRESSION

The second set of models regressed the Wave 3 clinically severe depression indicator on service time, the clinically severe depression at Wave 1 indicator, and all covariates with results presented in the accompanying supplemental materials (Supplemental Table S2, available in the online version of this article). Results revealed that COs who experienced clinically severe depression at Wave 1 were significantly more likely to experience clinically severe depression at Wave 3 ($OR = 17.915$, $95\% CI = 8.527\text{--}37.640$) compared with COs without a history of depression at Wave 1. Similar to the PTSD models, service time ($OR = 1.036$, $95\% CI = 0.967\text{--}1.109$) was not significantly associated with clinically severe depression at Wave 3. Model 2 introduced the interaction term between service time and clinically severe depression at Wave 1 on the odds of experiencing clinically severe depression at Wave 3 with results presented in Figure 2. Results of first differences indicate significant group differences in the predicted probability of clinically severe depression at Wave 3 between COs with and without a history of depression at Wave 1 as illustrated in the non-overlapping confidence intervals across the full range of service time.

A test of second differences was nonsignificant (*coefficient* = -0.051 , $p = .300$), meaning the change in the slope of COs with a history of depression at Wave 1 is not statistically different from the trendline of COs without a history of depression at Wave 1. Stated differently, the effect of clinically severe depression at Wave 1 on the probability of persistent clinically severe depression at Wave 3 does not significantly vary across levels of service time.

PERSISTENCE OF CLINICALLY SEVERE ANXIETY

The third set of models regressed the Wave 3 clinically severe anxiety indicator on service time, anxiety indicator at Wave 1, and all statistical covariates, with results presented in the accompanying supplemental materials (Supplemental Table S3, available in the online version of this article). The large odds ratio for the clinically severe anxiety indicator at Wave 1 reveals that COs who experienced clinically severe anxiety at Wave 1 were significantly more likely to experience clinically severe anxiety at Wave 3 ($OR = 9.446$, $95\% CI = 4.967\text{--}17.965$) compared with COs without a history of anxiety at Wave 1.

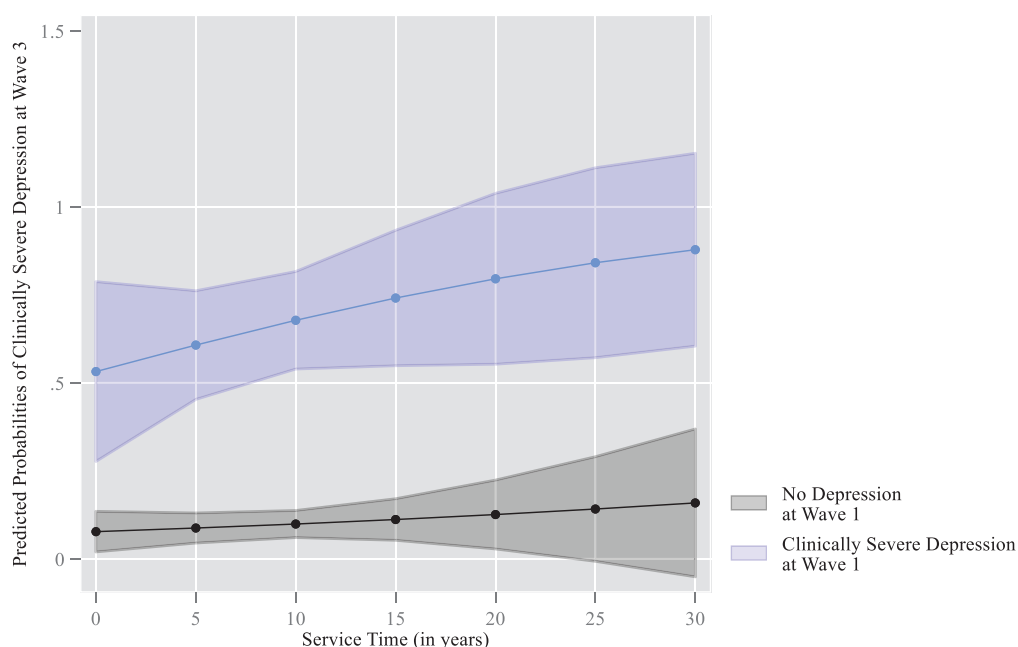


Figure 2: Predicted Probabilities of Clinically Severe Depression Persistence Across Service Time

Note. Each point represents the predicted probability of clinically severe depression at Wave 3 for COs with a history of depression at Wave 1 (top points and trendline) and without a history of depression at Wave 1 (bottom points and trendline). The shaded regions represent 95% confidence intervals of the predicted probabilities for each group. Non-overlapping confidence intervals indicate significant group differences in the probability of clinically severe depression at Wave 3 of COs with and without a history of depression at Wave 1 at that specific level of service time. A test of second differences, to assess for an interaction effect, was nonsignificant (*coefficient* = -0.051 , $p = .300$). When calculating for a possible moderating effect, statistical covariates (disciplinary incident exposure, job control, job demands, role ambiguity, role conflict, shift, facility, violence exposure outside the workplace, age, biological sex, family dynamics, and race) were all held at their means.

Similar to previous models, service time was not associated with the odds of clinically severe anxiety at Wave 3 ($OR = 1.009$, $95\% CI = 0.960\text{--}1.060$). Model 2 introduced the interaction term between clinically severe anxiety at Wave 1 and years of service time. Again, first and second differences tests were calculated to assess the possible moderating effects of service time on the persistence of anxiety with results presented in Figure 3. The test of first differences revealed significant group differences on the predicted probability of clinically severe anxiety in COs with and without a history of anxiety at Wave 1 until approximately 20 years of service time. There were no significant group differences in the predicted probability of Wave 3 clinically severe anxiety for COs with more than 20 years of service time, regardless of anxiety history. The test of second differences was nonsignificant (*coefficient* = 0.036 , $p = .360$), suggesting the persistence of clinically severe anxiety did not significantly vary across levels of service time.

SENSITIVITY ANALYSES

In addition to the primary analyses outlined above, several sensitivity analyses were also estimated. First, a second set of models were estimated for each mental health outcome, but

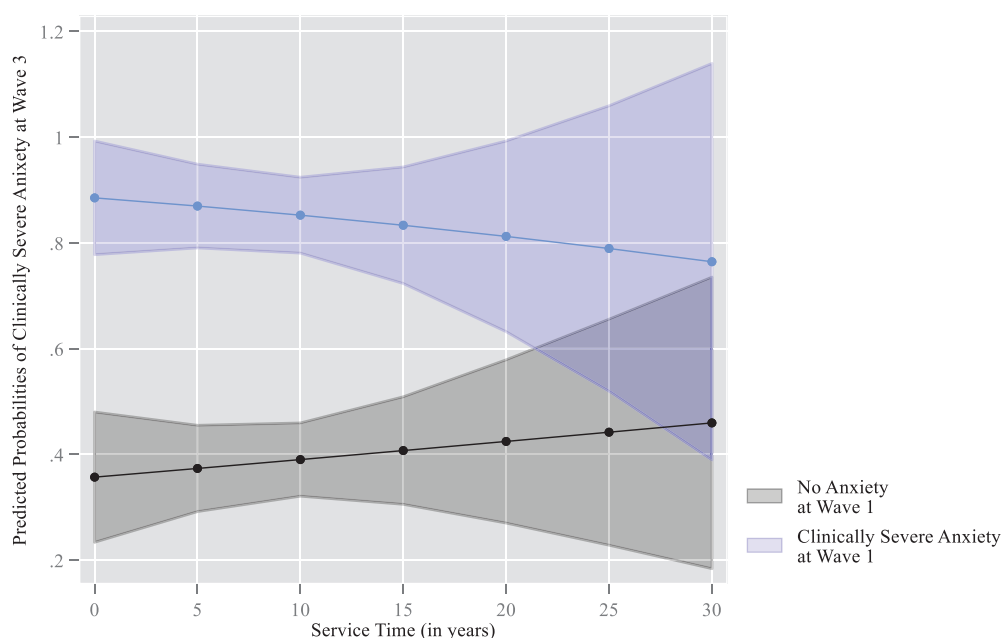


Figure 3: Predicted Probabilities of Clinically Severe Anxiety Persistence Across Service Time

Note. Each point represents the predicted probability of clinically severe anxiety at Wave 3 for COs with a history of anxiety at Wave 1 (top points and trendline) and without a history of anxiety at Wave 1 (bottom points and trendline). The shaded regions represent 95% confidence intervals of the predicted probabilities for each group. Overlapping confidence intervals indicate nonsignificant group differences in the probability of clinically severe depression at Wave 3 of COs with and without a history of anxiety at Wave 1 at that specific level of service time. The test of second differences, to assess a possible interaction effect, was nonsignificant ($coefficient = 0.036$, $p = .360$). When calculating for a possible moderating effect, statistical covariates (disciplinary incident exposure, job control, job demands, role ambiguity, role conflict, shift, facility, violence exposure outside the workplace, age, biological sex, family dynamics, and race) were all held at their means.

with a collapsed service time variable (where service time was winsorized at 20+ years). The patterns of significance from these sensitivity models were identical to models from the primary analysis using the full range of CO service time. As a result, the primary analysis retained the service time measure with the full range of observed years of service time. Second, a third set of models were estimated with the inclusion of a binary measure of supervisor status. The resulting pattern of results with this additional control did not differ in any substantive way from the primary models. Finally, missing data patterns were examined using logistic regression models and no systematic patterns of missingness were identified. Therefore, in the interest of model parsimony, listwise deletion was used to account for missing values for all estimated models.

DISCUSSION

Correctional officers (COs) disproportionately experience mental health problems such as post-traumatic stress disorder (PTSD) (Ellison et al., 2022), anxiety, and depression (Regehr et al., 2021). Despite these findings, previous research has yet to fully investigate the role of service time on the development and persistence of mental health problems within the

context of the resiliency-fatigue model framework. Using a longitudinal sample of COs from the Minnesota Department of Corrections (MnDOC), the current study investigated the persistence of clinically severe levels of PTSD, depression, and anxiety across levels of service time. The results highlight three key findings.

First, across all mental health outcomes, the strongest predictor of future mental health problems are past mental health problems. While not surprising given the noted stability of mental health symptoms (APA, 2013), this result is problematic as it indicates that COs with current clinically severe mental health problems are likely to experience severe symptoms for the foreseeable future. This finding is consistent with previous research focused on CO mental health problems (Schwartz et al., 2024) and suggests that occupational stressors, including traumatic experiences, inherent to corrections work may serve as an important mechanism driving increased mental health problems in this population. In addition, these findings also suggest that once a mental health problem surfaces, it is significantly more likely to persist for an extended period. While still speculation, this pattern of persistence may be the result of the further accumulation of traumatic work-related experiences, as suggested by the resiliency-fatigue model. Given this possibility, a greater emphasis on the implementation of recurring mental health screenings, needs assessments, and counseling services (Ricciardelli, Carleton, Gacek, & Groll, 2020) are likely to have wide ranging benefits for all COs but may be particularly impactful for those with a history of mental health problems.

Second, the probability of persistent clinically severe levels of PTSD was dependent on levels of service time. As service time increased from 0 to 30 years, the probability of persistent clinically severe PTSD more than doubles among COs with a history of PTSD. This may be the case as symptoms of PTSD are marked by recurrent, involuntary, and intrusive memories of a past trauma exposure that triggered the PTSD onset (APA, 2013). Such memories of violent events can occur in flashbacks where the individual feels as though the traumatic event is recurring in their current surroundings, in nightmares where the individual relives the traumatic event while sleeping, or trigger intense physiological responses to cues that were present during the traumatic event such as smells or sounds. These intense, and sometimes debilitating, symptoms may occur years after the event and can be amplified by different types of occupational stressors which may accumulate across service time. For example, Schwartz and colleagues (2024) found that as critical incident exposures continued to accumulate among COs, mental health problems became more prevalent. In this way, occupational stressors, including but not limited to trauma exposures, may accumulate over time which can potentially amplify existing PTSD symptoms. Along these lines, it is also possible that COs with a history of PTSD are more likely to hold distorted belief systems which exacerbate their PTSD symptoms. For example, trauma-exposed individuals with PTSD have been found to experience higher rates of distorted cognitive beliefs (i.e., changing the way you view the world) and distorted blame beliefs (i.e., I experienced a traumatic event because I am a bad person) compared with trauma-exposed individuals who did not suffer from PTSD (Cox et al., 2014). These distorted belief systems have also been found to result in more persistent PTSD symptoms over time (Paunovic, 1998).

These hypothesized mechanisms appear to be unique to PTSD and may be one possible explanation for the lack of moderating effect in the persistence of clinically severe depression and anxiety across levels of service time. The persistence of anxiety and depression may not be dependent on service time because their symptoms do not involve changes in

beliefs or include intrusive, recurrent, and pervasive memories of a past traumatic experience. It can be hypothesized that the underlying mechanisms of clinically severe depression and anxiety may be a function of more short-term stressors and environmental situations rather than long-term consequences to occupational stressors. For example, a systematic review found that depression and anxiety were associated with low levels of work support and low job satisfaction (Regehr et al., 2021). Workplace support and job satisfaction are more malleable within the short-term compared with long-term consequences of a PTSD triggering event.

Within correctional settings, preventive efforts to decrease exposure to occupational stressors, including trauma exposures, can be expected to benefit COs suffering from clinically severe levels of PTSD. From a prevention perspective, fully staffed correctional institutions offer greater safety for both officers and incarcerated individuals, preventing exposure to traumatic experiences and occupational stressors. Further, increased staffing levels may alleviate other common sources of workplace stressors, including less mandatory overtime (Finn, 1998). As a result, it is likely to take longer for negative workplace experiences to accumulate and reach the fatigue threshold posited by the resiliency-fatigue model. With that said, stressors are an inevitable aspect of correctional settings and interventions with an emphasis on fostering a trauma-informed environment, such as semi-regular meetings with a mental health professional (Ricciardelli, Carleton, Gacek, & Groll, 2020), are also likely to benefit COs suffering from PTSD. Within short-staffed institutions where mandatory overtime is necessary to maintain order, these trauma-informed interventions, such as fostering prosocial habits toward seeking mental health assistance and supports from commanding officers (Ricciardelli, Carleton, Gacek, & Groll, 2020) are still likely to be beneficial. For depression and anxiety, approaches geared toward bolstering workplace support systems and increasing job satisfaction are likely to be beneficial. Future research would benefit from a direct exploration of these factors with an emphasis on mechanisms contributing to the persistence of mental health problems, and their accompanying intervention strategies, among COs.

Third, results from the current study indicate resiliency and fatigue susceptibility to persistent mental health problems are likely unique to different types of mental health problems. Regarding PTSD and depression, results indicate that a pattern of fatigue may explain why officers with a history of PTSD and depression are likely to have persistent symptoms as service time increases. Within the context of the resiliency-fatigue model, it can be hypothesized that once COs meet the threshold of clinically serve PTSD or depression, they are less likely to regain resiliency which results in COs persistently suffering from severe levels of both PTSD and depression. Such findings are troubling as they suggest that more seasoned COs may require more mental health support than previously thought, especially for those with a history of PTSD or depression.

On the other hand, when it came to anxiety, results indicate there is no difference in the probability of experiencing clinically severe anxiety among COs with and without a history of anxiety after approximately 20 years of service time. There are at least two possible explanations for these findings within the context of the resiliency-fatigue model. First, it can be theorized that COs without a history of mental health problems may be more likely to exhaust coping resources for anxiety, but not for PTSD or depression. Resilience is the process and ability to successfully adapt to difficult environments through mental and behavioral flexibility and adjustment. It may be the case that when psychological stressors

are greater than available coping resources (Schaufeli & Peeters, 2000), fearful responses and increased anxiety levels are likely to manifest (Schwartz et al., 2024). These fearful and anxious responses, rather than depressed and PTSD symptoms, once available coping resources have been exhausted, may explain why the current study found no group difference in the likelihood of experiencing clinically severe anxiety at 20 years of service time, regardless of anxiety history.

Another possibility is that habituation is present among COs with a history of anxiety. Habituation is the process which posits that as experienced stressors increase in frequency and/or intensity over time, stress responses decrease over time (Rankin et al., 2009; Schwartz & Allen, 2024). It can be hypothesized that officers with a history of anxiety symptoms (i.e., excessive worry) become habituated to their stressful workplace environment as years of service time increase. On the contrary, the predicted probability of clinically severe anxiety increases over the range of service time for COs without a history of anxiety. It is possible that COs without a history of anxiety do not habituate to occupational stressors and may find that as stressors accumulate across service time, their anxiety symptoms also increase (Schwartz & Allen, 2024). This differential habituation hypothesis highlights the unique experience of COs with and without anxiety history as service time increases. Future research should further investigate unique factors and underlying mechanisms that manifest different mental health outcomes.

Additionally, the current study found that COs who did not have a history of clinically severe PTSD or depression did not have a significant increase in the probability of clinically severe onset as service time increased. It can be hypothesized that these COs are resilient to their stressful work environment with such resiliency being a protective factor from exhausting coping resources for PTSD and depression. For example, police officers with lower self-resilience were more likely to experience PTSD symptoms compared with officers with high self-resilience (Lee et al., 2016). Given these unique findings for PTSD and depression, future research should test the resiliency-fatigue model in other CO populations to see if such findings replicate.

Generally, the current study illustrates that mental health outcomes are complex phenomena that are influenced by a multitude of factors. For example, our models also indicated that other covariates, such as job control and violence exposures outside the workplace, are significant predictors of clinically severe PTSD. Further, role conflict was a significant predictor of clinically severe anxiety. Such results indicate that practitioners and researchers should consider multifaceted interventions to better understand, prevent, and treat mental health problems among COs.

The findings of the current study should be considered within the context of several limitations. First, while the employed mental health and perceptions of workplace environment measures have been previously validated and are widely used among various CO populations (Ellison & Jaegers, 2022; St. Louis et al., 2023), they rely on self-reported measures rather than clinical diagnoses as individual medical records were not available. The extent to which these findings would replicate if medical records indicating mental health diagnoses were employed remains an open question and should be investigated in future research. Second, the employed sample of COs was drawn from three facilities within a single state, potentially limiting the generalizability of the findings. Third, while the current study did employ a longitudinal design, it was limited to an approximate 12-month window with two measures of mental health information. Future research should

prioritize long-term cohort designs and multiple measurement occasions to better capture overall mental health problems, service time, and occupational stressors across the entire span of a CO's career.

Fourth, the current study used a binary measure for each mental health outcome. This restricts the application of results to COs who are not suffering from clinically severe levels of a mental health problem, but still experience subclinical levels. Assessing subclinical levels of mental health problems falls outside the scope of the current study but should be explored in future research. Fifth, the current study was not exhaustive in addressing underlying characteristics which can negatively influence CO mental health outcomes. Such individual differences can include baseline personality attributes, core beliefs, employment history, and limited career mobility. Future research would benefit from long-term cohort designs which follow CO recruits from their pre-employment training through retirement to control for baseline individual characteristics. Sixth, the current study utilized service time as a quantitative proxy measure for accumulating occupational stressors, including trauma exposures, within the context of the resiliency-fatigue model and was not able to capture the individual sources of influence that are expected to comprise service time. Future research should prioritize mixed methods designs to capture both quantitative statistical patterns and qualitative context to better understand how service time and accumulating trauma exposures affect mental health outcomes. Finally, the current study was not able to capture the distribution or growth of significant covariates due to insufficient datapoints for each covariate. Future research should prioritize additional data collection time points to better model the distribution and salience of relevant constructs across a CO's long-term career.

CONCLUSION

The results of the current study highlight the need for researchers and practitioners to emphasize mental health history and service time when considering interventions and policies aimed at improving CO mental wellness. Correctional institutions that hope to improve CO wellness should consider implementing interventions specifically targeting stress responses and fostering a trauma-informed environment. More specifically, "stress management interventions" (SMIs) aimed at providing officers with more effective coping strategies following prolonged stressor exposures have been previously discussed (Schwartz et al., 2024) as protective measures against exhausting coping resources. Additional studies have recommended evidence-based policies which advocate for a trauma-informed environment, such as Total Worker Health (TWH), are likely to be most effective because they combine individual, workplace, and community level considerations (Ellison et al., 2022) to target officer wellness. Multifaceted approaches, such as TWH, are likely to be beneficial to cover the identified workplace perceptions (i.e., job control and work conflict), individual characteristics (mental health history), and community trauma exposures (i.e., violence exposures outside work) that are likely to contribute to persistent mental health problems.

Pairing these trauma-informed interventions with workplace policies aimed at decreasing stigma in seeking mental health care services (Ricciardelli, Carleton, Mooney, & Cramm, 2020) and increasing workplace morale (Ricciardelli, Carleton, Gacek, & Groll, 2020) are also promising steps that may increase officer willingness to participate in workplace sponsored wellness interventions. The current study indicates that a more experienced CO does not always equate to a more resilient CO, and multifaceted approaches to mitigate

occupational stressors, including trauma exposures, are likely to benefit COs and improve officer wellness.

Moving forward, researchers should prioritize partnerships with correctional institutions across different jurisdictions (i.e., jails, prisons, and juvenile settings) to better understand the role of service time on persistent mental health problems across the range of correctional occupations. Partnerships should include both observational data collection and policy evaluation to better inform and refine mental health resources. Such efforts would not only help to better understand the ways that overall CO wellness may be improved, but also to increase the safety and equity of correctional institutions.

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SUPPLEMENTAL MATERIAL

Supplemental Tables S1–S3 are available in the online version of this article at <http://journals.sagepub.com/home/cjb>.

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