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Adverse childhood experiences and police mental health

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Abstract

Purpose —The purpose of this study is to examine cross-sectional associations between adverse childhood experiences (ACEs) and mental health among police officers.

Design/methodology/approach —The sample was from the Buffalo Cardio-Metabolic Occupational Police Stress study data (132 male and 51 female officers). Standardized surveys were administered to participants. Regression coefficients were obtained from models adjusted for age, sex, race and alcohol intake. All statistical tests were performed using a statistical significance level at $p < 0.05$.

Findings —Regression analyses showed significant positive associations between ACEs and mental health (Posttraumatic Stress Disorder [PTSD]: $\beta = 1.70$, $p < 0.001$ and depressive symptoms: $\beta = 1.29$, $p < 0.001$). Resiliency significantly modified the association between ACEs and PTSD. A positive and significant association was observed among officers with lower resiliency ($\beta = 2.65$, $p < 0.001$). The association between ACEs and PTSD was stronger among male officers compared to females ($\beta = 2.66$, $p < 0.001$ vs. $\beta = 0.59$, $p = 0.248$, respectively).

Research limitations/implications —Child abuse and development of PTSD or depression could not be traced through time as this was a cross-sectional study. Recall bias may affect results.

Practical implications —PTSD and depression associated with ACEs can affect the interpretation of threat and can exacerbate emotional regulation in officers. An inquiry should

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be expanded regarding work assignments of victimized officers, such as child exploitation and pornography investigation.

Originality/value —There are few studies on ACEs and the mental health of police officers. The present study is among the first to associate multiple police mental health issues with ACEs.

Keywords

Law enforcement; Adverse childhood experiences (ACE); PTSD; Depressive symptoms; Hopelessness; Resiliency

Introduction

Adverse childhood experiences (ACEs) can have a profound effect on the future well-being of individuals (Centers for Disease Control and Prevention, 2019). An estimated 62% of adults surveyed across 23 states reported that they had experienced at least one ACE during childhood and nearly one-quarter reported that they had experienced three or more ACEs (Merrick *et al.*, 2018). ACEs can have negative, lasting effects on health and emotional well-being. These exposures can disrupt social development and lead to substance misuse and other unhealthy coping behaviors in adults (Dube *et al.*, 2005; Chapman *et al.*, 2004).

Felitti *et al.* (1998) found a strong relationship between childhood abuse and several leading causes of death. Fuller-Thomson *et al.* (2016) reported that childhood physical abuse was significantly associated with suicidal ideation. Dube *et al.* (2005) found a positive relationship between adverse childhood experiences and the risk of attempts at suicide throughout life. Angelakis *et al.* (2020), in a systematic review, found that different types of childhood maltreatment including sexual abuse, physical abuse and emotional abuse were associated with a 2- to 3-fold increased risk for suicide attempts. Herzog and Schmahl (2018) commented that ACEs affect psychological and psychosocial mechanisms known to contribute to mental disorders, comprising disturbances in cognitive and affective processing. The risk for developing a mental disorder after ACEs was highest for depression, borderline personality disorder and substance abuse. Fergusson *et al.* (2013) found that exposure to ACEs was associated with consistent increases in risks of later mental health problems.

Despite previous research on police mental health, there exists a gap between police mental health outcomes and life course events such as ACEs. The purpose of the present study is to examine cross-sectional associations between ACEs and psychological problems among police officers. Specifically, the hypothesis is focused on the association of ACEs with posttraumatic stress disorder (PTSD), depressive and hopelessness symptoms.

Resiliency will be examined in this study to determine if it modifies the effects of ACEs on PTSD, depression and hopelessness. Resiliency has been described as the process of adapting to and bouncing back from adverse experiences (Southwick *et al.*, 2014; Ozbay *et al.*, 2007). McCanlies *et al.* (2017) found that resilience to be an important mediator between social support and symptoms of PTSD among police officers working during Hurricane Katrina in New Orleans. Resilient police officers are less likely to experience symptoms

of PTSD after a trauma (deTerte and Stephens, 2014) and are more likely to use personal skills in a positive manner to get through experienced trauma (Fredrickson *et al.*, 2003). Goldenson *et al.* (2021) examined the impact of ACEs on psychological functioning and assessed whether resilience had a moderating effect: participants with four or more ACEs had significantly more psychopathology and lower resilience (Goldenson *et al.*, 2021).

Gender differences in ACE's exposure will also be examined. It has been suggested that women may be more susceptible to depression because they are more likely to experience ACEs within established relationships (Olff *et al.*, 2007) of family or close relatives (Feletti, 1998). Sweeney *et al.* (2016) found that sexually abused women reported more lifetime depressive symptoms and mood disorders. In a 10-year review, Putnam (2003) found that child sexual abuse was a significant risk factor for psychopathology, especially depression and substance abuse.

The police and ACEs

Once in police work, officers are exposed to multiple traumas and stressors. They see many of the types of adverse childhood events they themselves may have suffered such as bruised children, abusive parents and neglect. ACEs may exacerbate stressful or traumatic exposures of police and lead to psychopathology. Violanti *et al.* (2017) found that exposure to abused children was ranked as one of the highest stressors by police.

There are few studies on ACEs and the mental health of police officers. In a study of relief efforts after Hurricane Katrina in New Orleans, Komarovscaya *et al.* (2014) found that 20% of police officers and other first responders who experienced physical abuse before age 18 reported symptoms of PTSD, peritraumatic dissociation, depression and sleep problems. Otte *et al.* (2005) concluded that a history of childhood trauma in police is a profound predictor of PTSD. The ongoing study measured biological risk in 400 police academy recruits and showed that 25% of the recruits who experienced traumatic stress were exposed to ACEs before the age of 13 years (Otte *et al.*, 2005). Stanley *et al.* (2021) found that greater exposure to ACEs among non-veteran law enforcement officers was associated with increased odds of PTSD.

Mental health concerns among police

Previous research has found mental health issues among police officers. Syed *et al.* (2020) conducted a meta-analysis to estimate the prevalence and risk factors for mental health problems among police personnel worldwide. The overall prevalence was 14.6% for depression, 14.2% for PTSD, 9.6% for generalized anxiety disorder, 8.5% for suicidal ideation, 5.0% for alcohol dependence and 25.7% for hazardous drinking. Syed *et al.* (2020) attributed police mental problems to poor social support, occupational stress and maladaptive coping strategies. Fox *et al.* (2012) reported that 24% of their police sample reported PTSD, 9% depression, and 19% alcohol abuse. Only 46.7% of the sample had ever sought mental health services. A survey study by Jetelina *et al.* (2020) of 446 officers found that 12% reported a lifetime mental health diagnosis, and 26% had positive screening results for current mental illness symptoms. Jetelina *et al.* (2020) suggested that depression, anxiety and suicidal ideation should be systematically addressed. Violanti (2020) commented that

the Jetelina *et al.* (2020) results highlight that PTSD is not the only mental health issue among law enforcement.

Depression is commonly comorbid with PTSD and other disorders (Hodgson and Webster, 2011). Police officers with both PTSD and depression are at an increased risk for health issues such as cardiovascular disease and gastrointestinal disorders and comorbid psychological conditions (Slavich and Irwin, 2014). Previous studies identified a significantly increased prevalence of the subclinical cardiovascular disease among those officers with severe PTSD symptom scores compared to those with the lowest PTSD severity scores (Violanti *et al.*, 2016).

Hopelessness may be a result of the frustration faced by police as their duties become increasingly complex. Violanti *et al.* (2016) found significant associations between hopelessness, work stress and PTSD among police officers. Administrative practices and lack of support by the department had a greater effect upon officer's perceptions of hopelessness than the danger of the officer's work. Administrative actions may be a source of hopelessness for police officers because they perceive them as unchangeable and beyond their control (Shane, 2010). LaRocco *et al.* (1980) reported that indicators of job stress are directly affected by work sources of support and that support helps to facilitate cognitive reappraisal of work stress, therefore alleviating negative self-blame (a factor in hopelessness).

Methods

Sample

The sample for the present study comprised of 240 police officers who had taken part in the Buffalo Cardio- Metabolic Occupational Police Stress study (see Violanti *et al.*, 2006a,b for complete methodology). No specific inclusion criteria were indicated for the study, only that participants be sworn police officers and were willing to participate. The response rate was 64%. Officers who did not have complete data on the main variables of interest were excluded from the analysis with 51 officers having missing data on PTSD and 6 officers having missing information on ACE, leaving a sample size of 183 (132 male and 51 female officers). Data were collected at the university health clinic and participants were compensated for time and travel. A written informed consent was collected from each participant and the study was approved by the Institutional Review Board of the State University of New York at Buffalo, NY.

Measures

Adverse childhood experiences (ACEs)

The ACE is a 10-item (yes/no) questionnaire to measure the severity of childhood abuse before age 18 (Feletti *et al.*, 1998). There are 10 types of ACEs measured in the ACE study: five are personal (e.g. "physical abuse," "sexual abuse," and "emotional neglect"), and the rest are related to other family members (e.g. "a parent who is an alcoholic," "a family member in jail," "a family member diagnosed with a mental illness"). Each item represents a type of ACE with the presence indicated by a value of 1. A total ACE score was derived

by summing all items, ranging from 0 to 10. A higher ACE score indicates more exposure to childhood adverse experiences for a participant.

Posttraumatic stress disorder (PTSD) symptoms

PTSD symptoms were assessed using the PTSD Checklist–Civilian version (PCL-C). The PCL-C is a 17-item questionnaire designed to measure the self-reported severity of PTSD symptoms experienced in relation to traumatic incidents in the past month (Weathers *et al.*, 1993). Examples of items are having repeated disturbing memories of a traumatic event, having bad dreams, feeling emotionally numb or being easily startled. Each item is scored on a five-point scale: 1 (not at all-did not occur) to 5 (extremely). A total PCL-C score was derived by summing all items, with scores ranging from 17 to 85. Higher scores indicate a higher range of PTSD symptoms and may be used as screening to perform a provisional PTSD diagnosis.

Depressive symptoms

Depressive symptoms were assessed using the Center for Epidemiological Studies Depression (CES-D) scale, a 20-item instrument commonly used to measure the self-reported level of depressive symptoms in the past week (Radloff, 1977). Participants rate each item on a four-point Likert scale, ranging from 0 (rarely or none of the time, less than 1 day) to 3 (most of the time, 5–7 days of the week), with higher scores indicating an increased frequency of the depressive symptoms. The overall CES-D score was derived by summing the scores for the 20 items, ranging from 0 to 60.

Hopelessness symptoms

Hopelessness was assessed using the Beck Hopelessness Scale, a 20-item true-false self-report instrument that assesses the degree to which a participant holds expectations about the future (Beck and Steer, 1993). Eleven of the items are keyed true and 9 false. A total hopelessness score was obtained by summing all 20 items, with scores ranging from 0 to 20. Scores on the Beck Hopelessness Scale indicate negative feelings about the future, loss of motivation and expectations.

Resiliency

The Conner-Davidson resiliency scale (CD-RISC 10) was used to measure resilience (Conner and Davidson, 2003). The CD-RISC 10 is a unidimensional self-report scale consisting of 10-items measuring resilience. Respondents' rate items on a five-point Likert scale, ranging from 0 (not true at all) to 4 (true nearly all the time). Total scores are calculated by summing all 10 items, ranging from 0 to 40. None of the items are reversed scored. Resiliency scores were divided at the median to create "low" and "high" resilience categories.

Statistical methods

Descriptive statistics were used to characterize the study population. Potential confounders were selected based on the information in the literature or/and their associations with ACE and PTSD/depressive symptoms. These associations, with ACE as an independent

variable and PTSD and depression scores as dependent variables, were analyzed using linear regression. Unadjusted and adjusted regression coefficients with standard errors were obtained from regression models. The adjustments were made for age, sex, race/ethnicity and alcohol intake. Associations were also investigated by stratifying on resiliency (using median) and sex to assess effect modification. All statistical tests were performed using a statistical significance level at $p < 0.05$. All analyses were conducted using SAS software, version 9.4 (SAS, 2008).

Results

Frequencies and means of demographic and lifestyle characteristics are presented in Table 1. The mean age of the officers was 48 (SD = 10) years, 28% were women, 67% were married and 45% had a college degree. Fifty-three percent held the rank of patrol officer, and 74% had served for more than 15 years in the department. The overall ACE score was mean = 1.6 (SD = 1.8) ranging from 0 to 9. The ACE score differed significantly between female and male officers (2.3 vs. 1.3, respectively, $p < 0.001$; data not shown).

Table 2 illustrates the number of officers responding “yes” with the corresponding percentage for each independent ACE item. The highest reported percentage of ACEs was having divorced parents (38.3%). Being sworn at and insulted (23.5%) and being slapped or grabbed (22.4%) were among the highest-rated adverse experiences.

Table 3 presents unadjusted and multivariable-adjusted associations of ACEs with psychological measures in the study. Regression analyses from the unadjusted model of ACEs with PTSD and depressive symptoms showed positive and significant associations: ($\beta = 1.60$, $p < 0.001$ and $\beta = 1.25$, $p < 0.001$, respectively), corresponding to the increase in 1.6 units in PTSD for every unit increase in ACE. In other words, for every 3 unit increase in ACE, there is a 5-unit increase in PTSD, reflecting the negative effect of having three or more ACEs. No significant associations were found between ACE and hopelessness in the overall sample. When adjusting for covariates in the model (age, sex, race/ethnicity and alcohol consumption), the associations were not attenuated: ($\beta = 1.70$, $p < 0.001$ and $\beta = 1.29$, $p < 0.001$, respectively) (Figure 1).

Table 4 shows associations of ACE with psychological measures stratified by sex. 19.6% of policewomen reported being sexually fondled as children. In a multivariable-adjusted model, the positive association between ACE and PTSD score was stronger among male police officers compared to their female counterparts ($\beta = 2.66$, $p < 0.001$ vs. $\beta = 0.59$, $p = 0.248$, respectively). This difference in the strength of the association was reflected in the corresponding test for interaction (p -interaction = 0.010). A borderline statistically significant association of ACE with hopelessness was observed among female officers only ($\beta = 0.196$, $p = 0.051$ vs. $\beta = 0.127$, $p = 0.271$). p -value for interaction was not significant ($p = 0.689$).

Analyses stratified by the median value of resiliency scores are presented in Table 5. Resilience modified the relationship between ACEs and PTSD symptoms. The interaction test was significant with $p = 0.011$. Significant adjusted positive associations were observed

between ACEs and PTSD among officers with resiliency scores below the median compared to those above the median ($\beta = 2.65, p < 0.001$ vs. $\beta = 0.844, p = 0.064$, respectively). Resiliency did not significantly modify associations between ACEs and depression or hopelessness.

Discussion

The mean number of ACEs among police was 1.6 (SD = 1.8) events. On average, this was higher than seen in the general population study (Felitti *et al.*, 1998) where an estimated 62% of adults surveyed across 23 states reported that they had experienced at least one ACE during childhood. In total, 13.7% of this police sample reported four or more ACEs compared to 12.5% of the general population. ACEs were significantly associated with PTSD and depressive symptoms. Non-significant associations were found between ACEs and hopelessness in the overall sample; however among women ACEs and hopelessness reached near significance. Officers with levels of resilience below the median had a significant positive association between ACEs and PTSD while officers with resilience at or above the median did not.

Parental divorce was the most prevalent type of ACE reported by police (38.3%). As adults, officers exposed to parents' divorce may have more difficulty dealing with stress, regulating emotions in times of strife and internalizing problems. The extent of risk for mental issues in children of divorced parents is nearly twice that of those in married families (Hetherington, 1999). Exposure to divorce threatens a child's sense of emotional security within the family which in turn affects the child's ability to regulate emotions when faced with stress (O'Hara *et al.*, 2019; Cummings *et al.*, 2009). Other studies have found that children who blamed themselves for the divorce tended to internalize problems, which may persist into adulthood (Buchanan *et al.*, 2001). Police work often involves conflict and may exacerbate the internalization of negative emotions and mental health in officers who were exposed to parent's divorce.

Present results indicated various types of abuse among officers in this sample, but a higher percentage experienced physical and emotional abuse. These events are considered most at risk for depression (Carr *et al.*, 2013). Norman *et al.* (2012) reported a higher odds ratio for depression when children were exposed to emotional abuse compared to physical abuse and a higher odds ratio for drug abuse when exposed to physical abuse compared to emotional abuse. Romero *et al.* (2009) found that physical abuse was independently associated with a greater prevalence of PTSD. Mandelli *et al.* (2015), in a meta-analysis, found emotional abuse showed the strongest association with depression, followed by neglect and sexual abuse. Spertus *et al.* (2003) found that emotional abuse predicted depressive symptoms after adjusting for physical and sexual abuse, suggesting that emotional abuse is independently related to depression. Verbal abuse was found to increase risk for depression compared with physical abuse (Teicher *et al.*, 2006). Khan *et al.* (2015) reported that nonverbal emotional abuses are stronger predictors of depression than other types of abuse.

Sex differences

Overall, women officers had a significantly higher mean in the total number of ACEs than male officers (2.3 vs. 1.3; $p < 0.001$) and were higher than male officers in each of the separate items in the ACE measure (data not shown). Results showed a near significant association between hopelessness and ACEs among women ($p = 0.051$). Hopelessness has been considered a pattern of negative future attributions, inferred consequences of those experiences and feelings that the situation cannot be changed (Conner *et al.*, 2001). Abramson *et al.* (1989) suggested that persons who are hopeless are likely to view the negative experiences as leading to more negative experiences and that they are unworthy.

Women officers had higher percentages in physical and sexual contact ACEs (insults, slaps, injuries, being touched and sexual fondling). ACEs such as sexual abuse can leave someone with long-lasting adverse effects on mental and physical health (Herzog and Schmahl, 2018). Sweeney *et al.* (2016) found that sexually abused women reported more lifetime depressive symptoms and mood disorders. In a 10-year review, Putnam (2003) found that child sexual abuse was a significant risk factor for psychopathology, especially depression and substance abuse. This result should be interpreted with caution, as male officers may have underreported any sexual experiences (Juval *et al.*, 2017). Eliot *et al.* (2015) found that women officers had higher burnout scores than male officers adjusted for age, years of service, marital status or having children at home. Personal stress was higher for women as well as greater feelings of depression (Eliot *et al.*, 2015). Dormann and Zapf (2002) concluded that work stressors such as social isolation and negative work climate were predictors of depression among women. Social stressors and lack of support appear to be salient aspects of police work environments and may be problematic for women (Spector and Jex, 1998; Harris *et al.*, 2001).

Interestingly, a significant association between ACEs and PTSD was not seen among women in the present study. In the general population, women appear to suffer from PTSD more frequently and more intensely than men (Lilly, 2009). However, gender differences typically have not been found in police samples. A meta-analysis by Brewin *et al.* (2012) found no correlation between gender and PTSD symptom severity in military samples. Lilly *et al.* (2009) found that women officers in their sample reported less PTSD symptoms despite more exposure to assaultive violence as their worst event. Lilly *et al.* (2009) stated that lower levels of PTSD symptoms among women officers may have existed prior to entering police work, indicating a higher level of resilience and the ability to deal with trauma. These same authors commented that women may be less likely to report PTSD symptoms due to fear of ridicule by male peers and supervisors.

Resilience

Present results suggest that resilience modified the association between ACEs and PTSD. Officers with lower levels of resilience had a significant positive association between ACEs and PTSD. Resilience in police work requires support from the organization (Paton, 2008). The police organization defines the context within which officers experience and interpret critical incidents and their subsequent effects (Paton, 2006). Thus, in police work, the organization is crucial in sustaining resilience. Trust by officers in the police organization

is a predictor of an enhanced resiliency and the ability to deal with traumatic experiences (Siegrist and Cvetkovich, 2000), particularly when relying on the organization to provide information and assistance. Officers are better able to work effectively in high-risk situations when they believe they can trust those who supervise their daily work (Dirks, 1999). In this regard, it is important for police departments to develop a milieu of trust and support among personnel. Also, implementing training in resilience can help to maintain a feeling of support and trust. A recent resiliency training program utilized by the International Association of Chiefs of Police is based on the University of Pennsylvania's Positive Psychology Center program (<https://ppc.sas.upenn.edu/resilience-programs/resilience-skill-set>). The program teaches self-awareness of stress, self-regulation of emotions and mental agility as well as other important techniques for officers to deal with stress and trauma.

Limitations

The path of child abuse and the development of PTSD or depression could not be traced through time as this was a cross-sectional study. Larger samples and longitudinal investigation will help to clarify the present results. It was not possible in this study to determine if ACEs occurred simultaneously or together in multiple stages. As Herzog and Schmahl (2018) pointed out, rarely do ACE experiences occur independently but rather in multiple types and times. A recent meta-analysis reported that 19% of individuals with major depression reported more than one form of childhood abuse and, while all childhood experiences have been shown to increase the risk of depression, experiencing multiple forms further elevates the risk (Nelson *et al.*, 2017). Robst and Van Glider (2011) found that the severity and length of abuse has an effect on psychological consequences; however, data were not available in the present study on ACE severity or duration. It is also important to know at what age the experiences occurred as various levels of childhood development may influence the intensity of the effect of ACEs and subsequent PTSD or depression (Robst and Van Glider, 2011). The present sample was primarily white. Future work should include a larger sample of minority participants. Merrick *et al.* (2018) found significantly higher ACE exposures reported by participants identified as black (mean score, 1.69; 95% CI, 1.62–1.76), Hispanic (mean score, 1.80; 95% CI, 1.70–1.91) or multiracial (mean score, 2.52; 95% CI, 2.36–2.67).

Further considerations

There are a wide range of reasons why someone would want to become a police officer. Robst and VanGlider (2011) found that childhood abuse is a factor related to occupational choice. Johnson (2019) in a survey of 1,673 law enforcement officers from across the USA found that 41% wanted to address an “injustice” and wanted to fight back after being a victim of a crime. As part of the psychological screening process, it would be helpful to determine if child abuse played a part in the candidate's decision to be an officer as it may affect future psychological complications as well as performance. Conversely, child abuse can have a positive influence on an officer candidate as the experience will motivate the desire to help others who may have been similarly victimized.

Interestingly, the mental health of other first responder occupations appears to be similarly affected by ACEs. Hom *et al.* (2016) found a significant correlation between early physical abuse and suicide risk in firefighters regardless of the danger and trauma they faced at work. Aronson *et al.* (2020) examined the relationship between ACEs and the mental health of military veterans. Fifty-nine percent of female and 39% of male veterans reported exposure to one ACE, whereas 44% of female and 25% of male veterans were exposed to multiple ACEs. For males, a higher level of abuse was associated with probable PTSD and anxiety. Combat experiences were associated with an increase in the likelihood of having a mental health problem (Aronson, 2020). Research should be expanded in these occupations in an effort to generalize reasons why these similar types of occupations were selected and what part of ACEs played in that selection.

Intervention is important in mental health issues among police. Such issues can affect performance. PTSD associated with ACEs can affect attention and interpretation of threat (Fani *et al.*, 2012) and can exacerbate emotional regulation in officers. Pollak *et al.* (2005) found that adults abused as children can experience high reactivity and easy provocation in stressful situations and will have difficulty in calming down. Anger problems have been reported by persons with PTSD and have been directly implicated in interpersonal problems (Hart and Rubia, 2012). In this regard, further research is needed on the tangential effects of childhood abuse on officers' performance and relations with the public. An inquiry should be expanded regarding the work assignments of officers who were victims of ACEs. An example would be child exploitation and pornography investigators. These officers face a range of exposures to obscene and disturbing images of children being abused and sexually exploited. The tasks of this type of work pose a significant risk for psychological pathology, especially among those officers who have experienced childhood ACEs (Krause, 2019).

There is a need for organizational support for officers who experience mental health difficulties. Many officers are hesitant to come forward with such problems, and sources of help should be confidential. Peer support programs in many police organizations have been helpful in this regard. Training which helps to reduce the stigma associated with mental illness would be beneficial as well. There are other dimensions yet unexplored which contribute to mental problems among police; and experiences that occurred in an officers' life prior to employment may provide clues to beneficial interventions. It may, therefore, be useful to examine events subsequent to ACEs during both officers personal and work life. Events such as traumatic occurrences at work and off duty that build upon ACE experiences and exacerbate mental health problems among officers are worth of further inquiry.

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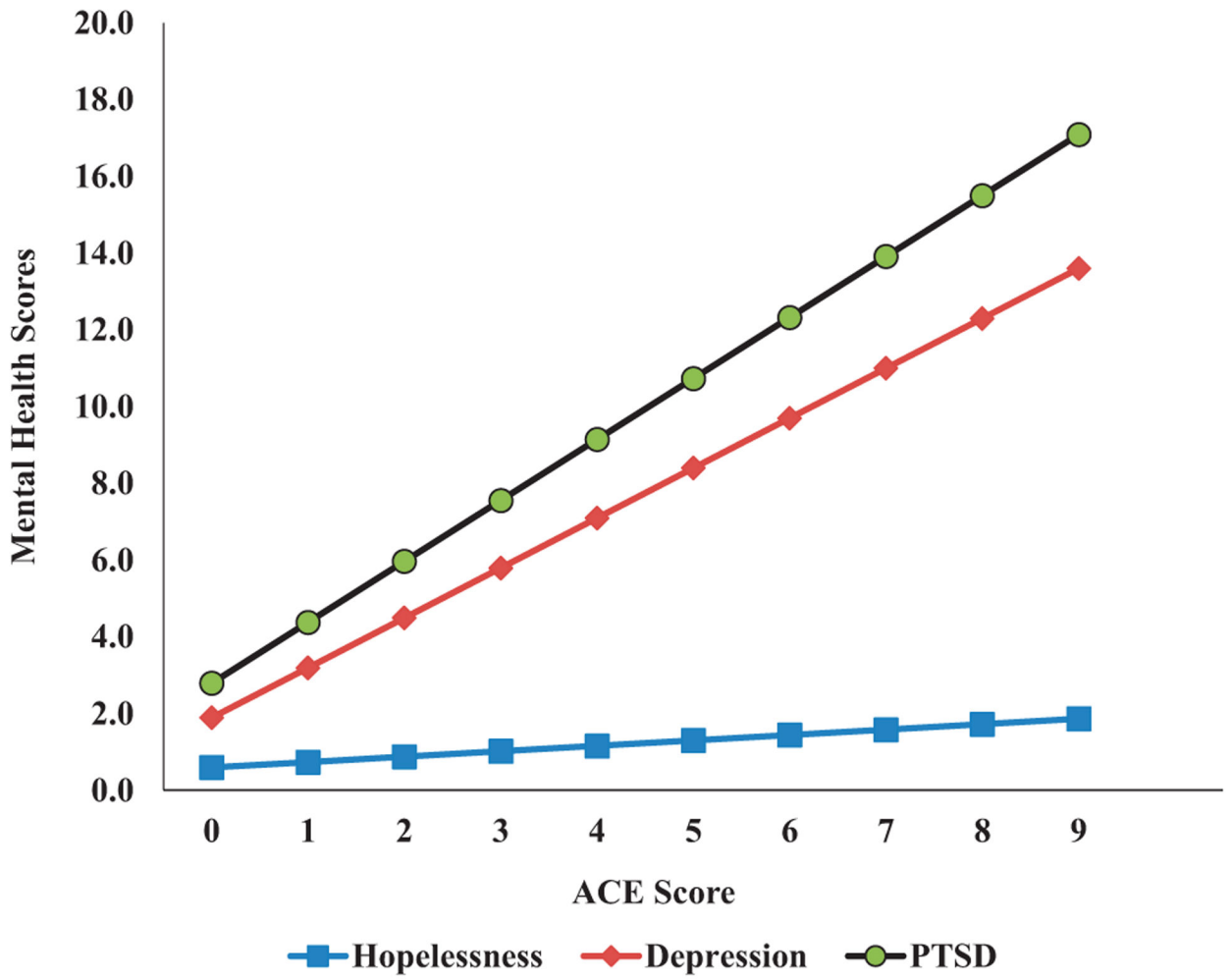


Figure 1.
Linear relationship of ACEs with PTSD, depression and hopelessness

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Table 1.

Demographic, lifestyle and physiological characteristics in officers stratified by gender

Characteristics	Total (N = 183) N (%)	Female (N = 51) N (%)	Male (N = 132) N (%)
<i>Marital status</i>			
Single	27 (14.8)	12 (23.5)	15 (11.5)
Married	121 (66.5)	27 (52.9)	94 (71.8)
Divorced	34 (18.7)	12 (23.5)	22 (16.8)
<i>Education</i>			
High school/GED	7 (3.8)	1 (2.0)	6 (4.6)
College <4yrs	93 (50.8)	20 (39.2)	73 (55.3)
College 4+yrs	83 (45.4)	30 (58.8)	53 (40.2)
<i>Smoking status</i>			
Current	8 (4.4)	2 (3.9)	6 (4.6)
Former	52 (28.4)	20 (39.2)	32 (24.4)
Never	123 (67.2)	29 (56.9)	94 (71.2)
<i>Years in Service</i>			
0–14 yrs	47 (25.7)	14 (27.5)	33 (25.0)
15–19 yrs	40 (21.9)	11 (21.6)	29 (22.0)
20+ yrs	96 (52.5)	26 (50.9)	70 (53.0)
<i>Rank</i>			
Police officer	97 (53.0)	27 (52.9)	70 (53.0)
Sergeant/Lieutenant	35 (19.1)	10 (19.6)	25 (18.9)
Captain/Detective	51 (27.9)	14 (27.5)	37 (28.0)
<i>Race</i>			
Caucasian	149 (81.4)	38 (74.5)	111 (84.1)
African American	34 (18.6)	13 (25.5)	21 (15.9)
	Mean (SD)	Mean (SD)	Mean (SD)
Age (yrs)	47.5 (10.4)	46.9 (9.9)	47.8 (10.5)
Alcohol intake (drinks/week)	4.7 (8.6)	2.8 (3.7)	5.4 (9.8)
ACE score	1.6 (1.8)	2.3 (2.3)	1.3 (1.6)
Depression score	6.5 (6.0)	7.0 (6.7)	6.3 (5.8)
PTSD score	8.0 (10.5)	7.9 (8.1)	8.0 (11.3)
Hopelessness score	1.4 (1.9)	1.5 (1.6)	1.4 (2.0)

Table 2.

Rank ordered number and percent of officers responding to each ACE question

Adverse childhood experiences	Number	%
Were your parents ever separated or divorced?	70	38.3%
Did a parent or other adult in the household often or very often ...	43	23.5%
Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid that you might be physically hurt?		
Did a parent or other adult in the household often or very often ...	41	22.4%
Push, grab, slap, or throw something at you? or Ever hit you so hard that you had marks or were injured?		
Did you live with anyone who was a problem drinker or alcoholic, or who used street drugs?	38	20.7%
Was a household member depressed or mentally ill, or did a household member attempt suicide?	30	16.4%
Did you often or very often feel that ... No one in your family loved you or thought you were important or special? or Your family did not look out for each other, feel close to each other, or support each other?	20	10.9%
Was your mother or stepmother Often or very often pushed, grabbed, slapped, or had something thrown at her? or Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard? or Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?	18	9.8%
Did an adult or person at least 5 years older than you ever ...	13	7.1%
Touch or fondle you or have you touch their body in a sexual way? or Attempt or actually have oral, anal, or vaginal intercourse with you?		
Did a household member go to prison?	10	5.4%
Did you often or very often feel that ... You did not have enough to eat, had to wear dirty clothes, and had no one to protect you?	1	2%

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Table 3.

Associations of ACE with PTSD, depressive scores and hopelessness

ACE	PTSD β coeff [SE] (<i>p</i> -value)	Depression β coeff [SE] (<i>p</i> -value)	Hopelessness β coeff [SE] (<i>p</i> -value)
Unadjusted	1.60[0.42](<0.001)	1.25[0.23](<0.001)	0.138 [0.08](0.072)
Model 1	1.58[0.41](0.0002)	1.24[0.23](<0.001)	0.137 [0.08](0.073)
Model 2	1.68[0.42](<0.001)	1.27[0.23](<0.001)	0.138 [0.08](0.082)
Model 3	1.70[0.42](<0.001)	1.29[0.24](<0.001)	0.141 [0.08](0.076)

Note(s): Model 1: age; Model 2: age and sex; Model 3: age, sex, race and alcohol intake. Significance level: $p < 0.05$

Table 4.

Associations of ACE with PTSD, depressive scores and hopelessness stratified by gender

	Women (N = 51)			Men (N = 132)		
	PTSD β coeff (p-value)	Depression β coeff (p-value)	Hopelessness β coeff (p-value)	PTSD β coeff (p-value)	Depression β coeff (p-value)	Hopelessness β coeff (p-value)
Unadjusted	0.690 (0.166)	1.08 (0.007)	0.192 (0.042)	2.56 (<0.001)	1.44 (<0.001)	0.092 (0.422)
Model 1	0.602 (0.221)	1.04 (0.009)	0.198 (0.039)	2.55 (<0.001)	1.44 (<0.001)	0.091 (0.429)
Model 2	0.583 (0.241)	1.02 (0.012)	0.202 (0.039)	2.67 (<0.001)	1.46 (<0.001)	0.129 (0.264)
Model 3	0.586 (0.248)	1.05 (0.012)	0.196 (0.051)	2.66 (<0.001)	1.46 (<0.001)	0.127 (0.271)

Note(s): Model 1: age; Model 2: age and race; Model 3: age, race and alcohol intake; Significance level: $p < 0.05$. p -values for interaction for PTSD, Depression and Hopelessness were 0.010, 0.432 and 0.689, respectively, and were obtained from fully-adjusted models

Table 5.

Associations of ACE with PTSD, depressive scores and hopelessness stratified by resiliency

	Resiliency < Median (N = 91)			Resiliency Median (N = 92)		
	PTSD β coeff (p-value)	Depression β coeff (p-value)	Hopelessness β coeff (p-value)	PTSD β coeff (p-value)	Depression β coeff (p-value)	Hopelessness β coeff (p-value)
Unadjusted	2.52 (<0.001)	1.64 (<0.001)	0.20 (0.142)	0.623 (0.244)	0.794 (0.002)	0.061 (0.300)
Model 1	2.56 (<0.001)	1.66 (<0.001)	0.22 (0.117)	0.813 (0.138)	0.881 (0.001)	0.051 (0.403)
Model 2	2.63 (<0.001)	1.76 (<0.001)	0.25 (0.091)	0.805 (0.143)	0.884 (0.001)	0.049 (0.415)
Model 3	2.65 (<0.001)	1.78 (<0.001)	0.24 (0.100)	0.844 (0.064)	0.899 (0.001)	0.049 (0.414)

Note(s): Model 1: age and sex; Model 2: age, sex and race; Model 3: age, sex, race, and alcohol intake; Significance level: $p < 0.05$. p -values for interactions for PTSD, Depression and Hopelessness were 0.011, 0.146 and 0.138 respectively, and were obtained from fully-adjusted models