

RESEARCH ARTICLE

Opening the proverbial ‘can of worms’ on trauma-specific treatment in prison: The association of adverse childhood experiences to treatment outcomes

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Abstract

A large body of research has shown that incarcerated populations have a high prevalence of adverse childhood experiences (ACEs), increasing their risk for associated mental health problems and violent and aggressive behaviours. Emerging research on treatment for trauma survivors shows evidence that incarcerated women and men, with the most complex histories of trauma and abuse, can be responsive to trauma-specific treatment. Current research assessing two gender-responsive and trauma-specific brief interventions (e.g., *Healing Trauma for Women and Exploring Trauma for Men*) have demonstrated feasibility, consistency and efficacy among incarcerated populations. The current study uses secondary data analysis to explore the relationship between cumulative ACEs and the impact of the *Healing Trauma and Exploring Trauma* on participant's (682 women and 624 men) mental health, aggression and anger outcomes. The mixed-method regression results show that the impact of ACEs on treatment outcomes is strong and cumulative (i.e., greater exposure to childhood traumatic events increased the likelihood of participant programme gain on all the mental health and aggression outcomes, ranging from .13 to 1.2 for women and .15 to .77 for the men). The lowest significant coefficient for both women and men was for verbal anger and the largest was for current trauma symptoms. The association of ACEs on anger outcomes varied between women and men (revealing more association among the men). The findings show a strong positive impact for the trauma-specific brief interventions, particularly for those with the highest levels of trauma, whom otherwise might not have been ineligible for any programme participation.

KEYWORDS

adverse childhood experiences, corrections, gender, prison, trauma, treatment

1 | INTRODUCTION

A series of reports from the adverse childhood experiences (ACEs) study identified a significant link between childhood abuse and lifetime physical and mental health problems (Anda et al., 2002; Dube et al., 2003; Dube et al., 2005; Felitti et al., 1998). The ACE study

found a strong graded relationship between a cumulative number of events of child abuse and household dysfunction prior to the age of 18 (e.g., emotional, physical and sexual abuse; parental separation or divorce; domestic violence; family members with substance use and other psychiatric disorders; or histories of imprisonment) and multiple risk factors for the leading causes of death. The original ACE studies,

however, were specific to a large health maintenance organization (HMO) population in a metropolitan area, which comprises individuals who are more socially integrated (e.g., employed, with higher socioeconomic status and higher levels of education) than individuals in the criminal justice system.

1.1 | ACEs among justice-involved populations

Justice-involved women and men report a significantly higher prevalence of all categories of ACEs as compared with the general population in the United States (Andrews & Bonta, 2016; Horwitz et al., 2001). A recent study of 598 incarcerated women and men showed nearly or over half reported ACEs prior to the age of 18: 64% reported emotional abuse, 60% reported physical abuse, 43% reported sexual abuse, 71% had divorced parents, 40% witnessed domestic violence, 64% had alcohol/drug use in their home, 34% had mental illness in their home and 42% had an incarcerated parent (Messina & Burdon, 2018; Messina & Calhoun, 2018).

Given the high prevalence of ACEs among justice-involved populations, Messina and colleagues replicated the ACE studies among 315 incarcerated women and 427 men to assess the association of childhood maltreatment and household dysfunction to current traumatic distress. The study found the impact of ACEs on current traumatic distress was strong and cumulative for both women and men, as greater exposure to ACEs increased the likelihood that respondents were experiencing current trauma symptomology association with post-traumatic stress disorder (PTSD) (Messina et al., 2007). Additional studies show that child abuse increases the likelihood of multiple mental health problems (Greenfield & Marks, 2010; Kendall-Tackett, 2000; Mechanic et al., 2008), the use of alcohol and other drugs (Hedtke et al., 2008; Najavits et al., 1997), repressed anger (Neumann et al., 1996; Newman & Peterson, 1996; Springer et al., 2007) and violence in adulthood (Grella et al., 2005; Horwitz et al., 2001; Reisig et al., 2006).

The significant association between ACEs, antisocial behaviours and mental health issues among justice-involved populations are crucial research results that have led many clinicians to propose treatment interventions that address histories of trauma (Bloom et al., 2003; Greenfield & Marks, 2010; Herman, 1992, 1997). However, histories of trauma and abuse are predominantly excluded as a focal point of corrections-based treatment and recovery (Kubiak, Covington, et al., 2017; Messina et al., 2004).

1.2 | 'Opening the can of worms on trauma'

There is great hesitancy to open the proverbial 'can of worms' and invite the discussion of trauma within the prison-based programmes (Kok et al., 2015; Najavits & Hien, 2013). Corrections officials and treatment administrators often cite multiple concerns as reasons to

Key Practitioner Message

- Correctional treatment is predominantly focused on reducing recidivism and/or substance use. Historically, those with complex histories of trauma and abuse or co-occurring mental health disorders have been ineligible for treatment as they are classified as disruptive and a 'non-programming population'.
- The significant association between adverse childhood experiences (ACEs) and antisocial behaviours among justice-involved populations are crucial research results that have led many clinicians to propose a need for treatment interventions that specifically address histories of trauma and the resulting adult multiple chronic conditions. Yet such histories have not been sufficiently explored among justice-involved populations, especially among men, and are often excluded as a focal point of treatment and recovery in corrections.
- The research findings outlined in this manuscript provide initial evidence that those with histories of childhood maltreatment can be treated in a custody setting when the programme content is addressing those histories with safety and appropriate material.
- The research findings outlined in this manuscript further provide initial evidence that those with histories of childhood maltreatment and extensive criminal justice involvement can have greater gain from trauma-specific treatment across gender and security level.

exclude the topic of trauma (Miller & Najavits, 2012; Najavits & Hien, 2013). Concerns include unmet needs for trauma-informed training among substance use case managers to work with participants with high levels of trauma (often a condition of programme ineligibility), lack of custody staff to address safety issues related with the aggressive and disruptive behaviours of participants with high levels of trauma and the limited availability of professional mental health staff needed to address retraumatization of participants (e.g., intense emotional reactions associated with past trauma). This position overlooks the fact that experiences in prison can trigger memories of traumatic events or that incarceration is also a traumatic event (Kubiak & Rose, 2007). The trauma and violence experienced in justice-involved populations lives continues in their custodial life (Messina et al., 2007; Owen et al., 2017). Recognizing that trauma impacts the behaviour and well-being of those under criminal justice care, while failing to address it, is not rehabilitative and potentially harmful.

The California Department of Corrections and Rehabilitation (CDCR) has recently become aware of the potential benefits of becoming a trauma-informed organization (Bloom, 2006, 2010; Covington, 2012, rev. 2019; Covington & Bloom, 2018; Miller &

Najavits, 2012). The California Corrections Health Care Services (CCHCS, 2020) and the CDCR released a solicitation in 2020 requesting proposals to review and identify gaps in all policies and procedures regarding trauma-informed practices and for the provision of trauma-informed training services (CCHCS Trauma-Informed Care Training and Technical Assistance, RFP #SD20-00030; November 2020). They have also begun to better understand the critical role of ACEs surrounding substance use, mental health, anger, aggression and conflict. The harmful consequences of ACEs are further emphasized in the recent California Surgeon General's report; moreover, the report goes on to suggest that toxic stress as a health condition is amenable to trauma-informed treatment (California Department of Public Health, 2020).

1.3 | Efficacy of trauma-specific interventions

Messina and colleagues have conducted a series of randomized controlled trials (RCTs) examining trauma-specific treatment programmes for incarcerated women (Messina & Calhoun, 2018; Messina et al., 2010) or outpatient substance use treatment programmes (Messina et al., 2012). The RCTs examined the impact of *Helping Women Recover* (Covington, 2012, rev. 2019) and *Beyond Trauma* (Covington, 2003, rev. 2016) compared with treatment as usual in prison or mixed-gender drug court programmes. The prison-based intervention group showed greater reductions in drug use, longer stay in residential aftercare and reductions in recidivism compared with the control group. The outpatient intervention group showed less disciplinary sanctions during drug court and improvements in PTSD compared with the control group. Messina and Calhoun (2018) also conducted an RCT to assess the effectiveness of a trauma-specific violence prevention programme (i.e., *Beyond Violence*; Covington, 2015) for incarcerated women. This study found the 20-session peer-led programme found that participants had significant reductions in depression, anxiety, PTSD, anger and emotional dysregulation when compared with the control group.

More recently, two trauma-specific brief interventions have been operating at various male and female facilities within the CDCR to reduce the reoccurrence of violence and aggression in prison and increase psychological well-being: *Healing Trauma: A Brief Intervention for Women* (Covington & Russo, 2011, rev. 2016) and *Exploring Trauma: A Brief Intervention for Men* (Covington & Rodriguez, 2016). *Healing Trauma (HT) for Women* and *Exploring Trauma (ET) for Men* are 6-session brief, trauma-specific interventions designed for women and men who have experienced trauma and violence associated with ACEs and adult victimization. *HT and ET* are manualized interventions with Facilitator's Guides and Participant Workbooks. They are composed of six, 2-h group sessions (meant to be delivered in small groups of six to 10). The materials are gender responsive and reflect an understanding of the impact of trauma, specifically how trauma impacts women and men differently.

Both are theoretically based and are designed for delivery in settings in which a short-term intervention is needed. These

interventions are considered trauma-specific interventions as there is a strong emphasis on therapeutic skills, mindfulness and coping and grounding exercises, as a primary treatment modality for trauma, as well as information and education about trauma.

The findings outlined below are based on the cumulative research between 2014 and 2018 of the *HT and ET* programmes operating within CDCR institutions. The data were collected from programmes operating on various prison yards of all levels of security. The highest security programmes (e.g., security housing units [SHU]) were led by trained programme directors, and the general population programmes employed a peer-led model of facilitation. The programme directors and the peer facilitators were trained by the programme authors at the facilities, and ongoing programme oversight was provided by the programme directors.

Results of the 39 SHU women and 186 SHU men who participated in the staff-facilitated *HT and ET* programmes demonstrated strong support for the efficacy of the brief interventions. The SHU women exhibited significant improvement across depression, anxiety, PTSD, aggression, anger and social connectedness from the *HT* brief intervention (Messina et al., 2020). Effect sizes were moderate to large in size, with the largest impact on physical aggression (Cohen's *d* ranged from .39 to .82). Significant improvement was found for 100% of the same measured outcomes for the SHU men (Messina & Burdon, 2018). Effect sizes were small to moderate in size, with the largest impact on depression, current trauma symptom severity, and anxiety (Cohen's *d* ranged from .54, .43, and .41, respectively).

An RCT was conducted incarcerated men using the peer-led model of delivery with 131 *ET* male participants and 90 control group members in the general prison population. Significant improvement was found for the intervention group compared with the control group on anxiety, depression, mental health, current trauma symptoms and 3 out of the 4 anger measures (PTSD symptoms did not show a difference between groups) (Messina & Burdon, 2019). The results from the peer-led model of *HT* among 682 women also demonstrated strong support for the efficacy of *HT*. The women exhibited significant improvement on over 90% of the outcomes measured on preintervention and postintervention outcome measures. Effect sizes were small to moderate in size, with the largest impact on depression, PTSD and angry feelings (Cohen's *d* ranged from .51, .41, and .42, respectively) (Messina & Zwart, 2021).

The consistent findings of the outlined research have shown the efficacy of trauma-specific interventions for incarcerated women and men with the highest level of need, at all levels of custody, and with the most complex mental health issues. Efficacy has also been demonstrated for treatment programme staff or trained peer-led delivery models. The previous pilot studies use paired-sample *t* tests to examine change over time per individual. Thus, the analyses did not control for other variables (e.g., age or race and ACEs) because each person was their own control case and demographic variables do not vary over time. Also, the RCT study did not employ control variables within the analysis as groups are rendered equal at baseline as a result of the random assignment (Pettus-Davis et al., 2016). Although some studies have explored childhood adversity as a mediator of violence and

aggression (Kubiak, Fedock, et al., 2017), additional research on treatment outcomes for trauma survivors is vital to determine if those with the most complex histories of trauma can be responsive to trauma-specific treatment.

The purpose of the current study is to explore the correlation between ACEs and the impact of the *HT* and *ET* brief interventions on participant's mental health, aggression and anger outcomes. This secondary analysis is the first time ACEs were examined as part of the *HT* and *ET* outcome analyses.

2 | METHODS

Data collection approvals for the original studies were obtained from the Office for the Protection of Human Subjects and the CDCR's Research Oversight Committee for the original data collection, which took place as part of the programme participation. The current research is secondary data analysis.

2.1 | Research questions

Based on the results of studies that reported the efficacy of *HT* and *ET* brief interventions among large samples of incarcerated women and men, we sought to examine if the trauma-specific interventions had significant impact for participants who reported a high number of ACEs, specifically. Given that those with a high prevalence of trauma are often ineligible for any programme services:

Research Question 1. Will there be a significant and graded relationship between exposure to childhood trauma and household dysfunction and mental health outcomes?

Research Question 2. Will there be a significant and graded relationship between childhood trauma and household dysfunction and anger and aggression outcomes?

Due to the high prevalence of ACEs found among both women and men in the sample, and the decision to analyse the data separately for women and men, we did not develop a hypothesis based on gender.

2.2 | Participants

A total of 846 women participated in the *HT* programme over the course of 2 years and 682 of those women completed the postprogramme survey (81% follow-up rate). A total of 814 men participated in the *ET* programme over the course of 2 years and 529 of those men completed the postprogramme survey (85% follow-up rate). Demographics for those who completed postsurveys were compared with those lost at follow-up. The two groups did not differ on basic demographic variables. The analyses for the men combine data collected from 624 participants in the *ET* programme from three prisons with differing levels of security risk from the lowest level II to the highest level IV. The level of housing is directly associated with

the level of security risk of the resident. The analyses for the women combine data collected from 682 participants in the *HT* programme in two prisons. The participants at the first female facility were women who were considered to be those with high needs and high risk of problematic behaviour. The participants at the second female facility were women who were housed in the reception centre waiting to be assessed for housing placement within the facility.

Flyers about the programmes were posted in the housing units, and any person not scheduled to be released or transferred before the end of their expected dates of programme participation were accepted and allowed to participate in the programme and evaluation. Evaluation data were collected as part of programme participation. Facility staff provided access to those who signed up prior to the first session of the intervention. Research staff explained the study, answered questions and those who agreed to participate were read the informed consent form and survey instructions.

2.3 | Peer facilitators

The *HT* and *ET* programmes were facilitated by peer mentors trained by the programme authors. Peer mentors in the California prison system are those who are chosen to provide education, support or other advice to other residents with the facility. The peer mentors chosen for this pilot study were referred to as 'peer facilitators' and were chosen by the wardens and the programme directors. Programme directors provided oversight of all aspects of the programme and the peers. The criteria included the ability to connect with other residents, to have social influence, had previously held positions of mentors and availability during programming hours. Peer facilitators participated in a 1-h position interview prior to being chosen. The peer facilitators were typically serving life without parole or long-term offenders serving more than 10 years. Peer facilitators are not represented in the data below.

2.4 | Data collection

Self-administered surveys were provided at each facility prior to the *HT* and *ET* programme entry. On average, the presurvey was completed within 45 min. The postsurvey took place after completion of the six sessions (approximately 3 weeks) and also took approximately 45 min to complete. Participants were not compensated for their participation in the programme or survey. Participants volunteered for both the programme and the survey and could participate in the programme and not the evaluation if they wished.

2.5 | Measures

To assess the effectiveness of the *HT* and *ET* brief interventions, data were collected during the presurvey and postsurvey on mental health and anger/aggression measures. Standardized instruments also

included detailed questions about demographics, childhood and adult trauma, mental health, substance use and criminal justice involvement. The feasibility of these measures and procedures were previously found to be effective and valid (Kubiak et al., 2014).

2.5.1 | Depression (Patient Health Questionnaire—Depression Subscale)

The Patient Health Questionnaire Depression Subscale is a nine-item subscale that measures current depressive symptomology (Kroenke & Spitzer, 2002; Spitzer et al., 1999). Participants report on the symptoms they have experienced in the preceding 2-week period. Responses are based on a 4-point Likert-type scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*) and are summed into an overall symptom severity scale score that falls between 0 and 27.

2.5.2 | Anxiety (Patient Health Questionnaire—Anxiety Subscale)

The Patient Health Questionnaire Anxiety Subscale is a six-item subscale that measures anxiety symptoms felt over the past 4 weeks (Spitzer et al., 1999). Responses are based on a 4-point Likert-type scale ranging from 0 (*Not at all*) to 3 (*Nearly every day*) and are summed into an overall symptom severity scale score that falls between 0 and 18.

2.5.3 | PTSD (Short Screening Scale for DSM-IV PTSD [modified version])

The modified version of the Short Screening Scale for DSM-IV PTSD (Breslau et al., 1999) is used to assess current symptoms of PTSD. Respondents who responded affirmatively to the question ‘In your life, have you ever had any experience that you considered frightening, horrible, or upsetting?’ were then asked to complete a seven-item Short Screening Scale, concerning symptom frequency in the prior 4-week period. Item responses were based on a Likert-type scale, ranging from 0 (*Not at all*) to 3 (*Nearly every day*), and scale scores ranged from 0 to 21.

2.5.4 | K6 Brief Mental Health Screen

The K6, a six-item brief mental health screening tool (Kessler et al., 2002, 2003), was used to assess participant's overall mental health. Responses, based on a Likert-type scale, ranging from 0 (*None of the time*) to 4 (*All of the time*), were summed into an overall scale with scores ranging from 0 to 24, with higher scores indicating a less healthy state of mental health.

2.5.5 | Aggression (Buss–Warren AQ)

Buss–Warren Aggression Questionnaire (AQ), formally the Buss–Perry AQ, is a 34-item instrument used to assess anger and aggression (Buss & Warren, 2000). The respondent rates the description on a Likert-type scale, ranging from 1 (*Not at all like me*) to 5 (*Completely like me*). The Buss–Warren includes five subscales: Physical Aggression (eight questions, 8–40 range), Verbal Aggression (five questions, 5–25 range), Anger (seven questions, 7–35 range), Hostility (eight questions, 8–40 range) and Indirect Aggression (six questions, 6–30 range) (Buss & Warren, 2000).

2.5.6 | Anger (Revised Instrumental and Expressive Representation Scales)

The Revised Instrumental and Expressive Representation Scales have 16 items with two subscales (instrumental and expressive) assessing anger expression (Campbell et al., 1999). Instrumental anger is a more outward expression of anger that is often used to control others. In contrast, expressive anger is characterized by holding in or suppressing anger until there is an ‘explosion’ of emotion. In the first subscales, respondents answered the degree of agreement about eight items measuring instrumental anger, including ‘I believe that physical force is needed to get through to some people’ and ‘If I hit someone and hurt them, they were asking for it’. The second subscales assessed expressive anger using eight items such as ‘During a physical fight I feel out of control’ and ‘After a physical fight I feel drained and guilty’. Participants responded on a scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Some items were reverse scored so that higher scores indicate stronger anger expression. The eight items from each subscale are summed with a range of 8–40 for each subscale.

2.5.7 | State–Trait Anger Expression Inventory-2

The State–Trait Anger Expression Inventory-2 (STAXI-2) is a 57-item instrument used to measure the experience and intensity of anger as an emotional state (State Anger) and as an emotional trait (Trait Anger). The State Anger Composite Scale assesses the intensity of angry feelings at a particular time and the Trait Anger Composite Scale measures how angry emotions are expressed over time (Spielberger, 1999). For the 15 State Anger items, participants rate the intensity of their emotions ‘right now’ on a 4-point Likert scale ranging from 1 (*Not at all*) to 4 (*Very much so*). For the 10 Trait Anger items, participants rate how they ‘generally’ feel on a 4-point Likert scale ranging from 1 (*Almost never*) to 4 (*Almost always*). For the 32 Anger Expression and Anger Control items, participants rated how they generally react in certain situations also on a 4-point Likert scale ranging from 1 (*Almost never*) to 4 (*Almost always*).

2.6 | Data analysis

This study uses secondary data analysis combining data from multiple prisons for women and men graduates from the *HT and ET* brief interventions. Analyses are conducted separately for women and men to explore gender-specific findings.

2.6.1 | Demographic characteristics

Initial analysis included descriptive and inferential statistics based on the reported background characteristics of 682 female and 624 male participants who completed both the intervention and the presurvey and postsurvey. Descriptive statistics included percentages, means and measures of variance. Frequency tables were used to examine cell sizes for categorical variables and nonnormality for continuous variables. Where categorical variables had small cell sizes, categories were collapsed to create cells of sufficient size. Chi-square (Fisher's exact one-sided significance tests) and *t* tests were calculated to determine significant differences between the women and men while grouping by prisons.

2.6.2 | Treatment outcomes associated with ACES

To quantify the raw change impact of the intervention, *gain scores* were computed on anxiety, depression, PTSD, mental health functioning, current trauma symptoms, multiple measures of aggression, hostility and anger (i.e., baseline test scores were subtracted from the postintervention test scores). To determine if the intervention induced a significant effect, *t* tests with H_0 : gain score = 0 versus H_A : gain score \neq 0 were run. A mixed-effects linear regression was used to assess the number of ACES as they related to the dependent variables of interest individually. The random effects term modelled the nature of the prison population sampled or the level of security. The mixed model is equivalent to a linear regression with a slightly modified intercept term, that is,

Linear Regression:

$$Y = \beta_0 + (\beta_1 * \text{Number of ACES}) + \text{Error.}$$

Mixed-effects model with random effect for prison:

$$Y = (\beta_0 + \text{Prison Effect}) + (\beta_1 * \text{Number of ACES}) + \text{Error.}$$

The random intercepts were analysed for between prison differences and overall variation explained. The decision to use a mixed-effects model rather than a GEE was to model the prison effect rather than average the two prisons together (Hubbard et al., 2010). Fixed effects were tested for significance using the Satterthwaite approximation (Kuznetsova et al., 2015). The Satterthwaite procedure was used due to its increased precision of the estimate compared with the likelihood ratio test which is fallible to sample size errors (Luke, 2017).

The variation attributed to the random effect is also reported. All analyses were ran in R using the *lme4* and *lmerTest* packages (Bates et al., 2015; Kuznetsova et al., 2015; R Core Team, 2020).

3 | RESULTS

3.1 | Demographics and trauma exposure

Participant characteristics and trauma exposure are described by gender to outline differences between the populations. Men were older than women at the time of the interview (men = 40.12, *SD* = 11.66; women = 37.14, *SD* = 10.66, $p < .001$), were younger at the time of first arrest (men = 17.12, *SD* = 8.44; women = 21.49, *SD* = 9.49, $p < .001$) and had been incarcerated longer (men = 16.94 years, *SD* = 9.92; women = 6.73 years, *SD* = 7.17, $p < .001$). Men and women did not differ on the number of times arrested prior to this incarceration (men = 12.39, *SD* = 21.1; women = 13.68, *SD* = 21.4). The men were more likely to be Hispanic (46.2% vs. 31.8%, $p < .001$), whereas women were more likely to be white (31.3% vs. 20.2%, $p < .001$), and 22.7% of the men and 19.8% of the women were black. Similar percentages of both women and men participants were never married (46.5% and 45.9%), although higher percentages of men reported being married or living as married prior to incarceration (39.1% vs. 29.4%, $p < .001$). The men were more likely than the women to have had some high school or a high school degree (61.6% vs. 57.4%, $p < .001$). Sixty-four per cent of the women were given a mental health diagnosis at some time compared with 31.5% of the men ($p < .001$).

Table 1 displays the prevalence of ACES by gender. Men were significantly more likely to report verbal abuse (67.2% vs. 60.4%), physical abuse (63.5% vs. 56.5%), neglect (33.3% vs. 24.4%) and incarceration of a household member (43.8% vs. 37.8%). Women more often reported sexual abuse (53.6% vs. 29.0%) and mental illness in the home (37.5% vs. 31.5%). Both women and men reported similar rates of emotional abuse, parental divorce or separation, domestic violence and substance use in the home. On average the men reported 4.88 ACES (*SD* = 2.75) and women reported 4.93 (*SD* = 2.85).

3.2 | Mixed model for women

The mixed-effects models showed that the number of ACES reported by the women was significantly correlated with the impact of the *HT* intervention for nine of the 14 outcomes measured (see Table 2). The negative coefficients signify the beneficial impact of the intervention (i.e., the negative mean change shows positive impact or improved well-being). The coefficient corresponding to mean number of ACES for women (ranging from 0 to 10; *mean [SD]* = 4.93 [1.22]) signified that for each additional ACE, there was a significantly greater impact of the *HT* intervention for anxiety, depression, PTSD, overall mental health and current trauma symptoms). Also, for each additional ACE,

TABLE 1 Adverse childhood experience (ACE) histories by gender (N = 1310)

Averse childhood experiences		Men (N = 616)	Women (N = 675)	Total (N = 1310)	p < .05
Verbal	Did a parent/adult in the household often/very often swear, insult, humiliate, put you down, or make you fear you might be physically hurt?	67.2%	60.4%	63.6%	.007
Physical	Did a parent/adult in the household often/very often push, grab, slap, or throw something at you? Or ever hit you so hard that you had marks or were injured?	63.5%	56.5%	59.8%	.006
Sexual	Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way? Or attempt to or have oral, anal, or vaginal intercourse with you?	29.0%	53.6%	41.8%	.001
Emotional	Did you often/very often feel that no one in your family loved you or thought you were important/special? Or your family did not look out for each other, feel close to each other, or support each other?	49.8%	54.2%	52.1%	.064
Neglect	Did you often/very often feel that you did not have enough to eat, had to wear dirty clothes, and had no one to protect you? Or your parents were too drunk or high to take care of you or take you to the doctor?	33.3%	24.4%	28.6%	.001
Parental separation	Were your parents ever separated or divorced?	71.0%	69.6%	70.3%	.316
Domestic violence	Was your mother/stepmother: Often/very often pushed, grabbed, slapped, or had something thrown at her? Or kicked, bitten, hit with a fist, or hit with something hard?	37.7%	38.5%	38.1%	.408
Substance use	Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?	64.2%	62.4%	62.4%	.271
Mental illness	Was a household member depressed or mentally ill, or did a household member attempt suicide?	31.5%	37.5%	34.6%	.014
Incarceration	Did a household member go to prison?	43.8%	37.8%	40.7%	.017

TABLE 2 Mixed-effects modelling for women (N = 682)

Outcome	Fixed effects		Random effects	
	Intercept	ACE_Sum Coef	Prison 1 (high need)	Prison 2 (reception centre)
1. Anxiety	-.27	-.25**	0	0
2. Depression	-1.45	-.29**	0	0
3. PTSD	-.66	-.25**	0	0
4. Mental health	-.91*	-.18**	0	0
5. Current trauma symptoms score	-2.1	-1.2**	0	0
6. Physical aggression	-1.14	-.22**	-.14	.14
7. Verbal aggression	-.18	-.13*	0	0
8. Indirect aggression	-.65	-.14*	-.14	.14
9. Anger	-.91	-.09	-.28	.28
10. Hostility	-1.5	-.13	-.5	.5
11. Instrumental anger	-1.7**	-.06	0	0
12. Expressive anger	-.11	-.28**	0	0
13. State anger	-2.2**	-.03	0	0
14. Trait anger	-1.24	-.09	-.62	.62

*p < .05. **p < .01.

there was a significantly greater impact of the *HT* intervention for physical, verbal and indirect aggression and expressive anger. However, the ACE coefficient was not related to participant's mean change from preintervention to postintervention on angry feelings, hostility, instrumental anger or state or trait anger (indicating that the intervention impacted participants similarly on these measures regardless of number of ACEs reported. Also indicated by the significant intercept terms).

Variation attributed to the prison was low; however, the high need women appeared to have a greater programme impact on some measures of aggression and anger compared with the women in the reception centre.

3.3 | Mixed model for men

The mixed-effects models showed that the number of ACEs reported by the men was significantly correlated with the impact of the *ET* intervention for 12 of the 14 outcomes measured (see Table 3). The coefficient corresponding to mean number of ACEs for men (ranging from 0 to 10; *mean [SD] = 4.88 [1.10]*) signified that for each additional ACE, there was a significantly greater impact of the *ET* intervention for anxiety; depression; PTSD; overall mental health; current trauma symptoms; physical, verbal, and indirect aggression; angry feelings; hostility; instrumental anger and expressive anger. The ACE coefficient was not related to participant's mean change from preintervention to postintervention on state or trait anger (indicating that the intervention impacted participants similarly on these measures regardless of number of ACEs reported).

Variation attributed to the prison was low; however, participants in the highest level of security had greater reductions in anxiety, depression, PTSD and anger compared with those in the lower security prisons. The intercept and the main effect for the ACE coefficient are significant for current trauma symptoms and instrumental anger, indicating that there is a significant treatment impact while holding the ACE score constant.

4 | DISCUSSION

Previous research of the *HT* and *ET* brief interventions outlined significantly improved psychological functioning, and reductions in anger, and aggression among incarcerated women and men. The current study's exploration of the relationship of ACEs to the *HT* and *ET* participant outcomes revealed that ACEs had a positive and graded correlation with outcomes for all of the mental health and aggression measures for both women and men (i.e., greater exposure to childhood traumatic events increased the likelihood participant programme gain). The current findings build upon existing literature to provide further evidence of the benefits of implementing trauma-specific interventions.

The long-held contention among corrections and treatment agencies that prison as an inappropriate environment to address histories of trauma for fear of triggering violence or causing distress or decompensation among participants is incorrect. The consistent and positive change found among the participants from the *HT* and *ET* interventions indicates that there is potential for effective trauma-specific programme services to be more broadly implemented in corrections. In fact, when the intervention is manualized and appropriate training and

TABLE 3 Mixed-effects modelling for men ($N = 624$)

Outcome	Fixed effects		Random effects		
	Intercept	ACE_Sum Coef	Prison 1 Level IV	Prison 2 Level III	Prison 3 Level II
1. Anxiety	-.69	-.18**	-.26	-.12	.38
2. Depression	-1.24	-.21**	-.56	-.39	.94
3. PTSD	-.45	-.21**	-.27	-.06	.32
4. Mental health	-.14	-.25*	-.12	-.23	.35
5. Current trauma symptoms score	-3.13**	-.77**	0	0	0
6. Physical aggression	-.67	-.28**	0	0	0
7. Verbal aggression	-.04	-.15*	0	0	0
8. Indirect aggression	.05	-.18**	-.07	0	.07
9. Anger	-.13	-.26**	-.017	.08	.09
10. Hostility	-.26	-.29**	0	0	0
11. Instrumental anger	-1.28*	-.20*	0	0	0
12. Expressive anger	.01	-.34**	0	0	0
13. State anger	.03	-.17	0	0	0
14. Trait anger	-.55	-.23	-.07	.04	.02

* $p < .05$. ** $p < .01$.

oversight is provided, a cost-effective peer-led model can be successfully facilitated at various levels of security.

Ultimately, the goal is to provide justice-involved populations with the recovery tools they need to pursue safe and healthy lives both in and out of prison. Particularly as those with the most complex needs are often ineligible for group programming, as they are considered too disruptive and in need of higher levels of custody and confinement.

4.1 | Limitations

One important limitation is that the findings are correlational, and thus, greater reductions in mental health and other symptoms among those who had the highest number of ACEs may be a function of a statistical regression to the mean. That is, those with the highest ACE scores had the greatest opportunity for gain. However, significant changes were revealed in many instances regardless of the number of ACEs reported. The current study also relied on self-administered survey data. We did not have access to objective measures (i.e., record-based data) to determine previous mental health diagnoses or to substantiate self-reported histories of crime and addiction. The questions on the ACE survey were also limited, as the results regarding histories of sexual and physical abuse were dichotomous (yes or no) questions, which did not inquire about the perpetrator(s) of the abuse, the age at which it occurred or the duration of the abuse. Thus, responses to the questions reflected each respondent's interpretation of the questions. All analyses explored the amount and patterns of missing data, and the amount of missing data was minimal; thus, mean substitution was used.

4.2 | Implications

The prevalence of residents with unrecognized and untreated trauma from the past, or those currently suffering from PTSD, can further complicate and negatively affect the prison environment and place even greater demands upon the staff. However, trauma-specific interventions are only a piece of the puzzle that is needed to create trauma-informed and trauma-responsive rehabilitative environments within corrections. A prison that is responsive to and promotes the mental health of those housed within its walls is more likely to be an organization that promotes the overall morale and well-being of staff. Creating a trauma-informed correctional organization incorporates the use of trauma-informed principles for all the staff and addresses the needs, beliefs, and attitudes of the organization as a whole. To become a 'trauma-informed' organization, corrections agencies must acknowledge the training, programmes, policy and practices that need in place to move to a 'trauma-responsive' organization (Bloom, 2010; Covington, 2012, rev. 2019; Covington & Bloom, 2018; Kubiak, Covington, et al., 2017).

The findings of the study also support change in institutional practice regarding the feasibility and impact of peer-facilitated

programmes. A peer-facilitated model of programme delivery can be significantly impactful for justice-involved populations to reduce trauma-related difficulties and increase well-being. In fact, the effectiveness of peer-led programmes has a positive impact for both facilitators and participants (Bagnall et al., 2015; South et al., 2014; Woodall et al., 2015). Recent RCTs have also outlined the significant impact of peer-facilitated violence prevention programmes for incarcerated women and men. The nation is currently challenged with a significant clinician shortage, and mental health care within the prison system is not immune to this shortage. The findings are further applicable to cost-effective corrections services, as they reveal the efficacy of brief interventions as well as peer-facilitated interventions. However, this study underscores the need for appropriate peer training, oversight and manualized curricula to enhance fidelity and reliability of the programme facilitation.

5 | CONCLUSION

Correctional treatment has predominantly focused on reducing recidivism and/or substance use. Complex histories of trauma and abuse have not been sufficiently explored as mediators of treatment outcomes, and treatment outcomes need to incorporate more in-depth measures beyond abstinence and recidivism. The research findings provide initial evidence that those with histories of childhood maltreatment can be treated in a custody setting when the programme content is addressing those histories with safety and appropriate material. Moreover, the current findings suggest that participants with the highest levels of trauma histories can be particularly influenced. Additional rigorous studies are needed to move these and other trauma-informed interventions from best practices to evidenced-based interventions.

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CONFLICT OF INTEREST

We have no known conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

The data are not available and belong to the California Department of Corrections and Rehabilitation. The current study is secondary data analysis.

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