Childhood Trauma, Traumatic Brain Injury, and Mental Health Disorders Associated With Suicidal Ideation and Suicide-Related Behavior in a Community Corrections Sample

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Suicidal ideation and suicide-related behavior among community-supervised offenders are significant public health problems. In a sample of 418 subjects served by the community corrections office of Iowa's Sixth Judicial District, 56 percent of subjects denied suicidal ideation and suicide-related behavior (control group), 17 percent reported suicidal ideation without suicide-related behavior (ideator group), and 27 percent reported engaging in suicide-related behavior (actor group). A model comprising five independent variables differentiated the ideator and actor groups from the control group: Caucasian race, depressive symptom sum, brain injury, childhood trauma, and avoidant personality. These five factors, combined with the additional variables of PCL:SV Factor 2 (Psychopathy Checklist-Screening Version) score and lifetime anxiety disorder, differentiated the actor group from the control group.

J Am Acad Psychiatry Law 41:245–55, 2013

As the responsibility of caring for offenders with mental illness continues to shift from medical to correctional services, one would expect the associated risks of self-harm to rise in correctional settings.[1,2] Several authors have noted that self-harm incidences are higher among correctional populations than in the general population.[3–9] Although most offenders are served in the community (5 million of the 7.2 million)[10,11] and previous research has indicated that community-supervised offenders are at greater risk to die than incarcerated persons,[12] few studies have examined the frequency of suicidal ideation or suicide-related behavior during community supervision.[13]

Offenders share many risk factors for suicidal ideation and behavior with members of the general population, including previous suicide attempts, mental health disorders (e.g., depression, psychosis, and substance use), impulsive aggressive personality style, significant social and occupational losses, social isolation, feelings of hopelessness, physical illness, family history of suicide, and exposure to suicide in the community.[2,12,14–16] Prior victimization and childhood trauma also appear to increase risk of suicidal ideation and behavior.[17–20]

Risk factors for a suicide attempt after suicidal ideation include mood instability, feelings of hopelessness, clinical change in affective presentation, suicidal communication to significant others, anhedonia, panic attacks, and a history of recent alcohol abuse.[15] Compared with incarcerated populations, newly released former inmates were found to be at

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Disclosures of financial or other potential conflicts of interest: None.

equal or increased risk of suicidal behavior in several,[21–23] but not all,[24] studies. Using a case-control study method, researchers recently reported that males and females newly released from prison were significantly (males 8 times and females 36 times) more likely than members of the general population to die by suicide, with risk factors of age greater than 25 years, release from a local prison, prior self-harm, alcohol abuse, and mental health needs requiring contact with community mental health after release.[25] Protective factors in this study of newly released inmates included nonwhite ethnicity and a history of previous imprisonment.[25]

Examinations of individuals under community corrections supervision indicated that probationers and parolees have higher rates of suicide than the general population or prisoner populations.[12,26–28] Sudden noncompliance with conditions of supervision after a period of satisfactory compliance was the only finding associated with death by suicide.[26] Substance use was another common finding associated with suicide among community offenders.[12] Regarding probationers, Wessely and colleagues[13] reported that 31 percent of the sample indicated a history of deliberate self-harm, frequently with suicidal intent. The authors noted significant overlap in the risk factors for deliberate self-harm and death by suicide in this group, including unemployment, substance abuse, lack of social supports, mental illness, and previous episodes of self-harm. Although the work of Sattar[12] and Biles *et al.*[26] suggested that younger inmates are at greater risk of death by suicide,[12,26] Pritchard and colleagues[28] examined age at the time of death and found that male probationers aged 35 to 44 and 45 to 54 years had 35 times the rate of death by suicide as same-aged peers in the community, compared with 9 times the rate of death by suicide for the sample as a whole aged 17 to 54.

Suicide-related behavior may be conceptualized as self-injurious without overt lethal intent, suicidal gestures, and recognized suicide attempts. Researchers have suggested that subjects engaging in self-harm are likely to underestimate the lethality of attempts, leading to misclassification.[29,30] Lanes[31] postulated that abuse and neglect during childhood, brain injury, lack of formal education, and mental illness (mood disorder or personality disorder) increase the likelihood that an individual will engage in suicide-related behavior. Suicide-related behavior may represent an attempt to relieve tension and anxiety, demonstrate frustration and hostility, express emotional pain (e.g., depression or anger), or forestall more dangerous self-destructive impulses.[3,15] Several psychiatric diagnoses have intermittently been associated with suicide-related behavior in offenders.[15] Specific diagnoses associated with increased risk of suicide-related behavior include borderline and antisocial personality disorders, anxiety disorder, posttraumatic stress disorder, and eating disorders (especially anorexia, binge-purge subtype).[5,15,32] In a sample of female inmates, those with histories of bulimic behavior, distorted self image, and prostitution were more likely to engage in suicide-related behavior.[5] However, Young *et al.*[33] reported that absence of Axis I mental disorder and presence of borderline personality disorder identifies offenders who are more likely to engage in suicide-related behavior, as does the presence of psychopathy, drug abuse, and young age, but not previous psychiatric treatment.

In a prior interval analysis, we examined factors associated with lifetime suicidal ideation, suicide attempts, and nonlethal self-harm in nonmutually exclusive groups and found that lifetime episodes of bone fracture and traumatic life experience before 18 years of age were uniquely associated with all three outcomes. Depression was associated with suicidal ideation and suicide attempts, and anxiety was associated with nonlethal self-harm. Psychopathy was associated with suicidal ideation and nonlethal self-harm. Caucasian race was associated with suicidal ideation.[34] We concluded from this work that traumatic life experience, depression, anxiety, psychopathy, and repeated injury were associated with suicidal ideation and suicide-related behavior. While completing the analyses, we noted that very few subjects would belong to the nonlethal self-harm group if those who also had suicidal ideation and suicide attempts were excluded. We hypothesized that the association between lifetime fractures and suicide-related behavior represents a more general construct of accidental injury and inferred that the more pertinent variable may well be brain injury. We also noted that the self-harm behaviors reported by those who denied lethal intent were similar in nature and risk to those who indicated lethal intent. One of the notable weaknesses of this work was the frequency of overlap between the groups. For instance, most members of the suicide attempt and nonlethal self-harm groups also reported suicidal ideation, and most members of

the nonlethal self-harm group also reported suicide attempts.

The current analysis extends this prior work by using a larger sample and mutually exclusive groups composed of individuals with neither suicide-related thoughts nor behavior (the control group), those with suicidal thoughts without suicide-related behavior (the ideator group), and those with suicide-related behavior regardless of ideation (the actor group). The primary purpose of this study was to identify factors that separate the ideator and actor groups from the control group among community-supervised offenders. Based on our prior interval analysis, we hypothesized that a model composed of childhood trauma, depression, anxiety, brain injury, and antisocial personality would produce statistically significant differentiation between the ideator and actor groups and the control group.

Methods

Before the study, the principal investigator met with members of the leadership team and administrative staff and with groups of case managers and clients from the community corrections office of Iowa's Sixth Judicial District (SJD). Staff expressed curiosity about the frequencies of medical and psychiatric illnesses in this population, and concern about the level of self-destructive thoughts and behavior observed among clients. Clients believed that correctional staff knew relatively little about them, apart from that which might have been discovered during the process of adjudication, and identified gaps in medical and mental health services available to them in the community that adversely affected them.[35]

After completion of the community consultation process, review of de-identified pilot data, and the University of Iowa Institutional Review Board approval of all study materials and methods, advertisements were placed in areas in the SJD community corrections programs in which clients were seen. The research team made particular attempts to place study information in areas that were identified by staff as serving women and members of minority groups to optimize recruitment of these individuals. Volunteers responded to the advertisements by contacting the research team. At first contact, potential subjects were screened to make certain that they were adults, currently served by SJD, not incarcerated, and not previously enrolled in the study. After obtaining written informed consent from each participant in person, a trained research assistant interviewed subjects in a private location. In addition to providing consent for the interview, subjects also provided consent for the research team to review the community corrections files. Data collected from the community corrections record and publicly available databases included supervision type and status, most recent charge, most recent adjudication, and current status. Following recruitment, consent, and initial data collection, trained research assistants administered the Semi-structured Assessment for the Genetics of Alcoholism Revised (SSAGA-II), Hare Psychopathy Checklist Screening Version (PCL:SV), and Achenbach Adult Self Report (ASR) to study subjects. Researchers provided compensation to subjects for their time at the completion of the interview. An investigator-initiated Certificate of Confidentiality was obtained from the National Institutes of Health.

The SSAGA-II is a comprehensive polydiagnostic instrument designed to assess substance use and co-occurring disorders. Using the SSAGA-II, interviewers collect demographic data, medical history, mental health history, and symptoms of a variety of mental health disorders including major depressive episode, panic, agoraphobia, generalized anxiety disorder, posttraumatic stress disorder, antisocial personality disorder, and several substance use disorders, including tobacco dependence, alcohol abuse and dependence, marijuana abuse and dependence, cocaine abuse and dependence, stimulant abuse and dependence, and other drug dependencies. Diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)[36] were applied to the resulting data to yield lifetime diagnoses. The SSAGA-II also has sections that allow for data collection in the areas of suicidal ideation, suicide attempts, and episodes of volitional self-harm without the intent to die.[37–39] SSAGA-II questions used for group assignment for the primary analyses included: Have you ever thought about killing yourself? Have you ever tried to kill yourself? Other than when you tried to take your own life, did you ever hurt yourself on purpose, for example by cutting or burning yourself? Regarding health variables, research assistants coded the subjects as having a traumatic brain injury if the subject reported that a health care provider had ever told him that he had a head injury or concussion, or if the subject reported that he had been unconscious for

more than five minutes. Research assistants coded subjects as having experienced a traumatic life event if the subject reported that he had ever witnessed something that is so horrible that it would be distressing to almost anyone.

The PCL:SV is a structured interview used to assess for psychopathy.[40,41] Whereas the PCL:R has 20 items and a maximum possible score of 40, the PCL:SV contains 12 items and has a maximum possible score of 24. On the PCL:SV, a sum score of 0 to 11 indicates absence of psychopathy, a score greater than 17 indicates likely psychopathy, and the remainder are indeterminate.[42] Like the PCL:R, two factors may be derived from the PCL:SV: Factor 1 is a measure of emotional features associated with psychopathy, and Factor 2 is a measure of antisocial lifestyle.[43]

The ASR is a self-report instrument that focuses the subject's attention to the six-month period before the interview. The ASR allows for the scoring of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)[44] oriented scales, defined in the scoring manual as those scales corresponding to diagnostic categories described in DSM-IV, such as depressive, anxiety, somatic, avoidant personality, antisocial personality, and attention deficit hyperactivity disorder problems. The instrument may be used as a dimensional assessment or with categorical cut-offs. For the purposes of this study, categorical cut offs of normal, borderline, and clinical were used as defined in the manual.[45]

More than 80 variables were screened for univariate association with the three-category study group variable (ideators versus actors versus controls). For continuous variables, comparisons were made using analysis of variance (ANOVA), with Student-Newman-Keuls *post hoc* pairwise comparisons when the omnibus ANOVA was statistically significant. For dichotomous and categorical variables, comparisons were made using the chi-square test of association, with comparisons of standardized residuals for statistically significant Pearson chi-square values. As a result of this screening process, 27 variables were identified for consideration of inclusion in the multivariable multinomial regression analyses. The main statistical analysis was performed with multinomial (three-group criterion variable) regression with the control group as the reference (0) category (versus ideator (1) and actor (1) groups). The forward-selection method was used to iteratively include significant variables in the model. The Wald criterion was evaluated for statistical significance for each variable entered. Odds ratios and 95 percent confidence intervals (CI) were calculated. This approach allowed us to identify the most important main effects, to explain the greatest amount of variance without burdening the equation with numerous (>50) clearly nonsignificant independent variables. Although variables with nonsignificant univariate relationships with the criterion may sometimes become significant in adjusted models, we had no specific hypotheses to anticipate such effects.

Table 1 Sample Characteristics

Characteristics	% (*n*) or Mean (SD)
Gender	
Male	70 (291)
Female	30 (127)
Race	
Caucasian	75 (313)
African American	21 (89)
Other	4 (16)
Age, years	33.5 (9.6)
Marital status	
Single, never married	59 (246)
Divorced	22 (90)
Separated	8 (35)
Widowed (widower)	1 (4)
Married	10 (43)
Education	
<High school, no GED/diploma	24 (99)
GED	37 (155)
High school diploma	39 (164)
Full-time employment	82 (341)

Results

A total of 419 subjects were recruited; 418 completed all study instruments. The sample was predominately Caucasian (75%) and male (70%), with a mean age of 33.5 ± 9.6 years. Most subjects (59%) reported being single. Approximately one third (39%) had attained at least a high school diploma, and most (82%) were employed (Table 1). All subjects resided in the community at the time of the study. Most subjects were nonviolent offenders with multiple convictions (89% and 93%, respectively; Table 2). Over 40 percent of subjects reported experiencing suicidal ideation, and 27 percent reported past suicide-related behavior.

Three mutually exclusive groups were formed for analysis based on the suicide parameters. The control group was defined as no suicidal ideation or actions (n = 235; 56%). The ideator group was defined as

Table 2 Correctional Characteristics

Correctional Characteristics	% (*n*)
Multiple convictions	92 (386)
Current conviction	
Person	11 (45)
Property	40 (167)
Driving while intoxicated	21 (88)
Drug	25 (105)
Other	3 (13)

suicidal ideation without actions ($n = 70$; 17%). The actor group was defined by suicide-related actions regardless of ideation ($n = 113$; 27%). Most individuals reporting lifetime suicide-related behavior also reported lifetime suicidal ideation. Less than three percent of the sample ($n = 12$) reported suicide-related behavior in the absence of suicidal ideation. This was a diverse group of individuals who reported that they acted to cause death before being aware of having thought about it; remembered the attempt but not the preceding moments (sometimes due to intoxication); or, in a minority of subjects, acted only to relieve stress (Table 3).

Regarding traumatic life experience, 59 percent of subjects reported that they had "experienced or witnessed something so horrible that it would be distressing or upsetting to almost anyone." Thirty-one percent of subjects indicated that trauma occurred before age 18. Witnessing trauma, such as seeing someone seriously injured or killed, was the most frequently reported trauma, followed by being assaulted or abused.

Most subjects (93%) met criteria for at least one lifetime substance use disorder and, more commonly, multiple substance use disorders (mean, 2.9). Lifetime tobacco dependence was the most frequently occurring substance use disorder ($n = 292$; 70%). While two-thirds of the sample met criteria for lifetime drug dependence, 7 percent did not meet criteria for any lifetime substance use disorder, 3.5 percent ($n = 15$) of the sample met criteria for tobacco dependence as the only lifetime substance use

Table 3 Suicidal Ideation and Suicide-Related Behavior

Ideation and Behavior	% (*n*)
No suicidal ideation or behavior	56 (235)
Any suicidal ideation	41 (171)
Any suicide-related behavior	27 (113)
Suicidal ideation without suicide-related behavior	17 (70)

Categories are not mutually exclusive.

Table 4 Descriptive Data for Trauma and Mental Health Variables

Variables	% (*n*) or Mean (SD)
Childhood traumatic life experience	31 (131)
Lifetime brain injury	22 (92)
Anxiety disorder	31 (130)
Depression symptom sum	3.3 (3.7)
Depressive disorder	41 (171)
Avoidant personality	
Borderline	9 (38)
Clinical	11 (47)
Three or more ASPD DSM criteria A	88 (368)
Any substance use disorder	93 (388)
Number substance use disorders	2.9 (1.6)
Drug dependence	67 (278)
PCL:SV Factor 1	4.5 (3.2)
PCL:SV: Factor 2	6.6 (3.0)

disorder, and less than 3 percent ($n = 12$) met criteria for alcohol dependence as the sole lifetime substance use disorder. Following substance use disorders, antisocial personality disorder was the next most commonly diagnosed lifetime mental health condition in the sample, with 63 percent meeting full diagnostic criteria for antisocial personality disorder (ASPD) and 88 percent of the sample meeting criteria A for ASPD. Lifetime anxiety and depressive disorders were also relatively frequent in the sample (31% and 41%, respectively). See Table 4 for a summary of lifetime trauma and mental health disorders.

Regarding lifetime suicidal ideation and suicide-related behavior derived from the SSAGA-II, 27 screened factors were associated with increased risk of suicidal ideation or suicide-related behavior in uncontrolled univariate analyses. The statistically significant demographic variables included Caucasian race, age (continuous variable in the direction of younger age), and number of separations from a spouse or significant other. Other SSAGA-II variables that were significant in the uncontrolled analyses included traumatic life experience before age 18, prior diagnosis of sexually transmitted disease, fractures (continuous variable in the direction of higher number of episodes), brain injury, mental health history variables (medications and therapy, inpatient and outpatient), current mental health treatment variables, anxiety disorder, depressive symptom sum, lifetime substance dependence (tobacco, cocaine, and stimulant dependence, as well as the number of substance use disorders), and DSM-IV-TR[36] criteria A of antisocial personality disorder (total criteria met and individual criteria of deception, impulsivity, and irresponsibility). From the ASR DSM-IV-oriented

Table 5 Variables Screened for Possible Association With Suicidal Ideation or Suicide-Related Behavior

- Demographic Variables
  - Gender
  - Age (younger)*
  - Race*+
  - Ethnicity
  - Marital status
  - Current spouse or partner
  - Number of separations from spouse or partner*
  - Educational achievement
  - Employment and type
  - Usual occupation
  - Annual income
- Criminal Justice Variables
  - Current supervision status
  - Current conviction type
  - Number of prior convictions
  - Prior conviction type
- Health and Treatment Histories
  - Current health
  - Current health relative to past health
  - Prior diagnoses by care provider
    - Sexually transmitted diseases*
    - Mental health or substance use disorder*
    - Traumatic brain injury*†
    - Fractures*
  - Inpatient medical treatment
  - Outpatient medical treatment
  - Outpatient surgeries
  - Emergency department visits
  - Scheduled medical visits last six months
  - Inpatient mental health and/or substance abuse treatment*
  - Outpatient mental health and/or substance abuse treatment*
  - Current mental health treatment*
  - Medications prescribed more than two weeks ever
    - Any*, sleep*, anxiety*, depression*, energy*, steroid*
    - Headache, birth control, other
  - Medications prescribed within past 30 days
    - Any*, sleep*, anxiety*, depression*
    - Energy, steroid, headache, birth control, other
  - Talked to a professional about mental health concerns ever*
  - Traumatic life experience (type, frequency, chronicity, age*†)
- SSAGA 2 Lifetime Diagnoses
  - Antisocial personality disorder
    - Number of DSM A Criteria*
    - Individual DSM A Criteria
    - Repeated illegal acts
    - Deception*
    - Impulsivity*
    - Irresponsibility*
    - Recklessness
    - Irritability/aggression
    - Lack of remorse
  - Anxiety disorder*†
    - Panic disorder
    - Agoraphobia
    - Generalized anxiety disorder
    - Posttraumatic stress disorder
    - Social phobia
  - Depressive disorder*
    - Number of depressive criteria during most severe episode*†
    - Number of depressive episodes
  - Eating disorder (any)
  - Substance use disorder (any)
    - Number of substance use disorders*
    - Alcohol abuse and dependence
    - Cocaine abuse and dependence*
    - Marijuana abuse and dependence
    - Other drug abuse and dependence
    - Stimulant abuse and dependence*
    - Tobacco dependence*
- Achenbach Adult Behavior Checklist Self-Report (last six months)
  - DSM-Associated Scales
    - Antisocial personality*
    - Anxiety*
    - Attention deficit hyperactivity*
    - Avoidant*†
    - Depression*
    - Somatic
  - Problem Scales
    - Alcohol
    - Drug
    - Tobacco
    - Mean substance use*
- Hare Psychopathy Checklist Screening Version
  - PCL:SV total score*
  - Factor 1 score*
  - Factor 2 score*†

* Significant uncontrolled univariate associations with ideator or actor group membership.
† Differentiated ideator or actor group from control group.

scales measuring problems occurring within the six months before interview, depressive, anxiety, avoidant, attention deficit hyperactivity, and antisocial problems were all associated with suicidal ideation or suicide-related behavior when compared with the control group. When measured according to the substance abuse scales from the ASR, mean substance use rose to significance, while no single substance category (tobacco, alcohol, drugs) did. From the PCL:SV, the Factor 1, Factor 2, and total scores were all associated with suicidal ideation or suicide-related behavior. Though marital status was not associated with suicide-related variables, the number of separations from a spouse or significant other was associated. See Table 5 for a list of all variables screened, those found to have significant univariate relationships to either suicidal ideation or suicide-related behavior, and those who survived modeling.

Forward entry analysis with conditional inclusion was then used to generate the most relevant variables

Table 6 Multinomial Model: Suicidal Ideation Relative to No Suicidal Ideation/Action

Factor	$p \leq$	Wald	Odds Ratio (95% CI)
Caucasian	.001	14.58	5.98 (2.38–14.97)
Depression symptom sum	.003	8.59	1.13 (1.04–1.23)
Brain injury	.007	7.19	2.63 (1.30–5.35)
Childhood trauma	.008	7.13	2.70 (1.30–5.61)
Avoidant personality	.028	4.81	2.97 (1.12–7.87)
PCL:SV Factor 2 score	.070	3.28	1.10 (0.99–1.22) ns
Any anxiety disorder	.075	3.17	0.55 (0.28–1.06) ns

for inclusion in a multinomial regression model differentiating the actor and ideator groups from the control group. Seven independent variables significantly differentiated the ideator or actor group from the reference group. Those included Caucasian race, number of depressive symptoms during the most severe depressive episode (i.e., depressive symptom sum), traumatic brain injury, childhood trauma, avoidant personality, anxiety disorder, and PCL:SV Factor 2 score. The resulting multinomial model explained approximately 42 percent of the variance in group membership. Five of these variables were significantly associated with ideator status (Caucasian race, depressive symptom sum, brain injury, childhood trauma, and avoidant personality; Table 6). All seven variables were significantly associated with actor status (although the effect sizes were different in magnitude; Table 7).

Discussion

Our hypothesis that a model composed of childhood trauma, head injury, depression, anxiety, and antisocial personality would separate the control, ideator, and actor groups was partially supported. As the result of these analyses, we conclude that Caucasian race, childhood trauma, traumatic brain injury, depression, and avoidant personality are independent risk factors for both suicidal ideation and suicide-related behavior in a relatively young sample of adults serving a community sentence for a nonviolent offense. Two additional factors, presence of a lifetime anxiety disorder and increased antisocial lifestyle score on the PCL:SV, were associated with actor, but not ideator, group assignment.

Table 7 Multinomial Model: Suicide-Related Behavior Relative to No Suicidal Ideation/Action

Factor	$p \leq$	Wald	Odds Ratio (95% CI)
Depression symptom sum	.001	29.08	1.24 (1.14–1.35)
PCL:SV Factor 2 score	.001	15.62	1.23 (1.10–1.36)
Brain injury	.001	13.93	3.61 (1.84–7.10)
Avoidant personality	.001	13.02	5.24 (2.13–12.87)
Childhood trauma	.001	10.33	2.97 (1.52–5.76)
Caucasian	.005	7.79	2.69 (1.34–5.39)
Any anxiety disorder	.012	6.31	2.21 (1.19–4.10)

Despite the clinical importance of differentiating individuals who contemplate suicide but never act against themselves from those who do act against themselves, limited constructs exist for doing so.[46–51] Because the literature is replete with risk factor analyses, the following discussion will focus on positioning the current findings within the landscape of the existing literature.

Much work in the area of suicide risk assessment reports Caucasian race as a risk factor for suicidal ideation and suicide-related behavior in community samples. However, the current findings are in contrast to the work of Kessler and colleagues,[51] in that this study did not find significant independent associations of female gender and marital status with suicide attempts, and did find an independent association of Caucasian race with both suicidal ideation and suicide-related behavior.

Traumatic life experience before the age of 18 was independently associated with both suicidal ideation and suicide-related behavior in this study. Childhood trauma is a risk factor for a variety of negative outcomes, including aggression and suicide-related behavior in correctional and noncorrectional populations.[52–54] It has been associated specifically with personality disorder, psychotic symptoms, dissociative states, externalizing behavior (substance use and violence), and internalizing disorders (depression and anxiety).[5,55–58] Criminal offenders have high rates of childhood trauma and suicide-related behavior.[59–61] Prior studies have identified the presence of negative emotions such as distress, feelings of hopelessness, and shame in female inmates with a history of childhood abuse, a form of childhood trauma, and postulate that these are important risk factors for suicidal and other self-harm behavior.[61–63] Biological theories postulate that child abuse may result in attenuated serotonergic activity, which may underlie impulsivity, in turn leading to a greater propensity to act on aggressive impulses toward the self or others.[58]

In keeping with prior findings in the literature, brain injury was significantly associated with suicidal ideation and suicide-related behavior.[64–67] Tsaousides and colleagues[68] reported that community adults living with brain injuries were at increased risk

for suicidal ideation, regardless of demographic characteristics, severity of injury, or co-occurring psychiatric disorders. Recent findings in a small sample of veterans suggest that traumatic brain injury is associated with both impulsivity and suicidal behavior and hypothesize a neurobiological vulnerability to suicide risk mediated by frontal white matter changes on diffusion tensor imaging.[69] This theory differs from that of Oquendo and colleagues,[64] who suggest that preexisting hostility and aggression underlie the association between traumatic brain injury and suicidal behavior. Yet another possibility is that the head-injury variable, like the fracture variable in the previous study, is in fact more akin to existing literature concerning higher rates of accidental injury and poorer health status among individuals with substance use and antisocial personality disorders.[30,70–73]

Anxiety was associated with actor group membership, whereas avoidant personality (a form of anxious attachment) and depression were associated with both ideator and actor group membership in the current study. Anxiety and depressive disorders are frequent in the general population, as well as in forensic populations. In this sample, 31 percent of subjects met criteria for a lifetime anxiety disorder and 41 percent for a lifetime depressive disorder. Although these frequencies are somewhat lower than one might expect, they are in keeping with existing literature in the area. In a sample of inmates entering the Iowa prison system, 23 percent met criteria for a lifetime depressive episode and 38 percent met criteria for an anxiety disorder.[74] In other studies, the rate of depression in male offenders has been shown to be between 30 and 37 percent and slightly higher in female offenders.[3] Finally, in a sample of female inmates, 23 to 30 percent met criteria for depression.[75]

Anxious attachment style, such as is present in avoidant personality disorder, has been correlated with suicidal behavior in the literature,[76,77] as has anxiety more generally. In the work of Klonsky and colleagues,[78] both anxiety and depression were associated with self-harm in a sample of Air Force recruits, and similar findings have been suggested by other investigators in other populations.[32,79]

Regarding depression, a higher number of criteria during the most severe depressive episode differentiated both ideator and actor groups from the control group. Other investigators have noted the associations of suicidal ideation and suicide-related behavior with depressive symptoms, and depression has been found to be the best predictor of suicide in prison populations.[1,14] Unrecognized depression may greatly increase the risk of suicide-related behavior when psychologically vulnerable persons endure the stresses of the criminal justice system,[80] and particular care must be taken to monitor for depression in community corrections settings as well.

The Factor 2 sum score of the PCL:SV was uniquely associated with membership in the actor group in the current analysis. Elsewhere in the literature, suicidal ideation and attempts have been correlated with Factor 2 scores.[33,81–84] When testing a four-factor model of psychopathy and suicide-related behavior, researchers noted that the Factor 2 contribution to suicide-related behavior was largely due to Facet 3 impulsivity, as opposed to Facet 4 antisocial behavior.[85] Although it may seem surprising that the Factor 1 sum score was not associated with ideator or actor status, some authors have suggested that high scores measuring the affective features of psychopathy (i.e., elevated Factor 1 scores) are actually protective against suicide-related behavior,[84,85] though this effect may be gender specific.[86]

Limitations

This sample of offenders was composed of volunteers from a subsection of a community corrections population, largely those in residential programing; thus, generalizability may be limited. Reliance on volunteerism in a community-dwelling sample may have resulted in inadvertent selection of individuals who were healthy and resilient. There were no known deaths in the sample or the underlying community corrections population from which these subjects were drawn during the relatively brief study period of one year. All data concerning mental health symptoms, substance use, suicidal ideation, and suicide-related behavior were self-reported by study subjects, and potential sources of error from self-report measures may include social desirability, recall bias, and inaccurate symptom reporting (either over-reporting or underreporting). As both a strength and a weakness, we chose not to attempt to classify self-injurious behavior based on subject-reported lethal intent because subjects engaging in self-harm may underestimate the lethality of their attempts leading to misclassification,[29,30] though the potential exists that intent may be an important differentiation. And last, owing to the construction of the semistructured

interview, it was not possible to establish a time line between traumatic life experiences, traumatic brain injury, depressive episodes, anxiety symptoms, suicidal ideation, and suicide-related behavior.

Conclusions

Although many studies have examined the associations of a variety of variables with suicidal ideation and the related phenomenon of suicide-related behavior, very few have modeled these variables and examined relative contributions of each to the outcome of interest. Much of the existing research on suicidal ideation and suicide-related behavior is of limited utility in correctional settings because most offenders are at increased risk relative to community dwellers by virtue of the preponderance of males, frequency of substance use disorders, antisocial behavior and personality, and limited social supports. Yet correctional settings have relatively few resources with which to tackle these problems. Thus, research differentiating groups of offenders at risk of suicidal ideation without suicide-related behavior from those most likely to engage in suicide-related behavior could provide guidance in allocating suicide prevention resources. These data suggest that anxiety and higher antisocial lifestyle scale score were uniquely associated with suicide-related behavior, when combined with other variables that were associated with suicidal ideation (Caucasian race, depression, brain injury, childhood trauma, and avoidant personality). At least one possible theory concerning the contribution of anxiety and Factor 2 psychopathy score to acting against the self, but not to suicidal ideation, in this offender sample, would be that when anxiety and psychopathy co-occur, a frustration-aggression diathesis may be set up that ultimately ends in an impulsive act that discharges the tension.[59]

Acknowledgments

We thank Gloria Wenman and Nancy Hollenbeck for help with data collection and Gerald Hinzman and the staff of the Community Corrections Office of Iowa's Sixth Judicial District for help with interview facilities.

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