Prevalence of Traumas and PTSD Among Individuals Adjudicated Not Guilty by Reason of Insanity

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Trauma and posttraumatic stress disorder (PTSD) are common among psychiatric and criminal populations, yet there have been few studies among forensic psychiatric populations and no known studies have specifically examined insanity acquittees. This study aimed to identify the prevalence of trauma and to assess recognition of PTSD in forensic settings. Using a cross-sectional self-report survey methodology, we examined traumas, adverse childhood experiences (ACEs), and PTSD in insanity acquittees ($n = 107$). Most insanity acquittees experienced trauma (86%, averaging 11 events) and ACEs (76%, averaging 3 types). The most commonly experienced traumas were sudden death of a loved one, witnessed death or serious injury, adult physical assault, and motor vehicle accident. Women were significantly more likely to experience any ACE (especially witnessing domestic violence, household members with mental illness, emotional abuse, and emotional neglect) and adult sexual assault. PTSD prevalence was 25 percent, with 97 percent of cases being previously undiagnosed. Sexual traumas and younger age were significantly associated with PTSD. These results suggest that insanity acquittees have high levels of trauma, ACEs, and PTSD. While PTSD was about seven times more common than in previous findings in the general population, it frequently goes undiagnosed in forensic settings. Potential explanations and implications of our findings are discussed.

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Despite the high prevalence of posttraumatic stress disorder (PTSD) among psychiatric and criminal populations, there have been few studies of trauma in forensic psychiatric hospitals, particularly in the United States. Trauma frequently goes unrecognized during the course of treatment in forensic patients, but its identification is important because trauma is linked with subsequent mental health and legal problems.[1,2] This study focuses on the prevalence of specific trauma types, adverse childhood experiences (ACEs), and PTSD among those who have been adjudicated not guilty by reason of insanity (NGRI).

Lifetime prevalence of exposure to any trauma and PTSD in the general population has been estimated to be at least 51 percent and 7.8 percent, respectively.[3] These numbers are higher in psychiatric and criminal populations. Among patients with severe mental illness, lifetime trauma may be as high as 91 to 98 percent,[4,5] with rates of lifetime PTSD from 7 to 42 percent.[4,6,7] In prisons, PTSD has been found to range from 0.1 to 38 percent (the extremely low end of the range is from a study in India and may represent cultural differences in diagnosis and self-report or methodological problems with accurately assessing PTSD in very large sample sizes).[8,9] Given the severity of mental illness among forensic populations, and since trauma is a risk factor for criminal justice involvement,[1] we hypothesized

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trauma and PTSD rates to be high among NGRI acquittees.

There have been few studies on the frequency of trauma and PTSD in forensic hospital patients. The studies we identified were small, included few if any women, and were outside the United States. Timmerman and Emmelkamp[10] reported a 78 percent lifetime trauma prevalence among 39 Dutch male forensic patients. Spitzer *et al.*[11] noted a prevalence of 64 percent for lifetime trauma and 17 percent for current PTSD among 53 German forensic inpatients. Garieballa *et al.*[12] identified a 100 percent prevalence of lifetime trauma and 38.7 percent prevalence of current PTSD in 31 German and Sudanese forensic patients (including four women).

To our knowledge, this is the first trauma or PTSD prevalence study in an NGRI population, the first for a forensic hospital in the United States, and the first ACE study in a forensic hospital. Considering the known links between trauma and a variety of biopsychosocial problems, notably criminality, we believe this is an important topic.

Methods

This study was approved by the Michigan Department of Health and Human Services institutional review board. We provided cross-sectional self-report surveys to NGRI acquittees involuntarily committed at the Center for Forensic Psychiatry (CFP) in Saline, Michigan. All NGRI acquittees in Michigan are initially committed to CFP, which is the highest security psychiatric facility in the state. Exclusion criteria included age <18 years and unwillingness or incapacity to consent or lack of consenting guardians. The majority of subjects were male (87.9%) and white (56.1%), and the average age was 40 years.

Investigators provided an informational session to staff and patients on each inpatient unit. Sugarless candy approved by the nursing staff was offered to all individuals for attending the informational session, regardless of their willingness or qualification to participate in the study. Potential subjects were told that participation or lack thereof would not affect their care and that they could withdraw from the study at any time. To reduce possible stigma (e.g., subjects believing that by filling out the survey they were revealing themselves to have a trauma history to observers), subjects were told that their information would not be shared with the treatment team and would be de-identified. The investigators who performed data entry were not part of the care team at CFP. Investigators specifically stated that everyone was encouraged to complete the survey, regardless of trauma history, because we wanted to compare those with and without trauma histories. Subjects were encouraged to discuss any distress experienced from the survey with staff, and staff were encouraged to intervene if they observed any distress, which is part of standard practice at CFP.

Potential subjects with NGRI acquittals ($n = 181$) were interviewed individually to assess capacity to consent, reading and writing ability, and willingness to participate. Interviewers provided information about the study and contact information for the investigator and the institutional review board, and answered questions. Of those without a legal guardian ($n = 153$), consent was obtained via signature from 132 (86.3%). Of those with a legal guardian ($n = 28$), consent was obtained via guardian for 10 (35.7%). Willing subjects were provided with a non-descript envelope containing self-report survey measures. Investigators offered assistance to subjects who had reading or writing deficits. A total of 115 subjects returned completed surveys (63.5%), after which they received additional sugarless candy and a ten-dollar credit for facility vending, which allows for the purchase of security-approved items such as toiletries, batteries, phone cards, stamps, food, etc. Potential subjects were previously informed about the candy, but not the ten-dollar credits, at the informational sessions. In addition to subject surveys, medical records were reviewed for demographic and NGRI information, and treating psychiatrists were surveyed for diagnostic information for consenting subjects. Once all information was collected for a subject, the information was anonymized. A total of 107 subjects were included in this study based on completion of both subject and psychiatrist surveys.

Trauma history was assessed using the Trauma History Screen (THS), which is a survey assessing the presence and number of 14 stressors (Table 1).[13,14] ACEs were assessed using the ACE Questionnaire, which evaluates various types of abuse, neglect, and household dysfunction.[15] Presence and severity of posttraumatic stress symptoms were assessed using the PTSD Checklist (PCL) for Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).[16] The PCL is commonly used in clinical and research settings and has strong internal

Table 1 Lifetime Trauma Exposure and ACEs

	n (%)	Mean (range)	Men	Women	*p*
Any trauma	92 (85.98)	11.42 (1–101)	79 (84.04)	13 (100)	.207
Sudden death of loved one	63 (58.88)	2.49 (1–16)	53 (56.38)	10 (76.92)	.231
Witnessed death/serious injury	38 (35.51)	2.13 (1–10)	33 (35.11)	5 (38.46)	1
Adult physical assault	36 (33.64)	3.28 (1–16)	30 (31.91)	6 (46.15)	.354
MVA	36 (33.64)	1.56 (1–4)	31 (32.98)	5 (38.46)	.758
Weapon attack	34 (31.77)	1.79 (1–10)	28 (29.79)	6 (46.15)	.340
Childhood physical abuse	30 (28.04)	3.20 (1–12)	27 (28.72)	3 (23.08)	1
Childhood sexual abuse	25 (23.36)	3.32 (1–15)	19 (20.21)	6 (46.15)	.073
Natural disaster	21 (19.63)	1.24 (1–3)	18 (19.15)	3 (23.08)	.716
Adult sexual assault	20 (18.69)	4.05 (1–20)	13 (13.83)	7 (53.85)[a]	.002[b]
Severe accident (other than MVA)	17 (15.89)	1.47 (1–3)	16 (17.02)	1 (7.69)	.668
Military trauma	5 (4.67)	4.6 (1–10)	5 (5.32)	0	1
Other sudden event that caused severe fear/helplessness/horror	36 (33.64)	4.55 (1–25)	30 (31.91)	6 (46.15)	.354
Nontraumatic stressor					
Sudden move or loss of home/possessions	51 (47.66)	3.06 (1–20)	42 (44.68)	9 (69.23)	.139
Sudden abandonment by spouse/partner/parent/family	28 (26.17)	3.39 (1–20)	23 (24.47)	5 (38.46)	.318
Any ACE	82 (76.63)	NA	69 (73.40)	13 (100)[a]	.036[c]
Parents separated/divorced	54 (50.47)	NA	47 (50)	7 (53.85)	1
Household member with substance abuse	43 (40.19)	NA	35 (37.23)	8 (61.54)	.132
Childhood emotional abuse	40 (37.38)	NA	31 (32.98)	9 (69.23)[a]	.016[c]
Childhood physical abuse	37 (34.58)	NA	30 (31.91)	7 (53.85)	.132
Childhood emotional neglect	37 (34.58)	NA	28 (29.78)	9 (69.23)[a]	.010[b]
Household member with mental illness	28 (26.17)	NA	19 (20.21)	9 (69.23)[a]	.001[d]
Childhood sexual abuse	23 (21.49)	NA	18 (19.15)	5 (38.42)	.147
Childhood physical neglect	20 (18.69)	NA	15 (15.96)	5 (38.46)	.065
Witnessed domestic violence	19 (17.76)	NA	13 (13.83)	6 (46.15)[a]	.011[c]
Household member in prison	17 (15.89)	NA	13 (13.83)	4 (30.77)	.216
Mean ACE score	2.97	NA	2.649	5.308[a]	.0005[d]

N = 107 subjects; Men: *n* = 94 (87.9%); Women: *n* = 13 (12.1%).
[a] Significantly greater levels than the comparison group.
[b] $p < .01$
[c] $p < .05$
[d] $p < .001$
ACE = adverse childhood experience
MVA = motor vehicle accident
NA = not applicable

consistency, reliability, and validity.[17] A total posttraumatic stress symptom severity score was measured, as well as severity scores for each of the 20 individual posttraumatic stress symptoms and the four posttraumatic stress symptom clusters based on DSM-5 criteria.[18] Subjects were considered to meet DSM-5 PTSD criteria if they reported a trauma history along with at least moderate severity (≥ 2 on a 0–4 scale) of the following: at least one intrusion symptom, at least one avoidance symptom, at least two mood or cognitive symptoms, and at least two hyperarousal symptoms. To be conservative, less than moderate symptoms were not considered sufficient for diagnosis. There are ongoing nosological debates about what does and does not constitute a trauma. While we report all experiences that were assessed, for the purposes of making a PTSD diagnosis the authors only considered experiences in THS and ACE that most closely met DSM-5 criterion A for a trauma, acknowledging that many do not (e.g., sudden move or loss of home/possessions, parents separated/divorced).

Statistical significance was calculated with chi-square analysis. Both standard chi-square and Fisher tests were used to calculate *P*, although only the latter data are shown because there was no difference in which variables were statistically significant between formulas. For mean ACE score and mean age, the two-sample *t* test with two-tailed hypotheses was used to calculate significance.

Results

Table 1 displays trauma and ACE prevalence. The majority experienced any trauma type (85.98%), the most common being sudden death of loved one

(58.88%), witnessed death/serious injury (35.51%), adult physical assault (33.64%), and motor vehicle accident (33.64%). The average number of traumas experienced among all participants was 11.42 (13.28 among only those with at least one trauma). The traumas most commonly experienced multiple times were related to military service (4.6), adult sexual assault (4.05), and childhood sexual abuse (3.32). The majority experienced at least one ACE (76.63%), the most common being parents separated/divorced (50.47%), household member with substance abuse (40.19%), and childhood emotional abuse (37.38%).

Every woman experienced trauma (100%) and ACEs (100%), and most men experienced trauma (84%) and ACEs (73%). Women were significantly more likely than men to have experienced a higher ACE score (5.3 versus 2.6, $p = .0005$), a household member with mental illness (69.23% versus 20.21%, $p = .001$), adult sexual assault (53.85% versus 13.83%, $p = .002$), childhood emotional neglect (69.23% versus 29.78%, $p = .010$), witnessing domestic violence (46.15% versus 13.83%, $p = .011$), and childhood emotional abuse (69.23% versus 32.98%, $p = .016$), and at least one ACE (100% versus 73.40%, $p = .036$).

About one quarter of the subjects (25.23%) met PTSD criteria. Table 2 compares characteristics of those with and without PTSD. There were no significant differences between race or psychiatric diagnoses. Those with PTSD were significantly more likely to be younger (33.07 versus 42.31 years, $p = .003$) and to have experienced any trauma (100% versus 81.25%, $p = .011$), natural disaster (37.04% versus 13.75%, $p = .013$), childhood sexual abuse (40.74% versus 17.5% using the THS, $p = .019$; 37.04% versus 16.25% using the ACE Questionnaire, $p = .031$), and adult sexual assault (33.33% versus 13.75%, $p = .042$). Of the five subjects (4.67%) who had a previous diagnosis of PTSD, one met PTSD criteria at the time of the survey. The four individuals with historical diagnoses of PTSD who did not meet current symptomatic criteria did meet trauma criteria.

Discussion

To our knowledge, this is the first known trauma study specific to NGRI acquittees, in whom we found an 86 percent lifetime trauma prevalence. Even among those without PTSD, 81 percent had a trauma history. These values are higher than has been reported in the general population[3] and similar to other studies that have reported 64 to 100 percent in forensic populations[11] and 91 to 98 percent in populations with severe mental illness.[4,5] While our sample averaged approximately 11 traumas, only 31 percent of the general population has experienced four or more traumas.[19] Our high levels add to evidence that trauma is an important risk factor for criminal behavior.[1] More research is needed to investigate the relationship between trauma and criminal behavior (e.g., correlation versus causation) and its potential as a target for clinical intervention in forensic settings.

The most commonly experienced traumas were sudden death of a loved one, witnessed death/serious injury, adult physical assault, and motor vehicle accident. A study of almost 69,000 adults previously reported that these were the four most common trauma types (in the same order) in the general population.[19] Military and sexual traumas were the trauma types most likely to be experienced multiple times in our sample. The observation that these traumas are more likely to recur may explain partially why these trauma types have been reported previously to be most associated with severity of posttraumatic stress symptoms.[20] To our knowledge, this is the first known ACE study in an NGRI population. While we found an average of three ACEs, only 9.5 percent of the general population has been found to experience at least three ACEs.[21] High ACE scores are expected among NGRI populations because they are linked with various physical, behavioral, and social problems.[22] Furthermore, these traumas and experiences may present opportunities to study criminogenic risk factors, clinical targets to reduce recidivism, and child welfare targets to prevent future problems.

In the first known study comparing trauma rates by gender in forensic hospital patients, we noted that women were more likely to experience most traumas and ACEs, significantly so for any ACE, mean ACE score, adult sexual assault, witnessing domestic violence, a household member with mental illness, childhood emotional abuse, and childhood emotional neglect. This finding is consistent with higher levels of childhood maltreatment and sexual trauma among women.[23,24] Surprisingly, PTSD was not significantly different between genders, despite women generally having higher rates of PTSD; this may be due to the small number of women in this study.[3,23,25] While additional studies are needed to

Table 2 Subject Characteristics

	PTSD	No PTSD	*p*
Age, years	33.07	42.31[a]	.003[b]
Gender			
Male	24 (88.89)	70 (87.50)	1
Female	3 (11.11)	10 (12.50)	
Race			
White	17 (62.96)	43 (53.75)	.503
Black	9 (33.33)	25 (31.25)	.816
Native American	2 (7.41)	6 (7.50)	1
Asian	0 (0)	3 (3.75)	.570
Hispanic	0 (0)	2 (2.50)	1
Other	1 (3.70)	6 (7.50)	.676
Psychiatric disorder			
Schizophrenia-spectrum	18 (66.67)	62 (77.50)	.308
Substance use	14 (51.85)	28 (35.00)	.171
Bipolar	6 (22.22)	17 (21.25)	1
Anxiety	4 (14.81)	5 (6.25)	.226
Posttraumatic stress	1 (3.70)	4 (5.00)	1
Borderline personality	3 (11.11)	2 (2.50)	.101
Antisocial personality	2 (7.41)	3 (3.75)	.598
Intellectual disability	2 (7.41)	2 (2.50)	.264
Neurocognitive	0 (0)	2 (2.50)	1
Autism spectrum	1 (3.70)	1 (1.25)	.443
Depressive	0 (0)	1 (1.25)	1
Other personality	0 (0)	1 (1.25)	1
Other mental	1 (3.70)	1 (1.25)	.443
Any trauma	27 (100)[a]	65 (81.25)	.011[c]
Sudden death of loved one	20 (74.07)	43 (53.75)	1
Witnessed death/serious injury	12 (44.44)	26 (32.50)	.352
Adult physical assault	11 (40.74)	25 (31.25)	.480
MVA	11 (40.74)	25 (31.25)	.480
Weapon attack	9 (33.33)	25 (31.25)	.816
Childhood physical abuse	11 (40.74)	19 (23.75)	.136
Childhood sexual abuse	11 (40.74)[a]	14 (17.50)	.019[c]
Natural disaster	10 (37.04)[a]	11 (13.75)	.013[c]
Adult sexual assault	9 (33.33)[a]	11 (13.75)	.042[c]
Severe accident (other than MVA)	5 (18.52)	12 (15.00)	.762
Military trauma	0	5 (6.25)	.327
Other sudden event that caused severe fear/helplessness/horror	11 (40.74)	25 (31.25)	.480
Nontraumatic stressor			
Sudden move or loss of home/possessions	10 (37.04)	41 (51.25)	.266
Sudden abandonment by spouse/partner/parent/family	10 (37.04)	18 (22.50)	.204
Any ACE	22 (81.48)	60 (75.00)	.604
Parents separated/divorced	15 (55.56)	39 (48.75)	.657
Household member with substance abuse	13 (48.15)	30 (37.50)	.369
Childhood emotional abuse	9 (33.33)	31 (38.75)	.653
Childhood physical abuse	10 (37.04)	27 (33.75)	.817
Childhood emotional neglect	12 (44.44)	25 (31.25)	.246
Household member with mental illness	8 (29.63)	20 (25.00)	.622
Childhood sexual abuse	10 (37.04)[a]	13 (16.25)	.031[c]
Childhood physical neglect	8 (29.63)	12 (15.00)	.151
Witnessed domestic violence	8 (29.63)	11 (13.75)	.081
Household member went to prison	7 (25.93)	10 (12.50)	.128
Mean ACE score	3.704	2.725	.094

Data are presented as *n* (%) unless otherwise noted. *N* = 107 subjects; PTSD Group: *n* = 27 (25.2%); No PTSD Group: *n* = 80 (74.8%).
[a] Significantly greater levels than the comparison group.
[b] $p < .01$
[c] $p < .05$
ACE = adverse childhood experience
MVA = motor vehicle accident

elucidate gender and trauma among forensic populations, it is possible that high trauma rates in forensic populations act as somewhat of an equalizer between genders when it comes to PTSD risk. In other words, because both genders experience a trauma burden much higher than the general population, they experience PTSD at comparable and higher rates. It is also possible that men may have been through similar childhood experiences as women but did not label or interpret them in the same way. For example, men may have normalized being hit by their parents as having deserved punishment, or sex with an adult as wanted and consensual.

Our point prevalence of 25 percent PTSD among NGRI acquittees is about three times higher than the lifetime prevalence of 7.8 percent in the general population[3] and almost seven times higher than the past-year prevalence of 3.6 percent in the general population.[26] Our findings are within the wide point prevalence range of 7 to 42 percent in populations with severe mental illness,[4,6,7] 0.1 to 38 percent in prison,[8,9] and 17 to 39 percent in forensic populations.[11,12] In contrast with the general population, in which women have a higher past-year prevalence than men (5.2% versus 1.8%),[26] our sample had nearly equal PTSD prevalence with men (25.5%, about 14 times higher than the general population) slightly higher than women (23.1%, more than four times higher than the general population). Our high prevalence suggests that NGRI populations may have greater risk factors for developing PTSD (possibly besides just higher trauma rates), which may suggest the need for more training in trauma-informed care and trauma-focused therapies among forensic staff.

The PTSD prevalence we observed was considerably higher than the 4.7 percent of subjects with a previous diagnosis of PTSD. Although 80 percent ($n = 4$) of those with a previous diagnosis of PTSD did not meet PTSD criteria at the time of the survey, that may be explained by recovery (rather than misdiagnosis), especially considering these individuals did endorse traumas consistent with DSM-5 criterion A. Regardless, the fact that 97 percent of those whom we determined to have PTSD had not previously been diagnosed indicates the need for greater awareness, education, screening, and diagnostic assessments among forensic staff. We suspect, as have others,[27] that underdiagnosis of PTSD reflects a treatment focus on more prominent or active psychiatric symptoms such as psychosis and mood. This underdiagnosis seems to be the case in our population, which had high levels of serious mental illness, with 95 percent having either schizophrenia-spectrum or bipolar disorders. Surprisingly, there were no significant differences in psychiatric diagnoses between those whom we found to have PTSD and those whom we found not to have PTSD. Though more research is needed, better identification of comorbid trauma history and PTSD symptoms may allow treatment teams to utilize trauma-focused treatment approaches, which may improve patient engagement and health outcomes.

Among trauma types, PTSD was significantly more likely among those who were younger and those with higher exposure to natural disasters, childhood sexual abuse, and adult sexual assault. Younger age has been associated with higher rates of PTSD.[25] Previous studies have also consistently reported that sexual traumas are more predictive of PTSD development compared with other traumas.[23,27] It should be noted that four participants met symptomatic criteria without meeting trauma criteria and were thus excluded from meeting full PTSD diagnostic criteria. Of these, two reported emotional neglect along with other nontraumatic stressors (i.e., parental separation, family member with mental illness). This finding suggests that life stressors that do not meet DSM-5 criterion A may nonetheless cause significant and lasting negative effects. Considering we are unable to determine causality and a temporal relationship, however, it is also possible that the symptoms were independent of these nontraumatic stressors.

Limitations

Limitations of our study include cross-sectional methodology, self-report reliability, and a small sample of women. Varying definitions of trauma is a universal difficulty in trauma research (e.g., self-report versus clinician interpretation, wording in different questionnaires versus different DSM editions). Though admittedly less common in forensic evaluations due to a lack of validity scales, the measures we used are frequently found in clinical and research settings. Because it was made clear that treatment teams would not have access to individual results and that data would be anonymized, it is unlikely that there would be an incentive to feign. Nevertheless, even in

Table 3 Comparison of Survey Questions About Childhood Physical and Sexual Abuse

	Trauma History Screen	ACE Questionnaire
Childhood physical abuse	Hit or kicked hard enough to injure – as a child	Did a parent or other adult in the household often push, grab, slap, or throw something at you? *or* Did a parent or other adult in the household ever hit you so hard that you had marks or were injured?
Childhood sexual abuse	Forced or made to have sexual contact – as a child	Did an adult or person at least five years older than you ever touch or fondle you or have you touch their body in a sexual way? *or* Did an adult or person at least five years older than you try to or actually have oral, anal, or vaginal sex with you?

forensic evaluations and with testing, the accuracy of trauma reporting and diagnosis of PTSD is often difficult to determine.

Interestingly, we found slightly different response rates to questions about childhood physical abuse (higher with the ACE Questionnaire than with the THS) and childhood sexual abuse (higher with the THS than with the ACE Questionnaire). This finding indicates the importance of how questions are phrased and what qualifiers are used (Table 3) and is consistent with previously expressed concerns about how researchers and subjects determine what constitutes a trauma.[28] While inaccurate memories and delusional traumas are a possibility, especially among individuals with a severe mental illness, there is rarely a way to verify trauma histories independently.

We admittedly do not include assessments of DSM-5 PTSD criteria F (duration) or G (impairment), the lack of which can lead to overdiagnosis.[29] These criteria are commonly assumed in PTSD studies, however, and we sought to be more conservative than many studies in our diagnosis by accepting at least moderate severity of symptoms, by evaluating each symptom according to DSM-5 criteria rather than using cutoff scores, and by using the PCL in conjunction with instruments that assess criterion A (trauma). It should be noted that the PCL, when used alone, is common practice in PTSD research and has been found to have good diagnostic utility for PTSD, even when compared with structured clinical interviews.[23,30–33]

Additionally, considering the paucity of studies in this area, we believe the novelty of our study and that it has the largest known sample size among existing trauma prevalence studies in forensic settings makes it worthwhile. We hope it will help increase awareness about the pervasiveness of trauma in forensic populations and lead to more research to identify risk and protective factors for a variety of problems, improve prevention of adverse outcomes, and improve forensic assessments and trauma-informed care.

Conclusion

The prevalence of trauma, ACEs, and PTSD is high among NGRI acquittees, yet PTSD frequently goes undiagnosed in forensic settings. We believe that trauma is a significant topic for forensic evaluators, clinicians in forensic settings, researchers, and policy makers because it is an understudied yet common problem among forensic populations.

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