

# Posttraumatic stress disorder (PTSD) symptoms mediate the relationship between substance misuse and violent offending among female prisoners

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Received: 17 June 2016 / Accepted: 10 October 2016 / Published online: 21 October 2016  
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## Abstract

**Purpose** Despite empirical evidence suggesting complex associations between psychological trauma, substance misuse, and violent offending, there is a dearth of research investigating these associations in the female prison population.

**Methods** A cross-sectional, interview-format questionnaire study was undertaken with a sample of 89 female prisoners. History of traumatic events, DSM-5 PTSD, drug use, and offending behaviour were assessed.

**Results** Traumatic experiences had occurred in 97.8 % of the sample, while 60.5 % met criteria for a PTSD diagnosis. The majority of the sample (70.8 %) reported using illicit drugs, and 59.6 % had committed at least one violent offence. History of drug use was significantly correlated with trauma, PTSD status, and violent offending. A mediation analysis identified an indirect effect of PTSD symptoms on the relationship between history of drug use and violent offending.

**Conclusions** The result of our mediation analysis further highlights the importance of addressing PTSD symptoms

and substance misuse, among female offenders, to help prevent violent offending.

**Keywords** Posttraumatic stress disorder (PTSD) · Substance misuse · Violent offending · Female prisoners

## Introduction

Despite increased numbers of women in prison in recent decades, it has been acknowledged that we do not have sufficient understanding of female offending behaviour, or of the needs of female offenders [1, 2]. Female offenders have complex mental health needs, including substance misuse and childhood abuse, which appear to have important implications for their use of violent and other offending behaviour [2, 3]. The rates of trauma amongst female prisoners have been reported at 94.3 % for any trauma, and 31.2 and 26.2 % for childhood sexual and non-sexual abuse, respectively. PTSD rates are accordingly high, with 40.2 % of female prisoners affected, compared with 12.5 % of males [4]. Drug use is also common in this population, with a systematic review finding drug abuse prevalence rates of 30–60 % among female prisoners and some indication of female prisoners reporting greater use of the most harmful and addictive drugs such as heroin, cocaine, ecstasy, and LSD than males [5, 6]. Although trauma histories, substance misuse, and mental illness are considered to be crucial explanatory factors in female offending, our understanding of how these are linked is still limited [2]. This knowledge could be extremely valuable in addressing both the complex mental health needs and the increasing number of women being sentenced to prison for violent offending [7].

It has been demonstrated that childhood trauma and subsequent PTSD symptoms increase the likelihood of

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substance misuse and of violent offending [8]. Trauma exposure may lead to the use of substances as a coping mechanism, though the common pathways theory would suggest that certain personality traits or coping styles could lead to risky behaviours that increase the likelihood of exposure to trauma, substance misuse, and acts of violence [9]. Moreover, it is known that drug use is associated with offending, generally, and violent offending, specifically [10]. The cycle of violence theory would explain how people who have experienced physical abuse are at increased risk of perpetrating violence, while emotional abuse has also been found to predict the perpetration of violence among drug users [11, 12]. The association between PTSD symptoms and aggressive behaviour has been confirmed by a meta-analysis which found a significant correlation of  $r = .29$ , between PTSD and ‘anger out’ [13]. Substance misuse patients with PTSD have been found to be more likely to engage in violence where they have higher levels of hyperarousal, indicating that these symptoms, in particular, may be a key factor in this relationship [14].

Some attempts have been made to clarify the associations between these variables among female offenders. One study undertaken with 491 female prisoners demonstrated that more extensive offending behaviour is likely to occur among those who have experienced a serious mental illness, and this is exacerbated by experience of traumatic victimisation and drug use [15]. Within a subsample, witnessing violence was shown to predict certain violent offences. Clark et al. [9] confirmed associations among trauma, substance misuse, and violent offending, whereby those who have experienced both trauma and regular substance use are significantly more likely to have homicidal ideation and commit offences against the person. However, this study utilised a substance misuse treatment sample, rather than an incarcerated one, and did not account for gender differences. Thus, although there is evidence to suggest that traumatic life events, traumatic symptomatology, drug use, and violent offending are closely related issues among women who engage in offending behaviour, there is a lack of research exploring precisely this within the female prison population. We set out to investigate these associations, within a female prison population, and hypothesised the existence of a pathway to violent offending, via trauma and drug use.

## Method

### Participants

The sample consisted of  $n = 89$  participants. The inclusion criteria were: being willing to participate voluntarily and to

give written consent, serving a sentence of at least 6 months so they can be interviewed if they were selected and agreed to participate, if on medication having been on a stable dose for at least 6 weeks to be able cope with the demands of the interview, aged between 18 and 65 years. Exclusion criteria included being too unwell to participate such as presenting with suicidal ideation or having a history of psychosis, current major depressive episode or known learning disability.

The mean age of participants was 34.52 years ( $SD = 9.97$ ) and the majority were British (96.6 %). Age and ethnicity profile of the sample are representative of the prison population in Scotland [16]. The majority were parents (71.9 %) and single (67.4 %), and were unemployed at the time of the offence (80.9 %). The majority were taking psychotropic medication (59.6 %) and had psychiatric input prior to imprisonment (57.3 %), while 70.8 % had used illicit drugs. The average age at which those participants started using drugs was 17.1 years ( $SD = 6.03$ ), and 32.6 % of the sample stated that they had committed a crime to get drugs.

Participants had been sentenced for an average of 5.15 years ( $SD = 5.03$ ), and the most prevalent index offence types were violence, theft, and drug offences. Most participants (59.6 %) had been charged with at least one violent offence.

### Procedure

A total of 100 prisoners were invited to take part, of which 89 participated and 11 declined. Ethical approval for the study was granted by, the relevant NHS Committee, the Scottish Prison Service (SPS) Research Access and Ethics Committee and the Ethics Committee of Edinburgh Napier University.

Special registrars in psychiatry (SPRs), in consultation with prison health-care staff, identified prisoners potentially meeting criteria. Prison health-care staff then introduced the study to potential participants and confirmed their willingness to be approached. Participants were informed that participation would not affect their routine management and were informed of their rights.

A member of the research team then met with participants after a 24 h interval, to provide more information about the study, answer any questions, and ask if they were still interested in participating. After informed consent was obtained, the following assessments were administered by the SPRs, in an interview format.

### Measures

The Childhood Trauma Questionnaire (CTQ) [17] is a 28-item self-report questionnaire assessing the history of

childhood sexual, physical and emotional abuse, and physical and emotional neglect. Respondents are asked to rate the frequency with which they experienced each of the 28 items on a 5-point scale ranging from “never true” to “very often true”. Cutoff scores for the presence of each trauma category were used, in accordance with the manual [17], and childhood trauma was considered present when a participant exceeded the cutoff score in one or more categories.

The Life Events Checklist (LEC-5) [18] is a 17-item, self-report measure that was used to screen for potentially traumatic events in adulthood. The LEC-5 assesses exposure to 16 traumatic events and also captures any other extraordinarily stressful event. There are five response categories available, but for the purposes of the current analyses the items were coded as “happened to me” or “not happened”, where “not happened” encompassed any other response type. The total number of life events “happened” was calculated and used in analyses.

The PTSD Checklist (PCL-5) [19] is a self-report 20-item standardised questionnaire which assesses DSM 5 posttraumatic symptoms. Participants respond in a 5-point scale, ranging from “not at all” to “extremely” on how much the symptom bothered them over the past month. The total score was used as a continuous variable in analyses.

Finally, the history of drug use was assessed by the item: “Have you ever used illicit drugs?” while violent offending was assessed by the item: “Have you ever been charged/convicted of a violent offence?” Both questions were devised for the purposes of the present research and were coded as dichotomous (yes/no) variables.

## Analysis

Descriptive statistics on the prevalence of the variables of interest were calculated using SPSS version 20. Associations between the variables were then examined, using Pearson’s correlation and logistic regression analyses. Variables which were significantly associated were entered into mediation analyses, using the PROCESS Macro for SPSS [20]. Bootstrapped confidence intervals (1000 iterations) and the Sobel significance test were examined to determine the presence of an indirect effect.

## Results

### Associations between trauma, drug use, and violent offending

The majority of the sample (97.8 %) had experienced some form of trauma; childhood trauma was experienced by 85.2 % of the sample, while 92.1 % experienced at least

one traumatic life event. Both childhood and adulthood traumatic experiences had occurred in 78.7 % of the sample. According to the PCL-5, 60.5 % of our sample met the diagnostic criteria for PTSD. Table 1 shows the correlations between trauma, drug use, and offending variables. History of drug use was significantly associated with higher levels of childhood and adulthood trauma, more severe PTSD symptoms, and committing violent offences. Violent offending was also significantly positively associated with PTSD symptom severity, adulthood life events, and experiencing both childhood and adulthood trauma.

A series of logistic regression analyses were undertaken to determine the factors predicting the history of drug use in this sample. In separate univariate analyses, all of the following variables were significant individual predictors: adulthood life events ( $\beta = .26$ , OR = 1.29, 95 % CI = 1.07, 1.55); childhood trauma ( $\beta = .02$ , OR = 1.02, 95 % CI = 1.00, 1.05); experiencing both childhood and adulthood trauma ( $\beta = 2.25$ , OR = 9.50, 95 % CI = 3.04, 29.69); PTSD symptoms according to the PCL-5 ( $\beta = .05$ , OR = 1.05, 95 % CI = 1.02, 1.08).

Another series of logistic regression analyses was undertaken to investigate the factors predicting violent offending in this sample. This also included a separate univariate analyses where all of the following variables were significant individual predictors: illicit drug use ( $\beta = 1.48$ , OR = 4.37, 95 % CI = 1.66, 11.55), adulthood life events ( $\beta = .18$ , OR = 1.19, 95 % CI = 1.02, 1.41), experiencing both childhood and adulthood trauma ( $\beta = 1.20$ , OR = 3.29, 95 % CI = 1.14, 9.43) and PTSD symptoms, according to PCL-5 ( $\beta = .04$ , OR = 1.04, 95 % CI = 1.02, 1.06).

Thus, associations were confirmed between the three variables of interest: trauma (as measured by the LEC and the PCL-5), drug use, and violent offending. As childhood trauma was not significantly associated with violent offending, this was not entered into further analyses.

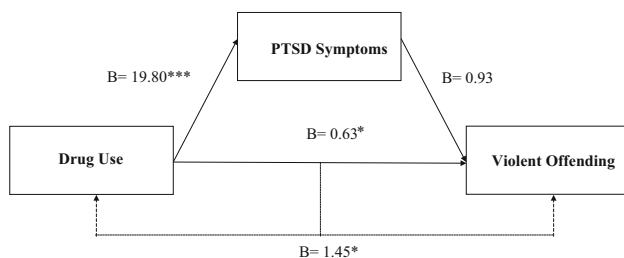
### Mediation analysis

A mediation analysis was undertaken to investigate a possible pathway from history of drug use to violent offending, via PTSD symptoms. The results indicate that PTSD symptoms partially mediate the power of drug use to predict violent offending, such that drug use has both a direct effect, and an indirect effect, via PTSD, on violent offending (indirect effect = .629, 95 % CI = .134, 1.389,  $p = .033$ ). This pathway is represented in Fig. 1. A pathway from history of drug use to violent offending, via adulthood life events, was also tested. No indirect effect of LEC on the association between history of drug use, and violent offending was indicated (indirect effect = .218, 95 % CI = -.056, .991,  $p = .231$ ).

**Table 1** Bivariate correlations of trauma, drug use, and offending variables

	1	2	3	4	5	6	7	8
CTQ	–	.47***	.56***	.60***	.26*	–.09	–.11	.21
LEC		–	.55***	.60***	.30**	–.03	–.15	.23*
Childhood and adulthood			–	.68***	.45***	–.20	–.39**	.24*
PCL-5				–	.43***	–.26*	–.24*	.38***
Drug use					–	n/a	n/a	.33**
Age of start of drug use						–	–.13	–.25
Committed crime for drugs							–	–.26*
Violent offending								–

Two-tailed *p* values \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001

**Fig. 1** Mediation model

## Discussion

In the present study, we hypothesised the existence of a pathway to violent offending in women, via trauma and drug use. Our results show the severe mental health needs of the female prison population, in line with previous research [2, 5]. With 85.2 and 92.1 % of our sample experiencing childhood and adulthood traumatic experiences, respectively, and 60.5 % meeting the diagnostic criteria for DSM-5 PTSD, it is clear that the vast majority of female prisoners have trauma-related needs which could benefit from further understanding and intervention. The substance misuse needs of this specific population also warrant attention, with 70.8 % of the sample having a history of drug use.

Crucially, we have also provided further important evidence of the relationship between psychological trauma, drug use, and violence in women. It also contributes to our understanding of trauma during the life span being an important risk factor in female offending [21]. We found that both history of drug use and violent offending are predicted by traumatic experiences and posttraumatic symptoms. Although causality cannot be assumed, this indicates that these behaviours may be preventable for some women, if their trauma needs were treated. Violent offending was also predicted by history of drug use, indicating another area for intervention with the potential to reduce violent offending among women.

Finally, we have demonstrated a statistically and theoretically viable pathway to violent offending in women, whereby history of drug use predicts violent offending and this is partially explained by the presence of PTSD symptoms. It is interesting that only PCL-5, and not measures of traumatic life events, had an indirect effect on this relationship. Although the cycle of violence theory [11] may suggest that the experience of violence could lead to the perpetration of violence, our findings imply it is the reaction to trauma (i.e. PTSD symptoms) that may lead to violent behaviour, and not the experience itself. This can be understood in light of the findings that PTSD hyperarousal symptoms may lead to violent behaviour, through being primed to engage in a “fight” response to threat [14]. This symptom cluster is therefore likely to be a key factor in this relationship, and future research should focus on these symptoms to investigate this. It is interesting to note that half of the participants (49.4 %) reported “serious injury, harm, or death you caused someone else” as a traumatic event, as assessed by the LEC. Thus, although the current research explores a pathway to violent offending, it is also possible to interpret the direction of causality such that violent offending leads to PTSD symptoms and drug use.

The implications for criminal justice and mental health services, are, therefore, that in particular, tackling female offenders’ substance misuse and trauma needs may be hugely beneficial, not only for the women, but also for society, as this may help reduce violent offending. Although the current study cannot account for violent recidivism, it is likely that ameliorating substance misuse and PTSD issues, among female prisoners, could help reduce further violent offending after release [10, 13]. Therapeutic programmes exist in British prisons for addressing addictions, substance-related offending behaviour, and psychological trauma; these should be continually resourced and updated, to ensure the best efficacy. Hyperarousal symptoms, in particular, may be addressed through both pharmacotherapeutic and psychotherapeutic interventions. Moreover, with the high prevalence of these

issues among female prisoners, and the time available while sentences are served, it is recommended that the prison environment be utilised as an effective tool in tackling these problems.

We acknowledge several limitations, including a cross-sectional methodology which does not allow for causal conclusions to be drawn, and a relatively small sample size when using logistic regression with an MLE estimator. History of drug use and violent offending were considered as dichotomous variables only, so variance in type, severity, or recurrence of the behaviours were not accounted for, nor were uncharged violent offences. CTQ and LEC share some common items (e.g. sexual assault), but we used CTQ to assess traumatic life events in childhood and LEC to assess traumatic life events in adulthood. All assessments used in the present study were self-reported, but were administered in the context of an interview to increase the reliability and minimise bias. However, it is possible that certain life events might have been overrepresented. We explored a pathway from drug use to violent offending, but effects may also exist in the opposite direction. The study focuses on a highly specific population, and results are therefore not generalizable outside of female prisoners. The sample also encompasses prisoners with longer sentences, who are therefore likely to have committed more serious offences. Future research should attempt to corroborate and extend these findings, and the use of prospective designs may allow for causal conclusions to be drawn.

Traumatic experiences and subsequent PTSD are highly prevalent among female prisoners, and the current findings support the view that this is related to their use of drugs. The finding that history of drug use predicts violent offending behaviour and this may be partially explained by PTSD symptoms further highlights the importance of addressing trauma and substance misuse needs among women in prison, as promoting recovery may help prevent violent crimes. Future research should explore whether addressing the trauma needs of female prisoners has an effect on the rates of violent offending.

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