



Review Article

Behind bars: A trauma-informed examination of mental health through importation and deprivation models in prisons

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ARTICLE INFO

Keywords:

Childhood maltreatment
Adverse childhood experiences (ACES)
Prison environment
Mental health
Trauma-informed care
Prisoners
Systematic review

ABSTRACT

Prisons are designed as institutions to punish criminal behavior, protect society from offenders, and rehabilitate individuals to reduce reoffending. However, research increasingly indicates that incarceration can exacerbate vulnerabilities and worsen mental health. Studies from numerous countries reveal that mental illness rates among prisoners are significantly higher than those in the general population. Evidence suggests that many inmates face considerable hardships prior to incarceration, which may contribute to their mental health challenges. Yet, other findings point to the prison environment itself as a factor that fosters mental health issues. This discussion centers on two key theories: the importation and deprivation models. The Importation Model (Irwin & Cressey, 1962) posits that inmates bring their pre-existing social backgrounds, values, and behaviors into prison, which influence how they interact with the institution. In contrast, the Deprivation Model (Skyles, 1958) emphasizes that prison conditions, such as the loss of autonomy and social connections, shape inmate behavior. Contemporary research (Dye, 2010; Edgemon, 2016; Kuo et al., 2023; Zhao et al., 2020; integrates both models, recognizing that individual characteristics and institutional deprivations interact to influence behavior. This paper explores these models through the lens of trauma, recognizing that trauma frequently precedes imprisonment and is often compounded within prison walls. This systematic review explored the association between childhood maltreatment, prison environment and mental health of prisoners (importation and deprivation model) based on systematic searches of five databases. In total, 31 studies met our inclusion criteria. Results suggested that both childhood maltreatment and prison environment had positive association with various mental health problems in prisoners. The review highlights the need for more research on deprivation model as researchers found only two studies. It further highlighted the importance of addressing childhood maltreatment, prison environment, and mental health issues in prisoners through prevention programs.

Introduction

The global prison population has seen a very high rise in the last couple of years. In fact, according to the report by Fair and Walmsley (2024), >10.99 million people are being kept in penal institutions across the globe either as pre-trial detainees/remand prisoners or having been convicted and sentenced. The prison population surpassed 9.25 million in 2006, increased to over 9.8 million by 2008, and reached >10.99 million by 2024. The United States has approximately 1.8 million inmates, China has 1.69 million (plus undetermined numbers in pre-trial detention and other types of detention), Brazil has 840,000, India has 573,000, Russia has 433,000, Turkey has 314,000, Thailand has 274,

000, Indonesia has 265,000, Mexico has 233,000, Iran has 189,000, and the Philippines has 181,000 (Fair & Walmsley, 2024).

Prison populations differ significantly across continents, with notable regional variation within each. In Oceania, the overall prison population has surged by 84 %, while in the Americas it has grown by 39 %, in Asia by 43 %, and in Africa by 53 %. In contrast, Europe has seen a reduction of 26 % in its prison population. This European decrease is largely due to significant declines in Russia (59 %) and central and eastern Europe (48 %), while in other parts of Europe, excluding Russia, the prison population has risen by 12 %. The most substantial increases have occurred in South America (224 %) and western Asia (141 %) (Fair & Walmsley, 2024).

Authors ContributionThe first author contributed to the conceptualization and writing of the paper, while the second author was responsible for the conceptualization and review.

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<https://doi.org/10.1016/j.ejtd.2025.100516>

Received 12 November 2024; Received in revised form 21 January 2025; Accepted 27 January 2025

Available online 28 January 2025

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The intended and unintended outcomes of incarceration

Imprisonment brings about various unintended repercussions, such as heightened substance use, worsening physical and mental well-being, and an increase in suicide rates among inmates (Adu-Gyamfi et al., 2024; Skowronski & Talik, 2018). According to the Sainsbury Centre for Mental Health (2008), the prisons have the potential to cause more harm to an individual's physical and mental health, shorten their lives and lower their intellectual functioning, and introduce drugs or increase access to drugs.

This systematic review will focus on the worsening of mental health as a detrimental effect of incarceration, an issue that demands immediate intervention and attention called trauma informed approaches. One of the major trauma informed approaches is SAMHSA's Trauma-Informed Care model. SAMHSA's Trauma-Informed Care model includes six key principles: safety, trustworthiness, peer support, collaboration, empowerment, and cultural, historical, and gender responsiveness (Substance Abuse and Mental Health Services Administration, 2014). In correctional settings, these principles can be operationalized by providing trauma-informed training for staff, ensuring physical and emotional safety in the environment, offering peer support groups, and using restorative justice practices that empower inmates. Additionally, integrating culturally sensitive care and individualized treatment plans can further enhance the approach (Substance Abuse and Mental Health Services Administration, 2014).

The prevalence of mental illness in the incarcerated populations

Compared to the general population, individuals in prisons, jails, and juvenile detention centers (referred to collectively as prisons hereafter) face disproportionately high rates of mental health issues, substance abuse, infectious illnesses, and chronic health conditions (Aldridge et al., 2018; Borschmann et al., 2024; Kinner & Young, 2018). Mental health problems within prison populations are associated with various negative consequences, such as increased likelihood of reoffending, victimization, and self-injury (Chang et al., 2015; Fazel et al., 2016). Mortality rates are also significantly elevated for incarcerated individuals compared to those in the general community (Liu et al., 2021), particularly due to external causes like suicide (Fazel et al., 2017), and post-release health outcomes are often severely compromised (Wang et al., 2013).

A Bureau of Justice report found that 31 % of jail detainees self-reported major depressive disorder diagnosis. Mental health problems frequently co-occur alongside substance abuse issues. Substance abuse, mental health problems, and their combination, otherwise known as "co-occurring disorders" or CODs, appear at troubling rates among jail detainees - a group criminologists tend to examine less frequently than prison populations. Whereas the 1998 percentage accounted for those in prison with mental health disorders at 16 % (Ditton, 1999), the numbers escalated to 56 % in 2005 - a constant increase of diagnosed mental health conditions within the correctional facility system (James & Glaze, 2016; Kleinsasser & Michaud, 2002; Lynch et al., 2014). As might be expected given the high prevalence of mental illness and substance abuse among inmates, CODs are common in correctional settings, including among jail detainees.

While prevalence studies provide critical insights into the extent of mental illness within prison populations, several important factors warrant consideration. First, mental health screenings provided at the time of prison admission are often conducted by those who have limited or no particular training in mental health and therefore tend to lead to underdiagnoses (Edgar & Rickford, 2009). The other aspect is that very few or no prisoners' information concerning mental health is transferred whenever such is being transferred from one facility to another, inhibiting the compilation of accurate continuous records (Durcan & Zwemstra, 2014). Consequently, the actual prevalence of mental illness among inmates may be substantially underestimated. Furthermore,

prevalence studies are frequently cross-sectional, capturing data at a single point in time, which limits insight into how mental health issues may evolve with variables such as sentence length, recidivism, type of facility, or the nature of the offense (Edwards & Potter, 2004). Addressing these complexities is essential for gaining a clearer understanding of the mental health crisis within prison systems.

Pre-incarceration adversities: understanding the roots of prisoner challenges

Scholars and policymakers broadly acknowledge that prison populations disproportionately include individuals who had psychologically traumatic experiences during their childhood and adolescence (Crisanti et al., 2014) and that pre-prison trauma is significant in the everyday life of incarcerated people for whom apparently insignificant events can trigger feelings of fear and hopelessness (Auty et al., 2023). While the implementation of prison trauma-informed initiatives has been criticised, there is broad agreement that trauma heightens the pain of incarceration and augments mental health problems (Auty et al., 2023; Jewkes et al., 2019).

Experiences in childhood and adolescence – mainly traumatic ones – significantly shape how people see the world, script their inner stories, and act (Moreira et al., 2022). Events such as rape, child abuse, physical violence, and chronic stress have been proven to have cognitive and emotional consequences for the development of personality (Bunce et al., 1995). Psychological trauma in general, but particularly during childhood and adolescence, incepts anxiety, feelings of being overwhelmed, and relational and cognitive biases that lead the person to see the world through negatively laden assumptions and create inner narratives informed by a loss of faith in humanity and life (Todd-Kvam & Goyes, 2023). Trauma affects personality traits by incepting mental organisational constructs associated with cognitive, affective, and behavioural vulnerabilities (Daud et al., 2008). The inward-biased cognitions which stem from trauma include "low self-esteem, rejectedness, shame, guilt, self-blame, and a variety of psychological distresses." On the other side of the spectrum, outward cognitions are comprised of "anger and anger rumination, resentment, hypervigilance to aggressive stimuli, hostile attributions, vengeful thoughts, and feelings of injustice" (Eisner, 2023). Each of these different adversities enables criminal behavior and mental health problems later in life to be linked. Recent evidence has shown that the higher the level of educational deprivation, the higher the incidence of major depression, post-traumatic stress disorder, and psychosis.

Extensive research indicates a strong link between childhood trauma, such as abuse, and the onset of mental health disorders, including PTSD, depression, and psychosis (McKay et al., 2022; Schneider & Weber, 2020; Talwar et al., 2024). Further studies, like those by McNeil et al. (2024), reveal that a considerable number of incarcerated individuals with mental health issues had experienced homelessness prior to their detention. These findings underscore the vital connection between early social marginalization and later psychological distress, shedding light on the complex web of adversities that many inmates endure before entering the prison system.

Prison conditions: Key factors impacting inmate mental health

Yet prisoners with preexisting experiences of trauma, social exclusion, and poverty are at far greater risk of developing mental health problems. These experiences, however, are all exacerbated or even created in prison. The World Health Organization has noted that the circumstances of confinement can precipitate mental illness (WHO/ICRC, 2005). A number of features of prison life - overcrowding, threat of violence, separation from family, uncertain future regarding family and work, inadequate health and mental health services, and lack of personal privacy - multiply the psychological strain on prisoners and exacerbate the mental health problems. These factors further deteriorate

mental health. Even commonplace procedures, such as putting prisoners with severe mental health conditions in solitary units to lessen environmental stress, might backfire in extreme circumstances; prolonged isolation, for example, is highly linked to significant psychological injury (Metzer & Fellner, 2010).

Research suggests that incarceration often produces more harmful than deterrent outcomes for offenders (Edgemon & Clay-Warner, 2023), as individuals encounter various obstacles and restrictions during their time in prison. Beyond individual characteristics, elements of the prison environment and the broader correctional climate can adversely affect inmates' mental well-being. The prison setting can be inherently harmful to mental health due to separation from family, community, and support networks; the loss of autonomy; reduced life meaning and purpose; fear of victimization; heightened boredom; an unpredictable environment; overcrowding and harsh conditions; exposure to and witnessing of violence; negative interactions with staff; and other distressing experiences (Gabrysch et al., 2020).

Incarceration's impact also varies with factors like the duration of imprisonment and the timing of entry and release. For example, the initial weeks in prison and the post-release period carry an elevated suicide risk (Bukten & Stavseth, 2021). Additionally, longer sentences are associated with a greater demand for healthcare services (Yang et al., 2009). The widespread occurrence of violence in prisons is another crucial element impacting the mental health of inmates. Dye (2010) referred to prison violence as a "central aspect of the hardships of incarceration" (p. 789), and research consistently shows high frequencies of assaults between prisoners (Stephan & Karberg, 2003). Although there is still a lack of comprehensive knowledge regarding prison violence (Blitz et al., 2008), these violent events usually result in trauma, which is a significant contributing factor to the development of mental health conditions like PTSD. According to earlier research, physical attacks are a major traumatic event associated with the development of PTSD (Breslau et al., 2012).

Blitz et al. (2008) studied the association between mental health problems and physical victimization across a sample population of 7528 inmates. The survey revealed that inmates having some kind of problem with mental health were more liable to be victimized. Whereas in men, the reporting of any history of a mental problem presented a risk of physical assault by other inmates 1.6 times higher, female prisoners with such mental health history had their risk for physical harm elevated 1.7 times. Such findings imply that the prison environment—with its inevitable exposure to violence and trauma—not only aggravates existing disorders but possibly creates new ones. The multifaceted features of imprisonment make it very traumatic; hence, this contributes to a very high level of mental health disorders among the inmates.

Pre-prison adversities vs. incarceration factors

Importation (Irwin & Cressey, 1962) and deprivation models (Sykes, 1958) allow us to further the necessary theoretical exploration of whether the mental illness among incarcerated individuals was driven more by challenges experienced in prison or by those predating incarceration. That is, this perspective seeks to determine whether psychological distress emanates from the conditions of incarceration or whether inmates simply bring pre-existing vulnerabilities with them. Drawing on a trauma-informed perspective, this framing has allowed for a more nuanced examination of the role that adversities in life both predating incarceration and during the period of incarceration itself play in the high prevalence of mental health problems in the prisoner population. These are dynamics through which researchers can learn more about whether mental illness in prisons is better explained by the stressors and burdens associated with the environment of imprisonment or whether it is better attributed to imported trauma and disadvantage.

Importation vs. deprivation: Unraveling the causes of mental illness in prisons

The prison environment has been scrutinized through both the importation and deprivation models to understand the roots of mental illness among inmates. Importation theorists posit that pre-existing mental health issues often contribute to criminal behavior, leading to eventual incarceration (Irwin & Cressey, 1962). This view suggests that pre-incarceration adversities and personal histories, as discussed earlier, may largely explain the elevated rates of mental health disorders in prison populations. Conversely, proponents of the deprivation model (Sykes, 1958) argue that psychological maladaptation, including mental illness, arises in response to the hardships and isolation imposed by the prison environment, as previously outlined.

A primary criticism of the deprivation model is its inability to account for why only some prisoners develop mental health problems despite facing similar conditions (Dye, 2010). If deprivation alone caused mental distress, one would expect uniformly high rates of mental illness among prisoners, which is not supported by existing prevalence studies (Fazel & Danesh, 2002). Similarly, the importation model's limitation lies in its disregard for the impact of the prison setting itself, overlooking the influence of environmental stressors such as violence and confinement (Dye, 2010). Drawing from prison suicide literature, researchers argue for a "combination model" to explain maladaptation, suggesting that both imported factors and deprivation contribute to outcomes like suicide (Dear et al., 2019). This dual perspective may also apply to mental illness, where the "pains of imprisonment" could intensify pre-existing vulnerabilities, clarifying why some prisoners are more susceptible to mental health issues than others.

Trauma unveiled: Rethinking importation and deprivation models of mental health in prisons

As previously noted, a significant proportion of prisoners carry with them histories of trauma, including both abuse and other forms of adverse experiences (Fazel et al., 2016; Gabrysch et al., 2020). This trauma, brought into the prison setting, is often compounded by further exposure to harm, including physical violence and isolation through solitary confinement (Metzer & Fellner, 2010; Stephan & Karberg, 2003). These additional adversities intensify inmates' psychological suffering, deepening their distress and worsening their mental health. In this sense, the prison environment mirrors the deprivation model, in that it creates conditions that heighten the risk of mental illness.

According to the transactionist theory of prisoner adjustment (Wright, 2013), environmental features, together with personal attributes, can act as stressors influencing inmates' behaviors. Inmates often carry the detrimental impacts of past trauma into prison—a process known as importation. However, during incarceration, they frequently encounter further traumatic experiences, such as exposure to violence—referred to as deprivation (Gabrysch et al., 2020). The cumulative nature of trauma's harmful effects places prisoners at heightened risk of developing or worsening mental health disorders. Therefore, mental illness in correctional facilities may be explained by both importation and deprivation factors.

Additionally, imprisonment can lead to post-incarceration syndrome, a condition akin to posttraumatic stress disorder (PTSD), with lasting psychological consequences that persist even after release (Liem & Kunst, 2013). This syndrome can include institutionalized personality traits, such as distrust toward others or difficulty forming relationships, along with social-sensory disorientation and a sense of social and temporal detachment.

Female prisoner's mental health: A special trauma case?

Mental health disorders are particularly prevalent among the female prison population, with about 80 % being diagnosed with a mental

condition, while within the general population, it is around 15 % (World Health Organisation, 2021). The female prison population has rates up to five times higher for mental health problems compared with women in the general population (Tyler et al., 2019). Specific mental health disorders prevalent in this group include 3.9 % for psychotic disorders, 14.1 % for major depressive episodes, 10 %–24 % for alcohol misuse, 30 %–60 % for drug misuse (Fazel et al., 2016), and 21.1 % for post-traumatic stress disorder (Baranyi et al., 2021). Additionally, about 30 % of women in prison engage in self-harm. These women are up to 20 times more likely to die by suicide while their risk increases 36-fold in the first year after release compared to their counterparts in the general population (Fazel et al., 2011; Pratt et al., 2014).

Many women entering prison have histories of domestic, physical, emotional, and sexual abuse, which contribute to complex, unresolved trauma that may lead to criminal behavior (Gunter, 2012; Alves et al., 2018). Trauma is strongly linked to the onset of mental health issues (Jewkes et al., 2020; Karlsson & Zielinski, 2020), which can result in a range of negative consequences both during incarceration and after release, including heightened risk of violence and assault (Caravaca-Sánchez et al., 2021) and increased chances of reoffending (Baillargeon et al., 2010).

From the trauma importation model, these women bring significant psychological distress and past abuse into the prison environment. According to the trauma deprivation or aggravation model, the jail setting per se can contribute to worsening pre-existing conditions. The trauma of intrusive practices such as physical searches, invasion of privacy, and verbal and emotional abuses perpetrated within the prison system may further deteriorate female convicts' mental health status (Moloney et al., 2015). A deeper understanding of the high prevalence rates of poor mental health amongst women prisoners may be achieved by incorporating an approach that combines both the importation and deprivation models from a trauma perspective. In this regard, the Kyiv Declaration has described the need to grant first priority regarding the mental health of women prisoners to the diseases associated with trauma (Moloney & Moller, 2009).

The purpose of present study

Through the dual lenses of the Importation and Deprivation models, this study aims to analyze and synthesize the literature, exploring the relationship between adverse childhood experiences and mental health in offenders. The purpose of this study is to determine whether the most common mental health disorders among inmates are caused by pre-incarceration adversities like trauma, social marginalization, poverty, and adverse childhood experiences (ACEs) (Importation Model) or whether prison conditions like overcrowding, violence, isolation, lack of access to mental health services, and institutional practices (Deprivation Model) significantly exacerbate or even cause them.

Method

Inclusion and exclusion criteria

The present systematic review includes studies that incorporate samples of incarcerated individuals. The studies included were published between 2015 and 2025. The included studies were: (1) published in English; (2) with an incarcerated sample of any age (3) that analyzed the link between ACEs and mental health in samples of offenders and (4) that analyzed the link between prison environment and mental health in samples of offenders. Studies were excluded from review if they were: (1) written in a language other than English, (2) dissertations & conference abstracts, (3) full text was not available, (4) review articles, (5) population other than prisoners, (6) study designs other than cross-sectional design, (7) not measuring adverse childhood experiences and mental health.

Information sources and search strategy

The literature search was performed according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Scientific articles were searched through five databases called Scopus, ProQuest, PubMed, PsycInfo, and EBSCO with the terms ("Adverse Childhood Experiences" OR "ACE" OR "Childhood Trauma" OR "Early Life Adversity") AND ("Prison Environment" OR "Prison Trauma" OR "Incarceration Trauma" OR "Prison Stress" OR "Correctional Facilities") AND ("Mental Health" OR "Mental Illness" OR "Mental Disorder" OR "Psychiatric Illness" OR "Psychological Wellbeing") AND ("Offenders" OR "Inmates" OR "Prisoners" OR "Detainees" OR "Incarcerated Individuals"). The research results in 381 articles.

Data management and selection

The selection process of the articles comprised in this study is shown in Fig. 1. Articles were reviewed in the following order: title, abstract, and full text. Three hundred eighty one articles were identified through the databases search. After that, duplicates were removed. Posteriorly, titles and abstracts were screened, which led to a total of 123 articles. The inclusion criteria previously stated were implemented in these articles, resulting in the final 31 articles.

Data extraction

Data extraction was performed by one independent reviewer. The following information was extracted for each study: Authors, year of publication, country, sample characteristics (sample size and age range), methodology, and key findings related to ACEs, prison environment and mental health issues.

Results

Study sample

The studies comprised a total of 42,429 inmates. The characteristics of each sample, the country, and the key findings are described in Table 1. The samples differed in sex, age, and size. Participants were justice involved children, adolescents and adults of any age. The smallest sample size matched the number of 54 participants (Cazala et al., 2023), and the study with the largest sample size matched the number of 24,508 inmates (Auty & Liebling, 2020).

In China, studies by Yang et al. (2024) and Liu et al. (2024) showed that juvenile offenders and incarcerated women with histories of maltreatment had higher levels of psychopathy, aggressive emotions, and callous-unemotional traits. Yang et al. (2024) also noted that emotional neglect was particularly linked to lower empathy in offenders. Similarly, Liu et al. (2024) found a significant association between childhood discrimination and elevated aggression in adult female prisoners.

Studies in South Africa (Naidoo et al., 2024) and the United States (Oei et al., 2023) provided compelling evidence that multiple ACEs are strongly correlated with severe mental health outcomes. Naidoo et al. (2024) demonstrated that incarcerated women with high ACE scores were at much greater risk for PTSD, alcohol use disorder, and substance use disorders. In Singapore, Oei et al. (2023) highlighted that youth with polyvictimization showed severe behavioral problems, including conduct and oppositional disorders, and antisocial attitudes.

In the United Kingdom, Moran et al. (2024) found that young male offenders with Disinhibited Social Engagement Disorder (DSED) had significantly higher ACE scores, with neglect being a predominant experience. This was corroborated by studies from Bowler et al. (2018) and Kennedy et al. (2021), which showed that individuals who experienced childhood sexual abuse were at higher risk for poor mental health, including depression, anxiety, and suicidality.

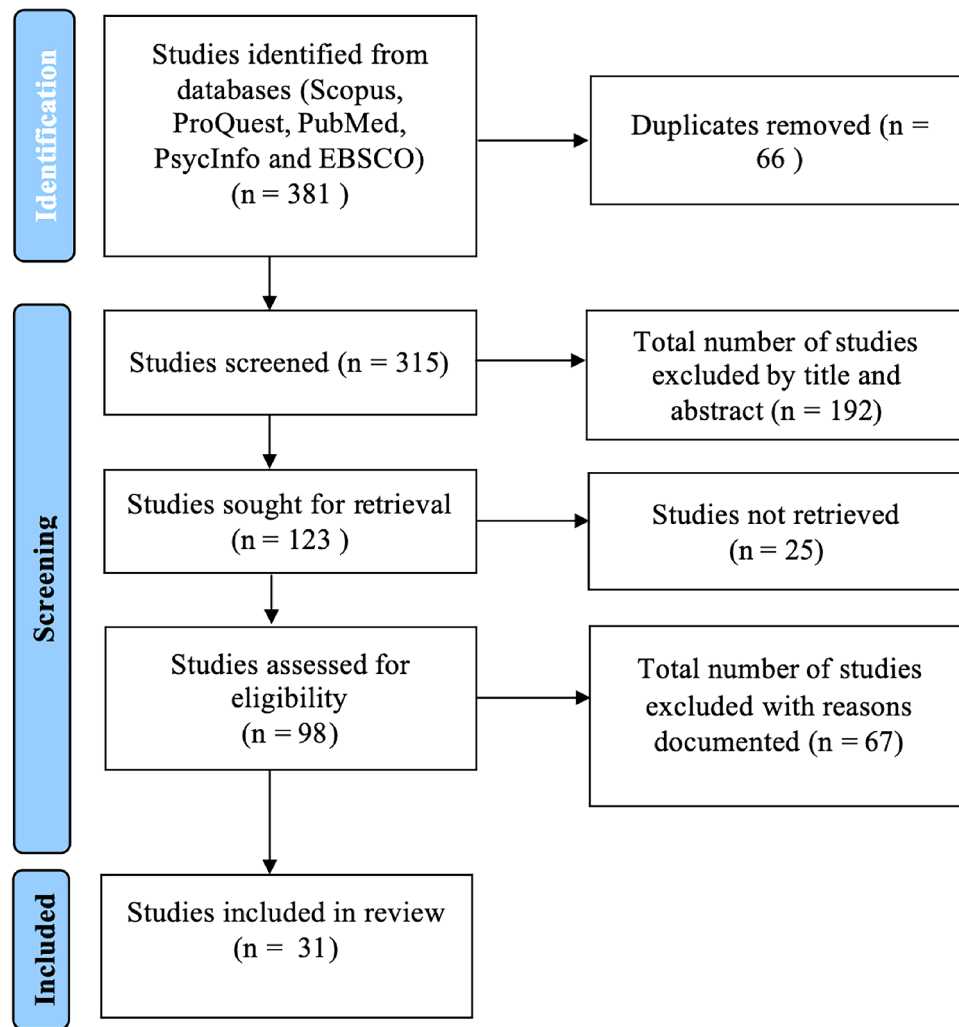


Fig. 1. Flow diagram of the studies selection.

Further studies from the United States, such as those by [Cazala et al. \(2023\)](#) and [Capuzzi et al. \(2022\)](#), found that physical abuse was strongly associated with sadistic tendencies and violent behaviors. [Cazala et al. \(2023\)](#) specifically noted that homicide was more likely to occur among individuals with physical sadism, often stemming from childhood trauma. [Capuzzi et al. \(2022\)](#) also found that emotional abuse was a significant predictor of ADHD symptoms in male prisoners, linking early trauma to neurodevelopmental disorders.

In Italy, [Capuzzi et al. \(2020\)](#) and [Turner's \(2021\)](#) studies highlighted the correlation between emotional abuse and psychotic symptoms in prisoners, while [Turner et al. \(2021\)](#) also found that individuals with multiple ACEs exhibited the highest levels of mental health disturbances, including thought problems and rule-breaking behaviors. In Turkey, [Kaya et al. \(2023\)](#) and [Cantürk et al. \(2021\)](#) showed that childhood violence, including sexual abuse, was associated with severe psychopathology and violent tendencies in male inmates.

Other studies, such as those by [Chen et al. \(2022\)](#) and [Geng et al. \(2021\)](#) in China, demonstrated that individuals with antisocial personality traits were more likely to have experienced emotional and physical neglect, which was linked to impulsive behavior and PTSD symptoms. Similarly, studies from Spain by [Sánchez et al. \(2018\)](#) and [Bielas et al. \(2016\)](#) showed that childhood trauma, particularly emotional and sexual abuse, was a strong predictor of depression, PTSD, and suicidality among male prisoners.

Studies from South Korea ([Choi et al., 2017](#)) and Belgium ([Vahl et al., 2016](#)) found that emotional maltreatment and neglect were significant

predictors of both internalizing and externalizing mental health problems, including aggression, anxiety, and depression. Additionally, [Moore et al. \(2021\)](#) reported that stressful events in prison, often linked to past childhood trauma, significantly worsened mental health outcomes, including feelings of loneliness and hopelessness.

The review also found a significant association between ACEs and higher rates of dissociation and self-harm, as reported by [Ford et al. \(2020\)](#) and [Golshani et al. \(2020\)](#) in the United Kingdom and Iran, respectively. These studies highlighted the pervasive impact of early trauma on mental health in incarcerated populations. Moreover, regarding the deprivation model or the stress and trauma in prison due to prison climate or prison factor, there were two studies found in the review. First study by [Moore et al. \(2021\)](#) showed that stressful events i. e. cell relocations, insults from others in prison, and disciplinary actions were strongly associated with loneliness, hopelessness, and suicidality. Specific incarceration-related stressors (e.g., isolation, disciplinary actions, interpersonal conflicts) significantly worsened mental health outcomes. Another study by [Auty & Liebling \(2020\)](#) showed that decency, personal autonomy, and prisoner safety were found to be significantly correlated with lower rates of proven reoffending. Furthermore, prison environments that prioritize safety, characterized by reduced levels of drug prevalence, violence, and exploitation, were associated with more favorable post-release outcomes. A positive social and moral climate within correctional facilities fosters prisoner well-being, supports personal development, and facilitates desistance from criminal behavior.

Table 1
Characteristics and key Findings of Reviewed Studies ($n = 31$).

Authors	Country	Sample Characteristics	Methodology	Key findings
Yang et al. (2024)	China	625 juvenile offenders Mean Age: 17.22 years	Cross-sectional study	Research showed that participants who experienced maltreatment exhibited significantly higher psychopathy scores. Moreover, participants who exhibited higher emotional neglect had greater callous-unemotional traits and lower empathy.
Naidoo et al. (2024)	South Africa	126 female inmates Age range: 18+ years	Cross-sectional study	All participants reported experiencing at least one Adverse Childhood Experience (ACE), with 93.7 % having four or more ACEs (binary version) and 80.2 % on the frequency version. The most common ACEs were physical abuse (87.3 %), emotional abuse (93.7 %), and witnessing household violence (89.7 %). Participants with four or more ACEs were significantly more likely to develop PTSD (6.28 times higher risk), Alcohol Use Disorder (6.80 times higher risk), Substance Use Disorder (3.76 times higher risk), and Borderline Personality Disorder (3.17 times higher risk). These findings highlight the strong link between childhood trauma and long-term mental health issues.
Moran et al. (2024)	United Kingdom	110 male young offenders Age range: 16–23 years	Cross-sectional study	Participants with Disinhibited Social Engagement Disorder (DSED) reported a significantly higher number of ACEs compared to those without the disorder. Neglect was a common experience, with 86 % of individuals with DSED and 55 % of those with Reactive Attachment Disorder (RAD) reporting a history of neglect.
Liu et al. (2024)	China	411 incarcerated women Age range: 18–65	Cross-sectional study	Higher levels of childhood discrimination were significantly associated with elevated aggressive emotions ($\beta = 1.183, p < 0.001$).
Annett et al. (2023)	United States	500 incarcerated women Age range: 20–62 years	Cross-sectional study	The study identified significant positive correlations between ACEs and mental health outcomes. Specifically, higher ACE scores were positively associated with increased levels of traumatic stress, depression, and anxiety.
Oei et al. (2023)	Singapore	Sample Size: 1130 youth male and female offenders Age range: 12–20 years	Cross-sectional study	Youth in the Polyvictimized (PV) group had the highest levels of conduct disorder, indicating severe behavioral challenges. Both the Abusive Environment (AE) and Polyvictimized (PV) groups showed higher levels of oppositional disorder compared to the Low ACE (LA) and Indirect Victimization (IV) groups. The Polyvictimized (PV) group also displayed the highest levels of antisocial attitudes, reflecting more negative beliefs and behaviors. In contrast, the Low ACE (LA) group had the lowest levels of antisocial attitudes, indicating fewer behavioral concerns. These findings highlight the strong impact of multiple childhood adversities on youth behavior and attitudes.
Kaya et al. (2023)	Turkey	370 male inmates Mean age of 34.51 years	Cross-sectional study	The results indicated that inmates with a history of childhood violence exhibited significantly elevated scores across all measured domains, including depression, anxiety, and general psychopathology. Notably, sexual abuse scores were highest among inmates involved in multiple offenses and those convicted of homicide.
Jin et al. (2023)	China	282 male inmates Age range: 20 to 63 years	Cross-sectional study	Results showed that crimes of passion offenders experienced significantly more childhood maltreatment, particularly emotional neglect and physical neglect, compared to other offenders. Moreover, High borderline personality trait group reported higher rates of childhood maltreatment, except for sexual abuse.
Cazala et al. (2023)	United States	54 male adolescent offenders Age range: 14–21 years	Cross-sectional study	Physical abuse was found to have a substantial correlation with both physical and vicarious sadistic tendencies. Sadistic tendencies were not consistently predicted by self-reported trauma, while expert-rated trauma yielded more precise information. Both homicide and non-homicide violent acts were significantly elevated by physical maltreatment, with homicide being more likely to occur when physical sadism was involved. When examined alone, vicarious sadism decreased the likelihood of violent non-homicide acts, but when combined, it increased the likelihood of physical abuse.
Yang et al. (2022)	China	1491 male prisoners Age range: 18–69 years	Cross-sectional study	Childhood trauma was strongly linked to traits of Antisocial Personality Disorder (ASPD) and Borderline Personality Disorder (BPD). The most common traumatic experiences reported were emotional abuse, physical abuse, and neglect.
Rodrik et al. (2022)	United States	1808 incarcerated adult males. Mean age: 32.6 years	Cross-sectional study	Results showed that externalizing behaviors were positively correlated with all forms of childhood trauma, including emotional abuse, physical neglect, and sexual abuse.
Capuzzi et al. (2022)	Italy	108 male prisoners Age Range: 18–65	Cross-sectional study	Results showed that Emotional abuse emerged as a notable predictor of ADHD symptoms, underscoring the relationship between early-life trauma and neurodevelopmental disorders.
Chen et al. (2022)	China	412 male inmates Age range: 18–65 years	Cross-sectional study	In the study, inmates with antisocial personality traits exhibited significantly higher levels of childhood emotional abuse (mean = 9.43, $p < 0.001$) and physical neglect (mean = 10.72, $p < 0.001$) compared to those without antisocial traits. Emotional abuse demonstrated a strong correlation with motor impulsiveness ($r = 0.224, p < 0.05$), while emotional neglect was significantly associated with non-planning impulsiveness ($r = 0.293, p < 0.01$). These findings highlight the links between specific forms of childhood maltreatment and distinct dimensions of impulsiveness in incarcerated individuals.
Kennedy et al. (2021)	United States	183 incarcerated women Age range: 18 to 72 years.	Cross-sectional study	Results showed that women in the High Sexual Abuse cluster were 4.83 times more likely to experience suicidal ideation than those in the Low Victimization cluster. Additionally, women in the Severe Polyvictimization cluster had significantly higher dissociation as compared to the Low Victimization group.
Cantürk et al. (2021)	Turkey	313 male prisoners Age range: 18 to 65 years	Cross-sectional study	Result showed that there is a relationship between childhood trauma and criminal behavior in prisoners. There was a significant relationship between childhood traumas and the tendency to be violent.
Capuzzi et al. (2021)	Italy	215 male prisoners Age range: 18–65 years	Cross-sectional study	Prisoners with a history of suicide attempts had significantly higher Childhood Trauma Questionnaire scores than those without. Sexual abuse and emotional neglect were the strongest predictors of suicide attempts among the types of childhood trauma.
Turner et al. (2021)	Germany	161 adolescents and young offenders Age range: 14–25 years	Cross-sectional study	Results showed that higher levels of adverse childhood experiences were significantly associated with poorer mental health outcomes. Individuals in the multiple-ACE subtype exhibited the highest levels of mental health disturbances, including thought problems and rule-breaking behavior. Those in the neglected subtype demonstrated significant associations with social problems and aggressive behaviors.

(continued on next page)

Table 1 (continued)

Authors	Country	Sample Characteristics	Methodology	Key findings
Geng et al. (2021)	China	1484 male prisoners Age range: 18–69	Cross-sectional study	Trauma exposure showed a significant association with both PTSD and depressive symptoms. Additionally, a history of frequent drinking (three or more times per week) and gambling addiction were strongly linked to increased rates of PTSD and depression.
Capuzzi et al. (2020)	Italy	141 male inmates Age range: 18–65 years.	Cross-sectional study	Result showed that emotional abuse and physical neglect were notably more prevalent among inmates who exhibited psychotic symptoms. Among these, emotional abuse emerged as the most significant trauma-related predictor of psychotic symptoms.
Ford et al. (2020)	United Kingdom	468 adult male prisoners Age range: 18–69 years	Cross-sectional study	Prisoners with four or more ACEs were significantly more likely to report mental illness, lifetime self-harm, and suicide attempts in prison compared to those with no ACEs.
Golshani et al. (2020)	Iran	69 male prisoners Age range: 25–48 years	Cross-sectional study	Both low and high adulthood trauma scores were associated with elevated dissociative symptoms. Dissociation was more strongly linked to childhood trauma than adulthood trauma.
Sanchez et al. (2019)	Spain	943 male inmates Age Range: 18+	Cross-sectional study	40 % of participants reported at least one form of childhood abuse. Survivors of abuse exhibited more severe depression, anxiety, and stress symptoms compared to those without abuse histories. Emotional abuse was the most common, followed by physical and sexual abuse. Moreover, Survivors of emotional and sexual abuse had higher rates of PTSD compared to those exposed to physical abuse.
Bowler et al. (2018)	United Kingdom	756 male inmates Age range: 15–76 years	Cross-sectional study	The findings showed that participants who experienced childhood sexual abuse were nearly three times more likely to report poor mental health.
Sánchez et al. (2018)	Spain	2270 male inmates Mean age = 36.7 years	Cross-sectional study	Among inmates who reported near-lethal suicide attempts, 73.9 % experienced at least one form of childhood trauma. Emotional abuse and parental substance abuse were identified as significant correlates of near-lethal suicide attempts, highlighting the critical impact of adverse childhood experiences on suicidal behavior in incarcerated populations.
Chen et al. (2017)	China	1705 adult prisoners Age range: Majority were under 35 years old	Cross-sectional study	In this study, 1640 of the respondents reported suffering from at least one type of childhood trauma. Moreover, childhood trauma was strongly associated with alexithymia, depression, anxiety, and hopelessness.
Tang et al. (2017)	China	1082 male offenders Age Range: 16 to 28 years	Cross-sectional study	Results showed that Emotional neglect was the most common (51.11 %), followed by physical neglect (67.19 %), emotional abuse (30.78 %), physical abuse (44.73 %), and sexual abuse (29.30 %). Moreover, there was positive relationship between trauma and trait anger. Emotional and physical abuse had the strongest associations with trait anger.
Choi et al. (2017)	South Korea	173 male juvenile detainees Age range: 16–19 years	Cross-sectional study	Emotional abuse (OR = 1.26, $p = 0.009$), sexual abuse (OR = 1.23, $p = 0.022$), and physical abuse (OR = 1.23, $p = 0.008$) were found to be significantly associated with conduct disorder (CD), indicating that these forms of childhood maltreatment increase the likelihood of developing CD.
Vahl et al. (2016)	Belgium	341 detained adolescents Age range: 12–17 years	Cross-sectional study	Emotional maltreatment, emotional abuse and neglect, significantly predicted both internalizing (e.g., anxiety, depression) and externalizing (e.g., aggression, rule-breaking) mental health problems, even beyond the effects of physical and sexual abuse. Emotional abuse had the strongest correlation with both internalizing and externalizing problems across genders, while emotional neglect was specifically linked to externalizing problems in boys. Sexual abuse was more strongly associated with internalizing problems in girls and externalizing problems in boys.
Bielas et al. (2016)	Switzerland	130 male juvenile detainees Age range: 13.8 to 19.5 years	Cross-sectional study	Higher cumulative ACE scores were strongly associated with increased risks of PTSD, depressive disorders, anxiety disorders, and suicidality.
Moore et al. (2021)	United States	160 incarcerated individuals Age range: 18–65 years	Cross-sectional study	Participants reported an average of 3.9 stressful life events in the past six months. Common events included cell relocations (38.6 %), insults from others in prison (34.8 %), and disciplinary actions (32.3 %). Stressful events were strongly associated with loneliness, hopelessness, and suicidality but had weaker associations with self-reported depression. Specific incarceration-related stressors (e.g., isolation, disciplinary actions, interpersonal conflicts) significantly worsened mental health outcomes.
Auty & Liebling (2020)	United Kingdom	24,508 prisoners	Cross-sectional study	Higher scores on dimensions such as decency, personal autonomy, and prisoner safety were significantly associated with reduced rates of proven reoffending. Additionally, safer prison environments characterized by lower levels of drug prevalence, violence, and exploitation were linked to improved post-release outcomes. Positive social and moral climates facilitate prisoner well-being, personal development, and desistance from crime.

Discussion

This systematic review underscores the significant impact of childhood maltreatment and the prison environment on the mental health and behavioral outcomes of incarcerated individuals across various countries ($n = 31$). A consistent pattern emerges across studies, revealing that adverse childhood experiences (ACEs), such as physical, emotional, and sexual abuse, significantly contribute to the development of psychological disorders and maladaptive behaviors among offenders. These findings are particularly evident in studies from China, South Africa, the United States, the United Kingdom, and other regions, highlighting the global relevance of childhood trauma in shaping offender behavior.

The cumulative nature of ACEs, particularly those related to neglect and abuse, is strongly linked to a range of severe psychological outcomes, including PTSD, psychopathology, substance use disorders, depression, conduct disorder, maladaptive behaviors and personality disorders. Studies from countries such as China, Italy, Turkey, South

Korea, Spain, South Africa, the United States, and the United Kingdom further support these associations, demonstrating how childhood trauma influences adult mental health, particularly in female offenders and juvenile populations. Emotional neglect, in particular, emerges as a critical factor, contributing to lowered empathy and increased aggression in both male and female prisoners (Bowler et al., 2018; Capuzzi et al., 2022; 2020; Cazala et al., 2023; Kennedy et al., 2021; Moran et al., 2024; Naidoo et al., 2024; Oei et al., 2023; Turner, 2021; Kaya et al., 2023) Cantürk et al., 2021; Chen et al., 2022; Geng et al., 2021; Choi et al., 2017; Sánchez et al., 2018; Bielas et al., 2016)

Additionally, the prison environment itself plays a pivotal role in exacerbating the mental health challenges of individuals with prior trauma. Stressors within the prison, such as cell relocations, disciplinary actions, and lack of personal autonomy, amplify feelings of hopelessness, anxiety, and suicidality. In contrast, safer and more supportive prison environments, as evidenced in studies from the UK and the US, are linked to better rehabilitation outcomes, highlighting the importance of trauma-informed care and prison reform in fostering better

mental health and reducing recidivism (Auty & Liebling, 2020; Moore et al., 2021).

These findings align with the broader literature on prison mental health, such as the work of Borschmann et al. (2024) and Jewkes et al. (2020), which emphasize the urgent need for transitional healthcare programs and trauma-informed prison designs to address the complex interplay of childhood trauma and incarceration. While some countries have adopted progressive approaches to prison reform, challenges remain in mitigating the adverse effects of outdated and harsh prison conditions, particularly in mixed-gender facilities and overcrowded settings.

Policy relevance

The World Health Organization (WHO, 2022) provides comprehensive guidelines for prison health policy initiatives, emphasizing that prison environments must support physical and mental health by reducing environmental stressors and facilitating trauma recovery. Overcrowding is identified as a significant determinant of poor health outcomes, necessitating effective population management strategies to address this issue. Additionally, WHO advocates for the integration of mental health care into prison health services, delivered by trained professionals employing trauma-sensitive approaches. Achieving health equity in prisons requires effective governance and sustained political commitment, ensuring long-term policy implementation and resource allocation. Furthermore, inclusive governance is highlighted as essential, with stakeholder engagement at all stages of prison health planning. Aligning with these guidelines enables prison systems to better address trauma, mental health needs, and environmental challenges, ultimately enhancing health outcomes and rehabilitation prospects for incarcerated individuals.

Practical implications

It has been suggested that incarceration is a time to concentrate interventions (Friestad et al. 2014). Addressing the unique mental health and other needs of inmates who have experienced ACEs is likely to improve not only the mental health of inmates but also their rehabilitation, increase their trust in support services, and have wider societal and public health benefits. Future study should focus on identifying characteristics that help prevent mental health issues in this susceptible group as well as therapies that can improve mental health and wellbeing in inmates who have experienced ACEs. Additionally, primary prevention of ACEs should continue to be a priority. Future generations should be less likely to commit crimes and interact with the criminal justice system if ACEs are avoided and children impacted by them, including those of convicts, are supported.

Trauma-informed staff training should be a foundational intervention across correctional facilities. This training must go beyond basic awareness and equip correctional officers, healthcare providers, and administrative staff with practical skills to recognize trauma responses, de-escalate crisis situations, and build trust with incarcerated individuals. Beyond training, routine trauma history screenings upon prison entry should be standardized. These screenings, conducted by trained mental health professionals, can help identify individuals with significant trauma backgrounds and enable the development of personalized care plans. Screening tools must be sensitive to gender-specific trauma experiences, ensuring that female prisoners' unique needs are addressed comprehensively.

Furthermore, integrating mental health services into prison healthcare systems is essential to bridge the gap between trauma exposure and rehabilitation. Correctional facilities must have on-site mental health professionals, including psychologists, counselors, and crisis intervention specialists, available for routine check-ins and emergency care. Mental health services should include individual therapy, group counseling sessions, and peer-support programs, tailored specifically to

address women's unique trauma experiences, including domestic violence and sexual abuse. Additionally, dedicated therapeutic spaces should be established within prisons to provide a safe, calming environment for mental health interventions, free from common environmental triggers. Collaborative partnerships with community mental health services and NGOs should also be prioritized to ensure continuity of care post-release, reducing the likelihood of relapse or re-traumatization. By embedding these interventions into correctional practices, prisons can foster a trauma-informed culture that prioritizes emotional well-being, rehabilitation, and long-term reintegration into society.

Limitations and future directions

While the study provides valuable insights into the relationship between prison design, trauma, and mental health outcomes, it largely relies on secondary data and theoretical frameworks, lacking substantial primary empirical evidence. This limitation raises questions about the generalizability of findings across diverse cultural and regional contexts. Prisons operate within unique social, political, and economic environments, which significantly influence how trauma-informed care principles. The applicability of the importation and deprivation models—which explain how pre-existing individual characteristics and prison-specific conditions affect prisoners' experiences—remains underexplored in a global context. Without cross-cultural validation, the models risk being seen as regionally bound, failing to account for context-specific factors such as cultural attitudes toward incarceration, resource availability, and governance structures.

To address this gap, future research should adopt a cross-cultural comparative approach, incorporating primary data collection across multiple prison systems worldwide. Studies should examine how importation and deprivation factors manifest in different cultural and institutional settings, identifying commonalities and divergences in trauma exposure, mental health outcomes, and rehabilitation success. Additionally, mixed-methods research, combining quantitative surveys with qualitative interviews and observational studies, can offer a more nuanced understanding of the interplay between individual trauma histories and institutional practices. Collaborations between researchers, prison authorities, and international organizations like the World Health Organization (WHO) can facilitate large-scale, cross-border studies to establish evidence-based best practices for trauma-informed prison design and healthcare delivery. Such research can ensure that interventions are globally adaptable while remaining sensitive to regional and cultural contexts, ultimately contributing to more effective prison health and rehabilitation policies worldwide.

Conclusion

Of the many unintended consequences of incarceration, one that perhaps stands out is a high prevalence of mental illness among inmates. For a long time, scholars have debated what causes the high prevalence of mental health illnesses: whether people bring in most of the problems or whether the prison environment acts as a trigger for the emergence of these problems. The theoretical frameworks of importation and deprivation models, which present opposing theories for maladaptive behaviours in jail, serve as the framework for these discussions. Research from other fields, such as prison suicide, indicates that a combination of importation and deprivation models provide the most thorough explanation for maladaptation, even if there have been less studies that have explicitly examined mental health (Armour, 2023). It's possible that this dual paradigm can be used to comprehend mental health in correctional facilities.

The current analysis advocates for integrating a trauma-informed perspective into the importation and deprivation models to better explain the relationship between trauma and mental health in prisons. Inmates often enter the prison system with pre-existing trauma, which is

further intensified by additional traumatic experiences during incarceration. This cumulative trauma significantly increases the risk of developing severe mental health conditions such as PTSD and psychosis, supporting the need for this approach (Shevlin et al., 2008). However, it is essential to acknowledge other factors contributing to mental health issues in prison, particularly the high prevalence of substance use disorders, overcrowding, and prison environment which complicate the management of mental health within this environment (Moloney & Moller, 2009; Moloney et al., 2015).

CRedit authorship contribution statement

Sania Mazher: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Takashi Arai:** Conceptualization, Writing – review & editing.

Declaration of competing interest

The author, Sania Mazher, declares that there are no financial, personal, or institutional conflicts of interest in the preparation or submission of this manuscript. This research is conducted solely for academic and professional purposes, with no commercial or external influence on its findings or interpretations.

Acknowledgements

The authors would like to express their sincere gratitude to the Tohoku University Support Program for the Article Processing Charge (APC) FY2024 for their generous financial support, which made the publication of this work possible. Their commitment to advancing academic research and promoting the dissemination of knowledge is greatly appreciated.

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