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221 00 Lund
+46 46-222 00 00

Self-harm in young violent offenders and forensic psychiatric patients

NATALIE LAPORTE

DEPARTMENT OF CLINICAL SCIENCES, LUND | FACULTY OF MEDICINE | LUND UNIVERSITY



Self-harm in young violent offenders and forensic psychiatric patients

Natalie Laporte



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DOCTORAL DISSERTATION

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To be defended at Segerfalksalen, Sölvegatan 17, Lund,

Friday 20th of May 2022 at 9 am.

Faculty opponent

Professor Vivienne de Vogel, Maastricht University
and University of Applied Sciences Utrecht

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Author(s) Natalie Laporte		
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Abstract		
Background and Aims		
<p>This thesis aims to provide knowledge on self-harm, encompassing non-suicidal self-injury and suicide attempts, and clinical, psychological and psychosocial covariates thereto in forensic samples. Self-harm is a global health issue causing suffering and great society costs. Self-harm has, amongst others, been associated to various mental disorders, emotion dysregulation, and adverse childhood experiences. The predictive power of non-suicidal self-injury on completed suicide is large and suicide has been found to be up to 10 times more common in prison populations compared to the general population and is the leading cause of death in prisons worldwide. Another vulnerable group susceptible to self-harm is forensic psychiatric patients. Their clinical representation is often burdened by severe and multifaceted problems with mental disorders in combination with substance use disorders, various psychosocial problems, and antisocial behavior patterns.</p>		
Methods and Results		
<p>Data were collected in two different samples: 269 young violent offenders incarcerated in one of nine correctional facilities in Sweden during 2010–2012 (Paper I), and 98 forensic psychiatric patients cared for at a high-security forensic psychiatric clinic in Sweden at any point during 2016–2020 (Papers II–IV). Data were collected through file information (Papers I–IV), clinical assessments (Paper I) and self-reports regarding emotion regulation, adverse childhood experiences, and non-suicidal self-injury (Papers II–IV).</p>		
<p>Results showed that self-harm was common in both samples; 23% of prison population and 68.4% in forensic psychiatric patients. In both samples, self-harm was associated to anxiety disorders, mood disorders, childhood bullying victimization and exposure to violence. In forensic psychiatric patients, emotion dysregulation in general, and specifically subscales related to difficulties controlling impulsive behaviors, inability to engage in goal-directed behaviors when distressed, and limited access to emotion regulation strategies perceived as effective differed between participants with and without self-harm. The main function of non-suicidal self-injury reported was affect regulation, self-punishment and signaling distress. Also, forensic psychiatric patients in general reported multiple and severe forms of adverse childhood experiences, which in turn increased the risk of self-harm.</p>		
Conclusion		
<p>The results of this thesis add on to existing knowledge on self-harm and its covariates in general, and fill gaps of knowledge on forensic samples in Sweden, particularly on forensic psychiatric patients' clinical, psychological and psychosocial covariates of self-harm.</p>		
Key words Self-harm, suicide attempt, forensic psychiatry, prison, offenders, non-suicidal self-injury, mental disorders		
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*Do not go where the path may lead, go instead where there is
no path and leave a trail.*

- *Ralph Waldo Emerson*

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Abstract

This thesis aims to provide knowledge on self-harm, encompassing non-suicidal self-injury and suicide attempts, and clinical, psychological and psychosocial covariates thereto in forensic samples. Self-harm is a global health issue causing suffering and great society costs. Self-harm has, amongst others, been associated to various mental disorders, emotion dysregulation, and adverse childhood experiences. The predictive power of non-suicidal self-injury on completed suicide is large and suicide has been found to be up to 10 times more common in prison populations compared to the general population and is the leading cause of death in prisons worldwide. Another vulnerable group susceptible to self-harm is forensic psychiatric patients. Their clinical representation is often burdened by severe and multifaceted problems with mental disorders in combination with substance use disorders, various psychosocial problems, and antisocial behavior patterns. Data were collected in two different samples: 269 young violent offenders incarcerated in one of nine correctional facilities in Sweden during 2010–2012 (Paper I), and 98 forensic psychiatric patients cared for at a high-security forensic psychiatric clinic in Sweden at any point during 2016–2020 (Papers II–IV). Data were collected through file information (Papers I–IV), clinical assessments (Paper I) and self-reports regarding emotion regulation, adverse childhood experiences, and non-suicidal self-injury (Papers II–IV). Results showed that self-harm was common in both samples; 23% of prison population and 68.4% in forensic psychiatric patients. In both samples, self-harm was associated to anxiety disorders, mood disorders, childhood bullying victimization and exposure to violence. In forensic psychiatric patients, emotion dysregulation in general, and specifically subscales related to difficulties controlling impulsive behaviors, inability to engage in goal-directed behaviors when distressed, and limited access to emotion regulation strategies perceived as effective differed between participants with and without self-harm. The main function of non-suicidal self-injury reported was affect regulation, self-punishment and signaling distress. Also, forensic psychiatric patients in general reported multiple and severe forms of adverse childhood experiences, which in turn increased the risk of self-harm. The results of this thesis add on to existing knowledge on self-harm and its covariates in general, and fill gaps of knowledge on forensic samples in Sweden, particularly on forensic psychiatric patients' clinical, psychological and psychosocial covariates of self-harm.

Svensk sammanfattning

Självskadebeteende är ett globalt folkhälsoproblem som orsakar både lidande och omfattande samhällskostnader. Forskare har länge försökt förstå varför vissa personer skadar sig. Hittills har man upptäckt att personer som skadar sig själva oftare lider av psykisk ohälsa, har svårare att reglera sina känslor och oftare har vuxit upp under svåra omständigheter med våld och övergrepp. Det är svårt att säga om någon av riskfaktorerna väger tyngre än andra, men forskare är överens om att personer som skadar sig själva löper betydligt högre risk för suicid. I fängelser är suicid en av de ledande dödsorsakerna och är upp till 10 gånger vanligare jämfört med i den övriga befolkningen. Då tidigare forskning mestadels har undersökt vad som kan vara relaterat till självskadebeteende hos ungdomar eller i allmänpsykiatriska grupper, syftar denna avhandling till att bidra med kunskap om självskadebeteende och vad som kan vara relaterat därtill i forensiska grupper. Avhandlingen beskriver också mer djupgående gruppen rättspsykiatriska patienter.

I det första delarbetet genomgick 269 unga män dömda för våldsbrott inklusive sexualbrott, mellan 2010–2012, en omfattande klinisk utvärdering om bland annat psykiatriska diagnoser, aggressivitet, självskadebeteende och suicidförsök. De tre efterföljande delarbetena baseras på en studie som genomfördes 2016–2020 på en rättspsykiatrisk högsäkerhetsklinik. Omfattande information om deltagarna samlades in genom journal- och aktgranskning och självskattningsformulär om känsloreglering, barndomstrauma samt självskadebeteende och dess funktion. Majoriteten av de 98 deltagarna var män med schizofrenispektrumsyndrom som huvuddiagnos. Resultaten visade att självskadebeteende och suicidförsök var vanligt hos fängelsedömda våldsbrottslingar och rättspsykiatriska patienter. I båda grupperna visade sig ångestsyndrom, förstämningssyndrom samt att ha varit utsatt för mobbing och våld i barndomen ha ett starkt samband med självskadebeteende och suicidförsök. I enlighet med tidigare forskning hade rättspsykiatriska patienter med självskadebeteende också svårare att reglera sina känslor än patienter utan självskadebeteende. Det primära syftet med självskadebeteendet var känsloreglering, självbestraffning och ett sätt att signalera att man inte mår bra. Sammanfattningsvis bidrar denna avhandling med nya perspektiv på fängelsedömda våldsbrottslingars och rättspsykiatriska patienters kliniska behov samt information om vilka faktorer som kan relateras till självskadebeteende och suicidförsök hos en utsatt och vårdkrävande grupp.

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List of papers

- I. **Laporte,*** N., Ozolins, A., Westling, S., Westrin, Å., Billstedt, E., Hofvander, B., & Wallinius, M. (2017). Deliberate self-harm behavior among young violent offenders. *PLoS One*, *12*(8), e0182258.
- II. **Laporte,*** N., Ozolins, A., Westling, S., Westrin, Å., & Wallinius, M. (2021). Clinical characteristics and self-harm in forensic psychiatric patients. *Frontiers in Psychiatry*, *12*, doi:10.3389/fpsy.2021.698372
- III. **Laporte,*** N., Tuente, S. K., Ozolins, A., Westrin, Å., Westling, S., & Wallinius, M. (2021). Emotion regulation and self-harm among forensic psychiatric patients. *Frontiers in Psychology*, *12*, doi:10.3389/fpsyg.2021.710751
- IV. **Laporte,*** N., Ozolins, A., Westling, S., Westrin, Å., & Wallinius, M. (submitted). Adverse childhood experiences as a risk factor for self-harm in forensic psychiatric patients: A cross-sectional study. Unpublished manuscript.

* Corresponding author

Abbreviations

ACE	Adverse Childhood Experiences
ADHD	Attention Deficit Hyperactivity Disorder
APA	American Psychiatric Association
APD	Antisocial Personality Disorder
ASDI	Asperger Syndrome (and high-functioning autism) Diagnostic Interview
BPD	Borderline Personality Disorder
CI	Confidence Interval
C-SSRS	Columbia-Suicide Severity Rating Scale
CTQ-SF	Childhood Trauma Questionnaire—Short Form
DAABS	Development of Aggressive and Antisocial Behavior Study
DERS	Difficulties in Emotion Regulation Scale
DSH	Deliberate Self-Harm
DSM-IV	Diagnostic and Statistical Manual, 4th edition
DSM-5	Diagnostic and Statistical Manual, 5th edition
FPI	Forensic Psychiatric Investigation
FPP	Forensic Psychiatric Patients
GAI	General Ability Index
ICD-9	The International Classification of Diseases, 9th edition
ICD-10	The International Classification of Diseases, 10th edition
ISAS	Inventory of Statements About Self-Injury
IQR	Interquartile Range
LHA	Life History of Aggression
MENT-FOR	Mental health care needs in forensic psychiatric patients

NPV	Negative Predictive Value
NSSI	Non-Suicidal Self-Injury
OR	Odds Ratio
POI	Perceptual Organization Index
PPV	Positive Predictive Value
SA	Suicide Attempt
SCID-I	Structured Clinical Interview for Axis I Disorders
SCID-II	Structured Clinical Interview for Axis II Disorders
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
SUD	Substance Use Disorder
VCI	Verbal Comprehension Index
VO	Violent Offenders
WAIS	Wechsler Adult Intelligence Scale
WHO	World Health Organization

Introduction

This thesis concerns the serious global health issue of self-harm in forensic populations, in which growing prevalence rates and limited knowledge of covariates is a cause for concern.

Self-harm behavior, i.e., actions inflicting harm on one's own body, is a global health issue that has been described in early texts, for example, Oedipus' self-blinding in Sophocles' *King Oedipus* and the man cutting himself with stones described in Mark 5:5. Besides being a serious self-destructive behavior that causes immediate psychological and physical suffering, self-harm can have profound long-term consequences for a person's health and quality of life and his or her family and loved ones. It also challenges the healthcare system and imposes a significant economic cost on both the healthcare system and society in general. Because self-harm has been related to a range of mental disorders, determining the use of resources and costs directly linked to self-harm rather than to any of its underlying causes is complex (Sinclair et al., 2011). However, it is clear that the care process regarding self-harm is expensive because individuals who exhibit moderate to severe self-harm often require hospital care, including intensive medical care, surgery, orthopedic interventions, and psychiatric admission, including increased observation and medication (Hawton & Sinclair, 2003; Yeo, 1993). Unfortunately, the risk of repeated incidents of self-harm is high (Haw et al., 2007), and the downward spiral of hospitalization and being shunted between different healthcare institutions may lead to completed suicide (Owens et al., 2002).

Prevalence of self-harm

Because self-harm is often performed in private, is socially stigmatized and might therefore not be reported, and its definition varies, the actual prevalence of self-harm is hard to establish (McAllister, 2003). In 12–20-year-olds, the prevalences of non-suicidal self-injury (NSSI) and deliberate self-harm behavior (DSH) have been estimated to range from 2.4% to 52% for DSH and 2.4% to 42% for NSSI (Gillies et al., 2018). Self-harm is often initiated in adolescence (Yates, 2004), and in a Swedish randomized community sample of 3060 adolescents, 1088 (35.6%) reported at least one NSSI incident during the previous year (Zetterqvist et al., 2013). In another study of a representative community sample of 879 adolescents in

Sweden, 41% reported self-harm during the year before data collection (Lundh et al., 2011). Other samples of adolescents around Europe have reported similar prevalence estimates. Accordingly, the highest prevalence rates of NSSI and/or DSH in community samples seem to be found among adolescents.

However, there are other groups in society that also seem to be more vulnerable to engaging in self-harm: individuals with mental disorders and incarcerated individuals such as prisoners and forensic psychiatric patients (FPPs). While between 7% (Lader et al., 2003) and 48% (Chapman, et al., 2005) of prisoners report NSSI, 75% of a sample of adolescent prisoners reported lifetime incidents of NSSI (Kenny et al., 2008). Moreover, prevalence rates are alarmingly higher among FPPs, being variously reported to be 61% (Gray et al., 2003), 48% (Loughran & Seewoonarain, 2005), and 52.9% (Mannion, 2009).

Self-harm in forensic populations

Self-harm, including suicide (both attempted and completed), constitutes a growing issue in prisons worldwide and suicide is the leading cause of death therein (Berman & Canning, 2021; Fotiadou et al., 2006). An extensive literature examines the risk factors for suicide in prison populations. A review published in 2021, concluded that the strongest risk factors for suicide in prisoners were previously attempted suicide, mental disorder, living in a single cell, lack of social visits and alcohol misuse (Zhong et al., 2021). Self-harm is common in forensic populations (de Vogel & Versteegen, 2021; Dixon-Gordon et al., 2012; Favril et al., 2020), and has been found to be a risk factor for, and a predictor of, completed suicide (Hawton et al., 1999). Females have a slightly higher risk of engaging in self-harm in prison than do males (Favril et al., 2020). While environmental settings and criminological factors should not be neglected when discussing the persistence of self-harm behaviors (Dixon-Gordon et al., 2012), women in prison report that their self-harm behavior pre-existed their incarceration and often emerged in early adolescence (Walker et al., 2021).

There is growing research interest on self-harm in forensic psychiatric populations, although in-depth knowledge of prevalence, characteristics and possible treatment is still scarce for this population. In general, forensic psychiatry provides care for offenders with severe mental disorders. This is a group of vulnerable individuals in terms of their healthcare and social intervention needs. Their clinical presentation is often burdened by severe and multifaceted problems with comorbid mental illnesses such as psychotic and bipolar disorders in combination with substance use disorders (SUD), various psychosocial problems, and antisocial behavior patterns (Degl' Innocenti et al., 2014; Penney et al., 2019). Improved knowledge of risk factors for self-harm in risk assessments and prevention-oriented treatment can hopefully

reduce the risk of suicidal and self-injurious behavior in probation services and in forensic psychiatry. Increased knowledge can also contribute to a better understanding, and the possible reduction of coercive measures.

Regarding FPPs, they have a uniquely difficult situation, suffering from severe mental disorders and being subjected to incarceration. Every year around 300 individuals are sentenced to forensic psychiatric care in Sweden (Rättspsyk, 2020). These are individuals who have committed crimes while under the influence of severe mental disorders and are thus transferred to forensic psychiatric care. In Swedish legislation, severe mental disorder is a juridical term rather than a medical term and reflects only severe mental disorders with a distorted perception of reality (e.g., psychotic disorders) and, in some cases, severe neurodevelopmental disorders. In this thesis, the term “forensic population” is used when referring to both FPPs and individuals incarcerated in prisons.

Definitional issues

In the early 1940s, Karl Menninger described self-harm as “wrist cutting syndrome.” Later, in the 1960s, the term “wrist slashers” started to appear in clinical texts. During the 1960s and 1980s, self-harm was primarily discussed as a symptom of borderline personality disorder (BPD) and was included in clinical descriptions in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1980, p. 323). Self-harm has since been suggested to be a separate diagnosis, and is today included in descriptions of multiple diagnoses but not as a separate diagnosis. Over the years, various definitions of self-harm have been suggested, for example: DSH, NSSI, self-injury, self-mutilation, cutting, auto-aggression, parasuicide, self-inflicted violence and self-directed aggression. However, two of these dominate the field: NSSI (American Psychiatric Association, 2013; Nock & Favazza, 2009) and DSH (Hawton, 2002).

DSH is a broader term that includes all self-inflicted harm with and without an intention to commit suicide, and extends all the way to encompass suicide (Hawton, 2002). In the Diagnostic and Statistical Manual, 5th edition (American Psychiatric Association, 2013), NSSI is defined as “intentional self-inflicted damage to the surface of his or her body of a sort likely to induce bleeding, bruising, or pain (e.g., cutting, burning, stabbing, hitting, excessive rubbing), with the expectation that the injury will lead to only minor or moderate physical harm (i.e., there is no suicidal intent).” (American Psychiatric Association, 2013, p. 803). NSSI acts include cutting, burning, biting, scratching or excessively rubbing the skin, self-hitting, head-banging or hitting fists against objects, bone-breaking, interfering with wound healing, hair pulling, ingesting a substance, drug or object, and jumping from a height. In addition to those mentioned above, even more serious acts may involve

swallowing objects, self-strangulation, forms of severe and permanent physical injury including eye-gouging, genital mutilation, and amputations (e.g., of ears or tongue).

The term “suicide attempt” (SA) is specified as a “nonfatal self-directed potentially injurious behavior with any intent to die as a result of the behavior. A suicide attempt may or may not result in injury” (Crosby et al., 2011, p. 21). However, there are various terms that should be acknowledged within the area of suicidal behavior. There is a clear distinction between thoughts of engaging in a behavior with the intention of suicide (suicidal ideation) and suicide plan which refers to an actual plan of suicide (Nock & Favazza, 2009a). Preparatory acts of suicide are also mentioned in the literature, referring to when an individual moves beyond the suicide plan and actually procures materials needed to proceed with the suicide plan, but does not actually carry out the plan (Posner et al., 2007).

Because there are varying definitions and, perhaps more importantly, different classifications of self-harm, transparency and clarity are especially important when communicating research. In this thesis, three definitions referring to self-harm are used, partly as a result of the inconsistency in the literature regarding self-harm and partly because of the different data sets. In Paper I, data on NSSI and SA were collected separately and the participants who reported SA were also asked about suicidal intent. Participants were identified as without a history of self-harm or SA, with a history of self-harm, with a history of SA or with a history of both. Thereafter, the DSH definition was used to describe participants with either a history of self-harm or SA, or both. In the subsequent three studies, and in this thesis frame, the NSSI definition was used to differentiate participants with a history of self-harm without suicidal intent (i.e., NSSI) from those with a history of SA. The general term “self-harm” (Skegg, 2005) was used when discussing both NSSI and SA.

Covariates and possible risk factors for self-harm

Research on risk factors for and correlates of self-harm is rather extensive with three main focus areas: mental disorders (Klonsky et al., 2003), emotion dysregulation (Mikolajczak et al., 2009a), and various forms of childhood abuse (Boudewyn & Liem, 1995; Gratz et al., 2002). In addition to these, other distal and proximal factors have an impact on the aetiology of self-harm such as sociodemographic factors (e.g., low education and being female) and psychological characteristics (e.g., poor coping skills, low self-esteem, self-hatred, sensitivity to stress, poor problem-solving skills, high level of anxiety, impulsivity, depression, and aggression) (Fliege et al., 2009; Nilsson, 2021; Windfuhr & Kapur, 2011). NSSI has been determined to be one of the strongest predictors of completed suicide (Whitlock et al., 2013), and NSSI and SA often co-occur (Klonsky et al., 2013). Individuals who self-harm

have a 30–200-times greater risk of completed suicide during the year after the self-harm incident (Cooper et al., 2005). However, the risk is considerably higher in individuals with a history of repeated self-harm compared to individuals with only one self-harm incident (Zahl & Hawton, 2004).

Although the pathogenesis of suicide includes a wide range of biological, environmental, and sociodemographic factors, knowledge of the causes of suicide is insufficient in comparison with our knowledge of other lethal conditions such as cardiovascular disease, diabetes and some cancer diagnoses (Batty et al., 2018). Important risk factors for suicide are mental disorders (Chesney et al., 2014) and previous SA (which seem to accumulate faster in individuals with mental disorders) (Batty et al., 2018), low socioeconomic status (Crump et al., 2014; Li et al., 2011), and cognitive deficits (Andersson et al., 2008). Also, exposure to violence in childhood reportedly increases the risk of SA later in life (Enns et al., 2006) and accumulated adversities in childhood have been linked to suicide (Björkenstam et al., 2017). However, the causality between childhood adversities (e.g., parental loss, bullying, psychological distress, and institutionalization or foster care) and suicide has been questioned and the impact of cognitive deficits has not been ruled out (Batty et al., 2018). Furthermore, there is evidence of genetic and biological markers of suicide (e.g., abnormalities in the inflammatory system and stress–cortisol system; Brundin et al., 2017; Thomas et al., 2021) that are beyond the scope of this thesis, but that should be acknowledged.

Mental disorders

General psychopathology has been identified as a risk factor for self-harm (Hoertel et al., 2017; Kessler et al., 2010; Nock, 2008; O’Reilly et al., 2020), and has been described as one of the strongest predictors of completed suicide. Accordingly, mental disorders have been found in nine out of ten suicide cases (Hawton et al., 2013). An extensive review of 50 studies covering 24 countries reported that individuals presenting at hospitals with self-harm most frequently report anxiety, depression and alcohol misuse among adults and additionally, attention deficit hyperactivity disorder (ADHD) and conduct disorder among adolescents (Hawton et al., 2013). Self-harm has been interpreted as an expression of primarily psychotic disorders, but has also been viewed as an expression of religious mania (Favazza & Favazza, 1987) and as prevalent primarily in certain subcultures (Bowes et al., 2015). Although self-harm can be found in non-clinical populations (Briere & Gil, 1998), self-harm and psychopathology are strongly associated (Klonsky et al., 2003); specifically, self-harm is frequently found among individuals with elevated depressive symptoms (Muehlenkamp & Gutierrez, 2007), eating disorders, psychotic disorders, and personality disorders (Yates, 2004), specifically BPD (Xie et al., 2021). BPD is generally perceived as more prevalent among females than males, but there is ongoing discussion of the potentially equal gender distribution

of BPD (Grant, 2009), and some argue that the apparent gender difference in BPD is attributable to sampling bias (Bjorklund, 2006). Because females with BPD tend to exhibit self-harm and are therefore admitted to psychiatric care more often than males with BPD, the general misconception is that BPD is more prevalent among females (Sansone & Sansone, 2011). Moreover, substance use in general, apathy, insomnia, repeated self-harm and more violent methods of self-harm have also been related to completed suicide (Hawton & James, 2005). Self-harm has also been demonstrated to be highly prevalent among individuals with intellectual disabilities and other neurodevelopmental disorders, for example autism spectrum disorders, and seems to be related to deficits in cognitive, emotional, psychological, and communication skills (Denis et al., 2011) as well as in sensory-motor experiences (American Psychiatric Association, 2013).

Adverse childhood experiences

Adverse childhood experiences (ACEs) have been identified as a contributing factor for mental health issues later in life including SA, substance abuse and mood disorders (Norman et al., 2012). Five types of child maltreatment have commonly been included in the discussion: physical, emotional, and sexual abuse; and physical and emotional neglect.

Physical abuse is defined as the use of mild or severe forms of force, such as hitting, beating, shaking, burning, poisoning, or suffocating, which does or could result in harm to the child's health, development, survival, or dignity (Norman et al., 2012). Sexual abuse is defined as the child being involved in sexual activities that are not comprehensible, are considered social and/or legal violations, and to which the child cannot give consent (Boudewyn & Liem, 1995). Emotional abuse can be exemplified as: restricting a child's movement, insulting, blaming, threatening, or ridiculing, as well as other verbal rejection and hostile treatment. Emotional abuse is sometimes also referred to as psychological abuse. Neglect refers to when parents or other caretakers fail to provide for the child's emotional development, health, education, nutrition, shelter and other safe living conditions. Some argue that self-harm develops as a compensatory strategy when healthier relational and regulatory adaptations are hampered by trauma or maltreatment (Lang & Sharma-Patel, 2011). The caregiving environment must provide three primary pathways to serve the child's cognitive, affective, social and neurobiological needs: regulatory, representational, and reactive. Emotion regulation is equivalent to the regulatory pathway, which can be disturbed by trauma in childhood and thereby have a negative impact on a person's cognitive and affective processing, integration of thoughts and feelings, and development of the capacity to understand and express emotional states. The representational pathway is the interpersonal function of self-injury, and this pathway is affected when the attachment between child and parent/caregiver fails. The reactive pathway can be described as the way an

individual exhibits his or her emotions and thoughts and the individual's ability to inhibit his or her behavior (Lang & Sharma-Patel, 2011).

ACEs have repeatedly been strongly associated with self-harm (see review by Lang & Sharma-Patel, 2011). While some studies have examined the relationship between physical abuse and self-harm, confirming that there is an association (Hawton et al., 2002), other studies report more mixed results regarding the link between emotional abuse, neglect and self-harm (Lang & Sharma-Patel, 2011). The strongest associations have been found between sexual abuse and self-harm (Gratz et al., 2002), but the association has been demonstrated to be even stronger when other forms of abuse have been factored in (Briere & Gil, 1998). However, in the discussion of a causal relationship between childhood trauma and self-harm, opinions diverge. While some argue that the direct connections between self-harm and sexual abuse outweigh the possible effect of depression or other variables (Gladstone et al., 2004), others claim that there is not enough empirical evidence to support this theory. They argue that one cannot overlook the mediating effects of, for example, dissociation (Gratz et al., 2002; Yates et al., 2008), alexithymia (Paivio & McCulloch, 2004), and chronic depression (Aglan et al., 2008).

Emotion regulation

The principal function of the emotion system is to organize and motivate our physiological, cognitive, and behavioral responses (Walden & Smith, 1997). Emotions serve different purposes, for example cognitive ones such as facilitating decision making, or preparing our motor skills to react physically. Emotions can also enable communication and understanding between people. However, it is crucial that we should be able to regulate our emotions adequately so that they serve our situational and personal purposes (Fresco et al., 2013). Emotion regulation is generally associated with the downregulation of negative emotions such as anger or sadness, but can certainly also include the downregulation of positive emotions such as trying to “stay cool” when receiving a positive message. Emotion regulation also includes attempts to prolong or increase an emotion such as happiness or anger by, for example, sharing it with others (Lewis et al., 2008).

Our ability to regulate emotions is developed during life and starts with emotion recognition (Yoo et al., 2006). Because children do not yet have developed emotion recognition skills, they depend on their parents or other role models to teach them how to recognize and interpret emotions (Cassidy, 1994; Rothbart et al., 1992; Rutherford, 2015). Normally, as children develop into adolescence, their skills in emotion recognition elaborate into internalization and self-regulation skills (Rutherford, 2015; Zeman & Shipman, 1996). Existing research suggests that children growing up in a positive family climate where they feel secure to express

their emotions, are comforted when upset, and encouraged to solve problems, are better at regulating their emotions (Moreira & Cristina Canavarro, 2020). In contrast, children whose emotions are met in a non-supportive, negative manner are at higher risk of developing emotion dysregulation and internalizing symptoms (Sanders et al., 2015).

During adolescence, the individual undergoes considerable cognitive, psychological, physical, and social development, and emotional reactivity and stress is often associated with the changes involved (Ahmed et al., 2015). Some studies report that adolescents actually experience emotions more intensely than do children and adults (Bailen et al., 2019). Adolescents tend to shift from using more externalizing to internalizing emotional strategies and start experimenting with different emotion regulation strategies (Chapman et al., 2006).

Both self-directed aggression and aggression directed toward others are examples of maladaptive and destructive behaviors that have been associated with emotion dysregulation (Buckholdt et al., 2009; Mikolajczak et al., 2009; Robertson et al., 2012, 2014). In various clinical and community samples of both adolescents and adults, emotion dysregulation has consistently been associated with NSSI (see review by McKenzie & Gross, 2014). Individuals who engage in self-harm have reported that the behavior functions as a method to get rid of negative emotions (termed “intrapersonal functions”) (Gratz, 2003a). Self-harm has frequently been reported to be a means to reduce painful memories and flashbacks of childhood abuse, dysphoria and dissociation (Briere & Gil, 1998). Self-harm is mainly described as a strategy to avoid unwanted emotion and as a transition from psychological suffering to physical pain (Mikolajczak et al., 2009). Theories of emotion dysregulation suggest that individuals who are not well-equipped to process difficult emotions may use self-harm to regulate negative affect (Gratz & Roemer, 2008). Although self-harm has been explained as direct anxiety relief, researchers claim that the real issue is that afterwards it intensifies the feeling of anxiety, and the individual is then required to use the same or a more intense self-harming act to ease the distress (McKenzie & Gross, 2014), causing a destructive loop that actually reinforces the behavior.

Aims

General aim

The overall aim of the thesis is to provide an overview of self-harm and its covariates in forensic samples.

Specific aims

- I. To map prevalence and describe characteristics of self-harm among FPPs and violent offenders (VOs) (Papers I–II).
- II. To describe psychosocial background (including ACEs), clinical characteristics and criminal history and their association with self-harm among FPPs and VOs (Papers I–IV).
- III. To study emotion regulation skills and their association to self-harm among FPPs (Paper III).

Methods

Participants and procedures

This thesis is based on two samples (see Figure 1): young male offenders in the Swedish Prison and Probation Service (Paper I) and patients at a high-security forensic psychiatric clinic (Papers II–IV). Because the data collection for papers II–IV was part of the current PhD project, this data collection is extensively described, whereas the procedures used for Paper I are sparingly described; when needed, the reader is referred to the relevant publications for additional details.

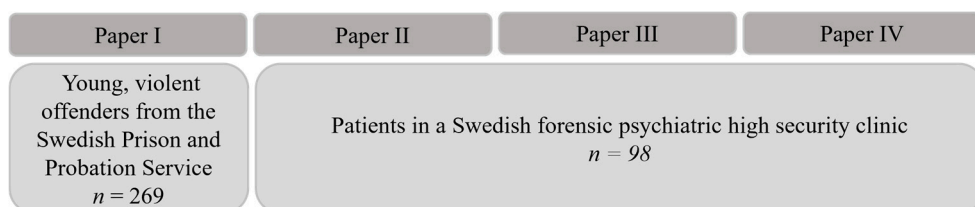


Figure 1. Samples studied in the thesis.

Young violent offenders

Paper I was based on data collected through the Development of Aggressive Antisocial Behavior Study (DAABS), which recruited *n* = 269 male offenders¹ (18–25 years old, participation rate 71%) incarcerated for violent crimes between March 2010 and July 2012 at any of nine correctional facilities in the western region of the Swedish Prison and Probation Service. A detailed description of the cohort is available in previous publications (Billstedt et al., 2017; Hofvander et al., 2017; Wallinius et al., 2016). Participants were assessed consecutively according to a

¹ Laporte et al. (2017) stated that the cohort was *n* = 270. One participant participated twice, but Laporte et al.'s study was published before this was discovered. A corrigendum has been written and all data have been reanalyzed. However, this did not have a significant impact on the results, so the corrigendum was not published by the journal but is instead provided in Appendix I of this thesis

preset protocol that included self-rating questionnaires, semi-structured diagnostic interviews, and neuropsychological assessments.

Questionnaires were completed by the participants before the clinical assessments, which were subsequently performed over a full day by a licensed psychologist with clinical experience in the field and special training in the instruments used. The assessor had read all the information on file available from the Swedish Prison and Probation Service on each participant, including prison healthcare journals, detailed reports on previous living circumstances, criminal history, and incidents during current incarceration.

Forensic psychiatric patients

The three subsequent papers (Papers II–IV) were based on data collected through the MENT-FOR study. Patients who met the initial criterion of being cared for at a high-security forensic psychiatric clinic in Sweden during the data collection period of November 2016 to November 2020 were candidates for participation. The sample included only patients sentenced to forensic psychiatric care. Patients with remand status or ongoing prison sentences with a temporary need for involuntary psychiatric care were excluded from the study. The aim was to collect 100 participants, but participant inclusion was terminated with a total of 98 participants (56% participation rate) in November 2020 due to the COVID-19 pandemic. See Figure 2 for a description of the inclusion and exclusion criteria for participation.

The mean age of the participants was 34.9 years (range 19–62, $SD = 10.7$) and 86.7% were male ($n = 85$). During data collection, nine participants chose to terminate their participation before all data had been collected, and one self-report was excluded after being assessed by a senior clinician as unreliable. In summary, the nine drop-out cases were 90% male, all with different current primary diagnoses and index crimes. The 184 eligible FPPs were given both oral and written information by the PhD candidate or a fellow PhD student, both of whom had clinical experience of working with FPPs. Patients who agreed to participate provided written, informed consent. Thereafter, the data collectors gathered all available file information, including the forensic psychiatric investigations (FPIs), medical records from current and previous psychiatric healthcare facilities, detailed reports on previous living circumstances and criminal history, written court verdicts, and records of incidents during the current treatment. The data collectors then met each participant on one or several occasions, depending on the participant's needs, when participants completed self-report questionnaires and participated in semi-structured interviews regarding details on SA. These interviews were also performed to collect complementary information on psychosocial background, criminological background, and substance abuse in case this information was lacking in file information. During completion of self-report questionnaires, the data collector was present to provide support (e.g., emotional support or interpretation of

questions) if needed. After data collection had been completed for each participant, all data were assessed for quality through a review by the data collector and a senior clinician and researcher in the field. If some data were unclear in the medical files or the patients could not answer a question, that specific question was assessed as unreliable and was excluded. In one case, a whole self-report protocol was excluded. Every participant received small monetary compensation (approximately EUR 10) for their contribution to the study.

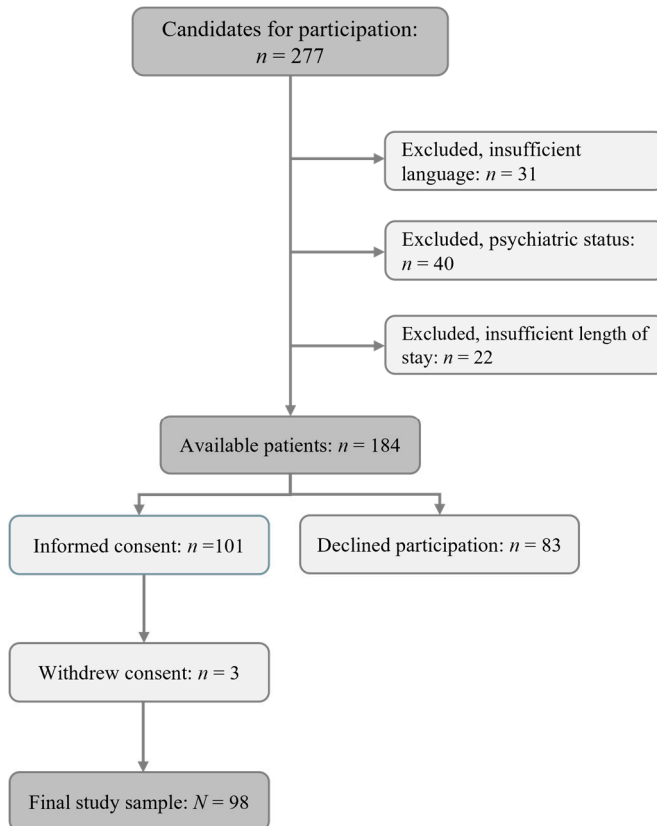


Figure 2. Flowchart of inclusion of the forensic psychiatric patients studied in Papers II–IV.

Measures

For both samples, data collection from files included similar information, while in the sample of young VO, the clinical assessments were more extensive than in the forensic psychiatric sample. Moreover, the self-report information was more extensive in the forensic psychiatric sample (see Figure 3). Information on NSSI and SA was collected separately.

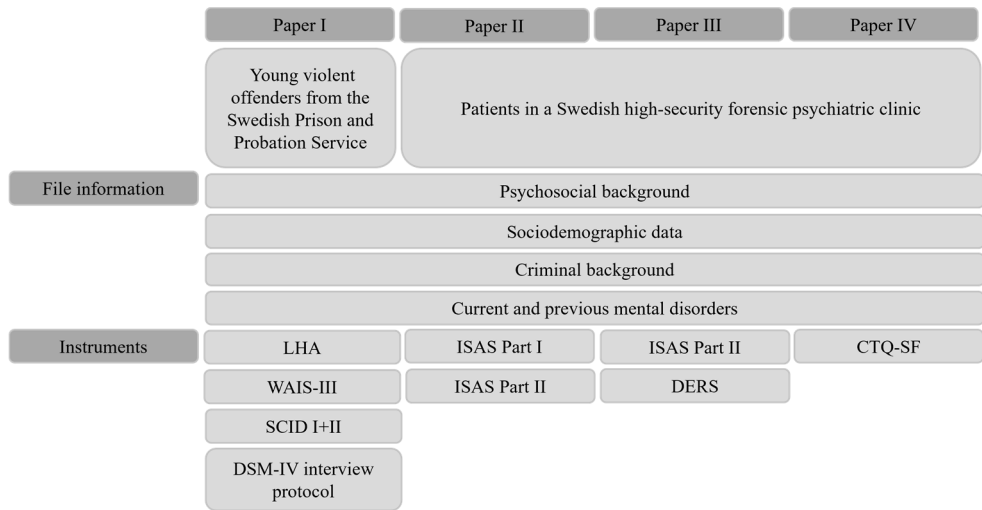


Figure 3. Specification of data collected and measures used in the two samples.

Note: LHA = Life History of Aggression, ISAS = Inventory of Statements About Self-injury, CTQ-SF = Childhood Trauma Questionnaire—Short Form, WAIS-III = Wechsler Adult Intelligence Scale, 3rd edition, SCID I + II = Structured Clinical Interview for Axis I+II Disorders, DERS = Difficulties in Emotion Regulation Scale, DSM-IV = *Diagnostic and Statistical Manual*, 4th edition.

Non-suicidal self-injury

Information on lifetime NSSI was collected using a structured data collection protocol from files (e.g., medical records, FPIs, and court verdicts) and complemented with semi-structured interviews. NSSI was defined as follows: “NSSI is the direct, deliberate destruction of one’s own body tissue in the absence of suicidal intent” (Nock & Favazza, 2009 pp. 9-18). The specific question participants were asked was: “Have you ever deliberately harmed your body without the intention to die?”

The self-report instrument Inventory of Statements About Self-injury (ISAS; Klonsky & Glenn, 2009) was used to collect detailed information on NSSI. The ISAS assesses NSSI in two parts: (I) the lifetime frequency of 12 NSSI behaviors made intentionally but without suicidal intent; and (II) the 13 functions of NSSI. In

Part I, participants were asked to estimate the number of times they had used specific methods of NSSI. Additional multiple-choice questions assess descriptive and contextual factors including age at onset, pain experienced during the NSSI act, whether the behavior is performed alone or in the presence of others, time between the first urge to self-harm and the actual act (<1 h, 1–3 h, 3–6 h, 6–12 h, 12–24 h, and >1 day), and whether the participant wanted to stop self-harming. Participants who confirmed one or more NSSI behaviors in Part I were asked to proceed to Part II. Here, 13 potential functions of NSSI (i.e., affect regulation, anti-dissociation, anti-suicide, autonomy, interpersonal boundaries, interpersonal influence, marking distress, peer bonding, self-care, self-punishment, revenge, sensation seeking, and toughness) were scored by three items per function rated as “0: not relevant”, “1: somewhat relevant”, or “2: very relevant”. These 13 functions constitute two overall factors: interpersonal functions (e.g., interpersonal influence and peer bonding), and intrapersonal functions (e.g., affect regulation and self-punishment). The Swedish ISAS translation has not been validated in a Swedish forensic sample, but has displayed good internal consistency and expected correlations with both clinical and contextual factors in other clinical and non-clinical samples (Lindholm et al., 2011). For the FPPs studied here, Cronbach’s alpha was used to calculate internal consistency, which was found to be good: $\alpha = 0.898$ for the intrapersonal scale and $\alpha = 0.859$ for the interpersonal scale, both above the acceptability threshold of 0.7.

Suicide attempts

Information on SA was collected from files and semi-structured interviews. In this thesis, the previously mentioned definition of SA by Crosby and colleagues was used: “A nonfatal self-directed potentially injurious behavior with any intent to die as a result of the behavior. A suicide attempt may or may not result in injury” (Crosby et al., 2011, p. 21). Participants were asked “Have you ever made a suicide attempt with the intention to die?” Participants were also asked if they had made an SA according to the above definition during the previous six months and asked to say what method was used in the most serious SA (e.g., strangulation, hanging, intoxication, suffocation, swallowing an object, traffic related, jumping from a height, cutting, or other method); if “other method” was selected, they were asked to describe the method.

Psychosocial and criminal background

Demographic information (e.g., age and gender) and information on psychosocial background (e.g., schooling, institutionalization during childhood, work experience, and alcohol and substance use) was obtained from files and complemented with interviews with the participant when necessary. Criminological information (e.g.,

number of verdicts, types of crimes committed, and age at onset) was collected through the FPI and written court verdicts from the relevant district court.

Mental disorders

For Paper I, lifetime occurrence of categorical diagnoses and dimensional symptoms of mental disorders was assessed according to DSM-IV (American Psychiatric Association, 1994), based on information from the Structured Clinical Interview for Axis I and II disorders (SCID-I and SCID-II; First, 1996; 1997) and information from files provided by the Swedish Prison and Probation Service. Symptoms of autism spectrum disorders and other neurodevelopmental disorders (e.g., ADHD) were measured using the Asperger Syndrome (and high-functioning autism) Diagnostic Interview (Gillberg et al., 2001) and a structured DSM-IV interview protocol. For Papers II–IV, information on the lifetime occurrence of diagnoses of mental disorders according to the DSM-5 (American Psychiatric Association, 2013) was collected from the patients’ medical files. In the files, diagnoses were often specified in DSM-IV or ICD-10 format and were therefore converted to DSM-5 by a senior clinician and researcher with considerable experience in the field.

Life History of Aggression

The Life History of Aggression (LHA; G. L. Brown et al., 1979) instrument was used in Paper I to investigate lifetime aggressive antisocial behaviors. The LHA evaluates the frequency of 11 types of aggressive and antisocial behaviors, rated on a five-point scale with a maximum total score of 55. The LHA total score equals the sum of the following subscales: Aggression, Antisocial behavior, and Self-directed aggression (Coccaro et al., 1997). The LHA was administered as a clinician-rated instrument, and the assessor based the ratings on all available information from interviews and files. Internal consistency was calculated and resembled that noted in previous studies (Coccaro et al., 1997) using samples with similar characteristics ($\alpha = .80$ for LHA Total, and 0.87, 0.74, and 0.48 for the subscales).

Adverse childhood experiences

For all Papers, information on ACEs was collected from files and complemented with interviews. Information on witnessing violence between parents, exposure to physical or sexual abuse, death of parents, parental alcohol and substance abuse, and parental and other close relatives’ mental illness was collected and categorized (i.e., “yes, single occasion”; “yes, multiple occasions”; or “no”). The questions concerning parental alcohol or substance abuse were categorized as follows: “yes, the mother”; “yes, the father”; “yes, both”; or “no.”

Ten variables collected through file reviews and complemented with interviews were merged into a compiled ACE variable: 1) bullying victimization, 2) institutional placement, 3) foster care placement, 4) parent(s) absent during childhood, 5) parental alcohol abuse, 6) parental substance abuse, 7) parental mental illness, 8) witnessed violence between parents during childhood, 9) exposed to physical abuse, and 10) sexual abuse during childhood. All ten items included in the ACE scale were dichotomized (0 = no, 1 = yes) and then computed to form an ACE score. The computed ACE scale had a Cronbach's α of .73, indicating acceptable internal consistency.

The Childhood Trauma Questionnaire—Short Form (CTQ-SF), designed to detect experiences of childhood abuse and neglect among adults as well as adolescents (Bernstein et al., 1998), was used to detect self-reported ACEs in the FPP sample. The CTQ-SF assesses five types of childhood maltreatment using 28 items, rated on a five-point Likert scale (1 = never true, 5 = very often true) for five items for each of the five subscales: Sexual Abuse, Physical Abuse, Emotional Abuse, Emotional Neglect, and Physical Neglect. The Swedish version of the CTQ-SF used here displayed good internal consistency ($\alpha = .87$), in line with that reported in previous studies (Gerdner & Allgulander, 2009).

Emotion regulation

Emotion regulation was assessed using the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), a 36-item self-report instrument that was developed to assess emotion dysregulation in six domains: non-acceptance of negative emotions, inability to engage in goal-directed behaviors when distressed, difficulties controlling impulsive behaviors, limited access to emotion regulation strategies perceived as effective, lack of emotional awareness, and lack of emotional clarity. The items are each scored on a five-point Likert scale (1 = almost never, 2 = sometimes, 3 = half of the time, 4 = mostly, 5 = almost always), with total DERS scores ranging from 36 to 180. The DERS has previously been found to display good test-retest reliability and adequate construct and predictive validity (Gratz & Roemer, 2004; Gratz & Tull, 2010). Internal consistency in the current sample was good for the total scale ($\alpha = 0.93$) and subscales ($\alpha = 0.60$ – 0.89). Gillespie et al. (2018) used the DERS self-report in examining an offender population and reported similar internal consistency ($\alpha = 0.66$ – 0.86) for the six subscales.

Statistical methods

In this cross-sectional, exploratory thesis, correlations and regressions were mainly used. Data for Papers I and II were analyzed using IBM SPSS Statistics 22–27 software. Data for Papers III and IV were analyzed using both SPSS 27 and Jamovi software for educational purposes. The collected data were anonymized, coded, and

categorized as nominal (e.g., gender, mental disorders, and type of crime), ordinal (e.g., parental substance abuse was categorized into “mother, father, both or none”), or continuous variables (e.g., age, number of placements during childhood, and self-report scores). A binary variable called DSH (Paper I) or self-harm (Papers II–IV) was created by merging the two variables “SA yes/no” and “NSSI yes/no.” All bivariate analyses were performed using the general DSH/self-harm variable as dependent variable. Effect sizes, confidence intervals (CIs), and odds ratios (ORs) were reported for ease of interpretation.

Descriptive statistics and bivariate associations

Descriptive and frequency tables were used to report descriptive statistics such as the prevalence of self-harm or mental disorders. Bivariate correlations using Spearman’s rho (r_s) were performed to examine associations between variables. As a second step to compare groups (e.g., participants with and without a history of self-harm/attempted suicide), χ^2 tests were used to test whether two categorical variables forming a contingency table were likely to be associated, for example, self-harm with psychosocial, criminological, and clinical factors. To compare differences in mean values between groups, t -tests were used. Student’s t -test was used for group comparisons when the data were normally distributed. When the data distribution was skewed, the non-parametric Mann-Whitney U test or Welch’s t -test was used. Welch’s t -test is an adaptation of Student’s t -test that is more reliable when sample sizes are unequal or when samples have unequal variances, and the Mann-Whitney U test is not dependent on a normal distribution (Pallant, 2007). To measure the strength of the relationships between variables, effect sizes (Cohen’s d) were calculated and presented.

Regression analysis

Binary logistic regression was used in simple and multiple models. A regression model is a correlation in which one variable is perceived as dependent and is assumed to change when the independent variable changes. Logistic regression is performed when the outcome variable is categorical/binary; because we had multiple independent variables and finally also adjusted for age, we performed two models of logistic regression, i.e., simple and adjusted (Field, 2013). All predictors were screened for multicollinearity to ensure that there was no intercorrelation between two or more of the predictors. This screening was performed using acceptable variance inflation factor values and tolerance. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated. Sensitivity and specificity use the prevalence of a certain condition to determine the likelihood of a test correctly diagnosing this condition, while PPV and NPV are the clinical relevance of a test and are independent of prevalence. Sensitivity reports the proportion of the sample testing positive among those who actually have the condition (i.e., true positives), while specificity reports the

proportion of the sample testing negative among those who do not have the condition (i.e., true negatives). PPV and NPV are tests of probability to ensure that a positive test result is actually positive, and a negative test is in fact negative.

Ethics

For Paper I, all offenders provided written informed consent before participation, and were given the opportunity to receive feedback on the preliminary results of the assessments. Offenders displaying indications of severe psychopathology were then given the opportunity to be referred to the prison psychiatrist for continued assessment and treatment.

For Papers II–IV, the treating, senior forensic psychiatrist was consulted before any patients were informed of the study, and patients considered currently unsuitable for the study due to psychiatric status or inability to provide informed consent were excluded. All patients who agreed to participate gave written informed consent before participation.

All studies, including the monetary rewards (which were low in order not to give an incentive that would compromise the free consent), were approved by the Research Ethics Committee at Lund University, Dnr 2009/405 (Paper I) and the Research Ethics Committee at Linköping University, Dnr 2016/213-31 and 2017/252-32 (Papers II–IV).

Ethical considerations

Research conducted in clinical psychiatric settings is crucial in order to produce generalizable and clinically relevant results. However, recruitment may present challenges in such settings. When planning the data collection for Papers II–IV, two main ethical concerns were recruitment difficulties and patients giving informed consent. First, the stigma related to mental disorders might influence the patients' willingness to participate in studies in clinical settings (Woodall et al., 2011). There is also evidence indicating that patients in clinical psychiatry report being “too sick” or “too tired” to get involved in a research project (Bixo et al., 2021). Second, there is the reverse issue that individuals in forensic settings might mistakenly believe that their participation in research will help them to advance in their care process or will give them a possibility of being released sooner; they may also feel pressure to participate in order to make a good impression. These matters were emphasized during the data collection processes in this thesis, i.e., that no such advantages were possible or were the purpose of participation. Third, concerns about knowing what patients are mentally stable enough to be informed and to provide informed consent has also been the focus of a few studies (e.g., Gupta & Kharawala, 2012). This

concern arises in studies including groups considered incapable of decision-making (e.g., small children, unconscious individuals, mentally disordered individuals, and individuals with cognitive deficits). It is important to consider how representative research in forensic psychiatry is if certain patients are excluded (Pedersen et al., 2021).

In this thesis, these dilemmas were addressed by letting the treating psychiatrist (Papers II–IV) assess each individual’s ability to give informed consent. If the individual was not cleared for participation, he or she was not informed. Furthermore, individuals who were informed and gave consent were repeatedly informed that their participation could not help them advance in the care process, or give them any other advantages. The risk of stress for the individual during the session was minimized by reminding them that participation was anonymous and confidential, that they could terminate their participation at any time, and by providing emotional and psychological support when needed. Although individuals in forensic settings are considered a particularly complex and vulnerable group, clinical experience has shown that most participants find research participation to be a positive experience and appreciate the opportunity to speak to someone who is interested in their opinions, feelings, and experiences. Also, when the indirect effect of participation, i.e., of doing good for someone else in the future, is explained to the participant, this is often met with positive reactions. In the data collection for Papers II–IV, excluded individuals were divided into two groups: 1) those who were unsuitable for participation at the current moment, but might be in the future; and 2) those who would never be suitable for participation. The first group of individuals comprised those with, for example, acute psychosis for whom we could not be certain that the information given was understood, as well as individuals who were too unstable at the moment for other reasons (e.g., previous trauma and severe aggression) for whom participation could potentially have a negative effect on their mental well-being. Members of this group were not informed of the study but were followed up by their treating psychiatrists, to see whether participation might be possible when their mental state had stabilized. The second group comprised individuals with severe autistic disorder/severe cognitive disorders who might not understand the nuances of self-reporting, and individuals with severe paranoia for whom participation could lead to worsened mental health or a safety risk for the data collector.

Individuals who gave their informed consent to participate met with a data collector (a fellow PhD student or myself) and underwent up to three hours of self-reporting and questions about substance abuse, demographics, and psychosocial background. The self-report questionnaires largely consisted of sensitive questions about positive and negative events that had happened during childhood.

Results

Prevalence and characteristics of self-harm in forensic samples

Of the 269 young offenders (Paper I), a total of 61 (23%) had engaged in self-harm at some point. The mean age at onset of NSSI was 16 years ($Mdn = 16$, $SD = 3.4$, range 5–22) and at onset of SA was 17 ($Mdn = 17$, $SD = 3.6$, range 9–25) years. When asked specifically about suicide intent, only 12.5% reported a suicidal intent with their SA. Information on methods of NSSI or suicide was not analyzed for the VO group. In FPPs (Paper II), self-harm was common, being found in 68.4% of the participants. The mean age at onset of NSSI was 17.4 years ($Mdn = 15.5$, $SD = 8.3$, range 4–41) and at onset of SA was 21.5 ($Mdn = 19$, $SD = 9$, range 9–53) years. In this group, no information on intention of SA was collected. For an overview of both samples, see table 1.

Table 1. Prevalence of self-harm in VOs and FPPs

	VO $n = 269$	FPP $n = 98$
Self-harm (NSSI + SA)	61 (23%)	67 (68.4%)
Mean age at onset of NSSI	16	17.4
<i>SD</i>	3.4	8.3
Range	5–22	4–41
Mean age at onset SA	17	21.5
<i>SD</i>	3.6	9
Range	9–25	9–53

The most common methods of NSSI reported among FPPs (Paper II) were banging one's head or fist against a wall or other solid surface ($M = 31$ occasions) and cutting ($M = 30$ occasions). Female participants who reported cutting all reported doing so on repeated occasions (i.e., 10–1000 times). Most FPPs with NSSI also reported experiencing pain when self-harming, a preference for performing self-harm in private, and a time interval from first thought of self-harm to the self-harm act of less than one hour. When asked if they wanted to stop self-harming, 81.8% ($n = 36$) of the participants answered yes. The most common SA method among the FPPs (Paper II) was hanging ($n = 14$, 26.4%) followed by self-poisoning ($n = 12$, 22.6%). A few differences could be distinguished between female and male participants in

the FPP group. Cutting oneself was reported to be the most common SA method among female participants ($n = 6$, 46.2%), while male participants reported hanging/strangulation to be the most common ($n = 13$, 15.3%). In the FPP group, the functions of NSSI were examined. The most prominent functions of NSSI among the forensic psychiatric participants were intrapersonal functions such as affect regulation, self-punishment, and marking distress (see Table 2).

Table 2. Mean scores of NSSI functions in FPPs as reported in Paper II.

ISAS scale	Function	<i>M (SD)</i>	Range
Intrapersonal			
	Affect regulation	3.04 (2.02)	0-6
	Anti-dissociation	1.55 (1.80)	0-6
	Anti-suicide	1.48 (2.02)	0-6
	Marking distress	2.23 (1.84)	0-6
	Self-punishment	2.48 (1.84)	0-6
Interpersonal			
	Autonomy	0.40 (1.07)	0-5
	Interpersonal boundaries	0.86 (1.35)	0-4
	Interpersonal influence	1.50 (1.53)	0-5
	Peer bonding	0.21 (0.51)	0-2
	Revenge	0.44 (0.88)	0-4
	Self-care	1.97 (2.07)	0-6
	Sensation seeking	0.60 (1.25)	0-6
	Toughness	0.90 (1.21)	0-4

Psychosocial background, adverse childhood experiences, clinical characteristics and criminal history and their association with self-harm

Psychosocial background

Regarding FPPs in general, with or without self-harm, only 43% of the 98 participants had finished primary school, 34% had ever had fulltime employment for over a year, 41% grew up with one or both parents absent, 28% had been in foster care, and 37% had been institutionalized during childhood (Paper II).

Among VOs (Paper I), there was no statistically significant association between number of correctional placements/institutionalizations and self-harm ($p = .280$, $d = 0.31$). Among FPPs, separate analyses were performed for placements in foster care and institutionalization in childhood (Paper II). Results showed that FPPs with a history of self-harm had not been in foster care more than participants without self-harm ($p = .17$, $OR = 2.04$, $CI = 0.73-5.69$). There was, however, a significant difference in institutional care reported between FPPs with and without a history of self-harm ($p = .015$, $OR = 3.38$, $CI = 1.23-9.30$).

Adverse childhood experiences

In the FPP group (Paper IV), physical abuse was reported in a total of 57.2% of all cases, and most of those (49%, $n = 48$) reported physical abuse on multiple occasions. Twenty percent of FPPs reported sexual abuse during childhood on repeated occasions, and 7.8% on a single occasion. A third (36.2%) had repeatedly witnessed violence between their parents during childhood, and 27.6% reported growing up with one parent absent for most of their childhood. Forty-one percent of the FPP group reported mental health issues among their parents. In total, 35.7% of FPPs reported parental alcohol abuse, and 13.3% reported parental substance abuse. Forty-three percent of the participants had repeatedly been bullied by peers during childhood.

Self-harm was associated with bullying victimization among VOs (Paper I) ($p \leq .001$). Among FPPs (Paper IV), bullying victimization was associated with NSSI and SA at $p = .033$ ($OR = 1.47$, $CI = 1.07-5.72$) and $p = .041$ ($OR = 2.37$, $CI = 1.03-5.45$), respectively. Results showed that VOs with a history of self-harm had been exposed to violence on repeated occasions during childhood ($p = .001$). Among FPPs, data on exposure to violence were captured by two variables: “Witnessing violence” and “Physically abused.” There was no statistical difference between participants with and without a history of NSSI regarding having witnessed violence ($p = .107$, $OR = 2.0$, $CI = 0.86-4.67$) or having been physically abused ($p = .030$,

$OR = 2.52$, $CI = 1.09–5.84$). Similar results were found when investigating SA and witnessing violence ($p = .264$, $OR = 1.61$, $CI = 0.70–3.71$) and physical abuse ($p = .572$, $OR = 1.27$, $CI = 0.56–2.88$). For both groups, ACEs were merged into a dimensional variable, and an increased number on this scale was significantly related to self-harm ($p \leq .001$, $d = .39$) among VOs.

Table 3. Covariates of self-harm in VOs and FPPs according to simple and adjusted logistic regression.

	Simple model			Adjusted model		
	<i>p</i>	<i>OR</i>	<i>CI</i>	<i>p</i>	<i>OR</i>	<i>CI</i>
Anxiety Disorders						
Violent offenders ^b	<.001	6.06	2.98–12.32	.014	2.81	1.23–6.40
Forensic psychiatric patients	.064	2.72	0.92–8.02	N/A		
Mood Disorders						
Violent offenders ^b	<.001	9.86	4.28–22.71	.001	4.99	2.01–12.35
Forensic psychiatric patients	0.190	2.06	0.69–6.15	N/A		
Bullying Victimization						
Violent offenders ^b	<.001	3.91	2.11–7.22	.001	3.27	1.59–6.71
Forensic psychiatric patients	0.385	0.67	0.27–1.66	N/A		
ACE						
Violent offenders ^b	.002	1.47	1.15–1.87	.502	1.280	0.62–2.63
Forensic psychiatric patients NSSI ^a	.016	1.29	1.04–1.59	.026	1.29	1.03–1.62
Forensic psychiatric patients SA ^a	.103	1.17	0.96–1.43	.174	1.16	0.93–1.45

^a Controlling for Anxiety and Depression; ^b Controlling for age

For FPPs, each additional ACE factor predicted an increased probability of NSSI ($p = .016$, $OR = 1.29$, $CI = 1.04–1.59$) but not of SA. When anxiety disorders and mood disorders were included in the model, ACEs remained a significant predictor of NSSI (see Table 3).

Furthermore, parental substance abuse was associated with NSSI ($p = .006$, $OR = 3.23$, $CI = 1.36–7.66$) and SA ($p = .018$, $OR = 2.75$, $CI = 1.18–6.42$). In a simple predictive model, each additional ACE factor predicted an increase in the probability of NSSI ($p = .016$, $OR = 1.29$, $CI = 1.04–1.59$), but not in SA. When including anxiety and mood disorders in the model, ACEs remained a significant predictor of NSSI.

In the FPP group (Paper IV), ACE self-reports were collected using CTQ-SF (see Table 4). NSSI and SA were significantly associated with CTQ-SF total scores (see Table 5), with medium effect sizes ($.60 \geq d \leq .63$, $p < .01$), and strongly associated with several CTQ-SF subscales (especially for SA). Several CTQ-SF subscales were also strongly associated with both NSSI and SA.

Table 4. Self-reported ACEs according to CTQ-SF for FPPs as reported in Paper IV.

CTQ-SF scales	Mean score	SD
Emotional Abuse	10.67	5.53
Physical Abuse	9.56	4.92
Sexual Abuse	7.77	5.30
Emotional Neglect	13.15	5.81
Physical Neglect	9.11	4.28
Minimization/Denial	.54	.93
Total score	50.82	19.98

Table 5. Associations between self-reported ACEs and NSSI and SA in FPPs as reported in Paper IV.

	<i>p</i>	Mean difference	CI		Effect size (Cohen's <i>d</i>)
			Lower	Upper	
NSSI					
Emotional abuse	.001	-3.77	-5.98	-1.559	-0.726
Physical abuse	.085	-1.82	-3.90	0.256	-0.375
Sexual abuse	.097	-1.75	-3.83	0.324	-0.347
Emotional neglect	.018	-2.93	-5.36	-0.506	-0.519
Physical neglect	.068	-1.69	-3.50	0.126	-0.400
CTQ-SF total	.006	-11.46	-19.59	-3.326	-0.600
SA					
Emotional Abuse	.008	-3.116	-5.39	-0.841	-0.585
Physical Abuse	.004	-2.846	-4.74	-0.956	-0.622
Sexual Abuse	.465	-0.820	-3.04	1.403	-0.156
Emotional Neglect	.008	-3.259	-5.64	-0.875	-0.584
Physical Neglect	.006	-2.435	-4.15	-0.722	-0.599
CTQ-SF total	.004	-11.971	-20.10	-3.839	-0.628

Clinical characteristics

Among the 269 VO participants (Paper I), self-harm was associated with anxiety disorders at $p \leq .001$ ($OR = 6.06$, $CI = 2.98-12.32$) and mood disorders at $p \leq .001$ ($OR = 9.86$, $CI = 4.28-22.71$). However, the predictive value of the model was low with wide confidence intervals. Anxiety and mood disorders were not significantly associated with self-harm in the FPP group. However, in FPPs, self-harm was primarily associated with neurodevelopmental disorders ($p = .014$, $CI = 1.23-8.02$, $OR = 3.14$) and disruptive, impulse-control, and conduct disorders ($p = .012$, $CI = 1.19-74.6$, $OR = 9.41$), with the proviso of very wide confidence intervals.

Criminal history

For FPPs, the mean number of previous convictions was 7.4 (range 0–38) (Paper II). Drug offenses (78%), other violent crimes excluding sexual crimes (78%), theft and robbery (71.4%), and assaults (not sexual) (60%), all on repeated occasions, were the most frequently reported crimes. The mean age at which FPPs had first been prosecuted was 22.3 years, with a wider age range for male participants (15–50 years) than female participants (20–41 years).

In VOs (Paper I), there were no significant differences between participants with and without a history of self-harm regarding criminological factors such as type of crime committed. For Papers II–IV, no criminological factors were tested in association with self-harm for FPPs.

Emotion regulation and its association with self-harm among forensic psychiatric patients

Self-reported aspects of emotion regulation were statistically significantly different between participants with and without a history of self-harm ($p = 0.004$, $d = 0.65$) for the DERS total scale (Paper III). Specifically, participants who reported self-harm had a median DERS total score of 85 ($IQR = 47.5$), while participants without a history of self-harm had a median value of 71.1 ($IQR = 29.25$). When analyzing the DERS subscales, large differences were noted for the subscales Impulse ($p = .001$, $d = .86$), Goals ($p = .014$, $d = .58$), and Strategies ($p = .012$, $d = .54$) between participants with and without a history of self-harm. Furthermore, the DERS total score was positively correlated with both the interpersonal ($r_s = .531$, $p < .001$, $n = 43$) and intrapersonal factors ($r_s = .503$, $p < .001$, $n = 43$) for NSSI functions as reported on the ISAS, with large effect sizes. Also, higher scores on several DERS subscales were related to functions of NSSI (see Figure 4). Only the DERS subscales Awareness and Clarity were not associated with the functions of NSSI.

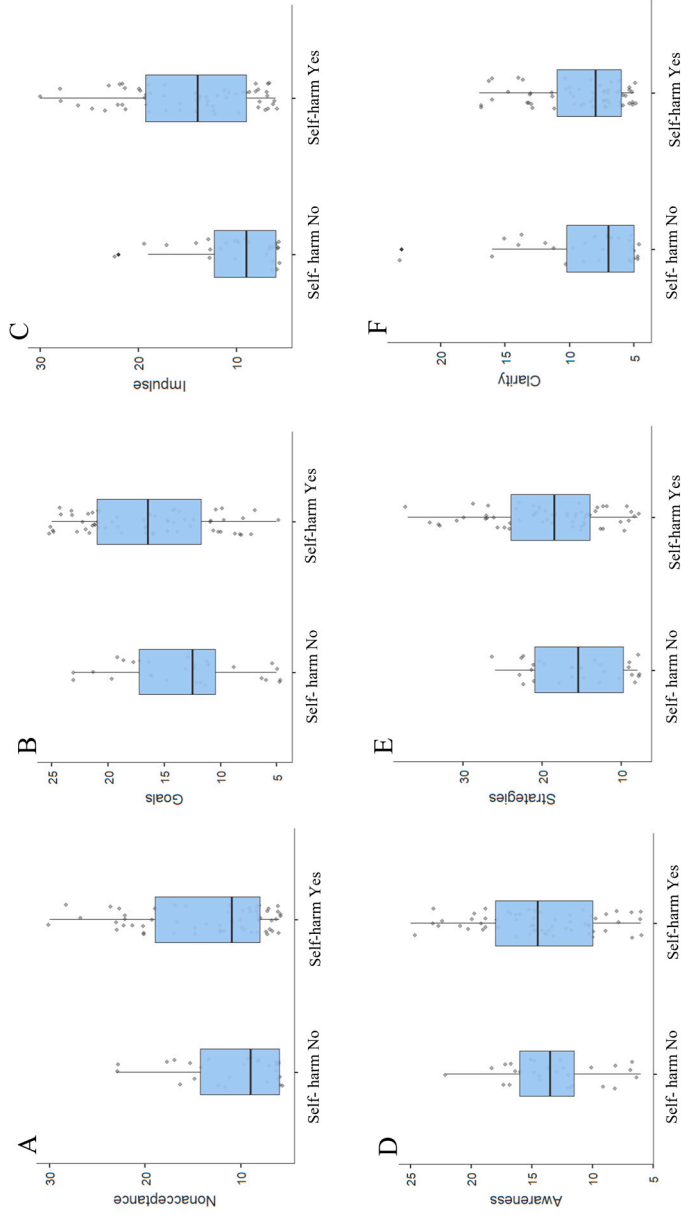


Figure 4. Difference in distributions of Difficulties in Emotion Regulation Scale scores (A-F) between FPPs with and without a history of self-harm, as reported in Paper III.

Discussion

Prevalence and characteristics of self-harm in forensic samples

This thesis demonstrates how serious the issue of self-harm may be in Swedish prisons and forensic psychiatry and that the prevalence rates found resemble those reported in existing international research. Although self-harm has been associated with mental disorders and might therefore be more common in psychiatric settings, this thesis provides evidence of the prevalence of self-harm in prison settings as well, as one in four young violent offenders (23%) had at some point in their lifetime engaged in self-harm (including SA), and among those who reported attempting suicide, only a few reported suicidal intent with the SA. The underlying reason for self-harm was not further investigated in this population, nor were the characteristics of self-harm. Paper II demonstrates an even higher rate of self-harm among FPPs (68.4%), similar to what has been found in other prison and forensic psychiatric samples around the world (e.g., Dooley, 1990; Hawton et al., 2014).

Specific methods and frequencies of self-harm, including SA, are presented in Paper II and are also similar to what has been reported in other studies (de Vogel & Verstegen, 2021; Sakelliadis et al., 2013), in which males preferred the more violent methods of NSSI (e.g., banging one's head against a wall) and SA (e.g., hanging), while females preferred less violent methods (e.g., cutting and intoxication, respectively). Age of onset of NSSI ranged between 4–41 years in the FPP group and between 5–22 for the offender group. In general populations, self-harm usually peaks in adolescence (Moran et al., 2012), while in clinical populations, self-harm seems to be highly prevalent and more persistent—somewhat expected from the strong association with psychopathology. Characteristics and frequencies of self-harm in correctional settings merit consideration when studying the specific environmental effects such as clustering of self-harm episodes and contagion effects (Hawton et al., 2014). Both these phenomena are important to consider since correctional facilities often have limited personal space and individuals are likely to observe others' behaviors. Although the female representation in these studies was low, research on self-harm must consider that females in prison and forensic psychiatry may be particularly burdened by self-harm with a higher frequency of repeated NSSI.

The results of Paper II show that FPPs report a predominantly intrapersonal orientation of the functions of NSSI, primarily affecting regulation, self-punishment, and distress signaling, comparable to findings in other clinical and non-clinical groups. However, possible interpersonal functions of self-harm must also be considered in forensic settings. That FPPs might, without any sort of emotionally manipulative incentive, intentionally harm themselves in order to be moved to another cell or receive extra attention or care should not be ignored; rather, this information gives insight into FPPs' perspectives on self-harm and might be useful in communication with the individual FPP. Intrapersonal functions may be less recognized compared to interpersonal functions and such recognition is essential for decisions on interventions directed toward self-harm in forensic settings.

Psychosocial background, adverse childhood experiences, clinical characteristics, and criminal history and their association with self-harm

There is no doubt that ACEs seem to play a significant role in an individual's development of self-harm in the future. Physical and sexual abuse in childhood has been thoroughly examined in relation to self-harm with findings of strong associations (Brown et al., 2018). FPPs with a history of self-harm in this study were no exception to this. Interestingly, in Paper IV, the results indicated that emotional abuse and neglect may also be strong factors to consider. This is confirmed by previous literature suggesting that an invalidating and neglectful family culture is a risk for future self-harm (Kaess et al., 2013). For the FPPs in the present sample, their childhoods had apparently been marked by trauma and various forms of adversity. Only 5% of the participants reported experiencing no emotional trauma at all during their childhood, while most reported repeated trauma and 38% had experienced 3–5 types of ACEs. The overall high frequencies of ACE is similar to what has been discovered in previous studies on FPP overall, and specifically in female FPPs (Bohle & de Vogel, 2017). Unfortunately, the representation of female participants in the current study was too low to examine gender differences. Furthermore, ACEs had a cumulative effect on NSSI, increasing the risk by 1.2 times, even when anxiety disorders and mood disorders were factored in. Together with previous research, this indicates that when investigating the source of self-harm, one must factor in ACEs and, more importantly, apply a consistent method when examining new FPPs (and prisoners) about all types of ACE. This is especially important because negligent parental styles (Bowlby, 1969) have been linked to the development of poor emotion regulation skills. In an attempt to summarize, one could conclude that self-harm seems to be one emotion regulation strategy that could

be a result of early childhood emotional and physical neglect and abuse, and one could think of ACEs as a mediator (see Figure 5).

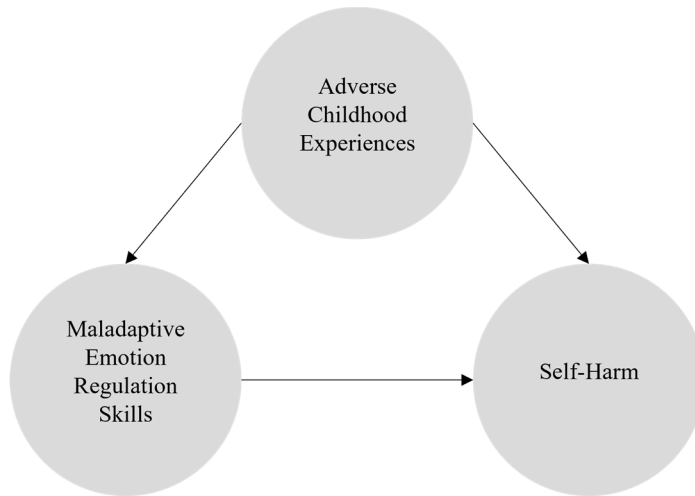


Figure 5. ACEs as a possible mediator of the association between emotion dysregulation and self-harm.

With support from previous research, we examined associations between self-harm and specific mental disorders (Papers I and II). Although self-harm could be associated with some disorders—Paper I: anxiety disorders and mood disorders; Paper II: neurodevelopmental disorders as well as disruptive, impulse-control, and conduct disorders—the confidence intervals were too wide and some of the groups too small to establish an association. Existing research on clinical groups with self-harm often reports BPD as the main associated disorder. In the diagnostic criteria, BPD includes repeated suicidal behavior, threats of suicide, or self-harm behavior (American Psychiatric Association, 2013). There is also some evidence that prisoners with autism spectrum disorder traits report higher frequencies of self-harm than do prisoners without these traits (Chaplin et al., 2021). Although self-harm was associated with neurodevelopmental disorders in FPPs in this thesis, the confidence intervals were too wide to draw any conclusions. However, self-harm has been associated with several mental disorders and seems to occur in various clinical groups.

Emotion regulation and its association with self-harm among forensic psychiatric patients

For years, researchers have investigated the function of self-harm in an attempt to solve the puzzle of self-harm, and research seems to point toward two areas of interest: affect regulation and communication (Brown et al., 2002). There is evidence that when facing a distressing task, individuals with a history of self-harm respond with physiological reactivity, have lower stress tolerance, and experience several difficulties in problem-solving in social settings (Nock & Mendes, 2008). Self-harm is explained as an emotion regulation strategy to help the individual avoid negative feelings and relieve both high and low negative affect states such as frustration, high anxiety or sadness, emptiness and loneliness (see e.g., Chapman et al., 2006; Gratz, 2003; Klonsky, 2009). Interestingly, in this sample with a complex psychiatric comorbidity and antisocial behavior, the emotion regulation total scores were similar to previous findings in both non-clinical samples and among offenders without psychiatric disorders (Garofalo et al., 2018). One explanation could be that while the perception and experiences of the ability to regulate emotions might be similar across samples, the expression and ability to control these expressions differ and could also be altered by the psychiatric disorder and its characteristics. It is, however, not possible to identify causal relations regarding this in this thesis, but it becomes evident that there is a need for further studies on emotion regulation in FPPs. Furthermore, with reservations to wide confidence interval scores, the scores in subscales differed between FPPs with and without NSSI, indicating that FPPs with NSSI had more difficulties in goal-directed behavior, controlling impulsive behaviors and accessing effective emotion regulation strategies, which is consistent with findings in samples with comorbid disorders. This needs to be further studied in FPPs, a group where impulsivity and disinhibitory behaviors has previously been reported (Delfin et al., 2020).

Although physiological reactions and stress tolerance remain to be studied in the current sample of FPPs, this information is concerning because being deprived of liberty is very stressful in itself. FPPs are also burdened with other clinical and psychosocial vulnerabilities that probably impede their ability to handle stressful situations adequately. An aggravating issue for incarcerated individuals with little or no influence on their own life setting is the reinforcement that is connected to self-harm. Researchers have not found the cause of this reinforcement, but it seems as though individuals who self-harm have difficulties tolerating stressful events and experience extreme arousal that becomes intolerable (Chapman et al., 2006). Self-harm seems to help temporarily hold back the arousal and suppress the negative emotions, but unfortunately reinforces the behavior (Najmi et al., 2007). This information is crucial for those working in forensic psychiatric settings, who need to be aware of this negative cycle and work with interventions to reduce the

reinforcement of behaviors that are maladaptive and might complicate progress in treatment.

Definitional issues

Among the major concerns in general discussions of self-harm are the inconsistencies in definitions of the behavior. Figure 6 was formulated when writing this thesis to illustrate the differences in prevalence estimates and definitions used by studies included in a review by Dixon-Gordon (2012). In many publications concerning mentally disordered offenders, FPPs, and prison populations, self-harm is not defined, while in other populations, differences in prevalence become extensive when suicidal behaviors are included in the definition.

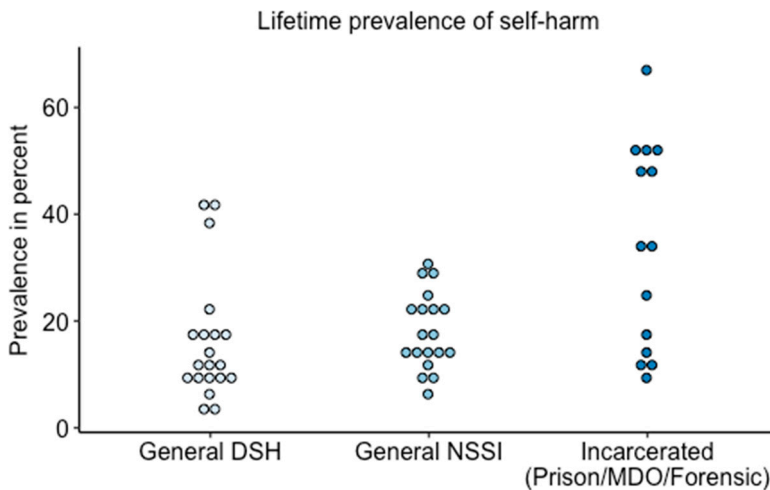


Figure 6. Overview of prevalence rates as reported by Dixon-Gordon (2012).

NSSI, which was proposed as a diagnostic category in the authoring of DSM-5, is now included in the same manual as a condition that merits further study. Some researchers argue that definitions of self-harm must include SA, because what could be described as an SA by the person performing the self-harming act might not lead to death, while severe forms of self-harm performed without the intention to die could easily be lethal (see Figure 7). Others claim that it is crucial to make a clear distinction between SA and non-suicidal self-harm that, despite its severity, is performed without the intention to die (Plener et al., 2015). Because of the difficulties in retrospectively investigating the intention underlying a self-harming act, one could argue that it might be useful to include all self-destructive behaviors

in one definition. However, the broad definition of DSH might not differentiate enough when investigating current self-harm. For example, individuals with a history of NSSI and SA report fewer reasons for living than do individuals without a history of NSSI or SA. However, individuals with a history of “only” NSSI report more reasons for living than do individuals with a history of “only” SA, indicating that individuals with a history of only NSSI are more likely to stay alive than are individuals who have attempted suicide, which is in line with the theoretical understanding of NSSI as an emotional coping strategy and antithetical to the motivations for suicide (Muehlenkamp & Gutierrez, 2007). However, there are individuals who frequently engage in suicidal behavior and persons who chronically attempt suicide (Gratz et al., 2002). This is, of course, a valid reason to include SA in the definition of self-harm. Another issue is that studies tend to define SA dichotomously as the presence or absence of these behaviors. Because these variables are often not normally distributed, this approach is logical; however, it may ignore the differences among individuals who engage in suicidal behavior: even suicidal behavior might vary in severity, and this variation would be important to map.

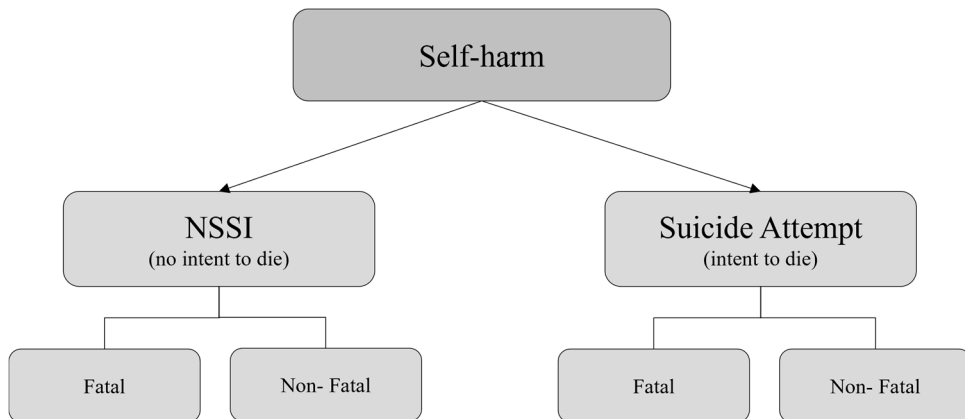


Figure 7. Intent and mortality of self-harm.

Conclusively, from a methodological perspective, it would be beneficial to have a unified definition, whatever it might be. Otherwise, the difficulties in comparing results across samples have been and will continue to be evident. Moreover, in clinical practice, individuals who attempt suicide and have no will to live and individuals who engage in NSSI and have a will to live need to be treated according to their specific clinical needs. Thus, it is crucial to 1) study the intention underlying SA (and the function of NSSI), and 2) develop a screening tool to detect and sort patients with NSSI in need of developing new skills to cope with negative emotions from patients with a low will to live in need of different treatment.

Conclusions

This thesis concludes that NSSI and SA are common issues in both the Swedish Prison and Probation Services and in forensic psychiatry. The characteristics associated with self-harm in these samples resemble those found in similar samples in other countries. This study also concludes that growing up in an unsafe environment and having poor emotion regulation skills, in combination with other clinical vulnerabilities, are related to self-harm and somewhat also to SA. In particular, multiple forms of childhood adversity (i.e., cumulative ACE) seem to increase the risk of self-harm. This thesis demonstrates that FPPs constitute a group severely exposed to different forms of abuse and neglect; in light of the present and previous findings regarding self-harm and ACEs, it is highly relevant to further investigate the extent of ACEs in these populations. In particular, emotional abuse and neglect would seem to warrant further attention within this group of individuals.

Forensic psychiatry needs to be equipped to help individuals with a combination of complex clinical needs, intrapersonal difficulties, and behavioral problems. Emotion regulation difficulties seem to play a big role in the development of maladaptive strategies such as self-harm and must be acknowledged and further studied in this population. A serious issue is the stigma related to self-harm and SA. If we thought of self-harm as a strategy of self-soothing, rather than as a symptom of illness, this would imply different possible attitudes on the part of both individuals and healthcare professionals. Although self-harm is common nowadays and our understanding and treatment of individuals with self-harm has improved since the 1960s, there are still traces of an outdated mindset regarding individuals with a history of self-harm (e.g., “anyone who cuts him/herself has borderline personality disorder” or “she only cuts herself for attention”). Research like this dissertation can contribute knowledge that helps healthcare professionals better understand and communicate with their patients or inmates, and can dispel some of the myths about self-harm.

Furthermore, related to the previous topic, the function of self-harm warrants further investigation in forensic settings where the environment poses both intra- and interpersonal challenges. Instead of assuming that one always understands the meaning of individuals’ self-harming acts, clinicians need to listen attentively to the patients and their accounts of their actions.

The inconsistency in definitions of self-harm has also been discussed, and it is concluded that, although differences in what is included in the definitions create some methodological issues, it is important that research be clear enough to be applicable in clinical settings.

Clinical implications

Based on the current findings, self-harm is deemed a clinical issue of importance in forensic settings. Identifying its correlates and risk factors, especially in psychiatric populations, would be a contribution toward better understanding this behavior in relation to psychopathology. The results of this thesis improve our understanding of the group of self-harming individuals in forensic samples, which can hopefully lead to improved care and treatment interventions and perhaps also to a different attitude toward individuals with a history of self-harm. Knowing how common self-harm is in forensic populations can be helpful when working with suicide prevention in different healthcare phases, such as enrollment, treatment, intervention, and outpatient care when the risk of completed suicide is elevated. Although mortality in general is higher in discharged FPPs, the rate of completed suicide is also alarmingly high (Davies et al., 2007; Ojansuu et al., 2018).

Furthermore, the findings regarding the clinical, psychosocial, and psychological covariates of self-harm emphasize the importance of detailed and wide-ranging inquiry when receiving individuals in forensic psychiatry or prisons. The findings in Paper IV conclude that ACEs, especially physical and emotional abuse, constitute an important concern in this group of FPPs and that their impact on self-harming behavior in such populations should be paid attention both in future research and in clinical work. ACEs must be noted in records and the affected individuals should be given the opportunity for treatment if needed.

Paper III is unique and reports emotion dysregulation in relation to functions of NSSI, something which has not previously been investigated in this population. Moreover, the general results concerning emotion regulation help describe the difficulties these individuals have in regulating their emotions. The findings also stress the need for intervention regarding emotion dysregulation strategies among FPPs, and perhaps also for educational interventions among caregivers in an attempt to reduce the stigma related to self-harm.

Also, because there is some evidence that more females than males report that professional intervention was important for their ceasing self-harm (Young et al., 2007), therapeutic interventions in forensic psychiatry should (also) be tailored to males, who have been demonstrated as less likely to seek professional help concerning psychiatric problems compared to females (Biddle et al., 2004), because there is a clear overrepresentation of males in this setting.

Strengths and limitations

The strength of the study of FPPs is that it is descriptive and explorative and uniquely describes the attributes of an FPP cohort in a Swedish setting. This thesis provides information on self-harm in relation to FPPs' psychosocial background, clinical profiles, and emotion regulation skills that has not previously been collected or examined to this extent. This thesis also provides information on self-harm in a sample of Swedish young violent offenders.

The forensic psychiatric sample was large considering previously reported difficulties in recruiting participants from forensic psychiatry (Pedersen et al., 2021), and represented about 5% of the total population with characteristics in line with the total population of FPPs in Sweden (RättspsyK, 2020). Furthermore, the DAABS cohort used in Paper I was large given the clinical design of the study, and has been reported as nationally representative for young, "hands-on" violent offenders in Sweden at the time of data collection. Also, for all papers information was collected by combining extensive information on file and self-reports from a cohort of individuals with several clinical challenges. Finding a scientifically suitable self-report instrument applicable to FPPs was challenging. However, a major strength of this study was that the data collection relied not only on self-reports, but also on a multiple-method design including self-reports (Papers II-IV), semi-structured interviews, and file reviews (Papers I-IV). Another strength of this thesis is the cohort design. The forensic psychiatric population is an understudied group and the inclusion of all individuals, regardless of mental disorder and gender, increased the generalisability of this study.

There are, however, several limitations to this research. The cohort of FPPs is complex in terms of comorbidity and treatment needs. This suggests considerable challenges because the relatively small group becomes heterogeneous and the spread in distribution large. This causes large confidence intervals, which implies that the detected associations should be interpreted carefully, and that some associations might even be partially ruled out once disorders or other confounders are accounted for. Moreover, the data on self-harm were collected differently in the two datasets, which complicates comparison of the samples. Also, although self-reports are an important tool, collecting data on self-harm through retrospective studies might not be the preferred method in forensic psychiatry. Several of the self-report measures were discussed in the thesis' constituent papers regarding the reliability of measuring, for example: 1) the number of self-harming acts in this population, in which frequencies tend to rise to exceed 100; and 2) the validity of the instrument, when individuals with severe cognitive deficits complete self-report instruments that address nuances in emotion regulation. Another limitation is that in the two studied samples, both >18 years of age, current self-harm was unfortunately not inquired into, as doing so could have created opportunities to make other interesting comparisons within the samples but could also have had substantial

ethical challenges where we as health care professionals are obliged to report potentially harmful and/or lethal behavior, but also must provide confidentiality for the participant within the research project.

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