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Self-harm in Prisons in Serbia: Correlates of Non-suicidal Self-injury and Suicide Attempts*

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Self-harm, including non-suicidal self-injury (NSSI) and suicide attempts (SA), is highly prevalent among incarcerated populations, yet no study has examined their co-occurrence and correlates in Serbian prisons. This study included 609 offenders from five correctional facilities, recruited as part of the national PrisonLIFE project. The prevalence of NSSI and SA was 17% and 9%, respectively, with 73% of those who engaged in NSSI also reported SA. Correlates were examined across four domains: sociodemographic (e.g., gender, age, education), institutional (e.g., isolation, disciplinary measures, prolonged cell time, lack of visits, absence of work), criminogenic (e.g., violent offenses, repeat offending, early criminal onset, pre-incarceration drug use, sentence length), and psychological (e.g., depressive symptoms, aggression, prior psychological treatment). NSSI and SA were significantly associated and shared multiple risk factors, particularly within the psychological and institutional domains. NSSI was further linked to pre-incarceration drug use and criminal history (e.g., repeat offending, early criminal onset), whereas SA was more strongly associated with older age, higher education, and longer sentences. Overall, findings reveal substantial overlap between the two behaviors, while also highlighting distinct patterns that suggest partially independent mechanisms.

KEYWORDS: self-harm / non-suicidal self-injury / suicide attempt / offenders / prison / Serbia

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Introduction

Self-harm in custodial settings occurs at markedly higher rates than in the general population, with prevalence estimates ranging from 5% to 24% (Hawton et al., 2014; Castelpietra et al., 2018). Self-harm also represents one of the most significant risk factors for suicide among offenders (Favril, 2019). The restrictive and isolating nature of imprisonment can intensify vulnerability to self-harm through social deprivation, institutional stress, and behavioral contagion, whereby self-harming acts may be observed and imitated (Smith & Kaminski, 2010). These behaviors pose serious clinical and operational challenges, requiring immediate medical intervention, coordinated involvement of custodial and mental health staff, and placing additional strain on under-resourced correctional systems. Together with severely limited access to psychological care in prisons compared to community settings (Stojadinović, 2024), this underscores the importance of understanding the mechanisms through which self-harm emerges and is maintained in incarcerated populations.

Explanatory models conceptualize self-harm as multiply determined, serving both intrapersonal and interpersonal functions (Dixon-Gordon et al., 2012). Intrapersonal motives often include affect regulation and self-punishment, as self-injury can relieve intense emotional distress or counteract negative emotions (Klonsky & Muehlenkamp, 2007). Interpersonal motives, such as eliciting care, asserting control, or influencing others, may be especially relevant in prison, where autonomy is restricted and communication opportunities are limited (Brezean et al., 2016).

Recent literature distinguishes two forms of self-harm: non-suicidal self-injury (NSSI), defined as deliberate self-inflicted harm without intent to die, and suicidal behaviors, including ideation and suicide attempts (SA). While some researchers conceptualize these behaviors as points along a continuum (Kapur et al., 2013), others emphasize their differences in intent, chronicity, and lethality (Smith & Kaminski, 2010). Most agree, however, that they are closely interrelated and should be examined concurrently, as NSSI is among the strongest predictors of subsequent SA (Favril, 2019; Radanović et al., 2022).

A broad range of factors contribute to self-harm in prison. Evidence suggests that rates of self-harm are either comparable between men and women (e.g., Favril et al., 2022) or higher among women (e.g., Hawton et al., 2014). Younger inmates tend to be more prone to NSSI (Lohner &

Konrad, 2007), whereas findings for SA are more variable, with some studies indicating different patterns across age groups (Stoliker et al., 2020). Socioeconomic disadvantage, which are reflected in low educational attainment, unemployment, and single status, has been linked to both NSSI and SA, while parental status (e.g., being childless) appears to have minimal influence (Dixon-Gordon et al., 2012; Favril, 2019; Smith & Kaminski, 2010).

Institutional factors such as disciplinary sanctions, isolation, lack of visits, absence of work opportunities, and a negative prison climate elevate the risk of self-harm. NSSI tends to occur earlier in incarceration, whereas SA often emerges after prolonged exposure to cumulative distress (Favril et al., 2022; Lohner & Konrad, 2007; Smith & Kaminski, 2010). Criminogenic characteristics, including violent offenses, longer sentences, and prior imprisonment, further contribute to self-harm vulnerability (Castelpietra et al., 2018; Hawton et al., 2014). Psychological vulnerabilities, such as depressive symptoms, aggression and impulsivity, prior substance abuse, psychiatric treatment history, and personality disorders, are prevalent across both NSSI and SA (Brezean et al., 2016; Favril et al., 2022). Functionally, NSSI often serves as an immediate means of affect regulation or interpersonal communication, whereas SA is typically associated with enduring psychological strain and hopelessness accumulated during confinement (Barry et al., 2020; Lohner & Konrad, 2007; Stojadinović, 2024).

Despite substantial international evidence, data from Serbia remain scarce. The most recent institutional report, from 2012, indicated that NSSI incidents occurred more frequently than suicide attempts, with NSSI representing the majority of recorded self-harm events (Dragišić-Labaš, 2018). A more recent study in the Special Prison Hospital (Stojadinović, 2024) showed that one in six men and one in two women were at high suicidal risk, suggesting that the gender suicide paradox, that is, higher rates of suicidal behavior among women and higher lethality among men, remains stable across environments, including prison settings. Both studies highlighted the high prevalence of psychiatric disorders and substance abuse among SA offenders. Research on NSSI in Serbia has been largely limited to adolescents in correctional settings, where over half reported NSSI, most commonly through cutting, scratching, or burning, was often associated with emotional dysregulation, depression, borderline pathology, and substance abuse (Velimirović & Mihić, 2018). Systematic data on adult offenders in Serbia are currently lacking.

Rationale

Self-harm among offenders has important implications for custodial management, clinical assessment, and the provision of health care within correctional settings. Beyond the immediate physical and psychological risks, these behaviors can destabilize institutional environments and increase demands on prison staff and available resources (Smith & Kaminski, 2010). Despite their significance, self-harm in incarcerated populations remains insufficiently studied in the Serbian context, where systematic empirical data are scarce.

This study seeks to address this gap by estimating the prevalence of self-harm in offending population, with a focus on distinguishing between NSSI and SA, and by examining a comprehensive set of factors associated with these behaviors. These factors include four domains: (1) demographic (e.g., age, gender, education), (2) institutional (e.g., disciplinary measures, solitary confinement, time spent in the cell), (3) criminogenic (e.g., type of offense, prior imprisonment), and (4) psychological (e.g., depressive symptoms, aggression, self-esteem).

By systematically investigating these factors, the study aims to generate empirical evidence on the correlates of self-harm in Serbian prisons. Such evidence is essential for informing future research, refining risk assessment practices, and guiding the development of targeted prevention and intervention strategies within this high-risk population.

Method

Participants and Procedure

This study employed a cross-sectional, observational design based on secondary analysis of prison records and self-report measures. Data were drawn from the national research project PrisonLIFE, which aimed to establish methods for measuring and monitoring, as well as improving, the quality of prison life in Serbia (Ilijić et al., 2024; Ilijić et al., 2025; Milićević et al., 2024). Data were collected between May 2022 and January 2023 in five of the largest correctional facilities in Serbia: four male facilities (Sremska Mitrovica, Niš, Zabela, and Belgrade) and one female facility (Požarevac).

The final dataset included 609 participants who completed the self-harm measures. The sample characteristics are presented in Table 1. Participation was voluntary, and all participants provided written informed consent. Inclusion criteria were as follows: serving a prison sentence for more than 30 days, literacy, proficiency in Serbian, and assignment to treatment groups after the Reception Department, which ensured that participants had completed the initial admission and assessment phase and were already integrated into regular therapeutic activities. Participants were informed about the study objectives, their right to withdraw at any time, and the principles of voluntariness and anonymity. The study was approved by the institutional Review Board.

Measures

Data were collected from two sources: self-report questionnaires completed by participants and prison records and case files, which provided official sociodemographic and institutional information. A broad set of variables was initially gathered, of which this study focuses on thirty potential correlates of self-harm. For analysis, variables were grouped into four categories: sociodemographic, institutional, criminogenic, and psychological, along with the outcome variable, self-harm.

Self-harm

Two indicators of self-harm were assessed: NSSI and SA. Participants reported whether they had engaged in self-injurious behaviors or attempted suicide with the following options: never, yes in prison, yes outside prison, or yes both in and outside prison. For this study, only NSSI and SA occurring in prison were considered. Variables were dichotomized (0 = no, 1 = yes).

Sociodemographic Variables

Variables included age, gender, education, marital status, and parental status. Age was treated as a continuous variable (in months). Gender was coded as female or male. Education was categorized into four levels: no or incomplete primary education, primary, secondary, and higher education, including university degrees. Marital status was classified as single, married/co-resident, or separated/divorced/widowed. Parental status was coded as having children or not.

Institutional Variables

Institutional variables captured daily life and engagement within the prison, including visits, education/training participation, work, time spent in the cell, solitary confinement, and institutional misconduct measures. Participation in visits, education/training, work, and confinement for six or more hours per day were coded as binary variables.

Institutional misconduct was quantified using the number of disciplinary, safety, special, and control measures applied to each offender. Disciplinary measures included: (1) warden's reprimand; (2) restriction on receiving packages for up to three months; (3) deprivation of extended rights or benefits for up to three months; and (4) limitation or ban on money disposal in the institution for up to three months.

Special measures included: (1) temporary confiscation of permitted items; (2) placement in a specially secured room; (3) placement under increased supervision; (4) testing for infectious diseases or psychoactive substances; and (5) separation from other inmates. Each indicator was coded as binary (0 = not applied, 1 = applied), then summed and averaged.

Two additional measures of institutional misconduct were assessed: solitary confinement ("Have you ever been punished with solitary confinement in this prison?") and control measures ("Have you ever been subjected to procedures of control or physical restraint by the security service?"), with participants reporting the number of instances.

Criminogenic Variables

Criminogenic variables captured criminal history and offending patterns. Type of offense was coded as non-violent or violent, and first-time incarceration was dichotomous. Total years in prison were categorized into five intervals: <1 year, 1–2 years, 3–5 years, 6–10 years, and >10 years; this variable was used as provided in the dataset and was not altered. Earlier prison sentences and juvenile delinquency were coded as binary variables.

Continuous variables included total number of times in prison, number of previous offenses, age at first conviction, and sentence length in months. Degree of risk and degree of recidivism were continuous measures based on structured assessments conducted by treatment officers, extracted from case files.

Psychological Variables

Psychological variables were assessed via self-report and included depressive symptoms, aggression, and self-esteem, all treated as continuous. Depressive symptoms were measured using the PHQ-9 (Kroenke et al., 2001), aggression using the Buss-Perry Aggression Questionnaire (Buss & Perry, 1992), and self-esteem using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Two dichotomous pre-incarceration variables were also included: drug use and prior psychological treatment (0 = no, 1 = yes).

Data Analysis

Analyses were conducted using IBM SPSS Statistics version 26. Descriptive statistics were calculated for all variables: means and standard deviations for continuous variables, and frequencies and percentages for categorical variables. Associations between the two self-harm forms (NSSI and SA) and between each self-harm measure and the four groups of correlates were examined.

For categorical variables, χ^2 tests and crosstabulations were performed, with standardized residuals (SR) identifying specific group differences. For continuous variables, independent-samples *t*-tests were applied when the assumption of normality was met; otherwise, Mann–Whitney *U* tests were used as a non-parametric alternative.

Results

Among 609 offenders, 17% (n = 102) reported a history of NSSI, and 9% (n = 55) reported at least one SA. NSSI and SA overlapped substantially: offenders with NSSI were far more likely to report SA (SR = 11.1), whereas those without NSSI were underrepresented among attempters (SR = −5.0). The association was statistically significant, with a large effect size (*see* Supplementary Table S1 for complete test statistics and effect sizes).

Sociodemographic Characteristics

Female offenders were overrepresented among NSSI cases (SR = 2.5), whereas male offenders were underrepresented (SR = −1.0). Age did not

differ meaningfully between those with and without NSSI. NSSI was more common among offenders with primary education (SR = 2.1) and slightly underrepresented among those with secondary education (SR = −1.3). Marital and parental status were not associated with NSSI (Table 1).

For SA, females were also overrepresented (SR = 4.8), and males underrepresented (SR = −1.9). Offenders with SA were older on average than those without (Mean Rank = 381.06 vs. 298.01), indicating a small to moderate effect of age. Individuals with higher education had higher SA incidence (SR = 3.1), whereas marital and parental status showed no meaningful differences. Overall, gender and education showed moderate associations with SA, whereas other sociodemographic variables had minimal effects (*see* Supplementary Table S1).

Table 1

Sociodemographic variables by NSSI and SA status

Sociodemographic	NSSI			SA		
domain	No	Yes	*p*	No	Yes	*p*
Age	39.92 (10.7)	39.17 (7.73)	.784[a]	39.45 (10.38)	43.25 (8.28)	**.001**[a]
Gender						
Female	62 (72%)	24 (28%)	**.003**[b]	65 (76%)	21 (24%)	**<.001**[b]
Male	446 (85%)	79 (15%)		492 (93%)	34 (7%)	
Education						
No school	34 (85%)	6 (15%)	.053[b]	37 (92%)	3 (8%)	**.002**[b]
Primary	114 (76%)	36 (24%)		133 (89%)	17 (11%)	
Secondary	323 (86%)	53 (14%)		352 (93%)	25 (7%)	
Higher	35 (81%)	8 (19%)		33 (77%)	10 (23%)	
Marital status						
Single	191 (81%)	44 (19%)	.464[b]	215 (91%)	21 (9%)	.662[b]
Married/co-resident	242 (85%)	42 (15%)		261 (92%)	23 (8%)	
Separated/divorced/widowed	73 (82%)	16 (18%)		79 (89%)	10 (11%)	
Parental status						
With children	273 (82%)	62 (18%)	.741[a]	301 (90%)	34 (10%)	.193[a]
Without children	224 (85%)	39 (15%)		243 (92%)	20 (8%)	

Note. NSSI = non-suicidal self-injury; SA = suicide attempts. Continuous variables are presented as mean (*SD*), and categorical variables as *n* (%). Significant *p* values are shown in bold.
[a] Mann–Whitney *U* test. [b] χ^2 test.

Institutional Characteristics

Offenders who were not engaged in work reported higher NSSI incidence (SR = 2.8). Spending six or more hours per day in a cell was also associated with increased NSSI (SR = 3.7), as was not receiving visits (SR = 1.7). Higher levels of NSSI were observed among offenders with more frequent institutional misconduct, including solitary confinement, disciplinary measures, safety measures, special measures, and control measures, all showing small to moderate effects. Participation in education or training was not associated with NSSI (Table 2).

Table 2

Institutional variables by NSSI and SA status

Institutional	NSSI			SA		
domain	No	Yes	*p*	No	Yes	*p*
Visits						
No	59 (76%)	19 (24%)	.051[a]	65 (84%)	12 (16%)	**.023**[a]
Yes	446 (85%)	82 (15%)		489 (92%)	41 (8%)	
Education/training						
No	476 (83%)	95 (17%)	.817[a]	522 (91%)	49 (9%)	.524[a]
Yes	27 (82%)	6 (18%)		30 (88%)	4 (12%)	
Work						
No	221 (77%)	68 (23%)	**<.001**[a]	258 (89%)	32 (11%)	.058[a]
Yes	282 (90%)	33 (10%)		294 (93%)	21 (7%)	
More than 6 hours in cell						
No	329 (89%)	40 (11%)	**<.001**[a]	348 (94%)	22 (6%)	**.001**[a]
Yes	165 (73%)	62 (27%)		195 (86%)	32 (14%)	
Solitary confinement	.35 (1.69)	1.42 (4.22)	**<.001**[b]	.43 (1.74)	1.58 (5.44)	**<.001**[b]
Disciplinary measures	.5 (.83)	1.05 (1.08)	**<.001**[b]	.55 (.87)	1.02 (1.08)	**<.001**[b]
Safety measures	.14 (.4)	.69 (.82)	**<.001**[b]	.18 (.46)	.75 (.9)	**<.001**[b]
Special measures	.48 (.94)	1.28 (1.45)	**<.001**[b]	.54 (.9)	1.31 (1.62)	**<.001**[b]
Control measures	.21 (.8)	1.81 (9.95)	**<.001**[b]	.47 (4.37)	.58 (1.17)	**.008**[b]

Note. NSSI = non-suicidal self-injury; SA = suicide attempts. Continuous variables are presented as mean (*SD*), and categorical variables as *n* (%). Significant *p* values are shown in bold.
[a] χ^2 test. [b] Mann–Whitney *U* test.

A similar pattern was found for SA. Offenders who did not receive visits had higher incidence (SR = 2.0), as did those spending six or more hours daily in their cells (SR = 2.5). Non-working offenders were slightly overrepresented among those with SA (SR = 1.3). Elevated rates of SA were found among offenders with more frequent institutional misconduct,

including solitary confinement, disciplinary measures, safety measures, special measures, and control measures, showing small to moderate effect sizes. Overall, restricted social contact, limited activity, and exposure to restrictive measures were associated with both NSSI and SA, while participation in education or training had negligible impact (*see* Supplementary Table S1).

Criminogenic Characteristics

Offenders convicted of violent offenses showed slightly higher incidence of NSSI (SR = 1.4). First-time offenders were underrepresented among NSSI cases (SR = −2.6), whereas repeat offenders were overrepresented (SR = 2.8). Longer cumulative time spent in prison, particularly exceeding 10 years, was associated with higher NSSI incidence (SR = 3.7).

Offenders with prior prison sentences and juvenile delinquency histories also showed elevated NSSI (SR = 1.9 and 2.3, respectively). Those with NSSI had more incarcerations and previous offenses, were younger at first conviction, and had higher assessed risk and recidivism levels, reflecting moderate to large effects. Sentence length did not differ significantly between groups (Table 3).

For SA, violent offenses were associated with slightly higher incidence (SR = 1.9). Longer cumulative time in prison increased SA likelihood, especially for those with more than 10 years of incarceration (SR = 2.5). Other criminogenic variables, including first-time versus repeat incarceration, prior sentences, and juvenile delinquency, were not meaningfully different between groups.

Offenders with SA had longer sentences and higher assessed risk and recidivism than non-attempters, with moderate effect sizes. Number of prior offenses, number of incarcerations, and age at first conviction showed negligible differences (*see* Supplementary Table S1).

Table 3

Criminogenic variables by NSSI and SA status

Criminogenic domain	NSSI			SA		
	No	Yes	*p*	No	Yes	*p*
Violent offense						
No	275 (86%)	44 (14%)	**.031**[a]	302 (94%)	19 (6%)	**.005**[a]
Yes	231 (80%)	59 (20%)		253 (88%)	36 (12%)	
First time in prison						
No	218 (77%)	67 (23%)	**<.001**[a]	258 (91%)	27 (9%)	. 703[a]
Yes	290 (89%)	35 (11%)		298 (91%)	28 (9%)	
Years in prison						
< 1 year	51 (91%)	5 (9%)	**<.001**[a]	53 (95%)	3 (5%)	**.006**[a]
1−2 years	101 (94%)	7 (6%)		105 (96%)	4 (4%)	
3−5 years	136 (88%)	18 (12%)		145 (94%)	9 (6%)	
6−10 years	104 (79%)	28 (21%)		116 (89%)	15 (11%)	
> 10 years	101 (70%)	43 (30%)		123 (85%)	22 (15%)	
Earlier prison sentence						
No	240 (88%)	33 (12%)	**.002**[a]	249 (91%)	25 (9%)	.980[a]
Yes	230 (78%)	64 (22%)		267 (91%)	27 (9%)	
Juvenile delinquency						
No	337 (86%)	57 (14%)	**.004**[a]	358 (90%)	38 (10%)	.832[a]
Yes	72 (74%)	26 (26%)		87 (90%)	10 (10%)	
Number of times in prison	2.76 (2.11)	3.69 (2.06)	**.001**[c]	2.95 (2.19)	3.56 (1.95)	.166[c]
Previous offenses	4.76 (4.25)	6.78 (6.24)	**<.001**[b]	5.05 (4.7)	6.13 (5.1)	.181[b]
Age first convicted	29.15 (11.22)	23.93 (7.97)	**.002**[b]	28.2 (10.94)	28.86 (10.58)	.679[c]
Sentence length (months)	95.38 (96.28)	108 (100.12)	.229[c]	92.77 (92.47)	144.67 (125.08)	**.003**[b]
Degree of risk	12.64 (5.63)	17.54 (5.07)	**<.001**[c]	13.15 (5.79)	16.39 (5.37)	**.001**[c]
Degree of recidivism	13.83 (5.55)	18.54 (5.46)	**<.001**[c]	14.34 (5.72)	17.24 (5.94)	**.003**[c]

Note. NSSI = non-suicidal self-injury; SA = suicide attempts. Continuous variables are presented as mean (*SD*), and categorical variables as *n* (%). Significant *p* values are shown in bold.
[a] χ^2 test. [b] Mann–Whitney *U* test. [c] Independent samples *t*-test.

Psychological Characteristics

Offenders with NSSI reported higher depressive symptoms and aggression, as well as lower self-esteem, compared with those without NSSI, reflecting moderate to large effects (Table 4). Pre-incarceration drug use was more common among NSSI offenders (SR = 3.4 for users; SR = −3.3 for non-users). The history of pre-incarceration psychological treatment was

strongly associated with NSSI (SR = 8.1 for treated; SR = −3.3 for untreated).

For SA, a similar pattern emerged, with higher depressive symptoms and aggression and lower self-esteem among attempters, showing moderate to large effect sizes. Pre-incarceration drug use did not differ meaningfully between SA groups (SR ≈ ±1.2), whereas prior psychological treatment remained strongly associated with SA (SR = 8.2 for treated; SR = −3.3 for untreated). Overall, depressive symptoms, aggression, self-esteem, and pre-incarceration psychological interventions were relevant for both NSSI and SA, whereas pre-incarceration drug use was specific to NSSI (*see* Supplementary Table S1).

Table 4

Psychological variables by NSSI and SA status

Psychological domain	NSSI			SA		
	No	Yes	*p*	No	Yes	*p*
Depressive symptoms	7.42 (5.9)	12.46 (7.58)	**<.001**[b]	7.78 (6.16)	13.35 (7.4)	**<.001**[b]
Aggression	73.31 (20.68)	91.8 (20.85)	**<.001**[c]	75.16 (21.38)	89.06 (21.89)	**<.001**[c]
Self-esteem	32.13 (5.29)	29.05 (6.37)	**<.001**[c]	31.74 (5.59)	29.52 (6.69)	**.020**[b]
Drug use (pre-incarceration)						
No	287 (91%)	29 (9%)	**<.001**[a]	293 (93%)	22 (7%)	.074[a]
Yes	221 (75%)	74 (25%)		264 (78%)	33 (13%)	
Psychiatric stays (pre-incarceration)						
No	456 (89%)	55 (11%)	**<.001**[a]	488 (95%)	24 (5%)	**<.001**[a]
Yes	39 (47%)	44 (53%)		53 (64%)	30 (36%)	

Note. NSSI = non-suicidal self-injury; SA = suicide attempts. Continuous variables are presented as mean (*SD*), and categorical variables as *n* (%). Significant *p* values are shown in bold.
[a] χ^2 test. [b] Mann–Whitney *U* test. [c] Independent samples *t*-test.

Discussion

This study addressed the paucity of empirical data on self-harm in Serbian prisons by estimating the prevalence of NSSI and SA and examining their correlates across sociodemographic, institutional, criminogenic, and psychological domains. By exploring these factors, the study aimed to elucidate both individual vulnerabilities and the broader institutional context contributing to self-harm among incarcerated individuals.

The prevalence of self-harm in this sample was comparable to international findings: NSSI was reported by 17% of offenders and SA by 9%, aligning with prior prison studies (Hawton et al., 2014; Favril, 2019). A substantial overlap was observed, as 73% of SA cases also reported NSSI, whereas offenders without NSSI were rarely represented among SA. This further supports the notion that self-harming offenders represent a high-risk subgroup within correctional populations (Castelpietra et al., 2018; Favril et al., 2020).

NSSI and SA in the present sample showed both shared and distinct sociodemographic patterns. Women were significantly more likely than men to report both NSSI (nearly twice as high) and SA (threefold). This contrasts with some studies that found comparable rates of NSSI and SA across genders (Castelpietra et al., 2018; Favril et al., 2020) but aligns with others reporting higher rates of self-harm among women (Hawton et al., 2014). Beyond general risk factors shared with men (e.g., past trauma, substance abuse, psychiatric history), women in correctional settings may face additional vulnerabilities, such as disrupted family relationships or separation from dependent children (Liebling, 1994), which may be compounded by the dual stigma of being both a "failed citizen" and a "failed caregiver" (Ćopić, 2024; Ilijić et al., 2024). The higher prevalence of SA among women also corresponds with findings from a Serbian special prison hospital sample (Stojadinović, 2024).

Age showed differential associations with NSSI and SA. Contrary to prior studies suggesting higher NSSI among younger inmates (Favril, 2019; Lohner & Konrad, 2007), no age association was observed for NSSI. By contrast, SA was more frequent among older offenders, consistent with a cumulative stress or "life-trajectory" perspective, where long sentences, deteriorating health, social isolation, and accumulated losses contribute to hopelessness and suicidal behavior (Barry et al., 2020; Stoliker et al., 2020). Education also demonstrated contrasting associations: lower educational attainment was linked to higher NSSI, while higher education correlated with SA. Although lower education and socioeconomic status are generally associated with more frequent NSSI possibly through limited coping strategies (e.g., Favril et al., 2020), the association between higher education and SA is a novel finding. It may reflect findings in community samples showing that individuals with higher educational achievement are more prone to SA when facing failures, public shame, or a loss of previously high functioning (Pompili et al., 2013).

Marital and parental status were unrelated to either NSSI or SA. While having children does not appear to be associated with self-harm (Favril et al., 2020), some studies have found that being without a partner may increase self-harm in prison (Favril et al., 2020; Zhong, 2021), potentially due to weaker social support networks or heightened isolation. However, such associations are not consistently observed (Blees et al., 2024), and in some contexts, marital status shows no significant effect, as in this study. These inconsistencies may reflect differences in relationship quality, gender, or the moderating influence of prison conditions.

Institutional factors showed broadly similar associations across NSSI and SA, suggesting that restrictive and punitive prison environments are important correlates of self-harm. Greater exposure to institutional misconduct measures, including disciplinary sanctions, solitary confinement, and control or special measures, so prolonged hours locked in cells, lack of visits, and absence of work engagement were all associated with higher rates of self-harm. These findings indicate that punishment, social isolation, and lack of purposeful activity may exacerbate psychological distress and vulnerability to both NSSI and SA (Favril et al., 2020; Međedović et al., 2024; Lohner & Konrad, 2007). Although the associations between visits (for NSSI) and work engagement (for SA) were only marginally significant, the negative trends underscore the importance of maintaining social contact and providing meaningful occupational opportunities. Interestingly, participation in education or training was unrelated to either form of self-harm, suggesting that such activities may not provide the same protective benefits as work engagement. While these associations cannot be interpreted causally, they suggest that self-harm is more likely in environments characterized by restriction and isolation, consistent with the higher prevalence of self-harm in correctional settings compared to community or clinical populations (Brezean et al., 2016).

Criminogenic correlates reveal distinct patterns for NSSI and SA. While violent offenses, assessed risk, and total years of imprisonment were associated with both behaviors, NSSI was particularly linked to indicators of chronic offending and criminal history. Offenders with earlier criminal onset, prior juvenile delinquency, multiple imprisonments, and a greater number of previous offenses were significantly more likely to engage in NSSI. This pattern suggests that NSSI may function as a habitual or learned strategy for managing distress or may reflect general dysregulation and persistent maladaptive coping (Dixon-Gordon et al., 2012; Smith & Kominsky, 2010). In contrast, these indicators were not associated with

SA, which may be less tied to chronic criminality and more to situational or contextual stressors. Supporting this view, SA was more frequent among those serving longer sentences, consistent with heightened perceptions of defeat, entrapment, and hopelessness in custody (Barry et al., 2020; Castelpietra et al., 2018; Favril, 2019).

Psychological factors showed consistent associations with both forms of self-harm. Offenders with NSSI and SA reported higher levels of depressive symptoms, aggression, lower self-esteem, and more frequent prior psychological treatment, reinforcing the view that emotional distress and longstanding mental health problems are central vulnerabilities among self-harming prisoners (Favril et al., 2020; Zhong et al., 2021). Pre-incarceration drug use was more strongly related to NSSI, while only marginally linked to SA. Prior psychological treatment and drug use further indicate vulnerabilities that offenders import into the prison context. Taken together, the co-occurrence of elevated depressive symptoms, aggression, and low self-esteem among self-harming offenders suggests the presence of pervasive distress and may indicate a "cry of pain" (Liebling, 1994). It could be tentatively suggested that psychological pain may manifest externally through aggression and disciplinary infractions or internally through depressive symptoms and self-harming behavior (Drndarević et al., 2021), or a combination of both in the context of deprivation may indicate specific vulnerabilities to maladaptive coping.

Overall, these findings suggest that NSSI and SA share several core vulnerabilities, including psychological distress and restrictive institutional conditions, but also exhibit domain-specific distinctions. NSSI appears more closely linked to chronic offending and substance-related dysregulation, whereas SA is associated with situational and cumulative stressors such as longer sentences, older age, and higher education.

Strengths, Limitations and Future Research Directions

Several limitations should be acknowledged. First, the sample was not fully representative of the broader Serbian prison population, which may limit generalizability. Nevertheless, it included participants from multiple major facilities with varied criminal history, reflecting a broad range of offender experiences. Importantly, the sample was relatively large) and included both male and female offenders, offering insights across diverse criminological profiles that are often overlooked in prior studies focused

on a single sex. Future studies could expand to include other correctional settings, such as juvenile institutions or individuals serving life sentences, to further capture variability across offender groups. Second, the cross-sectional design precludes causal inference. Longitudinal research is needed to clarify temporal links between NSSI and SA and to examine how psychological, criminogenic, and institutional factors interact over time to amplify risk or confer protection. Third, self-harm was assessed with a single binary item rather than specialized instruments, which would allow more detailed evaluation of NSSI frequency, methods, and functions, although this approach is consistent with frequently cited studies in prisoner populations (e.g., Favril, 2019).

Despite these limitations, the study has several notable strengths. To the authors' knowledge, prior empirical research on self-harm in Serbian correctional populations is extremely scarce, with only a few studies examining juvenile offenders (Velimirović & Mihić, 2018), suicide risk in a specialized prison hospital (Stojadinović, 2024), or reporting on administrative data (Dragišić-Labaš, 2018). This study therefore fills a significant gap by simultaneously examining both NSSI and SA across multiple prison facilities. Furthermore, it assessed a comprehensive set of variables, that is, over 30 factors organized into four broad domains (sociodemographic, criminogenic, institutional, and psychological), thus providing a multidimensional perspective on self-harm.

Given that self-harm is a multidetermined phenomenon, future research should continue to explore interactions among psychological, criminogenic, and institutional variables to identify which factors amplify risk or serve protective roles. Overall, despite some methodological constraints, the study contributes to understanding the correlates of NSSI and SA in Serbian prisons, highlighting both shared and distinct pathways and underscoring the importance of multidimensional approaches to self-harm in incarcerated populations.

Conclusion

This study provided an empirical examination of the prevalence and correlates of NSSI and SA in Serbian prisons, identifying both shared and distinct associations across sociodemographic, institutional, criminogenic, and psychological domains.

Self-harming offenders exhibited elevated psychological distress, including higher depressive symptoms, aggression, and lower self-esteem, and were more frequently exposed to restrictive and punitive institutional measures. NSSI was particularly associated with chronic offending and pre-incarceration substance use, whereas SA was more common among older, more educated offenders serving longer sentences, reflecting potential cumulative stress and hopelessness. These findings underscore the multifaceted nature of self-harm in correctional settings and suggest that interventions should address both individual vulnerabilities and environmental conditions. By examining both behaviors simultaneously, the study advances understanding of self-harm in incarceration and offers empirical insights relevant for future research and practical efforts within Serbian prisons.

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Conflict of Interest

The authors declare that they have no conflict of interest concerning this article.

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Samopovređivanje u zatvorima u Srbiji: Korelati nesuicidalnog samopovređivanja i pokušaja suicida∗

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Samopovređivanje, koje obuhvata nesuicidalno samopovređivanje (*Non-Suicidal Self-In*jury, NSSI) i pokušaje suicida (*Suicide Attempts*, SA), visoko je zastupljeno među zatvorskom populacijom, ali do sada nijedno istraživanje nije ispitivalo njihovu povezanost i korelate u zatvorima u Srbiji. Ovo istraživanje obuhvatilo je

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609 osuđenih lica iz pet kazneno-popravnih ustanova, a sprovedeno je u okviru nacionalnog projekta PrisonLIFE. Prevalenca NSSI i SA iznosila je 17% i 9%, pri čemu je 73% osoba koje su se samopovređivale takođe prijavilo pokušaj suicida. Korelati su ispitivani kroz četiri domena: sociodemografski (npr. pol, starost, obrazovanje), institucionalni (npr. izolacija, disciplinske mere, produženo vreme provedeno u ćeliji, izostanak poseta, neangažovanost na radu), kriminogeni (npr. nasilna krivična dela, povratništvo, rani početak kriminalne aktivnosti, zloupotreba psihoaktivnih supstanci pre zatvaranja, dužina kazne) i psihološki (npr. depresivna simptomatologija, agresivnost, prethodno psihološko lečenje). NSSI i SA pokazali su značajnu povezanost i zajedničke rizične faktore, naročito unutar psihološkog i institucionalnog domena. NSSI je dodatno povezan sa zloupotrebom droga pre zatvaranja i kriminalnom istorijom (npr. povratništvo, rani početak kriminalne aktivnosti), dok je SA snažnije povezan sa starijom životnom dobi, višim obrazovanjem i dužim trajanjem kazne. Ukupno posmatrano, nalazi ukazuju na značajno preklapanje ova dva oblika ponašanja, ali i na njihove različite obrasce koji sugerišu delimično nezavisne mehanizme.

KLJUČNE REČI: samopovređivanje / nesuicidalno samopovređivanje / pokušaj suicida / osuđena lica / zatvor / Srbija

PRIMLJENO: 29.10.2025.
REVIDIRANO: 21.11.2025.
PRIHVAĆENO: 24.11.2025.

Appendix

Supplementary Table S1

Group comparisons and effect sizes for NSSI and SA

	NSSI		SA	
Variables	Test statistic (*df*)	ES	Test statistic (*df*)	ES
NSSI	-	-	$\chi^2(1) = 163.98^{***}$	$V = .52$
Sociodemographic Variables				
Age	$U = 25413$	$r = .01$	$U = 11106.5^{***}$	$r = .14$
Gender	$\chi^2(1) = 8.72^{**}$	$V = .12$	$\chi^2(1) = 29.13^{***}$	$V = .22$
Education	$\chi^2(3) = 7.68^{\dagger}$	$V = .12$	$\chi^2(3) = 14.34^{**}$	$V = .16$
Marital status	$\chi^2(2) = 1.53$	$V = .05$	$\chi^2(2) = .63$	$V = .09$
Parental status	$U = 24604.5$	$r = .05$	$U = 13198.5$	$r = .04$
Institutional Variables				
Visits	$\chi^2(1) = 3.81^{\dagger}$	$V = .08$	$\chi^2(1) = 5.2^{*}$	$V = .09$
Education/training	$\chi^2(1) = .05$	$V = .01$	$\chi^2(1) = .41$	$V = .03$
Work	$\chi^2(1) = 18.44^{***}$	$V = .18$	$\chi^2(1) = 3.6^{\dagger}$	$V = .08$
More than 6 hours in cell	$\chi^2(1) = 26.89^{***}$	$V = 2.1$	$\chi^2(1) = 11.36^{***}$	$V = 1.4$
Solitary confinement	$U = 17894^{***}$	$r = .30$	$U = 11831^{***}$	$r = .16$
Disciplinary measure	$U = 17648^{***}$	$r = .24$	$U = 10983^{***}$	$r = .16$
Safety measure	$U = 16367^{***}$	$r = .36$	$U = 9821.5^{***}$	$r = .26$
Special measure	$U = 16688^{***}$	$r = .28$	$U = 11246.5^{***}$	$r = .16$
Control measure	$U = 19910.5^{***}$	$r = .27$	$U = 13411^{**}$	$r = .11$
Criminogenic Variables				
Violent offense	$\chi^2(1) = 4.64^{*}$	$V = .09$	$\chi^2(1) = 7.92^{**}$	$V = .11$
First time in prison	$\chi^2(1) = 17.7^{***}$	$V = .17$	$\chi^2(1) = .15$	$V = .02$
Years in prison (total)	$\chi^2(4) = 32.67^{***}$	$V = .24$	$\chi^2(4) = 14.39^{**}$	$V = .16$
Earlier prison sentence	$\chi^2(1) = 9.36^{**}$	$V = .13$	$\chi^2(1) = .0$	$V = .00$
Juvenile delinquency	$\chi^2(1) = 8.14^{**}$	$V = .13$	$\chi^2(1) = .05$	$V = .01$
Number of times in prison	$t(289) = -3.22^{***}$	$d = .44$	$t(289) = -1.39$	$d = .28$
Previous offenses (number)	$U = 16736^{***}$	$r = .13$	$U = 4849$	$r = .07$
Age first convicted	$U = 8823^{**}$	$r = .19$	$t(584) = -.41$	$d = .06$
Sentence length (months)	$t(607) = -1.2$	$d = .05$	$U = 11517.5^{**}$	$r = .08$
Degree of risk	$t(408) = -6.62^{***}$	$d = .90$	$t(410) = -3.31^{***}$	$d = .56$
Degree of recidivism	$t(408) = -6.37^{***}$	$d = .86$	$t(410) = -2.97^{**}$	$d = .51$
Psychological Variables				
Depressive symptoms	$U = 14377^{***}$	$r = .25$	$U = 7589^{***}$	$r = .22$
Aggression	$t(565) = -7.98^{***}$	$d = .89$	$t(565) = -4.34^{***}$	$d = .65$
Self-esteem	$t(569) = 5.02^{***}$	$d = .56$	$U = 10038.5^{*}$	$r = .10$
Drug use (pre-incarceration)	$\chi^2(1) = 27.55^{***}$	$V = .21$	$\chi^2(1) = 3.18^{\dagger}$	$V = .07$
Psych. stays (pre-incarceration)	$\chi^2(1) = 91.76^{***}$	$V = .39$	$\chi^2(1) = 85.65^{***}$	$V = .38$

Note. NSSI = non-suicidal self-injury; SA = suicide attempts; ES = effect size; χ^2 = chi-square; U = Mann–Whitney U; t = independent samples t-test; V = Cramer's V; r = rank-biserial correlation; d = Cohen's d.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$. $^{\dagger}p < .10$.