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Revista de cercetare și intervenție socială

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)
Selected by coverage in Social Sciences Citation Index, ISI databases

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Revista de cercetare și intervenție socială, 2017, vol. 57, pp. 28-50

The online version of this article can be found at:
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Published by:
Expert Projects Publishing House

expert projects publishing

On behalf of:
„Alexandru Ioan Cuza" University,
Department of Sociology and Social Work
and
Holt Romania Foundation
REVISTA DE CERCETARE SI INTERVENTIE SOCIALA
is indexed by ISI Thomson Reuters - Social Sciences Citation Index
(Sociology and Social Work Domains)

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Predicting Suicide Risk among Male Offenders: The Role of Severe Personality Disorders

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Abstract

One of the most critical complications of severe personality disorders is suicide. Earlier studies on patients with borderline personality disorder have reported rates from 8% to 10% of completed suicide. Some prospective investigations have also revealed antisocial personality disorder among predictors of future suicide attempts. On the other hand, there is substantial empirical evidence that severe personality disorders robustly predict suicidal behaviours among male and female offenders. In Romania, the literature on suicidal behaviours in prisons is relatively scarce. This study responds to a call to investigate factors that contribute to the prediction of lifetime suicide risk among persons imprisoned for criminal offences. Our aim was to test predictive models of current suicide risk and suicidal antecedents among imprisoned male offenders. A principal focus was on the role of severe personality disorders. Participants were 338 males incarcerated for a wide range of violent or non-violent offences (M_{age} = 34.41 years; SD = 8.95). Participants were interviewed individually using a protocol for demographic data, judicial status, vulnerabilities related to personal life history, and suicidal antecedents. The current suicide risk was captured with the Suicidal Behaviors Questionnaire-Revised. The psychiatric history and current diagnoses were collected from personal records. Raw data were analyzed using parametric and non-parametric comparative tests, multiple linear regression and binary logistic regression. At the time of data collection, eighty-two participants (24.3%) were

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diagnosed with at least one severe personality disorder. Antisocial personality disorder was prevalent (52.4%). Other diagnoses included: emotionally unstable personality disorder (17%), emotionally unstable personality disorder-impulsive type (13.4%), and borderline personality disorder (9.7%). Violent victimization during early socialization, disharmonic organization of personality in adolescence, personal history of self-harming behaviours, negative global perception of childhood and adolescence, and the presence of a severe personality disorder were predictors of suicidal antecedents. On the other hand, disharmonic organization of personality in adolescence, previous self-harming behaviours, and the diagnosis of severe personality disorder were the main predictors of current suicide risk. Furthermore, the likelihood of a future suicide attempt was higher among male inmates who had suicidal antecedents. The results suggest that severe personality disorders should be considered when developing self-destructive behaviours prevention programs in prisons.

Keywords: male offenders, suicidal antecedents, current suicide risk, vulnerabilities related to personal life history, severe personality disorders, predictive models.

Introduction

The factors contributing to suicide risk are divided into two major categories: individual factors and social factors (Kaplan & Sadock, 1998; McLean *et al.*, 2008; Yoshimasu *et al.*, 2008). The first category includes mental health issues (e.g., alcohol or drug addiction, mood disorders, severe personality disorders, schizophrenia, etc.), repeated engaging in deliberate self-harming behaviours, relapses of suicide attempts throughout one's lifespan, hereditary vulnerability (history of suicide events within the family-of-origin), chronic medical conditions (e.g., terminal stages of cancer diagnosis), as well as other psychological vulnerabilities (e.g., predisposing personality traits, emotional instability or social isolation accompanied by a chronic feeling of loneliness). The second category includes socioeconomic factors (e.g., status on the labour market, marital status), familial factors (e.g., severe marital troubles), and stressful life events. The cumulated effects of the two categories of factors can contribute to reduced individual tolerance in relation to psychological stress and to increased risk of suicide behaviour (van Heeringen, 2001).

Severe personality disorders (SPDs) are associated with numerous complications that may become acute or chronic throughout one's life, if they are not diagnosed in time (upon the onset of the first clinical signs) and if the person does not receive pharmacological treatment and proper psychotherapeutic assistance. Two of the most commonly diagnosed SPDs are antisocial personality disorder

(APD) and borderline personality disorder (BPD). Suicide spectrum disorders are acknowledged as one of the most frequent complications of SPDs (Jenkins *et al.*, 2005; Paris, 2002; Soloff *et al.*, 2000; Yen *et al.*, 2004). In particular, patients with BPD have a significant risk of engaging in self-harming behaviours with or without a suicidal character (Brodsky *et al.*, 1997; Gerson & Stanley, 2002; Paris, 2004; Yen *et al.*, 2003). Approximately 10% of the patients with BPD die by suicide (Trull, Stepp & Solhan, 2006). Suicidal behaviours associated with BPD may be conceived as a way for patients to express their psychological pain. A number of studies also report the comorbidity between APD and suicidal behaviours (Black *et al.*, 2010; Garvey & Spoden, 1980; Soloff *et al.*, 1994). Studies have revealed APD or criminal behaviour to be predictors of subsequent suicide non-lethal attempts (Buglass & Horton, 1974; Morgan *et al.*, 1976). Some of the patients with SPDs present a chronic aspect of suicidal behaviours with a wide array: from threats without committing the act to planning for taking one's own life and failed suicide attempts (Kernberg, 1987; Soloff *et al.*, 2000). Comorbidity of PDs with other psychiatric disorders contributes to suicidality and may markedly elevate suicide risk (Suominen *et al.*, 2000).

Compared to community population, inmates present higher risk of failed or finalized suicide attempts (Fazel *et al.,* 2010; Jenkins *et al.*, 2005; Snow *et al.*, 2002). According to the opinion expressed by certain authors, the prison environment contributes to increased exposure of an already-vulnerable population to an additional risk of engaging in suicidal behaviour. Suicidal behaviours in the prisons represent a complex phenomenon that results from the dynamic interaction between the individual characteristics of inmates and features of the environment where they are forced to live (Liebling, 2006). Data of several studies conducted among the population of inmates with suicidal history suggest that the predictors of the risk of self-destructive behaviours (especially of suicide) include a set of factors referring to the prison environment, situational factors (e.g., suicide antecedents), sociodemographic variables (e.g., gender, age or family status, etc.), individual vulnerability (e.g., substance abuse, low levels of psychological and social adjustment, mental disturbances, etc.) and traumatizing life experiences (Blaauw, Kerkhof & Hayes, 2005; Black *et al.,* 2007; Fazel *et al.*, 2008; Fruehwald *et al.*, 2004; Mann *et al.*, 1999; Marzano *et al.*, 2011; Roma *et al.*, 2010). Comparative studies highlight the negative life events and history of severe psychological trauma (e.g., abuses during childhood) among the predictors of suicidal behaviours (Blaauw *et al.*, 2002; Mann *et al.*, 1999; Marzano *et al.*, 2011). Other risk factors include aggressive behaviours manifested throughout the course of life, smoking and history of alcohol and drug abuse, i.e. health-risk behaviours (Mann *et al.*, 1999).

Findings of studies conducted among patients with mental disorders support an etiological model of factors acting cumulatively throughout the course of life, where the risk of manifesting suicidal behaviours appears as a result of the interaction between a series of factors related to early negative emotional and social experiences and those experienced by the individual during adulthood, social environment factors, personality factors, and poor mental health (Mann *et al.*, 1999). Among inmates, the SPD diagnosis records a significant prevalence (Black *et al.*, 2007; Fazel & Danesh, 2002). It represents one of the major risk factors for engaging in suicidal behaviours (Black *et al.*, 2010; Blaauw, Kerkhof & Hayes, 2005; Kullgren, Tengstrom & Grann, 1998).

Several theoretical models that focus on explaining the factors contributing to suicide among community population committed by persons with various mental health problems, as well as among the population of inmates have been developed. According to these models, suicidal behaviours are rarely the consequence of just one cause (e.g., a life event producing acute stress). Most of the times, they depend upon a complex of personality factors and acute mental states grafted on certain traumatic life events (Hawton & Van Heeringen, 2009; Jenkins *et al.*, 2005). The identification and understanding of the weighting of these factors and of their dynamic interaction represents an important objective of the applied research in the field of the mental health of inmates. It may contribute to the effort of elaborating the policies and prevention measures for undesired social phenomena in the prison environment.

The present study

A considerable part of the studies that focused on the factors contributing to the prediction of suicidal behaviours among inmates took into account a limited number of variables (Blaauw, Kerkhof & Hayes, 2005; Fazel, Cartwright, Norman-Nott & Hawton, 2008; Roma *et al.*, 2010). The present study aimed to test certain predictive models for current suicide risk and for suicide antecedents among the men imprisoned for various criminal offences. Compared to previous studies, we took into account a variety of factors that intervened in the personal life story of inmates, including: the sociodemographic characteristics, legal status, socioeconomic background of the family-of-origin, social, affective and educational climate within the family-of-origin, negative childhood and adolescence experiences (e.g., victimizing by exposure to recurrent violence), individual vulnerability emerged during early socialization (e.g., personal violent behaviours or disharmonic personality profile), risk behaviours for physical and mental health, etc. A key variable taken into account in the construction of predictive models was the presence of SPD diagnosis.

Method

Ethical statement

This study has been approved by the Ethics Committee of Grigore T. Popa University of Medicine and Pharmacy in Iasi. Participants provided their written informed consent to participate in this study. The Ethics Committee approved the consent procedure. The participation in the study was voluntary. Participants were informed about the purpose of the study and the task they had to perform. Participants were also told that their responses were to be used in a scientific study.

Participants and procedure

The data of the present study were obtained by processing the answers provided by 338 male imprisoned for committing a variety of offences in three prisons situated in Moldavia (Romania). Several interviews were conducted individually by the first author of the present paper in the period November 2014-February 2016. The data were collected in the context of a broader study emphasizing on the relevant psychosocial and pharmacological factors that contribute to the diagnosis and treatment of personality disorders among inmates. It was impossible to recruit female inmates, considering the profile of the prisons that represented the recruitment pool. All participants who were in remand custody or in quarantine were excluded from the study. The ages of inmates ranged between 19 and 66 years old (M = 34.41; SD = 8.95). One hundred sixty five (48.8%) were in prison for the first time, while the rest (N = 173; 51.2%) were at least second or multiple offenders.

Two hundred fifty six (75.7%) of the surveyed inmates featured no severe mental health history and they were not diagnosed with any mental disorder at the time of data collection. The rest (N = 82; 24.3%) were diagnosed with at least one SPD, as follows: a) APD (N = 43; 52.4%); b) BPD (N = 8; 9.7%); c) mixed PD with antisocial and borderline features (N = 2; 2.4%); d) emotionally unstable personality disorder/EUPD (N = 14; 17%); e) emotionally unstable personality disorder-impulsive type/EUPD-impulsive (N = 11; 13.4%), and f) mixed PD with features specific to APD and EUPD (N = 4; 4.8%). Over 24% of the inmates with SPD diagnosis had additional psychiatric diagnosis mentioned in their personal records (e.g., schizophrenia associated with liminar intellect, mild, medium or severe depressive episode, bipolar disorder, schizoaffective disorder-mixed type, syndrome of addiction to benzodiazepines, alcohol or other psychoactive substances, etc.

Data collection

The standardized interview guide included three sections, as follows: a) personal sociodemographic data and information regarding the legal status; b) characteristics of the family-of-origin (e.g., family status, educational and occupational status of parents, alcohol consumption, domestic violence, criminal records of first-degree or second-degree relatives, etc.); we also considered the vulnerabilizing factors acting throughout early socialization (e.g., negative social and affective climate within the family-of-origin, manifestation of disharmonic personality traits during adolescence, exposure to violence during childhood and adolescence, personal violent behaviours, problematic school years, etc.) and factors acting during adulthood (e.g., engaging in health-risk behaviours such as substance abuse, self-harms, suicide attempts, etc.); c) the medical history and current status of mental health. A part of the interview guide structure was present in details in a previous paper (Mihai, Robu & Chirita, 2016).

The history of suicidal behaviours manifested during adulthood was assessed using five items with close-ended answers, as follows: a) a dichotomous item (answers = YES/NO) that required inmates to indicate if, in the periods when they were free, they had tried to commit suicide; this item had the value of filter; b) an item that required inmates to indicate the number of suicide attempts during the periods they were free and the methods they had used to take their own life; c) the third item referred to the frequency of suicide attempts that multiple-offender inmates had committed during the times of their previous incarcerations; e) the last item concerned the presence of notes in the personal records of inmates regarding the suicide attempts they had committed in the period of the last incarceration or during the times of previous incarcerations (for multiple offenders). This item was used to validate the answers that inmates provided at the interviews. We started from the premise that some of the inmates, mostly those with SPD, are prone to exaggerate the spectrum of their psychopathological manifestations. The interviewed inmates were asked three questions that addressed the suicide attempts they had committed while they were free and then during the time of the last incarceration and during the previous periods of incarceration. Therefore, the answers to these questions, along with the information concerning suicide attempts mentioned in the personal records of inmates, were analyzed simultaneously. The purpose was to determine a global indicator regarding the presence/absence of suicidal attempts in the psychopathological history of each participant. The current suicide risk was captured with the *Suicidal Behaviours Questionnaire-Revised* (SBQ-R; Osman *et al.*, 2001). The total score is an indicator of the current risk of committing suicide. In the present study, the value of internal consistency (total sample) was 0.89.

Statistical analyses

Raw data were analyzed using SPSS for Windows 16.0 (IBM SPSS, Chicago, Illinois, SUA). For all statistically significant differences, we estimated the effect size using the well-known *d* coefficient proposed by Cohen. The association relationships between categorial variables were computed using the χ^2 non-parametric test. For this test, the effect size was estimated by calculating the coefficients φ or *Cramér's V*, depending on the number of categories for the variables involved. In order to compare the percentage frequencies based on two independent groups, the *z* non-parametric test was used (Novak, 2003). For each significant difference, the effect size was estimated by calculating the value of *h* coefficient (Cohen, 1992).

By using the multiple linear regression analysis (standard method), we tested a predictive model where the dependent variable was the global current level of suicide risk (i.e., SBQ-R score). Only the independent (categorial or quantitative) variables that highlighted significant relationships with the dependent variable were taken into account (Dascalu *et al.*, 2008). Hence, we included only the categorial variables (e.g., nature of criminal offence depending on the presence/absence of violence or the presence/absence of SPD diagnosis) which had high size effects ($d \geq 0.80$) upon the SBQ-R score, as well as the quantitative variables that revealed correlations $\geq |\pm 0.30|$ with the SBQ-R score. In order to facilitate the interpretation of results, all categorial variables were recoded as dummy variables, as follows: a) 1 = inmates with SPDs *vs.* 0 = inmates without past/current mental disorders; b) 1 = violent offences *vs.* 0 = non-violent offences; c) 1 = family-of-origin temporarily/permanently disorganized *vs.* 0 = intact family-of-origin; d) 1 = history of self-harming behaviours *vs.* 0 = absent self-harming self-harming behaviours; e) 1 = perceived unhappy/pretty unhappy childhood and adolescence *vs.* 0 = perceived neither unhappy, nor happy/pretty happy/very happy childhood and adolescence. In order to test the predictive model where the dependent variable was suicidal antecedents, the binary logistic regression analysis was used. The explanatory power of this model was estimated by computing the R^2-Nagelkerke indicator (Sava, 2011).

Results

Predictors of current suicide risk

The presence/absence of stable intimate relationship, along with nature of criminal offence depending on the presence/absence of violence, number of convictions, status of the family-of-origin, socioeconomic status of the family-of-origin, presence/absence of a SPD diagnosis, frequency of health-risk behaviours, presence/absence of self-harming history and of suicide history throughout the course of life, and the global evaluation of childhood and adolescence had significant effects upon the SBQ-R score *(Table 1)*.

Table 1. Comparative data: DV = current suicide risk (total SBQ-R score)

Independent categorical variables	Subsamples	N	M	SD	t-Student	d
Education	No education/(? 4 grades)	46	6.21	5.12	1.80	-
	? 5 grades	292	4.79	3.78		
Stable intimate relationship	Present	203	4.49	3.44	2.87 **	0.35
	Absent	129	5.87	4.71		
Nature of the offence (last conviction)	Using violence	96	7.25	5.54	5.18 ***	0.81
	Without using violence	228	4.15	2.81		
Number of convictions	Multiple offenders	170	5.57	4.41	2.54 *	0.28
	First conviction	163	4.46	3.50		
Mother's smoking during pregnancy	Yes	53	6.24	4.98	1.99	-
	No/he did not know	280	4.80	3.78		
Mother as victim of physical aggressions during pregnancy	Yes	42	5.69	4.11	1.72	-
	No/he did not know	291	4.64	3.70		
Status of the family-of- origin	Temporarily/ permanently disorganized	61	6.31	4.75	2.40 *	0.40
	Intact	272	4.74	3.79		
Socioeconomic status in the family-of-origin	Low/below average	192	4.35	5.42	2.13 *	0.23
	Average/ above average	141	3.48	4.50		
SPD diagnosis	Present	77	9.16	5.64	8.18 ***	1.62
	Absent	256	3.78	2.21		
Health-risk behaviours	Very high/high/ pretty high	57	7.25	5.25	3.55 **	0.68
	Moderate/low/ very low	279	4.60	3.60		
Self-harming history	Present	52	10.11	5.51	7.68 ***	1.78
	Absent	281	4.09	2.83		
Suicide behaviour history [a]	Present	57	8.70	4.16	22.22 ***	3.25
	Absent	276	2.32	1.07		
Global evaluation of childhood and adolescence	Unhappy/pretty unhappy	36	9.00	5.71	4.62 ***	1.20
	Neither unhappy, nor happy/ pretty happy/very happy	288	4.49	3.46		

Note: [a] For the comparison by the independent variable concerning the presence/absence of suicidal behaviours in the participants's history, the SBQ-R score was recalculated by adding up only the scores for items 2, 3 and 4. The score for item 1 (regarding the history of ideation and of suicide attempts throughout the course of life) was not considered, in order to avoid overestimating the correlation between the presence/ absence of suicide history and the total SBQ-R score. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed)

The comparisons performed taking into account as dependent variable the score in item 4 of the SBQ-R (regarding the likelihood of committing a suicide attempt) have also revealed significant differences by (Table 2): education level, presence/absence of stable intimate relationship, violent nature of the criminal offence, number of convictions, mother's smoking during pregnancy, status of the family-of-origin, socioeconomic status of the family-of-origin, presence/absence of a SPD diagnosis, level of health-risk behaviours, presence/ absence of self-harming and suicide antecedents, and the self-evaluations of inmates taking into consideration the history of their own childhood and adolescence.

Table 2. Comparative data: DV = likelihood of committing a suicide attempt

Independent categorical variables	Subsamples	N	M	SD	t-Student	d
Education	No education/(≤ 4 grades)	44	1.66	2.40	2.61 *	0.57
	≥ 5 grades	289	0.67	1.63		
Stable intimate relationship	Present	203	0.57	1.51	- 2.84 **	0.34
	Absent	129	1.17	2.10		
Nature of the offence (last conviction)	Using violence	96	1.87	2.46	5.64 ***	0.90
	Without using violence	228	0.38	1.19		
Nr. convictions	Multiple offenders	170	1.05	2.04	2.66 **	0.29
	First conviction	163	0.54	1.41		
Mother's smoking during pregnancy	Yes	53	1.35	2.19	2.06 *	0.37
	No/he did not know	280	0.70	1.68		
Mother as victim of physical aggressions during pregnancy	Yes	42	1.83	2.33	0.49	-
	No/he did not know	291	1.65	1.44		
Status of the family-of-origin	Temporarily/ permanently disorganized	61	1.54	2.27	2.91 **	0.52
	Intact	272	0.64	1.61		
Socioeconomic status in the family-of-origin	Low/below average	192	0.98	1.94	2.26 *	0.24
	Average/ above average	141	0.56	1.51		
SPD diagnosis	Present	77	2.61	2.50	8.02 **	1.59
	Absent	256	0.26	1.00		
Health-risk behaviours	Very high/high/ pretty high	54	1.72	2.34	3.28 **	0.63
	Moderate/low/ very low	279	0.63	1.60		
Self-harming history	Present	52	2.98	2.63	6.92 ***	1.70
	Absent	281	0.40	1.21		
Suicide behaviour history	Present	57	3.68	2.35	11.00 ***	2.87
	Absent	276	0.21	0.80		
Global evaluation of childhood and adolescence	Unhappy/pretty unhappy	36	2.55	2.53	4.55 ***	1.18
	Neither unhappy, nor happy/ pretty happy/very happy	288	0.59	1.53		

Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed)

The SBQ-R score (i.e., current suicide risk) highlighted negligible correlations with both the age of inmates ($r = - 0.03$; $p = 0.487$) and the age of sexual life onset ($r = - 0.06$; $p = 0.252$). The correlation with the age of smoking onset was negative, statistically significant, but with a modest size ($r = - 0.24$; $p < 0.001$). The correlations with the score in disharmonic personality ($r = 0.40$; $p < 0.001$) and the climate within the family-of-origin ($r = - 0.41$; $p < 0.001$) were more consistent. Higher levels of suicide risk tended to associate with a higher predisposition of inmates towards disharmonic cognitive, emotional and behavioural structures characterizing them during adolescence, and with a more negative socio-affective climate in the families-of-origin, respectively. In addition, the suicide risk was associated positively with both the frequency of victimization by exposure to violence during childhood and adolescence ($r = 0.33$; $p < 0.001$), and the frequency of violent behaviours that the inmates reported to display during childhood and adolescence ($r = 0.37$; $p < 0.001$).

The prediction model where the dependent variable was the current suicide risk was statistically significant ($R = 0.69$; $F_R = 31.43$; $p < 0.001$). Together, all independent variables explained 48.1% (value adjusted by the number of independent variables and by the sample size = 46.6%) of the variance of the SBQ-R total score. *Table 3* summarizes the values of regression coefficients for all independent variables introduced in the model.

Table 3. Multiple linear regression analysis: DV = current suicide risk

Independent variables	B	SE	β
1. Climate of the family-of-origin (childhood and/ or adolescence)	- 0.005	0.18	- 0.002
2. Violence-driven victimization (childhood and/ or adolescence)$_n$	0.08	0.54	0.009
3. Disharmonic personality (adolescence)	1.14	0.29	0.20 ***
4. Violent behaviours (childhood and/ or adolescence)	0.22	0.53	- 0.02
5. Health-risk behaviours	0.81	0.49	0.07
6. Self-harming history	2.64	0.58	0.23 ***
7. Nature of the offence (last incarceration)	- 0.04	0.48	- 0.005
8. Global evaluation of childhood and adolescence	1.44	0.63	0.11 *
9. SPD diagnosis	3.41	0.63	0.34 ***

Note: The regression model included the * $p < 0.05$; *** $p < 0.001$ (two-tailed)

The score in disharmonic personality during adolescence, along with presence of self-harming history, negative evaluation made by inmates taking into account all persons, events and situations that had marked their childhood and adolescence, and the presence of a SPD diagnosis were positive predictors of the current suicide risk. Among these predictors, the presence of a SPD diagnosis had the most consistent unique contribution (4.88%) to the explanation of differences between inmates regarding the SBQ-R score. Moreover, the presence of self-harming history and the disharmonic personality during adolescence had unique contributions worth mentioning (3.45%, 2.56%, respectively). The global evaluation of childhood and adolescence had a much more modest contribution (0.86%).

Table 4 shows the values of regression coefficients for the model where the dependent variable was likelihood of committing a suicide attempt (the score in item 4 of the SBQ-R). The model was statistically significant ($R = 0.72$; $F_R = 38.29$; $p < 0.001$). Together, all independent variables accounted for 51.8% (adjusted value = 49.9%) of the variance in likelihood of committing a suicide attempt.

The positive predictors of likelihood of committing a suicide attempt were the low level of education, disorganized family-of-origin, higher frequency of violence-driven victimization experiences during childhood and adolescence, presence of suicidal antecedents as well as of self-harming antecedents, and the presence of a SPD diagnosis. The negative climate within the family-of-origin was a negative predictor. The most consistent unique contribution to the explanation of variance in likelihood of committing a suicide attempt was the presence of suicidal antecedents (21.71%).

Table 4. Multiple linear regression analysis: DV = likelihood of committing a suicide attempt

Independent variables	B	SE	β
1. Education	0.66	0.17	0.12 ***
2. Situation in the family-of-origin	0.47	0.14	0.10 **
3. Nature of the offence (last conviction)	0.29	0.16	0.07
4. Climate of the family-of-origin (childhood and/ or adolescence)	- 0.12	0.06	- 0.08 *
5. Violence-driven victimization (childhood and/ or adolescence)	0.50	0.18	0.11 **
6. Disharmonic personality (adolescence)	0.19	0.09	0.08
7. Violent behaviours (childhood and/ or adolescence)	0.05	0.18	0.01
8. Health-risk behaviours	0.06	0.16	0.01
9. History of suicidal behaviour	0.75	0.18	0.57 ***
10. Self-harming history	0.56	0.19	0.11 **
11. Global evaluation of childhood and adolescence	0.10	0.21	0.01
12. SPD diagnosis	0.72	0.21	0.16 **

Note: The regression model included the constant. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed)

In addition, the low level of education (1.39%), disorganized family-of-origin (1.02%), and the presence of a SPD diagnosis (1.08%) displayed unique contributions over 1%. The contributions of the climate within the family-of-origin (0.64%), frequency of violence-driven victimization during early socialization (0.73%), and the presence of self-harming antecedents (0.77%) were much more modest.

Predictors of past suicide attempts

Both among inmates without mental disorders in the medical history or in the present ($\chi^2 = 180.92$; $p < 0.001$; *Cramér's* $V = 0.84$) and among inmates diagnosed with SPDs ($\chi^2 = 77$; $p < 0.001$; *Cramér's* $V = 1$), the answers to the first item of the SBQ-R were associated significantly with the presence/absence of suicidal antecedents. Concerning the noticed associations, effect sizes were very high. These results represent a test for the validity of the answers provided by inmates to the items concerning suicide history.

The analysis of suicidal antecedents involves the collection of information about a wide range of vulnerabilizing factors that act together throughout the course of life, thus precipitating suicide ideation, as well as the planning and application of the suicidal gesture. Thus, a consistent body of literature reveals consistent correlations between suicidal spectrum throughout the course of life and a person's likelihood of engaging in behaviours entailing risks for physical and mental health, such as smoking, alcohol and/or drug abuse or self-harming behaviours (Joiner *et al.*, 2005; King *et al.*, 2001; Yoshimasu *et al.*, 2008). Taking into account the aforementioned considerations, the study of predictors of suicidal antecedents among inmates becomes relevant, mostly if we consider the subpopulation of inmates with severe mental conditions, such as schizophrenia, depression or personality disorders. Often, suicidal gestures are expressions of some vulnerabilizing personality traits, emerging due to the interaction between an acute (Checherita *et al.*, 2016 a, b) or chronic pathological background (Carausu *et al.*, 2016 a, b) and certain stress-generating life circumstances. For this reason, our purpose was to explore the level of engagement in health-risk behaviours depending on the presence/absence of psychiatric diagnosis. The level of past and current health-risk behaviours was determined using simultaneous analysis and categorization depending on certain answers provided by inmates. The descriptive analysis shows that, from among inmates that reported very high/high/pretty high level of health-risk behaviours (N = 57), 52.6% had a SPD diagnosis, whereas the rest had no mental disorders in their medical history or in the present. On the other hand, among the inmates with moderate/low/very low level of health-risk behaviours (N = 281), only 18.5% had a SPD diagnosis in their medical history or in the present, whereas 81.5% did not report any mental disorder. Upon analyzing the percentage distributions for the level of health-risk

behaviours in the subsamples of inmates differentiated by psychiatric status, it was concluded that 36.6% of the inmates diagnosed with SPDs (compared to only 10.5% of those without mental disorders) met the criteria for the very high/high/pretty high level of health-risk behaviours. The difference between the two proportions was statistically significant ($z = 4.62$; $p < 0.001$), but with a modest effect size ($h = 0.27$).

In the prison population, self-harming behaviours recorded a much higher prevalence than in the community population. Around a third of the inmates report self-harming antecedents, without a suicidal character (Dixon-Gordon, Harrison & Roesch, 2012). On the other hand, it is well documented that the frequency of suicide tend to be associated with the frequency of self-harming antecedents (Hawton, Houston & Shepperd, 1999; Loughran & Seewoonarain, 2005). Deliberate self-harming behaviours represent one of the strong predictors of failed suicide attempts (van Egmond & Diekstra, 1989) or finalized suicide attempts (Gunnell & Frankel, 1994; Sakinofsky, 2000), even in studies where the effects of sociodemographic characteristics (e.g., gender or age) and of the presence of psychopathological symptoms were controlled (Joiner *et al.*, 2005). In addition, self-harming antecedents (without a suicidal intention) were highlighted among the robust predictors of suicide attempts among inmates (Almasi *et al.*, 2009; Borrill, 2002). The conceptual considerations and empirical evidence referred to above delimited our objective of studying the relationship between suicidal antecedents and the history of self-harming behaviours. Upon analyzing the prevalence of self-harming antecedents throughout the course of life, it has been noted that among inmates with antecedents ($N = 56$), 75% were known to have a SPD diagnosis, whereas the rest did not suffer from mental disorders. From among the inmates without self-harming antecedents ($N = 282$), only 14.2% had a SPD diagnosis. Upon analyzing the prevalence of self-harming antecedents depending on the psychiatric status of inmates, it was concluded that 51.2% of inmates diagnosed with SPDs (compared to only 5.4% of those without mental disorders) had self-harming antecedents. We found a statistically significant difference ($z = 8.04$; $p < 0.001$) between the two groups, with a moderate effect size ($h = 0.48$).

Suicidal antecedents were associated with the psychiatric status depending on the presence/absence of a SPD diagnosis ($\chi^2 = 78.12$; $p < 0.001$; $\varphi = 0.48$), with a high effect size. Thus, among the inmates that reported suicide attempts in their medical history, 67.7% were diagnosed with at least one type of SPD. Among inmates without suicide antecedents, the SPD diagnosis represented a minority (14.5%). On the other hand, 51.2 % of the inmates with SPDs (compared to only 7.8% of those without mental disorders) reported past suicide attempts. The difference between the prevalence of suicidal antecedents depending on psychiatric status was significant ($z = 7.53$; $p < 0.001$), with a moderate effect size ($h = 0.46$).

Inmates with a history of suicidal manifestations did not differ from those without suicidal antecedents in terms of age (t = - 0.15; p = 876) and of age at sexual life onset (t = - 0.28; p = 0.774). On average, inmates with suicidal antecedents had started smoking much earlier compared to the age of smoking onset among inmates without past suicide attempts (t = - 3.03; p < 0.01). However, for the aforementioned difference, the effect size was moderate. Moreover, compared to inmates without suicidal antecedents, those who reported having engaged in suicide behaviours throughout their course of life obtained a lower mean score (t = - 4.79; p < 0.001; d = 0.74) for the climate within the family-of-origin. On the other hand, compared to inmates without suicidal manifestations in their personal history, those reporting suicidal antecedents displayed higher mean scores for disharmonic personality during adolescence (t = 6.13; p < 0.001; d = 1.19), victimization by exposure to violence throughout childhood and/or adolescence (t = 4.05; p < 0.001; d = 0.82), and frequency of their own violent behaviours (t = 4.49; p < 0.001; d = 0.87).

Suicidal antecedents were also associated with the number of convictions for criminal offences (χ^2 = 8.33; p < 0.01; φ = 0.16). However, for this association, the effect size was modest. Around a quarter of multiple offenders had committed at least one suicide attempt throughout their course of life (compared to only 12.1% of the inmates convicted for the first time). The difference between the two percentages was significant (z = 2.93; p < 0.01), with a low effect size (h = 0.12). The suicidal antecedents displayed a significant association with the nature of the offence (χ^2 = 21.57; p < 0.001). The effect size was moderate (φ = 0.25). Thus, over a third of the inmates convicted for offences committed using violence reported suicidal antecedents, whereas only 12.2% of the inmates with convictions for non-violent offences reported suicidal manifestations in their personal life history. A significant difference (z = 4.19; p < 0.001) was obtained between the two proportions. However, the effect size was low (h = 0.22). Another variable that presented a significant association with suicidal antecedents was the level of health-risk behaviours (χ^2 = 22.17; p < 0.001). For this association, the effect size was moderate (φ = 0.25). Approximately 49% of the inmates with suicidal antecedents reported a very high/high/pretty high level of health-risk behaviours. Only 13.8% of the inmates who displayed a moderate/low/very low level of health-risk behaviours reported suicide attempts in their personal history. The difference between the two proportions was significant (z = 4.61; p < 0.001), with a low-to-moderate effect size (h = 0.37). Suicidal antecedents were also associated consistently with the presence/absence of self-harming antecedents ($\div^2$ = 73.81; p < 0.001; φ = 0.46). Around 59% of the inmates with self-harming antecedents (compared to only 10.2% of those without self-harming behaviours) reported at least one suicide attempt throughout their course of life. The difference between the two proportions was significant and it had a moderate effect size (z = 9.10; p < 0.001; h = 0.46). A significant association (χ^2 = 39.26; p < 0.001; φ = 0.35) was noted between suicidal antecedents and the global evaluation inmates made

considering all positive and negative aspects of their childhood and adolescence. Over 52% of the inmates who evaluated their own childhood and adolescence as unhappy/pretty unhappy (compared to only 11.8% of the inmates who considered their childhood and adolescence as neither unhappy, nor happy or as pretty happy/ happy) reported suicidal antecedents. The difference between the two groups of inmates was significant ($z = 4.82$; $p < 0.001$), with a moderate effect size ($h = 0.43$).

Because the dependent variable represented by the presence/absence of suicide attempts throughout the course of life was categorial, the prediction model was tested using the binary logistic regression analysis. Table 5 summarizes the values of unstandardized and exponentialized regression coefficients as well as the values of the Wald test to determine statistical significance. Concerning exponentialized regression coefficients, confidence intervals with a probability of 95% were indicated.

The global prediction model was statistically significant ($\chi^2 = 91.79$; $p < 0.001$). The explanatory power was moderate (R^2-Nagelkerke = 0.424). The predictors of suicidal antecedents among surveyed inmates were the violence-driven victimization throughout childhood and/or adolescence, disharmonic personality during adolescence, presence of self-harming antecedents, global evaluation of childhood and adolescence, and the presence of a SPD diagnosis. Compared to inmates who had not experienced victimization by direct exposure to violence, those who had been often the victims of violent acts reported a 2.56 higher risk (i.e., 156% more chances) of displaying suicidal manifestations throughout their course of life. Compared to inmates whose personality during adolescence featured no severe signs of disharmony, inmates who reported a disharmonic organization showed a 1.71 higher risk (i.e., 71% more chances) of engaging in suicidal behaviours throughout their lives.

Table 5. Data of binary logistic regression analysis: DV = past suicide attempts

Independent variables	B	SE	Wald	Exp (B)	95 % CI for Exp (B)	
					Lower limit	*Upper limit*
1. Climate of the family-of-origin (childhood and/ or adolescence)	0.31	0.21	2.22	1.36	0.90	2.06
2. Violence-driven victimization (childhood and/or adolescence)	1.09	0.49	3.88 *	2.56	0.97	5.72
3. Disharmonic personality (adolescence)	1.03	0.27	3.79 *	1.71	0.99	2.96
4. Violent behaviours (childhood and/or adolescence)	0.20	0.50	0.16	1.22	0.45	3.23
5. Health-risk behaviours	- 0.74	0.46	2.57	0.47	0.19	1.18
6. Self-harmin g antecedents	- 1.11	0.47	5.40 *	0.33	0.12	0.84
7. Nature of the criminal offence	0.62	0.60	1.05	1.86	0.56	6.10
8. Global evaluation of childhood and adolescence	- 1.11	0.54	4.20 *	0.32	0.11	0.95
9. SPD diagnosis	-2.00	0.67	8.89 **	0.13	0.03	0.50

Note: The regression model included the constant.* $p < 0.05$; ** $p < 0.01$ (two-tailed)

In comparison to inmates who did not report self-harming behaviours in their personal history, those with self-harming antecedents showed a 67% higher risk of also engaging in suicidal behaviours. Two other risk factors for the presence of suicidal antecedents were the negative evaluation of experiences during childhood and adolescence (this variable was associated with a 68% higher risk of displaying suicidal behaviours) and the presence of a SPD diagnosis (this variable was associated with an 87% higher risk of attempting suicide).

Discussion

The purpose of this study was to explore the role SPDs diagnosed among imprisoned males have in the prediction of past and current suicide risk. It is well documented that, compared to other clinical entities (depression excluded), personality disorders (mostly those involving severe manifestations and risks for patients, caretakers and the social environment) increase the suicide risk (Brodsky *et al.*, 1997; Gerson & Stanley, 2002; Soloff *et al.*, 2000; Yen *et al.*, 2003, 2004). According to several studies focused on identifying the factors contributing to suicidal behaviours among inmates, SPDs play a consistent predictive role (Black *et al.*, 2010; Jenkins *et al.*, 2005; Kullgren, Tengstrom & Grann, 1998). In the current sample of male inmates convicted for a wide range of offences, the presence of a SPD diagnosis associated with both the presence of suicide antecedents throughout the course of life and higher current suicide risk. The SPD diagnosis associated with an 87% higher risk of suicide attempts throughout the course of life. In addition, the presence of a SPD diagnosis explained 4.88% of the variance of the SBQ-R score. Our findings are consistent with data reported in a study assessing the associations between the severity of specific PD symptoms (e.g., BPD, schizotypal or schizoid personality disorders), likelihood of engaging in suicide behaviours and the level of stress among imprisoned males (Lamis, Langhinrichsen-Rohling & Simpler, 2008). In a case-control study conducted on a sample of 242 male inmates who were treated for various mental disorders, the deliberate self-harming behaviours were significantly associated with lower age, drug abuse and the presence of BPD diagnosis (Young, Justice & Erdberg, 2006). In another study conducted by Foster, Gillespie, McClelland and Patterson (1999), the presence of at least one PD diagnosis (regardless of the DSM-III-R cluster) was associated with an approximately 15 times greater risk of finalizing a suicide attempt.

Suicide risk increases when it is associated with the crisis episodes specific to PDs, mostly to the severe ones. During such episodes, the suicide act is often either demonstrative or manipulative (Perry & Vaillant, 1989), or impulsive (Brodsky *et al.*, 1997; Soloff *et al.*, 2000) and it does not necessarily involve a wish to actually die. However, except for the suicide risk associated to crisis

episodes, patients diagnosed with personality disorders may display chronic suicidal behaviour, mostly in cases that do not improve clinically (Kernberg, 1987; Paris, 2004). For instance, in case of severely disordered (Aminov *et al.*, 2014) patients who display clinical complications (Checherita *et al.*, 2013) due to unsuccessful treatments (Vitalariu *et al.*, 2015), death often comes after a finalized suicide attempt, which completes a long history of suicidal behaviour. It is well known that BPD increases the risk of committing a failed or finalized suicide attempt, because of low social skills, high level of impulsivity and emotional instability (Trull, Stepp & Solhan, 2006). Furthermore, through its implications in the psychosocial functioning of inmates, imprisonment (mostly when the person has to serve a long or lifetime term) may complicate the specific PD symptomatology, thus favouring genuine psychological crises among inmates, which may also entail suicidal manifestations. Often, the crisis occurs in the first days post-incarceration, when the risk of suicide behaviours is higher and is associated with a feeling of helplessness and despair (Shaw *et al.*, 2004).

In the current sample of inmates, the presence/absence of suicide antecedents throughout the course of life was the most consistent predictor for the likelihood of committing a suicide attempt. This variable explained over 21% of the variance of the score obtained by inmates in the last item of the SBQ-R. This finding is convergent with data reported by other studies conducted on samples of patients with diverse personality disorders and on samples of inmates displaying an elevate level of suicide risk (Blaauw, Kerkhof & Hayes, 2005; Fruehwald *et al.*, 2004; Green *et al.*, 1993; Soloff *et al.*, 1994). Another significant finding concerns the role of self-harming behaviours. Thus, the presence/absence of self-harming antecedents was a predictor for all indicators of suicide risk. The history of deliberate self-harming behaviours explained 3.45% of the differences between inmates regarding the SBQ-R score. This finding is convergent with data reported in previous studies (Neeleman, 2001; Yoshimasu *et al.*, 2008).

Nevertheless, this current study has a number of limits. Thus, the sample of inmates diagnosed with SPDs comprised only males. Moreover, the PD diagnoses were not cross-validated, due to administrative constraints concerning the time allocated for interviews. Therefore, the clinical stage of each participant was determined only by analyzing the personal forensic record and by general clinical observations made during the interviews. It is also worth noting that around a quarter of the inmates with SPDs also had other mental disorders (in various combinations). However, the very scarce number of these inmates and the disproportioned repartition of their mental disorders prevented us from making any comparison regarding suicide risk and from including the other mental disorders in the predictive models. The data collection method is another limit of our study. Thus, interviews were based on inmates' reports, which required them to recall mainly negative familial and emotional experiences lived during their own childhood and adolescence. However, some of these statements may not have been

genuine, if we take into account: a) the practice of declarative and/or behavioural dissimulations and simulations, i.e. exaggerating or minimizing mental disorder symptoms by inmates (Rogers & Shuman, 2005); b) the (unconscious) factors and mechanisms contributing to the partial or extended distortion of memories related to early traumatic experiences, such as sexual abuse (Ganaway, 1989; van der Kolk *et al.*, 1996).

One of the research directions that we are interested in is the comparison of suicide risk associated with SPDs in the population of inmates (both males and females) with the risk associated to other psychiatric conditions (e.g., depressive disorders, bipolar disorder or schizophrenia) acknowledged as entailing complications in the suicide spectrum (Baillargeon *et al.*, 2009; Fulwiler, Forbes, Santangelo & Folstein, 1997; Rivlin, Hawton, Marzano & Fazel, 2010).

Conclusions

Suicidal behaviours are recognized as one of the most frequent complications of PDs, mainly of the severe ones. On the other hand, consistent empirical evidence shows that PDs represent a risk factor for suicidal acts among imprisoned persons. In Romania, the literature that concerns with the issue of suicide in the prison population is relatively scarce. The present study responds to a need of investigating the factors contributing to the prediction of suicide risk throughout the course of life among imprisoned persons. Among the inmates we have interviewed, the predictors of past suicide attempts were violence-driven victimization during early socialization, disharmonic personality organization during adolescence, past self-harming behaviours, negative global evaluation of childhood and adolescence, and a SPD diagnosis. The predictors of current suicide risk were disharmonic personality during adolescence, presence of self-harming antecedents, and of a SPD diagnosis. Furthermore, the likelihood of committing a suicide attempt turned out to be higher among inmates with suicide antecedents. These findings suggest that SPDs must be taken into consideration when elaborated or revising prevention programs for self-destructive behaviours in the prison population.

Acknowledgements

This publication benefited from the financial support of the project "Programme of excellency in the multidisciplinary doctoral and post-doctoral research of chronic diseases", contract no. POSDRU/159/1.5/ S/133377, beneficiary Grigore T. Popa University of Medicine and Pharmacy of Iasi, project co-financed from the European Social Fund through the Sectoral Operational Programme Human Resources Development (SOP HRD) 2007-2013".

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