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Neurocognitive Impairment and Suicide Risk among Prison Inmates

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Abstract

Background: Worldwide, prisoners are at high risk of suicide. Reducing the number of suicides in jails and prisons is an international priority. Several risk factors for suicide attempts, such as historical, prison-related, psychosocial and clinical factors, have been found in prisoners. We assessed whether demographic, conviction-related and neuro-behavioral variables might be associated with current suicide risk and lifetime suicide attempts in two large central Italy prisons.

Methods: On a preliminary sample of 254 detainees within an ongoing project, we assessed whether demographic, conviction-related, psychiatric, cognitive variables and illness comorbidity might be associated with current suicide risk and lifetime suicide attempts in two large central Italy prisons. Psychiatric disorders and suicide risk was evaluated using the Mini International Neuropsychiatric Interview. We also have identified the detainees with clear-cut previous suicide attempts. The cognitive function was assessed with a brief neuropsychological battery including trail making A, trail making B, Digit Span, and Symbol Digit test. Impulsivity was assessed with the Barratt Impulsiveness Scale. Cumulative illness was evaluated with Charlson Comorbidity Index.

Results: Impairment in global cognitive function was the strongest predictor of both high suicide risk and lifetime suicide attempts (both $p<0.001$), independently of psychiatric disorders, psychopharmacological treatment, detention status, conviction time, substance use disorder, impulsivity, and illness comorbidity. **Limitation**: Cross-sectional study design and relatively small sample size.

Conclusion: Cognitive deficits may improve our understanding of the suicidal vulnerability and should be systematically included in the assessment of suicide risk, as potential predictors of suicidal acts and targets of preventive interventions.

Keywords: prison inmates, suicide risk, cognitive impairment, suicide prevention

Highlights

- Cognitive impairment is an independent predictor of high suicide risk in inmates
- Cognitive impairment is strongly related to lifetime suicide attempts in inmates
- Cognitive assessment in prisons may improve understanding of suicidal vulnerability

Introduction

Prisoners' health is a worldwide problem and represents one of the major challenges for public health. The inmates tend to show high rate of morbidity at admission, especially for chronic diseases, cognitive dysfunction and psychiatric disorders (Fazel et al., 2016; Fazel and Danesh, 2002; Kavanagh et al., 2010). It has been widely reported that prisoners have higher rates of mental disorders as compared with the general population, including psychosis, depression, personality disorders and substance misuse, which are risk factors for elevated suicide rates and premature mortality (Fazel et al., 2016; Fazel and Danesh, 2002). Suicide rates in inmates of both sexes are far higher than in the general population in many countries (Fazel et al., 2011). A number of independent risk factors for near-lethal suicide attempts have been found in male and female prisoners. These include historical (or lifetime) factors that may make a person vulnerable to suicide (e.g., childhood trauma), prison-related factors, psychosocial factors and clinical characteristics (Fazel et al., 2008). More recently, neurocognitive studies support the concept of vulnerability to suicidal behavior associated with certain neuropsychological deficits (Jollant et al., 2011; Richard-Devantoy et al., 2014). Reducing the number of suicides in jails and prisons is an international priority (World Health Organization, 2007) and many countries have released national standards and guidelines for suicide prevention in custodial settings (Daigle et al., 2007). Guidelines for suicide prevention recommend early screening of prisoners at first reception to custody, actions taken in response to positive screening, and ongoing risk monitoring (Konrad et al., 2007). We intended to assess whether demographic, conviction-related and neuro-behavioral variables might be associated with current suicide risk (SR) and lifetime suicide attempts (LSA) in two large central Italy prisons.

Methods

Design, participants and procedures. The high-security prison of Teramo (Abruzzo, Italy) and the prison of Pescara (Abruzzo, Italy) are the main correctional institutions in the Region of Abruzzo. This study was performed by personnel from Pescara General Hospital, Fondazione Onlus Caritas, Pescara, Italy, Centro Lotta Emarginazione e Droga (CLED), Pescara, Italy, and Italian Society for Prison Health and Medicine (SIMSPe), a nation-wide scientific society among infectivologists and psychiatrists working in Italian jails. Once the study was approved by prison authorities and the local Ethics Committee in Pescara, all inmates

were consecutively asked to participate in a cross-sectional study on health conditions of prisoners, started on June 2013 and still ongoing. Here we reported results of a preliminary analysis on 254 detainees recruited until October 2015. The investigation was carried out in accordance with the latest version of the Declaration of Helsinki. Two working groups were created. The first consisted of 10 professional educators who had the first contact with the inmates willing to participate, explained the study in detail and collected socio-demographic data (age, education level, and marital status). The other working group included 3 psychologists and 3 psychotherapists, with experience in the screening of psychiatric disorders and cognitive function. This working group was constantly supervised by psychiatrists in the prison. Eligible detainees were those at least 18 years of age, either sex, able to provide informed consent and with sufficient command on the Italian language to go through structured interviewing.

Educators exposed the characteristics and purpose of the study to all eligible detainees, collected their willingness to participate, disclosed they would not receive any financial compensation, privileges, or any other special benefit, such as a reduced sentence, for participating in the study. In the next step, detainees were invited to sign the informed consent and thereafter underwent a psychiatric and neuropsychological evaluation. The same operator assessed in a single session psychiatric disorders using a structured interview, cognitive functions with a brief neuropsychological battery test, and impulsiveness using a self-report questionnaire. The entire examination lasted about 60-80 minutes.

Assessment of psychiatric disorders. Psychiatric disorders were rated using the Mini International Neuropsychiatric Interview (MINI) version 5.0 (based on DSM-IV criteria), (Sheehan et al., 1998). The MINI was used as a screening tool for current and past major mental disorders and substance use disorders, including either abuse and dependence (in this study we have collapsed substance abuse and dependence disorders into a single category). *Assessment of current suicidal risk and lifetime suicide attempts*. Suicidal risk was assessed by the MINI suicide risk module. The MINI suicidality module was used to determine the current suicide risk. It consists of nine questions relevant to suicidal behavior. The questions (score for a positive response) were as follows: 1) intentional accident; 2) death wish; 3) self-harm wish; 4) suicide idea; 5) suicide plan; 6) suicide plan with preparation; 7) deliberate injuring of oneself; 8) suicide attempt in the past month; and 9) suicide attempt in lifetime. The final score makes it possible to stratify the current SR in

several levels of severity: in the present work current SR has been stratified in no SR, overall SR (including low-moderate and high SR) and high SR (HSR). Furthermore, based on the available clinical archives, we have identified the detainees with clear-cut previous suicide attempts (lifetime suicide attempts: LSA), including self-cutting, hanging, and self-poisoning, for example by drug overdosing. Suicide attempt was defined as intentional self-harm that required medical treatment in an emergency care unit. Self-harm, without the clear suicidal intention was not considered attempting suicide.

Neurocognitive assessment. A neuropsychological battery including Trail-Making A (sustained attention), Trail-Making B (task switching), Digit Span (working memory), Symbol Digit test (processing speed) was administered to participants. A standardized z-score was calculated by subtracting the appropriate Italian healthy population normative mean from the raw score and then dividing by the normative standard deviation (SD), (Amodio et al., 2002; Mondini et al., 2011). A composite neuropsychological summary (CNS-4) z-score, reflecting executive function, was calculated by averaging z-scores from each test. Standardized z-scores of each individual test and of CNS-4 were all dichotomized based on a threshold of 1.5 SD below the mean (i.e.<-1.5), with values below this threshold defining neurocognitive impairment. *Assessment of impulsivity*. The impulsive personality trait was assessed with the Barratt Impulsiveness Scale (BIS-11). The BIS-11 has a total score based on 3 subscales; motor impulsiveness, attention impulsivity and non-planning impulsivity (Fossati et al., 2001). *Cumulative illness evaluation*. Disease records were used to generate the Charlson Comorbidity Index (CCI) composite comorbidity scores (Charlson et al., 1994). With this index, a patient's composite CCI score is calculated as a weighted sum of the presence of 19 documented health conditions such as Congestive Heart Failure, AIDS, Diabetes, or Peripheral Vascular Disease. The CCI score was dichotomized using the 95th percentile as the cutpoint (>1 vs. 0-1).

Statistical analysis

At the univariate analysis, odds ratios (ORs) and the corresponding 95% confidence intervals (CIs) were used to estimate the association between LSA, overall SR and high SR, and patients' characteristics. We selected the variables significantly associated to each disorder, and included them, as appropriate, in the regression models, to perform the multivariate analyses. Data analysis was conducted with SAS for Windows version 9.4 (SAS Institute Inc, Cary, NC).

Results

The preliminary sample of inmates who agreed to participate in this ongoing study was 254 (after exclusion of 194 prisoners for language barriers, 21 for severe mental retardation, 18 for unwillingness to take part in the study, 29 for not signing the informed consent after initial acceptance to participate in the study). On multivariate analysis, neurocognitive impairment, as reflected by the explored domains, was the strongest predictor of both HSR and LSA, independently of current and past psychiatric disorders, psychopharmacological treatment, detention status, conviction time, substance use disorder, impulsivity, and illness comorbidity (Table 1). The raw scores of neuropsychological tests in the population of detainees as a whole and stratified according to LSA and HSR are detailed in Table 2. Compared with detainees with no SR, cognitive performance was significantly lower in those with both HSR ($p<0.001$ for any considered domain and CNS-4) and Overall SR ($p<0.001$ for any considered domain and CNS-4, except for task switching, $p=0.0073$) (Figure 1-A). Consistently, cognitive performance was significantly lower in detainees with LSA *vs.* no LSA (Figure 1-B). Interestingly, 66% (n=31) of inmates with current HSR had a history of lifetime suicide attempts, and conversely, about three-quarters (74%) of detainees without LSA were categorized as no SR at the psychiatric assessment.

Discussion

Research within prison samples has previously reported a high prevalence of traumatic brain injury, neurocognitive deficits, and attention deficit hyperactivity disorder (Durand et al., 2016; Kavanagh et al., 2010; Young et al., 2014). Neurocognitive alterations represent relevant vulnerability factors and potential endophenotypes of suicidal behavior (Richard-Devantoy et al., 2014). Indeed, a growing literature has reported cognitive deficits in patients with a history of suicidal acts as compared with non-suicidal patients and healthy controls (Jollant et al., 2011; Mann, 2003; Richard-Devantoy et al., 2015; Richard-Devantoy et al., 2014). However, neurocognitive functions have received little consideration in the suicide risk assessment among prisoners. To our knowledge, ours is the first study that correlates cognitive performance with the suicide risk in detainees. A recent neurocognitive model of suicidal behavior suggests that the alteration of some cognitive functions may facilitate the development of a suicidal crisis during stressful

circumstances independently of psychiatric comorbidity (Jollant et al., 2011; Mann, 2003; Richard-Devantoy et al., 2015). Putative genetic and molecular markers for self-harm behavior, involving abnormalities at the neurochemical and cellular level, have been described (van Heeringen and Mann, 2014b). Structural and functional MRI studies revealed regional brain structural abnormalities in patients who have a history of self-harm and deficits of the associated brain functions (known as neurocognitive correlates) (van Heeringen et al., 2014a). These neurocognitive factors may act as objective markers of self-harming behavior, overcoming the problem of self-reporting biases (van Heeringen and Mann, 2014b). Moreover, selected studies suggest that particular neurocognitive factors and specific cognitive tasks may have a role as predictors of repetition of self-harm (de Cates et al., 2017). In agreement with this body of evidence, in our cohort of inmates, poor cognitive performance was associated with higher current suicide risk, and with higher probability of LSA, independently of the presence of psychiatric comorbidities (with particular reference to anxiety disorders) and of impulsivity-prone behavior, known to be related to suicide risk and self-harm behavior. Interestingly, working memory was one of the cognitive domains more deeply affected in detainees with HSR and LSA. Previous studies on suicide attempters showed that working memory deficits were negatively correlated with cognitive inhibition (Richard-Devantoy et al., 2015).

Limitations of this study include lack of prospective observation and the relatively small sample size. Moreover, cognitive function has been assessed through a brief neuropsychological battery of tests. However, our choice was based on the higher sensitivity of these tests as compared to others.

In conclusion, cognitive deficits, besides improving our understanding of the suicidal vulnerability, should be systematically included in the assessment of suicide risk, as potential predictors of suicidal acts and targets of preventive interventions.

Declaration of interest: None

Contributors: Dr. Parruti and Dr. Vadini and had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. **Study concept and design**: Vadini, Parruti, Ricci, Santilli. **Acquisition, analysis, or interpretation of data**: Parruti, Vadini, Ricci, Santilli, Verrocchio, Calella, Sciacca, Fulcheri, Pieri, De Risio. **Drafting of the manuscript**: Vadini, Parruti, Ricci, Santilli, Verrocchio, Calella, Sciacca, Fulcheri, Pieri. **Critical revision of the manuscript for**

important intellectual: Parruti and Vadini. **Statistical analysis**: Ricci and Vadini. **Administrative, technical, or material support**: Sciacca, Vadini, De Risio. **Study supervision**: Parruti, Vadini, Fulcheri, Verrocchio, Santilli.

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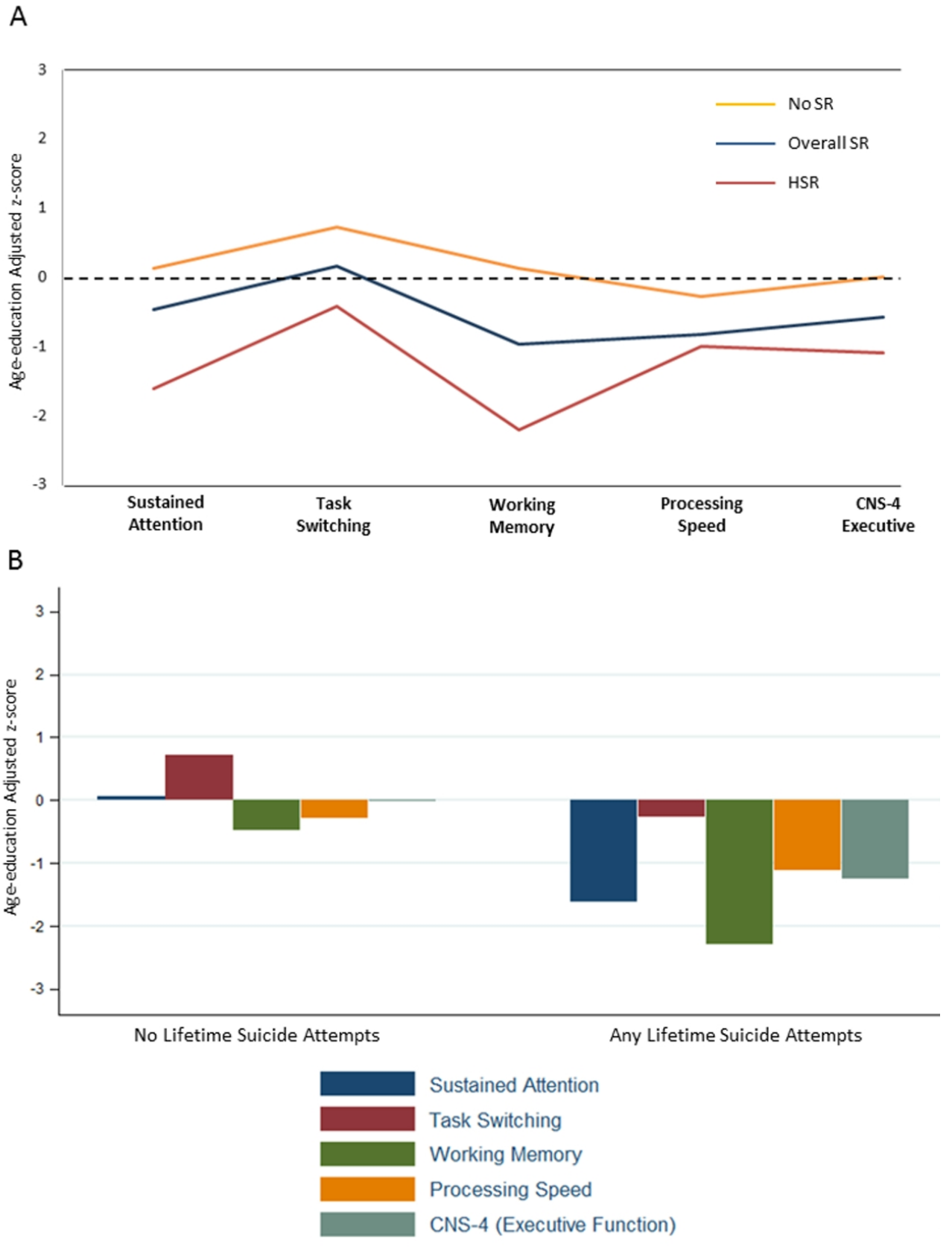
Figure legends

Fig 1 (A) Neurocognitive performance and current suicide risk. Median neuropsychological age-education adjusted z-score across four domains of function and composite neuropsychological summary (CNS-4) in detainees with no suicide risk, overall suicide risk and high suicide (No SR vs. Overall SR: $p<0.001$ for any considered domain and CNS-4, except for task switching $p=0.0073$; Overall SR vs. HSR: sustained attention $p=0.014$, task switching $p=0.0036$, working memory $p<0.001$, processing speed $p<0.001$, CNS-4 $p<0.001$). **(B) Neurocognitive performance and lifetime suicide attempts**. Median neuropsychological age-education adjusted z-score across four domains of function and composite neuropsychological summary (CNS-4) in detainees with and without lifetime suicide attempts (No LSA vs. LSA: $p<0.001$ for any considered domain and CNS-4).

SR=suicide risk; **HSR**=high suicide risk; **LSA**=lifetime suicide attempts


A
3
2
1
0
-1
-2
-3
Age-education Adjusted z-score
No SR
Overall SR
HSR
Sustained Attention
Task Switching
Working Memory
Processing Speed
CNS-4 Executive
B
3
2
1
0
-1
-2
-3
Age-education Adjusted z-score
No Lifetime Suicide Attempts
Any Lifetime Suicide Attempts
Sustained Attention
Task Switching
Working Memory
Processing Speed
CNS-4 (Executive Function)

Variable	Total	Overall SR	High SR	LSA	Overall SR	High SR	LSA
	N (%)				AOR (95% CI)		
Age range [N=254]							
18-35 y	96 (37.8)	28 (29.5)	13 (13.7)	10 (10.5)	1	1	1
36-55 y	132 (52.0)	56 (42)	30 (22.5)	24 (18)	**3.3 (1.5-7.1)** [b]	**4.0 (1.5-10.9)** [a]	**3.8 (1.3-11.2)** [a]
≥56 y	26 (10.2)	11 (42.3)	4 (15.4)	4 (15.4)	**4.0 (1.2-13.9)** [b]	4.0 (0.8-20.0)	3.2 (0.6-18.7)
Sex							
Male	235 (92.5)	84 (36)	40 (17)	35 (15)	1	1	1
Female	19 (7.5)	11 (57.9)	7 (36.8)	3 (15.8)	1.1 (0.3-3.8)	1.3 (0.3-4.9)	0.2 (0.0-1.1)
Marital status [N=254]							
Married	94 (37.0)	33 (35.1)	16 (17)	12 (12.7)	1	1	1
Single or divorced	160 (63.0)	62 (38.7)	31 (19.4)	26 (16.2)	0.7 (0.4-1.5)	0.6 (0.3-1.6)	1.0 (0.4-2.7)
Educational attainment [N=254]							
Low	202 (79.5)	75 (37.1)	39 (19.3)	31 (15.3)	1	1	1
Average to high	52 (20.5)	20 (38.5)	8 (15.4)	7 (13.5)	1.5 (0.6-3.5)	1.1 (0.4-3.2)	0.9 (0.3-3.0)
Detention status [N=250]							
Sentenced	188 (75.2)	70 (37.2)	35 (18.6)	30 (16)	1	1	1
awaiting trial	42 (16.8)	13 (33.3)	7 (16.7)	5 (12)	1.4 (0.6-3.6)	1.5 (0.4-5.0)	1.0 (0.3-3.7)
defendants recurring	20 (8.0)	10 (50)	5 (25)	3 (15)	2.1 (0.6-7.5)	1.9 (0.4-8.3)	0.8 (0.2-4.3)
Conviction time [N=236]							
< 1 y	126 (53.4)	50 (39.7)	25 (19.8)	18 (14.3)	1	1	1
> 1 y	110 (46.6)	37 (33.6)	18 (16.4)	18 (16.4)	0.7 (0.4-1.5)	0.9 (0.4-2.1)	1.5 (0.6-3.7)
Substance use disorder [N=254]							
Yes	35 (13.8)	23 (65.7)	12 (34.3)	9 (25.7)	2.4 (1.0-6.1)	1.4 (0.5-3.7)	1.2 (0.4-3.4)
No	219 (86.2)	72 (32.8)	35 (16)	29 (13.2)	1	1	1
Current anxiety disorders [N=254]							
Yes	71 (28.0)	47 (66.2)	26 (36.6)	24 (33.8)	**3.5 (1.7-7.3)** [c]	**2.6 (1.1-6.0)** [a]	**3.9 (1.6-9.5)** [b]
No	183 (72.0)	48 (26.2)	21 (11.5)	14 (7.6)	1	1	1
Current mood disorders [N=254]							
Yes	120 (47.2)	66 (55)	34 (28.3)	27 (22.5)	**2.8 (1.4-5.6)** [b]	1.9 (0.8-4.6)	1.4 (0.5-3.5)
No	143 (52.8)	29 (21.6)	13 (9.7)	11 (8.2)	1	1	1
Current psychotic disorders [N=254]							
Yes	64 (25.2)	42 (65.6)	22 (34.4)	14 (21.9)	**4.0 (1.8-8.8)** [c]	2.1 (0.9-4.9)	0.7 (0.3-1.8)
No	190 (74.8)	53 (27.9)	25 (13.2)	24 (12.6)	1	1	1
Any current psychiatric disorders (N=254)							
Yes	144 (56.7)	56 (72.8)	40 (28)	33 (23)	**3.3 (1.6-7.1)** [b]	**3.0 (1.1-8.8)** [a]	3.0 (0.9-9.7)
No	110 (43.3)	19 (17.3)	7 (6)	5 (5)	1	1	1
Past anxiety disorders [N=254]							
Yes	27 (10.6)	20 (74.1)	9 (33.3)	9 (33.3)	2.4 (0.8-7.8)	0.6 (0.2-1.8)	1.2 (0.4-3.6)
No	227 (89.4)	75 (33)	38 (16.7)	29 (12.8)	1	1	1
Past mood disorders [N=254]							
Yes	89 (35.2)	48 (53.9)	25 (28.1)	19 (21.3)	1.9 (1.0-3.8)	1.7 (0.7-3.8)	1.3 (0.5-3.2)
No	164 (64.8)	46 (28)	22 (13.4)	19 (11.6)	1	1	1
Past psychotic disorders [N=254]							
Yes	77 (30.6)	49 (63.6)	26 (33.7)	19 (24.7)	**3.3 (1.5-7.0)** [b]	1.8 (0.8-4.3)	1.1 (0.5-2.8)
No	175 (69.4)	44 (25.1)	21 (12)	18 (10.3)	1	1	1
Any Past psychiatric disorders (N=254)							
Yes	170 (66.9)	79 (46.5)	43 (25.3)	34 (20)	1.4 (0.6-3.3)	2.4 (0.6-9.3)	2.4 (0.5-10.3)
No	84 (33.1)	16 (19)	4 (5)	4 (5)	1	1	1
Current psychopharm. Treatments (N=254)							
Yes	42 (16.5)	30 (71.4)	16 (38.1)	14 (33.3)	**4.9 (2.0-11.8)** [c]	2.2 (0.9-5.2)	**2.6 (1.1-6.2)** [a]
No	212 (83.5)	65 (30.7)	31 (14.6)	24 (11.3)	1	1	1
Impulsivity, BIS-11 score [N=251]							
Mean ± SD (AOR by 5 additional points)	63.1 ± 11.8	69.4±11.0	73.0±8.2	73.0±9.9	**1.4 (1.2-1.6)** [c]	**1.5 (1.3-1.8)** [c]	**1.5 (1.2-1.8)** [c]
Neurocognitive (standardized z score) [N=249]							
Trail Making A z score							
<-1.50	56 (22.4)	32 (57.1)	24 (42.9)	19 (33.9)	**2.3 (1.1-5.0)** [a]	**6.5 (2.7-15.9)** [c]	**4.9 (2.0-12.1)** [c]
≥-1.50	194 (77.6)	61 (31.4)	23 (11.9)	18 (9.3)	1	1	1

Trail Making B z score							
<-1.50	44 (18.6)	19 (43.2)	11 (25.0)	8 (18.2)	1.7 (0.7-4.2)	**3.3 (1.1-10.0)** [a]	2.2 (0.7-7.1)
≥-1.50	193 (81.4)	65 (33.7)	29 (15.0)	23 (11.9)	1	1	1
Forward Digit Span z score							
<-1.50	50 (19.9)	34 (68.0)	25 (50.0)	21 (42.0)	**5.6 (2.4-13.4)** [c]	**10.3 (4.1-25.9)** [c]	**9.0 (3.6-22.8)** [c]
≥-1.50	201 (80.1)	59 (29.4)	22 (11.0)	16 (8.0)	1	1	1
Symbol Digit z score							
<-1.50	10 (4.0)	8 (80.0)	6 (60.0)	5 (50.0)	4.7 (0.7-30.2)	**7.5 (1.5-38.4)** [a]	**6.2 (1.2-31.4)** [a]
≥-1.50	241 (96.0)	85 (35.3)	41 (17.0)	32 (13.3)	1	1	1
CNS-4							
<-1.50	36 (14.3)	27 (75.0)	20 (55.6)	17 (47.2)	**5.8 (2.1-15.9)** [c]	**9.2 (3.4-24.4)** [c]	**8.1 (3.0-21.6)** [c]
≥-1.50	215 (95.7)	66 (30.7)	27 (12.6)	20 (9.3)	1	1	1
Charlson Comorbidity Index (N=254)							
0	143 (94.7)	88 (36.2)	41 (16.9)	33 (13.6)	1	1	1
≥1	11 (4.3)	7 (63.6)	6 (54.6)	5 (45.4)	2.3 (0.4-2.4)	**6.5 (1.2-34.6)** [a]	5.0 (0.9-27.0)

Table 1. Estimates of suicide risk and lifetime suicide attempts stratified by demographic, detention and clinical variables

Substance use disorder include: alcohol/substance abuse or dependence; **current mood disorders include**: major depressive episode (MDE), MDE with melancholic features, recurrent major depression, dysthymia, manic episode, hypomanic episode; **past mood disorders include**: anamnestic MDE; **current anxiety disorders include**: panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder, generalized anxiety disorder; **past anxiety disorders include**: panic disorder; **current psychotic disorder include**: psychotic syndromes, mood disorder with psychotic features; **past psychotic disorder include**: psychotic syndromes.

Model equation included terms for age range, substance use disorder, current psychiatric disorders, past psychiatric disorders, current psychopharmacological treatment, impulsivity, neurocognitive impairment and comorbidity illness.

SR=suicidal risk; **HSR**=high suicidal risk; **LSA**=lifetime suicide attempt; **AOR**=adjusted odds ratios

a: $p<0.05$; **b**: $p<0.01$; **c**: $p<0.001$

Table 2. Means and standard deviations of neuropsychological raw scores in the whole population of detainees stratified by age groups and education (**Low education**= < 13 years of school education; **High education**= ≥ 13 years of school education), and stratified according to lifetime suicide attempts (LSA) and high suicide risk (HSR).

	Age group	n	TMT-A	TMT-B	FDS	SDT
All detainees						
Low education	18-39	94	48.32 (28.25)	112.24 (67.64)	5.25 (1.55)	37.65 (10.97)
	≥ 40	108	54.71 (44.27)	86.33 (63.71)	5.19 (1.49)	31.20 (12.21)
Total	18-70	202	51.73 (37.68)	98.80 (66.73)	5.22 (1.51)	34.22 (12.06)
High education	18-39	31	54.54 (32.18)	86.86 (54.01)	5.70 (1.34)	46.35 (15.92)
	≥ 40	21	46.88 (23.05)	98.66 (57.55)	5.88 (1.36)	38 (10.99)
Total	18-70	52	51.73 (29.15)	90.29 (49.81)	5.77 (1.34)	43.28 (14.76)
LSA detainees	--	38	81.24 (53.09)	144.77 (81.96)	3.89 (1.50)	25.29 (9.30)
No LSA detainees	--	216	46.60 (29.58)	90.14 (57.33)	5.58 (1.35)	37.85 (12.79)
HSR detainees	--	47	75.78 (49.71)	141.4 (83.50)	4.0 (1.45)	26.17 (9.67)
No SR detainees	--	207	44.38 (27.39)	87.57 (53.35)	5.75 (1.27)	39.03 (13.00)

TMT-A = Trail Making Test part A; **TMT-B**= Trail Making Test part B; **FDS**= Forward Digit Span; **SDT**= Symbol Digit Test

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