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Italian validation of the Historical-Clinical-Risk Management-20 Version 3 among teenagers admitted to the youth justice system

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Abstract

Background: The Historical Clinical Risk Management-20 third version (HCR-20^{V3}) is a semi-structured interview for the assessment of past, current, and prospective risk factors for violent behaviors. Accumulating research across various forensic and clinical populations, has found that the HCR-20^{V3} is a psychometrically robust measure. However, to our knowledge, there is limited data on the use of the HCR-20 among adolescents. This study sought to investigate the psychometric properties of the HCR-20^{V3} in an Italian teen sample.

Methods: Sixty-one male teenagers, aged between 14 and 19, admitted to the Italian juvenile justice system were involved in the study. To assess convergent validity with measures of antisocial traits and personality impairments, the associations between the HCR-20^{V3}, the Psychopathy Checklist: Youth Version (PCL:YV), and the Structured Clinical Interview for DSM-5-Alternative Model of Personality Disorders Module I (SCID-5-AMPD), were examined. Known group validity was assessed by comparing participants with and without recidivism at the 6- and the 12-month follow-up.

Results: The HCR-20^{V3} showed good internal consistency: Cronbach's alpha (risk presence) = .88; Cronbach's alpha (risk relevance) .87. The split-half reliability was also good: Spearman-Brown (presence) = .92; Spearman-Brown (relevance) = .92. Convergent validity with the PCL:YV and the SCID-AMPD total score and domains were moderate-to-large in size (Pearson's *r* range .34 to .83, and .49 to .69, respectively). Compared to participants who had not been reported for a new crime, those who had a recidivism at the 6- and 12-month follow-up showed higher, albeit non-significant, scores both in the presence (Mann-Whitney's *U* = 133, *p* =.093; *U* = 243, *p* =.089, respectively) and the relevance items (*U* = 131, *p* =.083; *U* = 266, *p* =.185, respectively).

Conclusions: Results suggest that the HCR-20^{V3} is a suitable measure for assessing risk of violence in the juvenile justice systems. Considering the lack of tools for assessing youth violent behavior, HCR-20^{V3} might significantly contribute to the assessment of critical risk factors for recidivism, potential targets for interventions, and response to treatment.

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1. Introduction

Interpersonal violence is a visible and important issue for society, particularly when it involves youths (Krug et al., 2002). Over the past two decades, the field of risk assessment has broadened its focus from predicting recidivism to managing risk of violence. Risk management is defined as complex multidisciplinary strategies to mitigate or prevent interpersonal violence (Müller-Isberner et al., 2007). Reducing interpersonal violence across Countries has been identified among the targets of the United Nations 2030 Agenda for Sustainable Development (United Nations, 2015).

Compared to non-European Countries, Europe exhibits lower rate of violent crime, estimated to be less than 1 per 100,000 people (United Nations, 2015). However, despite an overall decline in criminal activity, certain types of violent crimes, such as robbery, assault, and threats, appear to be increasing in Italy (ISTAT, 2021). Notably, approximately 3.5% of individuals reported and detained are youths aged between 14 and 17 years old (ISTAT, 2021). Accumulated studies have demonstrated that punitive measures and sanctions are insufficient to deter juvenile reoffending (Vincent et al., 2012) and may even contribute to a higher likelihood of recidivism (Lipsey, 2009). Therefore, it is mandatory to develop tailored preventive interventions based on modifiable psychosocial risk factors for youth criminal behaviors. A comprehensive and effective risk-needs assessment holds particular relevance in preventing juvenile violent behaviors and can significantly reduce the emotional, social, and economic costs associated with juvenile offending (Cohen et al., 2010).

As part of this strategy, the “Structured Professional Judgement” (SPJ) work approach has gained significant support over the last 25 years. The SPJ approach to assess risk for violence involves a set of empirically-based inventories for risk and protective factors for criminal behaviors. The scoring of SPJ instruments is typically determined by professional judgments regarding which items best describe a specific case. This approach offers a comprehensive and structured system for professional decision-making, improving professional risk assessment and management (Hart et al., 2016).

In this scenario, the Historical - Clinical-Risk Management-20 (Dolan & Khawaja, 2004; Douglas et al., 1999; Douglas et al., 20010; Doyle et al., 2014), now at its third version (HCR-20^{V3}; Douglas et al., 2013) is one of the most reliable tools to assess violent crimes and risk of violent recidivism. The Scale represents a successful attempt to develop a structured standard measure of professional judgment regarding the risk that patients with mental illness, including those of forensic interest, will commit new violent behavior. Evidence suggests that the HCR-20 is a valuable aid for the psychiatric and forensic assessment teams, both in the clinical-

therapeutic practice of managing the patient within the institution and in the discharge process (Dolan & Khawaja, 2004; Douglas et al., 1999; Doyle et al., 2014).

The HCR-20^{V3} contains 20 risk factors empirically associated with violence and grouped into three domains. The Historical scale (H) includes 10 items which describe the history of violence and past psycho-social risk factors for violent crime; the Clinical scale (C) contains 5 items that describe current psychosocial adjustment; the Risk Management scale (R) contains 5 items that evaluate future psychosocial adjustment. Items are rated in terms of both “presence” and “relevance” for future violence and risk management. The presence of risk factors is rated as: Not Present (N = 0), Partially Present (P = 1) or Present (Y = 2). Whereas the relevance items are coded as: Low (L = 0), Moderate (M = 1), or High (H = 2) relevance to the interviewee.

The structure of the scale allows to separate the three aspects (historical, clinical and risk management) or to combine them into a “presence” and “relevance” score. Although the literature does not always support the use of a cut-off for the total score (Cawood & Corcoran, 2019), there are suggestions that a score greater than 21 (Thamakosit, 2007) or 27 (Fujii, Lichten & Tokioka, 2004) might be able to identify individuals at greater risk for violence. Therefore, HCR-20 can be used either as a composite measure of risk for violence (expressed in terms of low, medium or high risk) or as a cumulative measure of risk for violence.

The possibility to review the given scores and compare them over time provides forensic and mental health professionals with a situation that closely approximates the subject's reality, thereby enabling the identification of potential targets for intervention and the assessment of treatment response. Furthermore, the HCR-20 can be usefully employed specifically with offender and mentally ill individuals, supporting the development of multidisciplinary operational plans and strategies for managing violent behaviors in forensic settings.

To improve the validity of risk assessment, after its first publication in 1993, the HCR-20 has been constantly revised, with a first revision published in 1995, and a second version in 1997 (Douglas & Belfrage, 2014; Douglas et al., 1999). Since its first version, the HCR-20 has shown an excellent inter-rater reliability (Belfrage, 1998) and good concurrent validity with other measures of historical risk of violent and antisocial behavior, such as the Psychopathy Checklist-Revised or the Violence Risk Appraisal Guide (Douglas, 2014; Douglas et al., 1999; Strub et al., 2014). Furthermore, scores above the median of the HCR-20 were associated with high odds of past violent and antisocial behaviors (Douglas et al., 1999). The more recent version, the HCR-20^{V3}, showed good to excellent interrater reliability for the presence and the relevance items and for summary risk ratings (Intraclass Correlation Coefficient (ICC) from .69 to .94 for presence items, and from .60 to .80 for relevance items in an institutional sample). The

concurrent validity with the HCR-20^{V2} was also excellent (Pearson's r ranging from .67 to .90) (Douglas & Belfrage, 2014).

Extensive literature has supported the use of the HCR-20^{V3} in the adult forensic population (Brookstein et al., 2021; Douglas, 2014; Müller-Isberner et al., 2007; Rossdale et al., 2020), as well as in the psychiatric forensic population (Bjørkly et al., 2014; Ramesh et al., 2018). These studies confirm the efficacy of the HCR-20^{V3} for identifying psychological and environmental risk factors for violent behaviors, planning and managing multidisciplinary interventions, and measuring significant change over time (Cawood, 2017; Douglas et al., 2013; Howe et al., 2016;). The instrument has been translated into 20 languages (de Vogel et al., 2014; Shepherd et al., 2018; Adjorlolo & Chan, 2019; Sea & Bang, 2021) and adopted or evaluated in more than 35 countries (<http://hcr-20.com>).

However, to our knowledge, there is limited data on the validity of the HCR-20 among teenagers. Therefore, this study sought to investigate the psychometric properties of HCR-20^{V3} in an Italian teen sample. We hypothesize that the HCR-20^{V3} would show good internal and inter-rater reliability, convergent validity with measure of psychopathy and personality functioning, and adequate known group validity with recidivism.

2. Materials and Methods

2.1 Participants

All youths participated in the “Liberi di Scegliere” (Free to Choose) project, funded by the Italian Ministry of Justice, under the “Piano Operativo Nazionale Sicurezza (PON)” 2014-2020, in Italy. The project was aimed at developing educational and psychological programs for youth in charge of the Juvenile Justice system for both violent and non-violent crimes. Participants were considered eligible for this study if they were: a) in charge of the Juvenile Justice system for both violent and non-violent crimes; b) aged between 14 and 19 years of age; and c) sufficiently fluent in the Italian language.

The study initially involved 63 youths aged 14 to 19 in charge of the Italian Justice System from three regions of Southern Italy between 2020 and 2022. Since female participants were only two, these were excluded from the analyses, leading to a final sample of 61 male participants.

2.2 Procedures

The study was carried out within the “Liberi di Scegliere” (Free to Choose) project, authorized by the Italian Ministry of Justice, under the “Piano Operativo Nazionale Sicurezza (PON)” 2014-2020, in Italy.

The study was carried out in line with the Declaration of Helsinki about ethical principles for human research. Potential participants were informed about the study aims and procedures, the lack of any compensation for participating in the study, and the right to withdraw at any time without consequence.

Demographic (i.e., sex, ethnicity, education, and marital status) and criminological data (i.e., types of crime committed by the participant and by participant's family members) were collected using an ad hoc data sheet. Following the HCR-20^{V3} and the PCL:YV administration protocols (Douglas & Belfrage, 2014; Forth et al., 2003), information concerning the family and social context were collected from court case files, reports of social professionals, and interviews with family members and social and clinical professionals.

2.3 Measures

The HCR-20^{V3} (Caretti et al., 2019; Douglas & Belfrage, 2014) is a 20-item widely used instrument for assessing risk of violence with potential applicability to a variety of settings. The risk factors are grouped in three clusters: Historical factors concerning the past (H domain, $n = 10$ items); Clinical items describing current and modifiable correlates of violence (C domain, $n = 5$ items); and Risk Management items evaluating situational post-assessment factors that may either mitigate or aggravate the chance of violent behaviors (R domain, $n = 5$ items). Each item is assessed both on a Presence (presence of a specific risk factor) and a Relevance (relevance for risk for violence) three-point scale (Presence: 0 = No, 1 = Partially Present, 2 = Yes; Relevance: 0 = Low, 1 = Moderate, 2 = High). The Italian version of HCR-20^{V3} showed good internal consistency and split-half reliability both for the presence (Cronbach's $\alpha = .89$; Spearman's Brown $\rho = .77$) and the relevance items ($\alpha = .92$; $\rho = .83$), and excellent inter-rater reliability (Cohen's k ranging from .74 to 1; Intraclass Correlation Coefficient (ICC) .98 to .99). The exploratory factor analysis supported a unidimensional model of the scale (Bartlett's test = 2378.9, $p < .001$; Kaiser-Meyer-Olkin's test = .91) with the Presence items explaining 48% of the variance (factor loadings ranging from .18 to .78) and the Relevance items explaining 51% of the variance (factor loadings from .36 to .84). Concurrent validity was found both with measures of antisocial and psychopathic traits (Pearson's r (presence) = .51, r (relevance) = .46) and with measures of other pathological personality traits (Pearson's r (presence) = .30, r (relevance) = .25) (Caretti et al., 2019).

The Psychopathy Checklist: Youth Version (PCL:YV; Forth et al., 2003; Sabatello et al., 2012) provide a dimensional assessment of psychopathy among youths aged 12 to 18. The PCL:YV is a semi-structured interview that evaluates 20 items scored on a three-point scale (0= does not apply; 1= applies somewhat; 2= totally applies) based on the pervasiveness, severity, and chronicity of psychopathic personality dimensions. The 20 items are grouped in four domains:

Interpersonal, Affective, Behavioral, and Antisocial. The scores of the Interpersonal and Affective components ranged from 0 to 8, the scores of the Behavioral and the Antisocial components ranged from 0 to 10, and the Total score ranged from 0 to 40. The total and the components scores can be prorated when a limited number of items are missing. No cut-off scores have been established. The Italian PCL:YV showed satisfactory inter-rater reliability (Cohen's $\kappa = .79$), excellent internal reliability for the PCL:YV total score (Composed Reliability (CR) = .909) and good reliability for each factor, i.e. Antisocial (CR = .744), Interpersonal (CR = .702), Behavioral (CR = .713), Affective (CR = .700). The PCL:YV total score showed also good concurrent validity as indicated by positive large correlations with the total score of the SAVRY (Pearson's $r = .741$) and the Historical ($r = .650$), the Social/contextual ($r = .562$), the Individual ($r = .747$) domains, and the negative correlation with the Protective indicator ($r = -.633$) (Sabatello et al., 2022).

The Structured Clinical Interview for DSM-5-Alternative Model of Personality Disorders Module I (SCID-5-AMPD-I; Bender et al., 2018; Somma et al., 2020) is a semi-structured diagnostic interview that assesses a global Level of Personality Functioning (LPF) resulting from 4 personality domains, two for the self (i.e., Identity and Self-direction) and two for the interpersonal relationship (i.e., Empathy and Intimacy). Each domain includes three facets. The assessment of personality functioning begins by posing eight general questions to obtain an overall view of self and the quality of interpersonal relationships of the participant. Then, the 12 personality facets are in depth assessed using a combination of screening and supplementary questions, rated from 0 (= no impairment) to 4 (= extreme impairment). The SCID-5-AMPD-I showed good inter-rater reliability, with good Cohen's κ values when applying an LPF threshold of 2 for a PD diagnosis and moderate when using an LPF threshold of 1.5 (Fossati & Somma, 2021). Notably, to the best of our knowledge, no data on the SCID-5-AMPD-I is currently available for forensic samples of adolescents.

2.4 Statistical Analyses

The internal reliability of the HCR-20^{V3} was assessed from Cronbach's alpha coefficient for the "presence" and "relevance" items ($n = 20$ items each). Cronbach's alpha greater than .70 are generally considered acceptable (Nunnally & Bernstein, 1994). Split-half reliability was assessed from Spearman-Brown's correlation coefficients between two versions of the presence and the relevance, made with the odds and the even items, with values above .70 indicating good internal reliability. On a subsample of 10 randomly selected participants, inter-rater reliability was calculated using Cohen's κ .

The current sample size was not fully adequate to test the factor structure of the HCR-20^{V3} (KMO test = .66), whose unidimensionality has been anyway supported in the Italian validation

study of the measure (Caretti et al., 2019). After verifying normality of the distribution (presence items Shapiro Wilk = 0.98, $p = .482$; relevance items Shapiro Wilk = 0.98, $p = .632$), the convergent validity with measures of psychopathic traits and personality impairment was calculated using Pearson's correlations between the HCR-20^{V3}, the Psychopathy Checklist: Youth Version (PCL:YV), and the Structured Clinical Interview for DSM-5-Alternative Model of Personality Disorders Module I (SCID-5-AMPD). Consistently with Cohen's recommendations (Cohen, 1988), correlations above .1, .3, and .5 were considered small, moderate, and large in size, respectively. The known-group validity was assessed by comparing participants with and without violent recidivism at 6 and 12 months. Given the low number of participants with and without violent recidivism at 6 (8 with recidivism vs 53 without recidivism) and 12 (15 with recidivism vs 48 without recidivism) months, differences between groups were tested by performing Mann-Whitney's test. Analyses were performed using Jamovi version 2.2.5 (The Jamovi Project, 2021).

3. Results

3.1 Description of the sample

The 61 participants had a mean age of 17.4 (SD= 1.03), grew up in Southern Italian regions (i.e. Calabria, Campania, and Sicily), held mainly lower secondary school degrees (n=53, 86.9%; primary school degree n=2, 11.5%; higher secondary school degrees n=1, 1.6%). At the time of the assessment, 49.2% (n=30) were on bail, 41.0% (n=25) in institutional care, such as residential facilities, and 9.8% (n=6) in a juvenile prison. At the 6- and the 12- month follow-up, 13% and (n=8) and 24.5% (n=15) have been reported for a new crime.

The participants showed a mean score of 17 (SD = 7.25) at the presence items and of 18.1 (SD = 7.63) at the relevance items (Table 1). The distribution of the HCR-20^{V3}, the PCL:YV, and the SCID-AMPD was acceptably normal (as indicated by skewness and kurtosis $< |1|$), allowing for parametric analyses. Among the presence items, scores above 1 were observed in the H2 (history of antisocial behaviors), H3 (history of problems in close relationships), H4 (history of problems concerning job or school), H7 (history of pathological personality features), H8 (history of traumatic experiences and adversities), and R3 (future problems concerning personal support) items. Among the relevance items, scores above 1 were observed in the H1 (history of violent behaviors), H2 (history of antisocial behaviors), H3 (history of problems in close relationships), H4 (history of problems concerning job or school), H7 (history of pathological personality features), H8 (history of traumatic experiences and adversities), C4 (current tendency to instability), R3 (future problems concerning personal support), R4 (future problems concerning treatment or supervision response) and R5 (future problems concerning stressors or coping strategies) items (Table 2).

Table 1. Distributions of the HCR-20, the SCID-AMPD, and the PCL:YV scales

	HCR presence	HCR relevance	SCID-5 AMPD Identity	SCID-5 AMPD Self- direction	SCID-5 AMPD Empathy	SCID-5 AMPD Intimacy	SCID-5 AMPD tot	PCL:YV Interperso nal	PCL:YV Affective	PCL:YV Behavioral	PCL:YV Antisocial	PCL:YV tot
Mean	17.0	18.1	2.05	2.45	2.22	1.95	2.17	2.95	3.34	5.75	4.54	18.1
Standard deviation	7.25	7.63	0.73	0.68	0.71	0.71	0.64	1.94	1.64	2.51	2.09	6.51
Minimum	3	2	0.33	1	0.67	0	0.50	0	0	0	0	4
Maximum	33	35	3.33	3.67	4	3.33	3.42	7	7	10	9	30
Skewness	0.21	-0.06	-0.20	-0.20	-0.18	-0.40	-0.38	0.17	0.01	-0.23	-0.04	-0.22
Kurtosis	-0.41	-0.38	-0.48	-0.79	-0.22	-0.11	-0.29	-0.69	-0.14	-0.053	-0.79	-0.98

Table 2. Item distributions of the HCR-20

Presence	Mean	SD	Relevance	Mean	SD
H1	0.92	0.67	H1	1	0.78
H2	1.15	0.65	H2	1.21	0.73
H3	1.34	0.48	H3	1.49	0.50
H4	1.23	0.80	H4	1.21	0.86
H5	0.71	0.78	H5	0.71	0.86
H6	0.23	0.46	H6	0.26	0.55
H7	0.77	0.64	H7	0.89	0.76
H8	1.46	0.54	H8	1.67	0.51
H9	1.15	0.77	H9	1.23	0.82
H10	0.56	0.70	H10	0.54	0.70
C1	0.89	0.61	C1	0.85	0.65
C2	0.31	0.56	C2	0.25	0.54
C3	0.34	0.63	C3	0.36	0.66
C4	0.95	0.59	C4	1.03	0.68
C5	0.80	0.70	C5	0.85	0.77
R1	0.54	0.57	R1	0.64	0.71
R2	0.41	0.59	R2	0.44	0.67
R3	1.30	0.61	R3	1.38	0.64
R4	0.95	0.72	R4	1	0.75
R5	1	0.71	R5	1.10	0.75

Note. items on the left side of the table refer to presence items, whereas items on the right side refers to relevance items. Historical factors: History of problems with H1 = Violence; H2 = Other antisocial behavior; H3 = Relationships; H4 = Employment; H5 = Substance use; H6 = Major mental disorder;

H7 = Personality disorder; H8 = Traumatic experiences; H9 = Violent attitudes; H10 = Treatment or supervision response; C1 = presence of current problems concerning insight. Clinical factors: Recent problems with C1 = Insight; C2 = Violent ideation or intent; C3 = Symptoms of major mental disorder; C4 = Instability; C5 = Treatment or supervision response. Risk management factors: Future problems with R1 = Professional services and plans; R2 = Living situation; R3 = Personal support; R4 = Treatment or supervision response; R5 = Stress or coping.

3.2 Reliability

The HCR-20^{V3} showed good internal consistency, with Cronbach's alpha of .88 for the presence items and .87 for the relevance items. Table 3 showed item- scale correlations and Cronbach's alpha values if items were dropped. All items except R2 (presence of future problem concerning living situation), showed positive correlations with the total scale, with clinical items showing the greater proportion of correlations above .7. Spearman-Brown split-half reliability coefficient was .92 for the presence and .92 for the relevance items. On a selected subsample of 10 participants, Cohen's *k* inter-rater reliability ranged from 0.69 to 1.00 for both the presence items and from 0.55 to 1.00 for the relevance items (all $p \leq .05$) (Table 4).

3.3 Validity

Positive correlations were found between the HCR-20^{V3} presence and relevance items, the PCL:YV (Pearson's *r* range .34 to .83), and the SCID-5-AMPD (*r* range .49 to .69). Correlations were moderate in size for the PCL:YV Interpersonal domain, moderate to large for the Self-direction and the Empathy SCID-5-AMPD domains, and large for the remaining PCL:YV and SCID-5-AMPD domain (Cohen, 1988) (Table 5).

Compared to participants who had not been reported for a new crime, those who had a recidivism at the 6-month follow up (8 with recidivism vs 53 without recidivism) showed higher, non-significant scores, both in the presence (20.8 (5.28) vs. 16.4 (7.38), Mann-Whithney's $U = 133$, $p = .093$) and the relevance items (22.5 (5.37) vs. 17.5 (7.74), Mann-Whithney's $U = 131$, $p = .083$). A similar trend was observed at the 12 month follow up (15 with recidivism vs 48 without recidivism), both in the presence (19.6 (7.78) vs. 16.1 (6.95), Mann-Whithney's $U = 243$, $p = .089$) and the relevance items (20.5 (7.62) vs. 17.3 (7.55), Mann-Whithney's $U = 266$, $p = .185$).

Table 3. Reliability Analysis

Presence	Mean	SD	Item-rest correlation	Cronbach's α if item dropped	Relevance	Mean	SD	Item-rest correlation	Cronbach's α if item dropped
H1	0.92	0.67	.61	.88	H1	1	0.78	.58	.87
H2	1.15	0.65	.40	.88	H2	1.21	0.73	.38	.87
H3	1.34	0.48	.56	.88	H3	1.49	0.50	.51	.87
H4	1.23	0.80	.46	.88	H4	1.21	0.86	.27	.88
H5	0.71	0.78	.39	.89	H5	0.71	0.86	.40	.87
H6	0.23	0.46	.22	.89	H6	0.26	0.55	.29	.87
H7	0.77	0.64	.74	.87	H7	0.89	0.76	.68	.86
H8	1.46	0.54	.62	.88	H8	1.67	0.51	.54	.87
H9	1.15	0.77	.66	.88	H9	1.23	.82	.66	.86
H10	0.56	0.70	.36	.89	H10	0.54	0.70	.44	.87
C1	0.89	0.61	.74	.87	C1	0.85	0.65	.71	.86
C2	0.31	0.56	.53	.88	C2	0.25	0.54	.51	.87
C3	0.34	0.63	.48	.88	C3	0.36	0.66	.43	.87
C4	0.95	0.59	.72	.87	C4	1.03	0.68	.72	.86
C5	0.80	0.70	.71	.87	C5	0.85	0.77	.65	.86
R1	0.54	0.57	.15	.88	R1	0.64	0.71	.17	.88
R2	0.41	0.59	-.04	.90	R2	0.44	0.67	.09	.88
R3	1.28	0.61	.47	.88	R3	1.38	0.64	.54	.87
R4	0.95	0.72	.66	.88	R4	1	0.75	.61	.86
R5	1	0.71	.56	.88	R5	1.10	0.75	.47	.87

Note. Items on the left side of the table refer to presence items, whereas items on the right side refers to relevance items. Historical factors: History of problems with H1 = Violence; H2 = Other antisocial behavior; H3 = Relationships; H4 = Employment; H5 = Substance use; H6 = Major mental disorder; H7 = Personality disorder; H8 = Traumatic experiences; H9 = Violent attitudes; H10 = Treatment or supervision response; C1 = presence of current problems concerning insight. Clinical factors: Recent problems with C1= Insight; C2 = Violent ideation or intent; C3 = Symptoms of major mental disorder; C4 = Instability; C5 = Treatment or supervision response. Risk management factors: Future problems

with ... R1 = Professional services and plans; R2 = Living situation; R3 = Personal support; R4 = Treatment or supervision response; R5 = Stress or coping.

Table 4. Inter-rater reliability

	Presence		Relevance	
	K	P	K	p
H 1	1	< .001	1	< .001
H 2	.78	.011	.80	.003
H 3	.74	.016	.74	.016
H 4	1	.002	1	< .001
H 5	.69	.001	.69	.001
H 6	1	.002	1	< .001
H 7	1	< .001	1	< .001
H 8	.60	.038	.80	.010
H 9	.83	< .001	.50	.024
H 10	1	< .001	1	< .001
C 1	1	< .001	1	< .001
C 2	1	< .001	.83	< .001
C 3	1	< .001	1	< .001
C 4	.83	< .001	.51	.015
C 5	1	< .001	1	< .001
R 1	1	< .001	1	< .001
R 2	.83	< .001	.66	.004
R 3	1	.002	.55	.053
R 4	1	< .001	1	< .001
R 5	1	< .001	.80	< .001

Note. Items on the left side of the table refer to presence items, whereas items on the right side refers to relevance items. Historical factors: History of problems with: H1 = Violence; H2 = Other antisocial behavior; H3 = Relationships; H4 = Employment; H5 = Substance use; H6 = Major mental disorder; H7 = Personality disorder; H8 = Traumatic experiences; H9 = Violent attitudes; H10 = Treatment or supervision response; C1 = presence of current problems concerning insight. Clinical factors: Recent problems with ... C1= Insight; C2 = Violent ideation or intent; C3 = Symptoms of major mental disorder; C4 = Instability; C5 = Treatment or supervision response. Risk management factors: Future problems with ... R1 = Professional services and plans; R2 = Living situation; R3 = Personal support; R4 = Treatment or supervision response; R5 = Stress or coping.

Table 5. Validity Analysis

		HCR presence	HCR relevance	PCL:YV Interpersonal	PCL:YV Affective	PCL:YV Behavioral	PCL:YV Antisocial	PCL:YV tot	SCID-5 AMPD Identity	SCID-5 AMPD Self- direction	SCID-5 AMPD Empathy	SCID-5 AMPD Intimacy	SCID-5 AMPD tot
HCR presence	Pearson's r	—											
	p-value	—											
HCR relevance	Pearson's r	.93	—										
	p-value	< .001	—										
PCL:YV Interpersonal	Pearson's r	.34	.34	—									
	p-value	.007	.007	—									
PCL:YV Affective	Pearson's r	.52	.61	.31	—								
	p-value	< .001	< .001	.015	—								
PCL:YV Behavioral	Pearson's r	.72	.74	.34	.57	—							
	p-value	< .001	< .001	.008	< .001	—							
PCL:YV Antisocial	Pearson's r	.55	.60	.04	.40	.56	—						
	p-value	< .001	< .001	.762	.001	< .001	—						

PCL:YV tot	Pearson's r	.77	.83	.53	.72	.88	.72	—					
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	—					
SCID-5 AMPD Identity	Pearson's r	.68	.69	.44	.54	.67	.37	.71	—				
	p-value	< .001	< .001	< .001	< .001	< .001	.003	< .001	—				
SCID-5 AMPD Self-direction	Pearson's r	.49	.61	.32	.72	.65	.37	.70	.72	—			
	p-value	< .001	< .001	.013	< .001	< .001	.004	< .001	< .001	—			
SCID-5 AMPD Empathy	Pearson's r	.45	.58	.31	.67	.51	.32	.62	.67	.80	—		
	p-value	< .001	< .001	.014	< .001	< .001	.011	< .001	< .001	< .001	—		
SCID-5 AMPD Intimacy	Pearson's r	.53	.62	.35	.61	.63	.35	.66	.75	.83	.80	—	
	p-value	< .001	< .001	.005	< .001	< .001	.005	< .001	< .001	< .001	< .001	—	
SCID-5 AMPD tot	Pearson's r	.60	.69	.39	.70	.68	.39	.74	.87	.92	.90	.93	—
	p-value	< .001	< .001	.002	< .001	< .001	.002	< .001	< .001	< .001	< .001	< .001	—

4. Discussion

This study aimed to examine the psychometric properties of the HCR-20^{V3} in an Italian sample of youth offenders under 20. Only a few studies have examined the predictive validity of multiple risk assessment instruments in a group of young adult offenders (Kleeven et al., 2023; Vincent et al., 2019). The results of our analyses supported the measure's reliability and validity among Italian teenagers in charge of the Juvenile Justice System.

The internal reliability of the HCR-20^{V3} was good: Cronbach's alpha was .88 for the presence items and .87 for the relevance items. These results are in line with the Italian validation study of the HCR-20^{V3} on an adult criminal sample (.89 and .92, respectively; Caretti et al., 2019). All items showed positive correlations with the total scale, with clinical items showing the greater proportion of correlations above .7. The only exception was Item R2 (presence of future problem concerning living situation), indicating contextual factors that may foster future violent behaviors (e.g., access to weapons, substance use, or homelessness). The negative correlation between R2 and the total HCR-20^{V3} score might be explained by the fact that at the time of the interview the participants were either in prison, on bail, or in house arrest to serve their sentence, substantially reducing this type of risk factors. However, the finding might be also explained also by the possible influence of information bias. This suggests that the use of different sources of information might be recommended.

The Spearman-Brown split-half reliability coefficient was .92 for the presence and .92 for the relevance items. Considering .70 an acceptable value, the HCR-20^{V3} showed a good internal consistency, comparable to the adult Italian version of the tool (presence = .77 and relevance = .83). Consistently to the Italian validation on an adult sample, the inter-rater reliability was evaluated on a sub-group of 10 adolescents randomly selected and blindly assessed by two co-authors (RC and CC). Both the presence and the relevance items showed significant inter-rater reliability, with 18/20 of the presence items and 15/20 of the relevance items >.70. This suggests an adequate reliability of the HCR-20^{V3} not only in adults (Caretti et al., 2019), but also in teenagers.

Following the previous validation study for adult sample (Caretti et al., 2019), convergent validity was estimated from correlation between HCR-20^{V3} and measures of antisocial and psychopathic traits (PCL:YV) (Sea & Bang, 2021; Warren et al., 2005) and personality impairment (SCID-5-AMPD) (Løvgren et al., 2022; Warren et al., 2005). Consistently with that

study, positive correlations were found between the HCR-20^{V3} presence and relevance items and the PCL:YV domains, in particular with the Lifestyle, Antisocial and Total score of PCL:YV, that are mainly related to antisocial life-style. Similarly, the HCR-20^{V3} showed positive significant correlations with the SCID-5-AMPD domains and the overall personality functioning. These results are fully in line with International data on adult (e.g. Brookstein et al., 2021; Douglas, 2014; Müller-Isberner et al., 2007; Rossdale et al., 2020) and youth forensic population (e.g. Cacho et al., 2020; Pechorro et al., 2021).

In clinical psychiatry, forensic psychiatry, courtrooms and for security measures, predictive and preventive risk assessment tools, such as the HCR-20^{V3} are extremely important to assess the risk of violent recidivism among offenders affected by mental disorders (Dickens & O'Shea, 2017; Vitacco et al., 2016). With the progressive shift from the restraint psychiatry with patients residing in asylums, to the 'de-institutionalisation' and the spread of residential facilities and outpatient clinics, it has become increasingly important a careful assessment of violent behaviors. In recent years, it has been reported an increase in violent behavior committed by psychiatric patients, both with first-time and previous criminal convictions (Biancosino et al., 2009; Biondi & Picardi, 2018). Therefore, the applicability of the HCR-20^{V3} in psychiatric forensic settings is particularly important.

5. Strength and limitations

Considering the lack of tools that allow structural professional judgement to assess violent behavior from adolescence to adulthood, this study contribute to extend the use of the HCR-20^{V3} in juvenile justice settings. The use of a psychometrically validated, widely employed, instrument may improve the work of forensic, social, educational, and clinical professionals and the law enforcement in several relevant ways, including the possibility to share common language and measures, to recognize critical risk factors for recidivism and to monitor them over time, to identify potential targets for rehabilitative integrated interventions, and to better assess response to treatment.

As other studies, the findings of this preliminary study should be interpreted accounting for some limitations. First, the limited sample size might have affected the study power, increased the possibility of negative results, and prevented the investigation of the factorial structure of the scale. In addition, the lack of female participants affected the generalizability of the findings. Further sizeable, sex-balanced, studies are recommended to replicate and extend the findings of this study.

6. Conclusions

The findings of this preliminary study suggest that the HCR-20^{V3} is a suitable measure for assessing risk of violence in the juvenile justice systems. This is particularly significant given the unique challenges and complexities involved in evaluating youth behavior, which differs substantially from adult behavior due to developmental, psychological, and social factors. Considering the lack of tools for assessing youth violent behavior, HCR-20V3 might significantly contribute to the assessment of critical risk factors for recidivism, potential targets for interventions, and response to treatment. This tool's comprehensive framework can help identify underlying issues that contribute to violent behavior among youth. Future research is warranted to validate these preliminary findings across diverse Italian populations and settings and explore its integration with intervention strategies.

Ethical approval

Data has been collected as part of the multidisciplinary assessment of the “Liberi di Scegliere” project authorized and funded by the Italian Ministry of Justice, under the Italian “Piano Operativo Nazionale Sicurezza (PON)” 2014-2020.

Informed Consent Statement

Informed consent to participate in the “Liberi di Scegliere” project was obtained from all subjects involved in the study. Participation in the interviews was always free, no participant was paid or received anything in return such as a reduction in sentence or days off.

Data Availability Statement

Data associated to this study are available from the corresponding author upon reasonable request.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any potential conflict of interest.

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