Use of the Historical, Clinical, Risk Management-20 to assess the risk of violence by discharged psychiatric patients

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KEY MESSAGES

1. The Historical, Clinical, Risk Management-20 (HCR-20) can be used reliably to assess the violence risk in discharged psychiatric patients.
2. Most violent outcomes can be predicted by the structured final risk judgement of the HCR-20 at 6 months but not at 12 months.
3. To improve violent risk assessment and management in Hong Kong, a structured evidence-based risk assessment instrument such as the HCR-20 is recommended for early detection of high-risk patients.

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Introduction

Priority follow-up (PFU) is provided to patients with poor mental health and a history of criminal violence or disposition to violence. The PFU status of a patient is categorised as non-PFU, PFU-target, and PFU-subtarget (most dangerous) and regularly reviewed by the treating team using unstructured clinical judgement, which may not be accurate or consistent. Structured professional judgement is more useful; it bridges the gap between the actuarial approach and clinical practice for risk assessment. The Historical, Clinical, Risk Management-20 (HCR-20)[1] is a guideline developed by forensic clinicians for mental health professionals to identify risk factors that are amendable to clinical intervention and to develop individualised risk management strategies. The HCR-20 has strong inter-rater reliability and significant predictive validity in post-release community violence, and moderate-to-large effect sizes.[2] This study used the HCR-20 to assess discharged psychiatric patients in Hong Kong.

Methods

This prospective cohort study was conducted from June 2010 to April 2012 at the Castle Peak Hospital. The PFU status was reviewed in a multidisciplinary meeting within 2 weeks of admission. Between 1 August 2010 and 30 November 2010, 82 male and 28 female consecutive patients discharged with a PFU-target or PFU-subtarget status were included. An equal number of patients with a non-PFU status matched for sex, age, and primary psychiatric diagnosis were controls (Table 1).

The HCR-20 includes a historical scale (10 static factors), a clinical scale (five items that evaluate current psychological functioning, state of symptoms, insight, and attitudes), and a risk management scale (assessing plan feasibility, social network support, and contextual factors). Ten items are dynamic and amendable to clinical intervention. Based on the assessment of risk factors and the estimated degree of intervention needed to prevent violence, patients were classified as low-, moderate-, and high-risk. Each item was rated 0 for absent, 1 for possibly or partially present, or 2 for definitely present. Total scores range from 0 to 40; higher scores indicate higher risk of violence. Each assessment took about 60 to 90 minutes to complete. There were seven raters from different psychiatric professions. Each rater assessed around 45 patients with an overlap of 50% to evaluate inter-rater reliability.

Violence was defined as actual, attempted, or threatened physical harm of another person. Acts of violence were divided into four categories. Violence that occurred at 6 and 12 months after discharge was recorded. All statistical analyses were conducted in R.[3] Inter-rater reliability of the HCR-20 was tested using intra-class correlations (ICCs). The predictive validity for the HCR-20 and PFU status was established using receiver operating characteristic (ROC) analysis that produces the area under the curve (AUC).[4]

Results

Of the 110 discharged patients with a PFU-target or PFU-subtarget status, 42 were at low risk, 50 at moderate risk, and 18 at high risk. No non-PFU patient was at high risk, but 25 were at moderate risk. Respectively at 6 and 12 months after discharge, 4.9%

TABLE 1. Characteristics of 220 discharged psychiatric patients

Postoperative day	No. (%) of patients	
	Priority follow-up (PFU) [n=110]	Non-PFU (n=110)
Male	82 (74.5)	83 (75.4)
Mean (range) age (years)	43.65 (19-78)	43.11 (18-65)
Marital status		
Single	56 (50.9)	57 (51.8)
Married	20 (18.1)	37 (33.6)
Divorced	25 (22.7)	11 (10)
Education		
Tertiary or above	8 (7.2)	9 (8.1)
Secondary	76 (69)	70 (63.6)
Primary	23 (20.9)	30 (27.2)
Unemployed	75 (68.1)	61 (55.4)
Primary diagnosis		
Schizophreniform disorders	70 (63.6)	70 (63.6)
Bipolar affective disorder	12 (10.9)	12 (10.9)
Personality disorder	6 (5.4)	6 (5.4)
Depressive disorders	4 (3.6)	4 (3.6)
Substance abuse disorder	12 (10.9)	12 (10.9)
Others	6 (5.4)	6 (5.4)
Presence of secondary diagnosis	31 (28.1)	23 (20.9)
Violent history	109 (99)	73 (66.3)
Past violent convictions	71 (65.5)	31 (28.1)
History of substance abuse	85 (77.2)	67 (60.9)
PFU status		
PFU-subtarget	11 (10)	0
PFU-target	99 (90)	0
Non-PFU	0	110 (100)

TABLE 2. Inter-rater reliability for items, subscales, total score, and final risk judgement of the Historical, Clinical, Risk Management-20

Scale and item	Intra-class correlation (95% CI)
Historical scale	
H1	0.56 (0.39-0.70)‡
H2	0.46 (0.27-0.62)‡
H3	0.36 (0.14-0.54)‡
H4	0.54 (0.36-0.68)‡
H5	0.92 (0.88-0.95)‡
H6	0.48 (0.29-0.64)‡
H7	0.64 (0.49-0.76)‡
H8	0.63 (0.47-0.75)‡
H9	0.79 (0.68-0.86)‡
H10	0.28 (0.06-0.47)†
Total	0.71 (0.57-0.80)‡
Clinical scale	
C1	0.43 (0.23-0.60)‡
C2	0.26 (0.03-0.45)†
C3	0.51 (0.32-0.66)‡
C4	0.40 (0.19-0.57)‡
C5	0.26 (0.04-0.46)†
Total	0.43 (0.22-0.59)‡
Risk management scale	
R1	0.38 (0.17-0.56)‡
R2	0.44 (0.24-0.60)‡
R3	0.63 (0.48-0.75)‡
R4	0.33 (0.12-0.52)‡
R5	0.23 (0.00-0.43)*
Total	0.37 (0.16-0.55)‡
Total score	0.57 (0.39-0.70)‡
Final risk judgement	0.73 (0.60-0.82)‡

* P<0.05
† P<0.01
‡ P<0.001

and 4% patients committed violence against property, 6.3% and 6.6% patients committed violence against people, 2% and 1% committed sexual violence, 13.2% and 11.1% committed verbal violence, and 4.4% and 0.5% were convicted of a violent offence. The PFU groups committed more violence than the non-PFU group at both time points.

The ICCs for HCR-20 items are shown in Table 2. The ROC analyses for the HCR-20 subscale, HCR total score, structured final risk judgement, and PFU status are shown in Table 3. The AUC values for HRC-20 structured final risk judgement were significant for violent conviction (AUC=0.68, P=0.02), violence against property (AUC=0.69, P=0.01), and violence against others (AUC=0.78, P<0.001) at 6 and 12 months. The structured final risk judgement for verbal violence (AUC=0.67, P=0.001) was only significant at 6 months, and was not significant for sexual violence at either time point. The PFU status predicted violent conviction, verbal violence, and violence against others at both time points (Table 3). The AUC of HCR-20 total score (AUC=0.63, P=0.002), structured final risk judgement (AUC=0.64, P<0.001), and PFU status (AUC=0.61, P=0.004) for any violence within the 12 months were all significant. The ROC curves for HCR total score, HCR judgement, and PFU were compared using the Delong test. The AUC of HCR total score (z=2.13, P=0.03) and structured final risk judgement (z=3.27, P=0.001) were higher than those of PFU for violence against property only.

Discussion

The inter-rater reliability for most HCR-20 items was fair to moderate. The ICC of the historical scale

TABLE 3. Area under the receiver operating characteristic curves for subscales, final risk judgement, and priority follow-up (PFU) status of the Historical, Clinical, Risk Management-20

Variable	Verbal violence	Violence against property	Violence against others	Sexual violence	Violent conviction
6 months					
Historical score	0.67†	0.61	0.70†	0.44	0.80‡
Clinical score	0.68‡	0.60	0.68*	0.34	0.72†
Risk management score	0.52	0.55	0.57	0.32	0.66*
Total score	0.67†	0.61	0.71†	0.37	0.79‡
Final risk judgement	0.67‡	0.69†	0.78‡	0.41	0.68*
PFU status	0.61*	0.44	0.69†	0.68	0.69*
12 months					
Historical score	0.57	0.54	0.64†	0.35	0.86
Clinical score	0.59	0.69*	0.72†	0.63	0.97*
Risk management score	0.46	0.41	0.59	0.61	0.98*
Total score	0.57	0.56	0.69†	0.52	0.96
Final risk judgement	0.59	0.67*	0.65*	0.52	0.96*
PFU status	0.62*	0.48	0.68†	0.48	0.98*

* P<0.05
† P<0.01
‡ P<0.001

was substantial, whereas the ICC of the clinical and risk management scales was moderate and fair, respectively. This may be because the HCR-20 was rated by case files only and dynamic factors may not have been fully reported. Nonetheless, the ICC for the structured final risk judgement was substantial.

The predictive validity of structured final risk judgement was significant for verbal violence, violence against property, violence against others, and violent conviction at 6 months with moderate-to-large effect size. These results are similar to those of another study.[2] The clinical scale had the best predictive validity, although the historical and risk management scales as well as total score had no significant predictability. Sexual violence was not predicted at either 6 or 12 months. This was likely due to its low incidence.

Comparison of the predictive validity of HCR-20 and PFU status revealed a significant difference in violence against property only. The predictability of HCR-20 final score and structured final risk judgement was better than that of PFU status. The lack of a large difference between the predictive validity of HCR-20 and PFU status may be because the PFU system has been in use in Hong Kong for over 30 years, and all decisions were made by a multidisciplinary team rather than an individual. In addition, the Hospital Authority also provide some basic guiding principles.

The main limitation of the study was that the rating for the HCR-20 was file-based only. This may be a reason for the minimal difference between the predictive validity of HCR-20 and PFU system. The PFU status of patients was determined by a multidisciplinary team. The HCR-20 should have been rated by raters who have interviewed the participants, and the structured final risk judgement should have been decided following a multi-disciplinary meeting.

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