Predicting Institutional Violence in Offenders with Intellectual Disabilities: The Predictive Efficacy of the VRAG and the HCR-20


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Background There is a developing evidence base to support the use of risk assessment instruments in offenders with intellectual disability (ID). The aim of this study was to try to develop this literature with the inclusion of a control group of mentally disordered offenders without an ID, using the HCR-20 and VRAG.

Materials and methods The VRAG and the HCR-20 were completed for a group of offenders with an ID (n = 25) and a control group (n = 45), in four medium-secure units across the UK. The outcome measure was physical aggression measured over 6 months.

Results Both instruments consistently produced large effect sizes predicting any physical aggression and severe physical aggression. The structured clinical judgement based on the HCR-20 was especially good.

Conclusions The HCR-20 and the VRAG have excellent predictive efficacy in offenders with an ID. A structured clinical judgement based on the HCR-20 was especially predictive.

Keywords: actuarial measures, intellectual disabilities, risk assessment, structured clinical judgement

Introduction

In a review of literature on the prediction of violence, Borum (1996) outlined the legal and ethical obligations of mental health professionals to make accurate predictions of risk and recommended that more needs to be done to develop instruments and technology to aid clinicians to conduct risk assessments. There has been a wealth of research into developing risk assessment instruments that have been shown to improve upon the ability of clinicians to predict violence. Actuarial measures take a set of risk factors known to be predictive of future violence (from the research literature or from a construction sample) and combine them in a formula to predict an individual’s risk of future violence (Meehl 1954). The most well-validated actuarial instrument in the research literature is the Violence Risk Appraisal Guide (VRAG; Harris et al. 1993).

The VRAG was found to predict future violent offences with a large effect size in the construction sample of 618 male forensic psychiatric patients (Harris et al. 1993). This was later extended to a follow-up period of 10 years by Quinsey et al. (1998) who again reported large effect sizes. This high standard of predictive efficacy of the VRAG has been repeatedly replicated. For example, Harris et al. (2004) report that the VRAG has been validated in more than 25 studies in at least five different countries. Snowden et al. (2007) provide evidence for its efficacy in UK sample.

The risk assessment literature has evolved further, and the most commonly used risk assessment instruments are structured clinical guides. Structured clinical guides combine static variables with dynamic clinical variables that have been found to be associated with risk of future dangerousness (recidivism and violence) in mentally disordered offenders. Such instruments aid the clinician to focus on risk factors that have been proven by research to have predictive value for future violence. The most widely studied structured clinical guide is the History, Clinical, Risk-Management-20 Version 2 (HCR-20; Webster et al. 1997). There is
substantial evidence as to the predictive validity of the HCR-20 in incarcerated offenders, forensic psychiatric patients and civil psychiatric patients across the world, including the UK (e.g. Douglas et al. 1999; Belfrage et al. 2000; Doyle et al. 2002; Gregory, Lam, Binder & Sullivan, 2003; Gray, Taylor & Snowden, 2008).

Forensic psychiatric patients with intellectual disability (ID) are a subgroup of mentally disordered offenders who are treated as a specialist group in the mental health system in the UK (Murphy & Mason 1999). In line with the developments in risk assessment instruments in mentally disordered offenders, in forensic psychiatric patients with ID, the majority of the literature that has evaluated the ability of risk assessment instruments to predict future violence or offending has been with the VRAG and the HCR-20. Therefore, to be able to build upon previous research with forensic psychiatric patients with ID and to be able to compare with other mentally disordered offenders, it was decided to focus on these risk assessment instruments. Lindsay et al. (2008) tested the predictive abilities of the VRAG and the HCR-20 in a large sample of forensic psychiatric patients with ID in high security, medium/low security and in the community. Predicting violent incidents, verbal aggression, inappropriate sexual behaviour and aggression to property across 1 year, the VRAG and the HCR-20 were able to predict future violence significantly above chance levels producing AUCs of 0.71 and 0.72, respectively. This study provides evidence for the predictive validity of the VRAG and the HCR-20 in forensic psychiatric patients with ID across different levels of security in the UK.

Morrissey et al. (2007) present findings for the HCR-20 in a subsample of the sample employed by Lindsay et al. (2008), those in high security (n = 60), followed up over a 12-month follow-up period. The HCR-20 was significantly positively related to institutional aggression (r = 0.45, P < 0.001) and also to both physical aggression and aggression to property/verbal aggression (r = 0.42; AUC = 0.68, P < 0.05 and r = 0.44; AUC = 0.77, P < 0.01, respectively). Gray et al. (2007) evaluated the efficacy of the VRAG and the HCR-20 to predict violent and general recidivism in mentally disordered offenders with a diagnosis of ID (n = 145) compared with a control group of mentally disordered offenders without an ID. Both risk assessment instruments were able to predict violent recidivism over a 5-year period with large effect sizes. A similar pattern of results was also found for general offending. The efficacy of the VRAG and the HCR-20 was at least as good in the ID group as it was in a control sample of mentally disordered offenders without a diagnosis of ID, where the efficacy of these instruments is well established.

Quinsey et al. (2004) evaluated the ability of the VRAG to predict violence and hands-on sex offences committed by those with ID discharged from institutions into supervised homes into the community (n = 58) in Canada. The VRAG was found to have a significant, moderate relationship with violent and sexual incidents (r = 0.32; AUC = 0.69), as reported by staff, in the 16-month follow-up period. More recently, Camelleri & Quinsey (2011) utilized the MacArthur study database (Monahan 1981) to evaluate the predictive efficacy of the VRAG in a civil psychiatric population. The VRAG predicted violence with a large effect size in people with and without an ID.

There is a burgeoning literature to support the predictive efficacy of risk assessment instruments in forensic psychiatric patients with an ID. Although, relative to other mentally disordered offenders, this literature is somewhat in its infancy. The aim of this study was to try to contribute to developing this research literature by firstly trying to replicate previous research findings and, secondly, to try and build upon the previous studies to develop the literature further with the inclusion of a control group.

Further, the HCR-20 is intended as a structured clinical guide that can assist clinicians to structure their thinking, judgements and decisions about risk. It is not intended that the score alone be used to indicate risk, as in actuarial risk assessment instruments (Webster et al. 1997). There is a small literature on mentally disordered offenders which reports that a clinical judgement of risk based upon the HCR-20 adds incremental validity to the HCR-20 total score (deVogel & deRuitter 2005; Douglas et al. 1999). To date, no studies have evaluated the ability of a clinical judgement of risk of violence based upon the completion of the HCR-20, to predict future violence in forensic psychiatric patients with ID. Therefore, the aim of this study is to use the HCR-20 in line with the guidelines in the manual and use the HCR-20 to produce a clinical judgement about risk and then to test the predictive efficacy of this judgement.

**Method**

**Design**

The study was a prospective analysis of clients residing in four medium-secure units in the UK. The predictor variables were the risk assessment instrument scores, and the outcome measure was institutional violence:
specifically physical aggression. The predictive efficacy of the risk assessment instruments in offenders with ID (ID group) was compared with other mentally disordered offenders without a diagnosis of ID (control group).

Sample
A total of 74 participants were recruited from four medium-secure units in the UK (two independent sector medium-secure units and two NHS medium-secure units). One participant was excluded due to a lack of clarity regarding diagnosis. A further three participants consented to take part but withdrew from participation prior to the clinical records being read or the interview being completed. Therefore, the final sample consisted of 70 participants. Participants were admitted to hospital on the basis of having a major mental illness, psychopathic disorder or mental impairment and either having been convicted of a criminal offence \( (n = 60) \) or having exhibited behaviour that might have led to a conviction in different circumstances or which conferred significant risk of such behaviour \( \text{i.e. they were deemed to be a high enough risk of offending to warrant detention in a secure unit or did not receive a conviction for an offence, but were detained as a result of that offence \( (n = 10) \).}\)

Diagnoses
Diagnoses were made by a consultant psychiatrist on admission to the medium-secure unit using ICD-10 (WHO, 1992). The sample was divided into two groups, the ID group \((n = 25)\) and the control group \((n = 45)\). Those in the ID group all had a diagnosis of mental impairment (MI) as defined by ICD-10 (codes F70-F79). These diagnoses are synonymous with that of mental retardation as defined by DSM-IV-TR (APA, 2004). The ID group consisted of 21 participants with mild MI (ICD-10 code F70), three participants with moderate MI (ICD-10 code F71) and one participant with unspecified MI (ICD-10 code F79). In the ID group, five participants had a diagnosis of MI alone, and 20 participants had a diagnosis of MI and a co-morbid diagnosis of another mental disorder. The control group consisted of all the other participants, all of whom had some combination of mental disorder(s) but without MI. The co-morbid diagnoses for those in the ID group and the control group are outlined in Table 1.

The mean full-scale IQ score for the ID group was 64.59 (SD = 6.48), and in the control group it was 80.30 (SD = 13.67). IQ data were taken from the clinical records and were available for 22 of the 25 in the ID group (the entire ID group had a diagnosis of MI made by a consultant psychiatrist even if a full-scale IQ score was not available in the clinical records). IQ data were available for 20 of the 45 control cases. These data were not available for the majority of the control group as it is not routine practice to administer an IQ assessment unless it is clinically relevant.

Demographic data
In the ID group, there were 23 (92.0%) men and 2 (8.0%) women with a mean age of 29.77 years (SD = 10.29). In the control group, there were 32 (71.1%) men and 13 (28.9%) women. It is noteworthy that two (6.25%) individuals in the control group were in the process of gender re-assignment, who were biologically male but living as females. For the purpose of the study, these two individuals were treated as female (as they were in the medium-secure unit). The mean age of the control group was 38.16 years (SD = 13.73). The control group significantly differed to the control group on gender \((\chi^2 = 4.17, \text{d.f.} = 1, P < 0.05)\). The ID group also significantly differed to the control group on age \((t_{68} = -2.66, P = 0.01)\).

In the ID group, 24 (96.0%) participants were of White ethnic origin, and one (4.0%) participant was of Mixed Race ethnic origin. In the control group, 41 (91.1%) participants were of White ethnic origin, two (4.4%) were of Mixed Race ethnic origin, one (2.2%) participant was of Black ethnic origin and one (2.2%) participant was of Asian ethnic origin. The ID group did not significantly differ to the control group on ethnicity \((\chi^2 = 1.12, \text{d.f.} = 3, P > 0.05; \text{Cramer's } V = 0.13^2)\).

A borderline group were identified through the data-collection process. The borderline group consisted of patients with a full-scale IQ score in the borderline or LD range \(< 80\) but with no diagnosis of MI. Due to the low IQ scores, this borderline group was compared with the control group to examine whether they represented a distinct group or were similar to the control group. This borderline group did not significantly differ to the control group on any descriptive statistics (predictor variables and outcome variables) or any other statistical analyses (AUCs) and so were included in the control group.

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The VRAG produces a score (ranging from −24 to +36), and a risk category between one and nine based upon this score. VRAG scores can be completed from file review only. If, due to a lack of information, it was not possible to score an item of the VRAG then it was prorated (Quinsey et al. 1998).

The HCR-20 (Version 2; Webster et al. 1997) measures 20 variables related to the risk of future violence. The HCR-20 is divided into three subscales. The history subscale has 10 items related to a history of mental illness, psychopathy (measured using the PCL-R or PCL-SV), personality disorder and substance misuse. The clinical subscale has five items relating to the individual’s future social and treatment circumstances and their estimated reaction to these (exposure to destabilizers, lack of personal support, etc.). If, due to a lack of file information, it was not possible to score an item of the HCR-20 it was prorated (Webster et al. 1997).

In addition to scoring the HCR-20 and making a prediction of risk of violence based purely on adding the item scores (i.e. using the HCR-20 as an actuarial tool), the authors of the HCR-20 (Webster et al. 1997) advocate using the HCR-20 structure to make a clinical judgement of risk of violence. Most often, in research designs, the numerical judgement of risk is used to predict the outcome measure of violence; however, in practice, clinician’s are encouraged to (and more often do) use the HCR-20 to formulate the risk of violence and to inform risk-management strategies; in practice, the use of the HCR-20 is not limited to predicting the risk of future violence based on the score derived. Therefore, in addition to using the HCR-20 total score as a predictor variable, a clinical judgment based on the completion of the HCR-20 was made. The risk factors measured by the HCR-20 were used to formulate the risk of violence (as defined by the HCR-203), and from this formulation, a judgement of risk of violence was made. This clinical judgement was based on a five-point scale (very low, low, medium, high and very high). For similar studies on mentally disordered offenders

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**Table 1** Frequency of co-morbid diagnoses in patients in the ID group (n = 25) and the control group (n = 45)

<table>
<thead>
<tr>
<th>Diagnoses</th>
<th>ID (%)</th>
<th>Control (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD (no co-morbid diagnosis)</td>
<td>5 (20.0)</td>
<td>16 (35.6)</td>
</tr>
<tr>
<td>Mental illness</td>
<td>1 (4.0)</td>
<td>16 (35.6)</td>
</tr>
<tr>
<td>Personality disorder</td>
<td>7 (28.0)</td>
<td>4 (8.9)</td>
</tr>
<tr>
<td>Other diagnosis</td>
<td>4 (16.0)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Mental illness and personality disorder</td>
<td>3 (12.0)</td>
<td>10 (22.2)</td>
</tr>
<tr>
<td>Mental illness and other diagnosis</td>
<td>2 (8.0)</td>
<td>4 (8.9)</td>
</tr>
<tr>
<td>Personality disorder and other diagnosis</td>
<td>3 (12.0)</td>
<td>2 (4.4)</td>
</tr>
<tr>
<td>Mental illness, personality disorder and</td>
<td>0 (0.0)</td>
<td>8 (17.8)</td>
</tr>
<tr>
<td>other diagnoses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For one patient (2.2%), diagnosis was unknown as they had been admitted for the assessment of mental illness/personality disorder. There was no question that the individual might have ID or a low IQ, and so they were placed in the control group. In the ID group, the diagnoses outlined in Table 1 are all in addition to a diagnosis of MI.

1 A diagnosis of mental illness includes schizophrenia, schizotypal and delusional disorders, affective disorders and neurotic, stress-related and somatoform disorders.

2 Personality disorders are any disorders of adult personality and behaviour.

3 Other diagnoses include organic, including symptomatic, mental disorders, mental and behavioural disorders due to psychoactive substance use, behavioural syndromes associated with physiological disturbances and physical factors, disorders of psychological development, behavioural and emotional disorders with onset usually occurring in childhood and adolescence and sexual and identity disorders.

**Measures**

The risk assessment instruments employed in this study were the VRAG (Harris et al. 1993) and the HCR-20 (Webster et al. 1997).

The VRAG (Harris et al. 1993) is an actuarial risk assessment instrument that predicts the risk of re-offending based on 12 historical static variables (e.g. history of alcohol problems, criminal history, age at index offence, psychopathy score as measured by the PCL-R or PCL-SV). Each variable of the VRAG is weighted according to how different the individual is from the overall violent recidivism rate of the VRAG construction sample (± 5% from the mean rate is one weighted point). For example, on variable 1 ‘Lived with both biological parents until the age of 16’, it is possible to score ‘yes’, which receives a score of −2, or ‘no’, which receives a score of +3. Those who score ‘yes’ are 10% less likely than the construction sample to reoffend, whereas those who score ‘no’ are 15% more likely to reoffend.

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The outcome measure was institutional violence: if the individual was noted by nursing or other clinical staff to behave violently in the continuous care records. Records were reviewed to establish whether it met the conditions required for parametric statistical analyses. All data were screened to establish whether it met the conditions required for parametric statistical analyses. Nonparametric statistics were employed (Field 2000).

To maintain the continuous nature of both the risk assessment scores and the AVS subscale scores (and so maximize statistical power), a simple correlation for each of the subscales of the VRAG and the HCR-20 with ‘rate of aggression’ (as defined above: frequency of aggression/number of days followed × 100) for each of the AVS subscales will be calculated. As the outcome measure of institutional aggression (the frequency score on the AVS subscales) is not normally distributed, nonparametric statistics will be employed (Spearman’s rho). When comparing the correlations across the ID and the control group, note that \( \rho = 0.10 \) is a small effect size, \( \rho = 0.30 \) is a medium effect size and \( \rho = 0.50 \) is a large effect size (Cohen 1992).

The ability of the risk assessment instruments to predict whether someone was physically aggressive (AVS frequency of physical aggression categorized into physically aggressive or not) across the 6-month follow-up period was evaluated using Signal Detection Theory (SDT; Green & Swets 1996; McMillan et al. 2004), as this is a nonparametric statistic.

Using standard conventions, an AUC of 0.50 is chance, AUCs > 0.56 can be regarded as small effects, AUCs > 0.64 as medium effects and AUCs > 0.71 as large effects (Rice & Harris 2005). AUCs were compared to see whether they differed statistically from each other by the methods described by Hanley & McNeil (1992).

**Results**

**Descriptive statistics: risk assessment scores**

The descriptive statistics for the ID group and the control group on the VRAG and HCR-20 are outlined in Table 2.

**Descriptive statistics: aggression vulnerability scale (AVS)**

The AVS provides a frequency and a severity score (most severe incident) for physical aggression. At the end of the 6-month follow-up period, eighty per cent (20 of the 25) of participants in the ID group had at least one incident of physical aggression compared with 40.0% (18/45) in the

### Table 2.

<table>
<thead>
<tr>
<th>Description</th>
<th>ID Group Mean (SD)</th>
<th>Control Group Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRAG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCR-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Only those that were followed for the entire 6-month period were included in the ROC analyses.
Control group. The aim of the study was to score the AVS for the 6 months following the date of completion of the risk assessment instruments. In two ID cases and seven control cases, it was not possible to collect outcome data for the entire follow-up period due to the participant being discharged prior to the 6-month cut-off. The average length of follow-up for the ID group was 172.60 days (SD = 36.10, median = 182.00), and in the control group it was 171.67 days (SD = 35.61, median = 183.00). The length of follow-up was significantly different across the two groups (U = 405.50, N₁ = 25, N₂ = 45, P < 0.05). To take into account the different follow-up periods, an individual ‘rate of aggression’ (the AVS frequency of incidents/number of days followed) was calculated for each subscale of the AVS. The rates of aggression produced very small numbers and so were multiplied by 100 to give the ‘rates’ per 100 days to enable them to be more easily interpreted.

The mean rate of aggression for the AVS physical aggression subscale, at 6 months, was 3.45 (SD = 6.28) in the ID group and 0.92 (SD = 2.42) in the control group. The rate of aggression was significantly higher in the ID group (U = 219.00, N₁ = 25, N₂ = 45, P < 0.001).

Relationship between risk assessment scores and institutional aggression

The AVS frequency scores will be focused on in these analyses. In both the ID group and the control group, the AVS frequency subscale scores were highly positively correlated with the AVS severity subscale scores, the ID group physical aggression ρ = 0.88, N = 25, P < 0.01 and the control group physical aggression ρ = 0.92, N = 45, P < 0.01. These positive correlations suggest that those who were more frequently aggressive were also more severely aggressive. These correlations are possibly due to a lack of more severe incidents occurring within the follow-up period. The most severe incident of physical aggression in both groups was scored 3 of 10 (hitting another participant or a nurse). It is possible that this level of physical aggression is fairly frequent but more severe, near fatal physical aggression, such as stabbing someone, is less frequent in a medium-secure unit where there is little opportunity to act in such an aggressive way. As the AVS frequency and severity scores were highly correlated, it was felt redundant to repeat all analyses for both the frequency and severity subscale scores.

To maintain the continuous nature of both the risk assessment scores and the AVS subscale scores (and so maximize statistical power), a simple correlation for each of the subscales of the VRAG and the HCR-20 with ‘rate of aggression’ (as defined above: frequency of aggression/number of days followed × 100) for each of the AVS subscales was calculated. The correlations between risk assessment scores and AVS rates of aggression are presented in Table 3.

Violence risk appraisal guide

In the ID group, the VRAG significantly correlated with physical aggression with a large effect size. In the control group, the relationship between the VRAG and physical aggression was a small-medium effect size (non-significant).

History, clinical, risk-management-20

In the ID group, the HCR-20 significantly correlated with physical aggression with a large effect size. In the

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**Table 2** Descriptive statistics of the VRAG and HCR-20 across groups

<table>
<thead>
<tr>
<th>Risk assessment scale</th>
<th>ID group¹</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Control group²</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VRAG score</td>
<td>14.60 (7.23)</td>
<td>0 to +28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.38 (10.90)**</td>
<td>–15 to +23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total HCR-20</td>
<td>26.60 (4.54)</td>
<td>18 to 33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23.71 (5.98)*</td>
<td>9 to 36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History subscale</td>
<td>14.92 (2.18)</td>
<td>11 to 19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.29 (3.55)</td>
<td>5 to 19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical subscale</td>
<td>7.28 (1.99)</td>
<td>4 to 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.60 (2.45)*</td>
<td>0 to 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk subscale</td>
<td>4.36 (1.80)</td>
<td>1 to 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.89 (2.19)</td>
<td>1 to 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCR-20 clinical judgement³</td>
<td>3 (medium)</td>
<td>1 to 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 (low)</td>
<td>1 to 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹N = 25, ²N = 45, ³Averages measured by median.

*P < 0.05, **P < 0.01.

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5Only those that were followed for the entire 6-month period were included in these analyses.
control group, the HCR-20 was (not significantly) correlated with physical aggression with a small-medium effect size. In the ID group, the history subscale of the HCR-20 was significantly correlated with physical aggression with a large effect size. In the control group, there was no correlation between the history subscale and physical aggression. The difference in these correlations was statistically significant (Papoulis 1990), and the HCR-20 History scale was significantly greater in the ID group. It seems likely that this is because of the small, negative correlation in the control group.

In the ID group, the clinical subscale of the HCR-20 was (not significantly) correlated with physical aggression with a medium effect size. In the control group, the clinical subscale was significantly correlated with physical aggression with a medium effect size. In the ID group, the risk-management subscale of the HCR-20 was significantly correlated with physical aggression with a large effect size. In the control group, the risk-management subscale was (not significantly) correlated with physical aggression with a small-medium effect size.

The HCR-20 clinical judgement outperformed the HCR-20 total score in both groups. The HCR-20 clinical judgement performed especially well in the ID group and significantly predicted physical aggression with (very) large effect size. In the control group, the HCR-20 clinical judgement again significantly predicted all types of institutional aggression with medium–large effect sizes that were superior to the HCR-20 total score. However, the HCR-20 clinical judgement correlation was significantly greater in the ID group compared with the control group.

Signal detection theory (SDT)

It was decided to compare those who exhibited any physical aggression within the 6-month follow-up period to those who did not exhibit any physical aggression and also to compare those who exhibited the most severe type of physical aggression within the follow-up period (i.e. scored 3 of 10 on the AVS physical aggression severity subscale) to those who did not exhibit the most severe type of physical aggression (i.e. scored below three on the physical aggression severity subscale). The ROC analyses for predicting whether someone was physically aggressive (any physical aggression) and severe physical aggression are displayed in Tables 4 and 5.

Violence risk appraisal guide

In the ID group, the VRAG was able to significantly predict any physical aggression very well (with a large effect size). Predicting severe physical aggression, the VRAG again produced a significant large effect size. In the control group, the VRAG was able to predict physical aggression with a small–medium effect size and was able to (not significantly) predict severe physical aggression with a medium effect size (Rice & Harris 2005).

**Table 3** Correlation (rho) between the risk assessment instruments and the physical aggression subscale of the AVS in the ID group (n = 25) and control group (n = 45)

<table>
<thead>
<tr>
<th>Risk scale</th>
<th>Physical aggression (AVS)</th>
<th>ID group 1</th>
<th>Control group 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRAG</td>
<td>0.53**</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>HCR-20</td>
<td>0.61**</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>History subscale</td>
<td>0.49*</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Clinical subscale</td>
<td>0.32</td>
<td>0.36*</td>
<td></td>
</tr>
<tr>
<td>Risk subscale</td>
<td>0.60**</td>
<td>0.28</td>
<td></td>
</tr>
<tr>
<td>HCR-20 clinical judgement</td>
<td>0.74**</td>
<td>0.30*</td>
<td></td>
</tr>
</tbody>
</table>

AUCs differ between groups \( P < 0.05 \) (Papoulis 1990).

\* \( P < 0.05 \), ** \( P < 0.01 \), *** \( P < 0.001 \).

**Table 4** The Area Under the Curve (AUC) for the risk assessment instruments predicting any physical aggression

<table>
<thead>
<tr>
<th>Risk scale</th>
<th>ID group 1</th>
<th>Control group 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRAG</td>
<td>0.87*</td>
<td>0.60</td>
</tr>
<tr>
<td>HCR-20</td>
<td>0.77</td>
<td>0.58</td>
</tr>
<tr>
<td>History subscale</td>
<td>0.77</td>
<td>0.42</td>
</tr>
<tr>
<td>Clinical subscale</td>
<td>0.66</td>
<td>0.67</td>
</tr>
<tr>
<td>Risk subscale</td>
<td>0.73</td>
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<tr>
<td>HCR-20 clinical judgement</td>
<td>0.88**</td>
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\( n = 23, \quad n = 38 \). AUCs differ between groups \( P < 0.05 \) (Hanley & McNeil 1983).

\* \( P < 0.05 \), ** \( P < 0.01 \) (figure differs from chance, AUC = 0.5).
predicted any physical aggression with a large effect size, and the clinical subscale predicted any physical aggression with a medium effect size (Rice & Harris 2005). In the control group, the HCR-20 total score produced a small effect size (Rice & Harris 2005). The history subscale performed just below chance level. The clinical subscale produced the highest AUC and was a medium–large effect size. The risk-management subscale was able to predict physical aggression with a small–medium effect size (Rice & Harris 2005). The HCR-20 clinical judgement outperformed the HCR-20 total score predicting any physical aggression in both groups. In the ID group, the HCR-20 clinical judgement significantly predicted any aggression with a (very) large effect size and in the control group with a small–medium effect size (not significant).

In the ID group, the HCR-20 was able to significantly predict severe physical aggression with a large effect size. The history and clinical subscales produced medium effect sizes, and the risk-management subscale was able to significantly predict severe physical aggression with a large effect size (Rice & Harris 2005). In the control group, the HCR-20 produced a large effect size. The AUC produced by the history subscale improved somewhat in the control group and produced a medium effect size. The AUC of the clinical subscale was a large effect size, and the risk-management subscale was a medium effect size (Rice & Harris 2005).

Again, the HCR-20 clinical judgement performed very well, significantly predicting severe physical aggression with a (very) large effect size in the ID group and generating a medium-large effect size in the control group.

Summary

Overall, predicting any physical aggression, the risk assessment instruments had greater predictive efficacy in the ID group compared with the control group. The risk assessment instruments had similar predictive efficacy in both groups predicting severe physical aggression.

Which risk assessment instrument?

A secondary analysis was completed to ascertain whether any one of the risk assessment instruments was significantly better than the others at predicting any physical aggression within the ID group. The aim of this analysis was to inform whether any of the risk assessment instruments could be best recommended for use with offenders with ID to predict institutional aggression. A series of paired z-score comparisons revealed no significant differences in the ability of the risk assessment instruments to predict any physical aggression.

For the sake of completeness, the same comparisons were completed for the control group, and no significant differences were found between the predictive accuracies of the risk assessment instruments. The comparable predictive efficacy of the risk assessment instruments to predict any physical aggression.

Discussion

The ID group had higher risk assessment scores than the control group, and in line with this, the ID group also had a higher incidence of institutional aggression. In the ID group, the VRAG and the HCR-20, along with the HCR-20 subscales and the clinical judgement of risk of violence based on the HCR-20, were consistently able to predict any incident of physical aggression and severe physical aggression with medium–large effect sizes (Rice & Harris 2005). In the control group, the VRAG and the HCR-20 were able to predict any physical aggression with a small–medium effect sizes and severe physical aggression with medium–large effect sizes (Rice & Harris 20056).
The findings of this study replicate the previous studies that have found the HCR-20 and the VRAG to have predictive efficacy in forensic psychiatric patients with ID in the community and in inpatient settings (Quinsey et al. 2004; Gray et al. 2007; Morrissey et al. 2007; Lindsay et al. 2008; Camelleri & Quinsey 2011). This study also adds to the research literature the finding that a HCR-20-informed clinical judgement is an excellent predictor of institutional violence in forensic psychiatric patients with ID, indeed even outperforming the large effect sizes produced by the HCR-20 total score predicting any physical aggression and severe physical aggression. This is the first study to assess the ability of a clinical judgement of violence based upon the HCR-20, to predict institutional violence and so provides a unique contribution to the literature on forensic psychiatric patients with ID. This replicates the small literature in mentally disordered offenders which reports that a clinical judgement of risk based upon the HCR-20 adds incremental validity to the HCR-20 total score (Douglas et al. 1999; deVogel & deRuitter 2005).

The predictive efficacy of the subscales of the HCR-20 followed a different pattern across the ID and control groups. In the ID group, the ability of the history, clinical and risk-management subscales was on a par with each other. This is in line with previous research (Lindsay et al. 2008). In the control group, the ability of the clinical and risk-management subscales was superior to the history subscale. The superior ability of the clinical subscale to predict short-term institutional violence replicates the existing literature regarding mentally disordered offenders (Gray et al. 2003, 2004). It is also noticeable that the predictive efficacy of the HCR-20 in this control group seems quite low in comparison with the many previous studies of its predictive efficacy in inpatient settings (for a meta-analytic review, see Campbell et al. 2009). This may be due to the high prevalence of participants with a diagnosis of personality disorder. Gray et al. (2011) have shown that the HCR20 was not as predictive of recurrences for violence in this population. The majority of the ID group had a mild ID. At present, it is not possible to generalize these findings to those with moderate or severe ID. It would be useful to extend research into this area. The majority of the ID group had a co-morbid diagnosis of another mental disorder, but due to the small sample size, it was not possible to assess the predictive efficacy of the risk assessment instruments in those with a diagnosis of ID alone and those with a diagnosis of ID and a co-morbid mental disorder. It would have been useful to establish the predictive efficacy of the risk assessment instruments within diagnostic subgroups of offenders with ID.

Ideally, these ‘best practice’ risk assessment instruments would routinely be completed for all forensic psychiatric patients with ID in the UK. However, these risk assessment instruments are time-consuming and consequently costly for services to complete.

A screening tool that quickly and easily identifies those who are more likely to be violent could complement the best practice risk assessment instruments and identify those who more urgently require a full risk assessment. Fitzgerald (unpublished thesis, 2008) has developed such a tool: The Risk Assessment Protocol for Intellectual Disabilities (RAPID). The RAPID shows some promise in community services for adults with ID (Fitzgerald, unpublished thesis 2012)

In conclusion, the VRAG and HCR-20 each had superior ability to predict any physical aggression in the ID group compared with the control group. This study is the first to assess and validate the predictive utility of a clinical judgement of risk of violence based upon the HCR-20 structured clinical guide in offenders with ID.

Correspondence

Any correspondence should be directed to Suzanne Fitzgerald, Partnerships in Care, Abergavenny, UK (e-mail: fitzgeralds@cf.ac.uk).

References


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Many thanks for your assistance.

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Using e-Annotation Tools for Electronic Proof Correction

Required software to e-annotate PDFs: Adobe Acrobat Professional or Adobe Reader (version 7.0 or above). (Note that this document uses screenshots from Adobe Reader X)

The latest version of Acrobat Reader can be downloaded for free at: http://get.adobe.com/uk/reader/

Once you have Acrobat Reader open on your computer, click on the Comment tab at the right of the toolbar:

This will open up a panel down the right side of the document. The majority of tools you will use for annotating your proof will be in the Annotations section, pictured opposite. We’ve picked out some of these tools below:

1. Replace (Ins) Tool – for replacing text.

   Strike a line through text and opens up a text box where replacement text can be entered.

   How to use it:
   - Highlight a word or sentence.
   - Click on the Replace (Ins) icon in the Annotations section.
   - Type the replacement text into the blue box that appears.

2. Strikethrough (Del) Tool – for deleting text.

   Strike a red line through text that is to be deleted.

   How to use it:
   - Highlight a word or sentence.
   - Click on the Strikethrough (Del) icon in the Annotations section.

3. Add note to text Tool – for highlighting a section to be changed to bold or italic.

   Highlights text in yellow and opens up a text box where comments can be entered.

   How to use it:
   - Highlight the relevant section of text.
   - Click on the Add note to text icon in the Annotations section.
   - Type instruction on what should be changed regarding the text into the yellow box that appears.

4. Add sticky note Tool – for making notes at specific points in the text.

   Marks a point in the proof where a comment needs to be highlighted.

   How to use it:
   - Click on the Add sticky note icon in the Annotations section.
   - Click at the point in the proof where the comment should be inserted.
   - Type the comment into the yellow box that appears.
5. **Attach File Tool** – for inserting large amounts of text or replacement figures.

- **How to use it**
  - Click on the Attach File icon in the Annotations section.
  - Click on the proof to where you’d like the attached file to be linked.
  - Select the file to be attached from your computer or network.
  - Select the colour and type of icon that will appear in the proof. Click OK.

6. **Add Stamp Tool** – for approving a proof if no corrections are required.

- **How to use it**
  - Click on the Add stamp icon in the Annotations section.
  - Select the stamp you want to use. (The Approved stamp is usually available directly in the menu that appears).
  - Click on the proof where you’d like the stamp to appear. (Where a proof is to be approved as it is, this would normally be on the first page).

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7. **Drawing Markups Tools** – for drawing shapes, lines and freeform annotations on proofs and commenting on these marks.

- **How to use it**
  - Click on one of the shapes in the Drawing Markups section.
  - Click on the proof at the relevant point and draw the selected shape with the cursor.
  - To add a comment to the drawn shape, move the cursor over the shape until an arrowhead appears.
  - Double click on the shape and type any text in the red box that appears.

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For further information on how to annotate proofs, click on the Help menu to reveal a list of further options:

- Use the Attach File icon to add files to your proof.
- Click on the Add stamp icon to approve the proof.
- Utilize the Drawing Markups tools to draw shapes, lines and freeform annotations on your proof.

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Using e-Annotation Tools for Electronic Proof Correction

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Further details and instructions can be found in the Help menu.