VOLUME I

DO SCORES ON THE HCR-20 AND FAM PREDICT FREQUENCY OF SELF-HARM IN FEMALES WITHIN A SECURE PSYCHIATRIC HOSPITAL?

by

Lisa Campbell

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Overview

This thesis is submitted in partial fulfilment of the requirements for the degree of Doctorate of Forensic Clinical Psychology at the University of Birmingham. The thesis consists of two volumes.

Volume 1

This volume consists of three chapters. The first chapter is a literature review examining whether there is a link between psychopathy and self-harm. The second chapter is a quantitative study investigating whether scores on the HCR-20 and FAM risk assessment tools predict frequency of self-harm in females within a secure psychiatric hospital. The third chapter comprises a public domain briefing document which provides a plain language summary of the literature review and empirical paper.

Volume 2

This volume consists of five Forensic Clinical Practice Reports (FCPRs). The first details the case of a 63-year-old man with depression and paranoid schizophrenia, formulated from both cognitive and psychodynamic perspectives. The second is a service evaluation examining whether scores on the HCR-20 and HoNOS decrease over time for patients detained within a secure psychiatric hospital, and whether individuals' scores on these measures reflect the level of security in which they reside. The third FCPR documents the case of a 34-year-old man experiencing offence-related anxiety, shame and depression. The fourth FCPR is a single-case experimental design investigating the effectiveness of a trauma-focussed cognitive-behavioural intervention for offence-related PTSD. The fifth FCPR is an abstract of an oral

case presentation of a 14-year-old girl experiencing school anxiety. Pseudonyms have been used throughout to ensure anonymity.

Dedication

I dedicate this to my parents and Simon.

Thank you for believing in me when I doubted myself.

Thank you for teaching me to believe in myself.

Acknowledgements

Firstly, thank you to John Rose, Monica Lloyd and Tony Beech for not only developing this course, but also for allowing me the privilege of being part of the first cohort to endeavour on this journey to becoming a Forensic Clinical Psychologist. I feel that we have been on the journey together throughout the past four years. And guess what… we made it!

Thank you in particular to John, who has been my appraisal tutor. I really appreciate all of the support and guidance you have given me. When I was stressed, rather than allowing me to wallow, you told me to stop moaning and get on with it. Although I didn't realise it at the time, that's what I need. You showed me that I am far more capable than I think I am, and that when I doubt myself, I just need to ignore the doubt and carry on. Thank you for that.

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Chapter One: Literature Review

Is there a Link between Psychopathy and Self-Harm?

Abstract

Objective: To examine whether there is a link between psychopathy and self-harm.

Method: A systematic search identified 14 papers, containing 15 studies, which examine the link between psychopathy and self-harm. Six studies only contained male participants, one only females, and eight contained both males and females. A quality appraisal checklist developed by the National Institute of Clinical Excellence (NICE; 2012) was used to evaluate the quality of each of these studies in relation to their internal and external validity.

Results: The application of the quality appraisal checklist showed that the majority of the studies had good internal validity; however, there were some biases that affected the external validity of some studies. The results indicated that there may be a positive association between total psychopathy score and self-harm; however some studies with smaller sample sizes and low rates of self-harm failed to show this association. The results of most of the studies showed a positive association between Factor 2 of the Psychopathy Checklist (PCL-R; Hare, 2003) and self-harm. No link was found between Factor 1 and self-harm. The results did not show consistent evidence for a link between any of the four facets and self-harm.

Discussion: The majority of studies relied on self-report measures of self-harm, and few studies contained psychopaths within their sample. Although this review indicates a link between Factor 2 and self-harm, and a possible link between total psychopathy score and self-harm, the small number of studies in this area means that the research is not robust enough to provide strong evidence for these associations. Further research is required with more objective measures of self-harm and higher numbers of individuals with psychopathy.

Introduction

Psychopathy is a clinical term used to describe a specific set of interpersonal, affective and behavioural traits including grandiosity, callousness, shallow affect and impulsivity (Hare, 2003). Psychopathy is usually treated as a single construct (Skeem, Johansson, Andershed, Kerr, & Louden, 2007); however, theory and research indicates that it may actually be a heterogeneous construct (Skeem, Poythress, Edens, Lilienfeld, & Cale, 2003). Karpman (1948) suggested that there were two types of psychopaths: primary and secondary psychopaths. It is suggested that primary psychopathy is a hereditary affective deficit, characterised by a lack of emotional experience or empathy, whereas secondary psychopathy is an affective disturbance due to environmental factors, such as neglect or abuse, and is characterised by high levels of anger and anxiety.

The idea of psychopathy being a heterogeneous construct is supported by factor-analytical research into the Psychopathy Checklist Revised (PCL-R; Hare, 2003). The PCL-R is the most widely used and validated measure of psychopathy (Lee & Ashton, 2005; Vien & Beech, 2006), and research into the measure has shown that psychopathy can be broken down into two distinct, but correlated factors (Harpur, Hare, & Hakstian, 1989). Factor 1 includes interpersonal and affective features, and Factor 2 includes socially deviant behavioural features. Since then, further research using larger sample sizes has shown that the PCL-R can be further broken down into four 'facets'. Factor 1 can be broken down into an Interpersonal facet and an Affective facet, and Factor 2 can be broken down into a Lifestyle facet and an Antisocial facet (Parker, Sitarenios, & Hare, 2003. Cited in Hare, 2003).

A large amount of research has been conducted into the link between psychopathy and criminality, and research has shown that, compared to non-psychopaths, psychopaths commit crimes from a younger age, commit more types of crimes, and offend more frequently (Dolan

& Doyle, 2000; Harris, Rice, & Cormier, 1991). In addition to this, higher scores on measures of psychopathy have been linked to violent, sexual, and general recidivism (Hemphill, Hare, & Wong, 1998; Salekin, Rogers, & Sewell, 1996). Research has shown that both PCL-R factors are related to an increased risk of criminality (Grann, Laangström, Tengström, & Kullgren, 1999; Hemphill et al., 1998), with the corollary that three of the four facets are related to criminal behaviour (Corrado, McCuish, Hart, & DeLisi, 2015). However, the link between psychopathy and internalising problems, such as self-harm and suicide, has received less attention (Dhingra, Boduszek, Palmer, & Shevlin, 2015).

Early conceptualisations of psychopathy suggested that psychopaths are less likely than non-psychopaths to experience suicidality or self-harm (Cleckley, 1976). However, some research is inconsistent with this idea, and has found a positive correlation between antisocial and lifestyle-related psychopathic traits and lifetime suicide attempts (Verona, Patrick, & Joiner, 2001; Verona Hicks, & Patrick, 2005) and suicide-related behaviour (Douglas, Herbozo, Poythress, Belfrage, & Edens, 2006). Although these studies have demonstrated a link between psychopathy and suicidal behaviour, the studies have either not studied the link between psychopathy and non-suicidal self-harm (e.g., Verona et al., 2001; Verona et al., 2005) or not separated suicidal and non-suicidal self-harm within their methodology (e.g., Douglas et al., 2006). Therefore this review aims to examine the existing research literature to investigate whether Cleckley (1976) was correct in his assertion that psychopathy is associated with a lower risk of self-harm, and which of the factors or facets of psychopathy mediate this link.

Method

Literature search

A search was conducted on 26/05/2016 on the following databases: *Embase* (1974 to 2016 May 24), *Ovid Medline* (1946 to May Week 3 2016), *PsychInfo* (1967 to May Week 3 2016) and *PsychArticles* (Full Text). The following search terms were used:

A. Keyword search for "self-harm*" **or "**self-injur*" **or** "self-mutilat*" **or** "parasuicid*" **or** "DSH"
B. Keyword search for "psychopathy" **or** "psychopath" **or** "psychopaths" **or** "psychopathic" **or** "sociopath*"
C. Combine searches: A **and** B

Results = **359 references.**

Duplicates obtained by searching multiple databases were removed = **305 references.**

In order to ensure that the papers were relevant to the current review and that they were able to provide information relating to the research question, the following criteria were used:

1. Only peer-reviewed journal articles were included. Grey literature, such as book chapters or conference abstracts, was excluded. This was to ensure that there was enough information available to accurately assess the methodology of the studies.
2. Articles that used the term 'psychopath' to mean something different were excluded (e.g., use of the term 'psychopathic disorder' in the Mental Health Act to mean severe personality disorder).
3. Articles that examined the link between suicide and psychopathy, and did not separate self-harm and suicide were excluded.

4. Articles that mentioned self-harm or psychopathy, but that did not directly study them, or articles that studied self-harm and psychopathy, but in relation to a third variable, without directly examining association between psychopathy and self-harm were excluded.

All papers were screened using the above criteria, which resulted in 14 papers being included in this review. See Figure 1 for a diagram of the search and exclusion process.

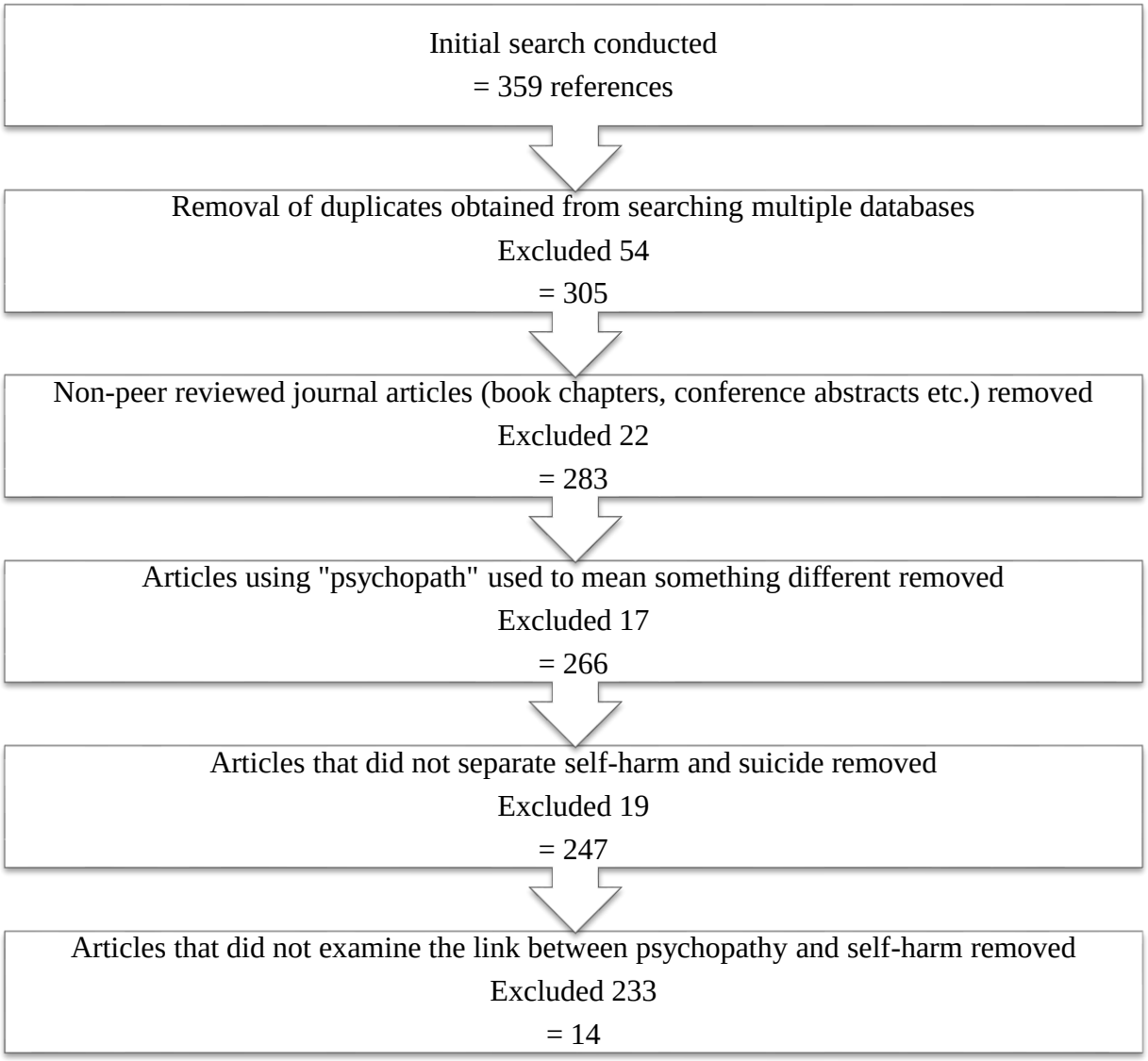

Figure 1. Search and exclusion process.

Quality Appraisal

In order to assess the quality and scientific rigour of the identified studies, a quality appraisal framework was identified for use in this review. The National Institute for Clinical Excellence (NICE; 2012) developed a quality appraisal checklist suitable for quantitative studies that report correlations and associations. The checklist is based on the appraisal stage of the Graphical Appraisal Tool for Epidemiological studies (GATE; Jackson et al., 2006). The checklist aims to examine the internal and external validity of studies, and is split into five sections. Section 1 assesses the *external validity* of the study, examining the population on which the study is based and the representativeness of the sample. Sections 2-4 assess the *internal validity* of the study, by examining the measurement of exposure, outcome and analysis. For sections 1-4, each item is assigned one of five ratings, which are presented in Table 1.

Table 1

Quality appraisal ratings for sections 1-4

Rating	**Description**
++	Risks of bias are minimised for this aspect of the study
+	Some, but not all potential sources of bias were addressed, or it is not clear whether all sources of bias were addressed
-	Significant sources of bias persist
NR	Study fails to report how sources of bias were, or might have been addressed
NA	Not applicable for this study

Section 5 is a summary of the internal and external validity, as assessed in Sections 1-4. Each study is assigned one of three ratings for its total internal and external validity, which are presented in Table 2.

Table 2

Quality appraisal ratings for section 5

Rating	Description
++	All or most of the checklist criteria have been fulfilled, and where they have not, the conclusions are very unlikely to alter
+	Some of the checklist criteria have been fulfilled, and where they have not been fulfilled or adequately described, the conclusions are unlikely to alter
-	Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter

The checklist has been adapted for use in the current review. For clarity, questions relating to 'exposure' and 'outcome' have been changed to 'psychopathy' and 'self-harm', respectively. One question related to contamination of exposure was removed, as it was deemed irrelevant to these studies. An additional question was added to the appraisal criteria which asked about number of psychopaths within the sample (Question 2.2; see Table 3 for a list of quality appraisal criteria).

Table 3

Quality appraisal criteria

Section 1: Population	
1.1	Is the source population well described?
1.2	Is the eligible population or representative of the source population?
1.3	Do the selected participants represent the eligible population?
Section 2: Psychopathy measures	
2.1	Selection of psychopathy group. How was selection bias minimised?
2.2	How many/what proportion of the sample were psychopaths?
2.3	Was the measure of psychopathy based on a sound theoretical basis?
2.4	How well were likely confounding factors identified and controlled?
2.5	Is the setting applicable to the UK?
Section 3: Self-harm measures	
3.1	Were the self-harm measures and procedures reliable?
3.2	Were the self-harm measurements complete?
3.3	Were all the important outcomes assessed?
Section 4: Analyses	
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?
4.2	Were multiple explanatory variables considered in the analyses?
4.3	Were the analytical methods appropriate?
4.4	Was the precision of association given or calculable? Is association meaningful?
Section 5: Summary	
5.1	Are the study results internally valid (i.e. unbiased)?
5.2	Are the findings generalisable to the source population (i.e. externally valid)?

Results

The description and relevant results of each study are summarised in Table 4, in date order. The quality of each study in relation to the five sections of the quality appraisal criteria (population, psychopathy measures, self-harm measures, analyses and summary) is then discussed. Finally, the studies are summarised based on their quality, results, and the evidence that they provide in relation to the research question. One article (Verona, Sprague & Javdani, 2012) contains two studies with different methodologies. Therefore, the quality of these studies will be assessed, and the results presented, separately. Additionally, as some of the studies examine wider research questions than the link between psychopathy and self-harm, only the results directly related to the link between psychopathy and self-harm will be presented and discussed within this review.

Table 4

Summary of final studies

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Gray et al., 2003	To examine the efficacy of the PCL-R, HCR-20 and Beck Hopelessness Scale in predicting institutional self-harm and suicide.	N = 34 (77% male, 23% female) Patients admitted to one of two medium-secure units in the UK 6% scored above the cut-off (≥25) for psychopathy	PCL-R	Aggression Vulnerability Scale (created for this study)	Spearman's Rho, Signal Detection Theory, AUC and Mann-Whitney U	No association between SH and Factor 1, Factor 2, or Total PCL-R score
Young, Justice, & Erdberg, 2006	To identify measures that were associated with self-harm in prison psychiatric treatment.	N = 242 (100% male) Prisoners receiving treatment in a psychiatric unit within a US prison	PCL-R	Prison psychiatric records	T-tests, Chi Square tests, Mann-Whitney tests and Logistic Regression	Presence of psychopathy (Total PCL-R score ≥30; X^2=3.59, p=0.05) and Factor 2 (t=2.15, p<0.05) identified those with a history of SH. However, model that best predicted SH did not contain psychopathy at all. Factor 1 results were not reported.
Das, de Ruiter, Lodewijks, & Doreleijers, 2007	To examine the predictive validity of psychopathic traits, as measured by the PCL:SV, for institutional disruptive behaviour in adolescent offenders.	N = 147 (100% male) Adolescents in one secure and one semi-secure treatment facility in The Netherlands 14% scored above the cut-off (≥30) for psychopathy	PCL:JV (Dutch version of the PCL:YV)	Records (daily reports)	Spearman's Correlations	Positive correlation between Interpersonal facet and SH in one sample (ρ=0.28, p<0.05) but not the other. No association between SH and Total PCL-R score, Factor 1, Factor 2, or any of the other three facets in either sample.

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Semiz et al., 2008	To examine the relationship between ADHD measures within a population with substance use disorders, self-injurious behaviour, suicide attempts and criminal behaviours.	N = 105 (100% male) Men referred for further psychiatric assessment after being assessed for the Turkish Military, who met the criteria for antisocial personality disorder 35% scored above the cut-off (≥30) for psychopathy	PCL-R	Semi-structured interview	Pearson's Correlation Coefficient	Negative correlation between Factor 1 and SH (r=-0.27, p<0.05) Negative correlation between Factor 2 and SH (r=-0.39, p<0.001) Positive correlation between PCL-R Total score and SH (r=0.27, p<0.05) However, data in the table does not match data in the text
Swogger, Conner, Meldrum, & Caine, 2009	To examine the relationship between psychopathy and suicide attempts/ non-suicidal self-injury in a civil psychiatric population.	N = 810 (59% male, 41% female) From one of three acute inpatient hospitals as part of MVRAS Hospitalised for <21 days Diagnoses: schizophrenia, schizophreniform disorder, schizoaffective disorder, major depression, dysthymia, mania, brief reactive psychosis, delusional disorder, alcohol/other drug abuse or dependence, or a PD	PCL:SV	Semi-structured interview about SH in the past two months	Mann-Whitney-Wilcoxon, F-tests and Multinomial Logistic Regression.	No association between SH and any of the four facets.

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Miller et al., 2010	To examine the relationships between the three areas of the Vulnerable Dark Triad (vulnerable narcissism, Factor 2 psychopathy, and borderline personality disorder) and personality, environmental etiological factors, and current functioning.	N = 361 (38% male, 62% female) Undergraduate students in the USA	LSRP SRP-III	Deliberate Self-Harm Questionnaire-Short Form (DSHQ-SF)	Regression	No correlation between SH and Factor 1. Positive correlation between SH and Factor 2 (r=0.26, p<0.001)
Witt et al., 2010	To examine how the NEO-PI-R measures of Fearless Dominance and Impulsive Antisociality are associated with other measures of personality pathology and psychopathology.	N = 733 (36% male, 64% female) Participants recruited for the Collaborative Longitudinal Personality Disorders Study (CLPS) US sample Met criteria for schizoid, borderline, avoidant or obsessive-compulsive PD (86%), or major depressive disorder without PD (14%)	NEO-PI-R	Schedule for Nonadaptive and Adaptive Personality (SNAP)	Concurrent Correlations	Negative correlation between Fearless Dominance and SH (r=-.47, p<0.05) Positive correlation between Impulsive Antisociality and SH (r=0.43, p<0.05) Weak negative correlation between FFM Psychopathy and SH (r=-0.15, p<0.05)

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Ates et al., 2011	To examine whether self-mutilation is associated with severity of psychopathy in men with antisocial PD not in prison.	N = 116 (100% male) Men referred for further psychiatric assessment after being assessed for the Turkish Military, who met the criteria for antisocial personality disorder 48% scored above the cut-off (≥30) for psychopathy	PCL-R	Interview, records, relatives, physical examination	Fisher's Exact tests and Chi-square tests for categorical data. Independent sample t-tests for continuous data. Spearman's Correlations to examine the association between SH and severity of psychopathy.	Compared to non-psychopaths, psychopaths had more frequent (p<0.05) and more severe (p<0.05) SH Positive correlations between Total PCL-R score and frequency (r=0.278, p<0.005), number (r=0.245, p=0.01) and severity (r=0.199, p<0.05) of SH.
Gunter, Chibnall, Antoniak, Philibert, & Hollenbeck, 2011	To examine risk factors for suicidal ideation, suicide attempts and self-harm without lethal intent in a community corrections sample.	N = 337 (65% male, 35% female) Volunteers who responded to study announcements placed in a community corrections office in the USA All were on probation, parole or work release 13% scored above the cut-off (≥30) for psychopathy	PCL:SV	Semi-Structured interview for the Assessment of the Genetics of Alcoholism-Revised (SSAGA-II)	Binary Logistic Regression	The model that best predicted SH contained Total PCL:SV score (OR=3.92, p=0.001). No association found with Factor 1 or Factor 2.

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Verona et al., 2012 [Study 1]	To examine the moderating role of gender in the relationship between psychopathy factors and risk of self-directed violence.	N = 318 (49% male, 51% female) Undergraduate students from one university in the USA	PPI-S SRP-II	One question about lifetime history of SH added into the Suicidal Behaviours Questionnaire-Revised (SBQ-R)	Hierarchical Regression	Negative correlation between Factor 1 and SH approaching significance (r=-0.10, p<0.1) Positive correlation between Factor 2 and SH (r=0.19, p<0.01). However, in women this was only true for those scoring high, but not low, on Factor 1
Verona et al., 2012 [Study 2]	To examine the moderating role of gender in the relationship between psychopathy factors and risk of self-directed violence. To examine whether BPD symptoms account for this relationship.	N = 459 (65% male, 35% female) Offenders in prison and the community	PCL:SV	Lifetime History of Aggression Questionnaire (LHA)	Moderating effect of BPD was examined using a composite score of suicide & SH, so will not be discussed. Zero-order correlations are presented.	No significant correlation between Factor 1 and SH Positive correlation between Factor 2 and SH (r=0.15, p<0.01)

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Negredo, Melis, & Herrero, 2013	To examine the relationships between different definitions of antisocial personality, suicide attempts and self-mutilation in men with mental disorders detained in a forensic psychiatric hospital.	N = 29 (100% male) Patients detained in a forensic psychiatric hospital in Spain	PCL:SV	Semi-structured interview asking about specific forms of self-harm (not validated)	Pearson's Correlation Coefficients	No significant correlations between SH and Factor 1, Factor 2 or Total PCL-R score
Dhingra et al., 2015	To examine the relationships between the four psychopathy factors and items indexing self-injurious thought and behaviour in a large sample of civil psychiatric patients, when controlling for mixed anxiety-depression, violence victimisation and gender.	N= 871 (58% male, 42% female) From one of three acute inpatient hospitals as part of MVRAS Hospitalised for <21 days Diagnoses: schizophrenia, schizophreniform disorder, schizoaffective disorder, major depression, dysthymia, mania, brief reactive psychosis, delusional disorder, alcohol/other drug abuse or dependence, or a PD	PCL:SV	Six questions relating to self-injurious thoughts and behaviour (not validated)	Latent Class Analysis identified two SH groups: Low-risk and High-risk. Logistic Regression used to assess association between class membership and psychopathy	Low scorers on the Interpersonal facet were more likely to be in the High-risk SH group (OR = 0.84, p<0.05) High scorers on the Affective facet were more likely to be in the High-risk SH group (OR = 1.27, p<0.001) No link found with Lifestyle or Antisocial facets

Authors/ Year	Aims	Participants	Psychopathy measure	Self-harm measure	Analysis	Results
Forouzan & Nicholls, 2015	To investigate factors of women presenting with psychopathy to evaluate whether these factors play a role in the emergence of psychopathy in females	N = 82 (100% female) French-speaking women who were removed from their family home and placed in Youth Centres during their childhood in Quebec, Canada. 41.5% scored above the cut-off for psychopathy when using cut-off of 25	PCL-R	File review	Phi coefficient	No difference between psychopaths and non-psychopaths in regards to history of SH.
Storey, Hart, Cooke, & Michie, 2016	To evaluate the psychometric properties of PCL-R ratings for a sample of male offenders.	N = 375 (100% male) All men who were assessed for prison classification over a one year period in the Pacific Region of Canada. 17% scored above the cut-off (≥30) for psychopathy	PCL-R	File review	Chi-squared for categorical data Point-biserial correlations	Weak positive correlations between SH and Total score (r=0.14, p<0.05), Factor 2 (r=0.20, p<0.001), Lifestyle facet (r=0.16, p<0.05) and Antisocial facet (r=0.21, p<0.001). No significant correlations between SH and Factor 1, Affective facet or Interpersonal facet.

Notes. PD = Personality Disorder, SH = Self-harm, NEO-PI-R = NEO Personality Inventory- Revised, FFM = Five Factor Model, MVRAS = MacArthur Violence Risk Assessment Study, PCL-R = Psychopathy Checklist- Revised, PCL:SV = Psychopathy Checklist: Short Version, BPD = Borderline Personality Disorder, PPI-S = Psychopathic Personality Inventory- Short form, SRP-II = Self-Report Psychopathy scale- II, SRP-III = Self-Report Psychopathy scale- III, ADHD = Attention Deficit Hyperactivity Disorder, HCR-20 = Historical, Clinical, Risk management-20, PCL:JV = Psychopathie Checklist: Jeugd Versie, Dutch version of the PCL:YV, PCL:YV = Psychopathy Checklist: Youth Version, LSRP = Levenson's Self-Report Psychopathy Scale.

Quality of the studies

The quality appraisal checklist contains five sections: population, psychopathy measures, self-harm measures, analyses and total internal/external validity. The results of the quality appraisal in relation to these five sections will be discussed in turn. The results of the quality appraisal are summarised in Table 5. The full table of quality appraisal ratings is provided in Appendix A, and the quality appraisal checklist for each study is provided in Appendix B.

Section 1: Population

The majority of studies were explicit about what population the study aimed to examine. However, not all of the studies selected participants that were representative of that population. Witt et al. (2010) used data that were obtained as part of the Collaborative Longitudinal Personality Disorders Study (CLPS), a study that only included participants with a diagnosis of four of the ten personality disorders (schizotypal, borderline, avoidant and obsessive-compulsive) defined within the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000). Therefore, this sample is unlikely to representative of all individuals with a personality disorder. Dhingra et al. (2015) and Swogger et al. (2009), used data from the McArthur Violence Risk Assessment Study (MVRAS), a study which only included participants hospitalised for less than 21 days. The exclusion of patients detained for longer than 21 days is likely to mean that this sample is unrepresentative of all patients detained in hospital. Negredo, et al. (2013) used participants from one forensic psychiatric hospital, and it is not clear how representative patients at this hospital are of patients in other forensic hospitals. Similarly, Gray et al. (2003) only included patients in medium-secure units, and these patients may differ from those in high or low secure units. Forouzan and Nicholls (2015) used women

who were taken into the care of the local authority as a child. This group is unlikely to be representative of all women. Finally, two studies used undergraduate students (Miller et al., 2010; Verona et al., 2012- Study 1), who may not be representative of the general population.

In addition to the non-representativeness, the method of recruitment of participants was unclear, or flawed in some of the studies. In five studies, it was not clear how participants were recruited (Das et al., 2007; Miller et al., 2010; Verona et al., 2012- Study 1 and Study 2; Witt et al., 2010). One study did not report how many participants did not give consent, or were excluded (Negredo et al., 2013). In another study, the authors noted that nine participants declined to take part in the study; however they did not discuss how these participants may differ from those who did consent to take part (Ates et al., 2011). In another study, 20% of the participants were unable to take part due to moving out of the area, 25% declined to take part, and a further 15% agreed to take part in the study, but did not take part, for reasons that were not given (Forouzan & Nicholls, 2015). One study relied on individuals volunteering for the study, and therefore the participants may not be representative of the eligible population (Gunter et al., 2011). Finally, one study did not make clear whether all, or just some of the participants were offenders, and what the inclusion criteria were (Semiz et al., 2008).

Overall, the majority of studies showed some methodological issues in the selection and/or recruitment of participants. Nine out of the 15 studies addressed some, but not all sources of bias (overall rating: +). The remaining 6 studies minimised the risks of bias to an acceptable standard (overall rating: ++).

Section 2: Psychopathy measures

12 out of the 15 studies used the PCL-R, or PCL:SV, to assess psychopathy (Ates et al., 2011; Dhingra et al., 2015; Forouzan & Nicholls, 2015; Gray et al., 2003; Gunter et al., 2011; Negredo, et al., 2013; Semiz et al., 2008; Storey et al., 2016; Swogger et al., 2009; Verona et al., 2012- Study 2; Young et al., 2006), whereas the other three studies used self-report measures of psychopathy. Although some argue that the PCL-R measure does not accurately encapsulate the whole construct of psychopathy (e.g., Skeem & Cooke, 2010), the PCL-R is the most widely used and validated ways of measuring psychopathy (Lee & Ashton, 2005; Vien & Beech, 2006). Therefore, the use of the PCL-R and the PCL:SV in these studies means that psychopathy was measured in a valid and reliable way. However, one study based on a Spanish population used the Canadian version of the PCL:SV, as a commercial version adaptable to the Spanish population was not available (Negredo et al., 2013). As this tool has not been validated on a Spanish population, the validity of using this tool with this population is unclear.

In two of the studies, participants were men being assessed for suitability for the Turkish military (Ates et al., 2011; Swogger et al., 2009). It was not clear whether their results on the PCL-R would affect their acceptance into the military; however, if it would, they may have over- or under-disclosed their psychopathic traits to impact upon their inclusion into the military, making the PCL-R results invalid. Another study used the Dutch version of the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), the PCL:JV (Das et al., 2007). The PCL:JV has been shown to be less reliable and have lower inter-rater reliability than the PCL:YV (Das, de Ruiter, & Doreleijers, 2008), and therefore this measure of psychopathy is likely to be less valid and reliable than the PCL-R

and PSL:SV, which was used in other studies. In addition to this, the authors of this study modified some of the items, which may affect the validity of the measure.

Of the three studies that did not use the PCL-R or its variants, one used the NEO Personality Inventory–Revised (NEO-PI-R; Witt et al., 2010), one used the Psychopathic Personality Inventory- Short Form (PPI-S) and the Self-Report Psychopathy scale-II (SRP-II; Verona et al., 2012- Study 1), and one used the Levenson's Self-Report Psychopathy Scale (LSRP) and the Self-Report Psychopathy scale-III (SRP-III; Miller et al., 2010). These measures all rely on self-report, and therefore are likely to be less valid than the PCL:SV and PCL-R which require collateral information in addition to self-report. This is particularly problematic in relation to psychopaths, who are often conning, deceitful and manipulative (Hare, 2003), and therefore for whom self-report may be even less reliable.

Of the 15 studies, 3 were unable to report how many psychopaths were in their sample, as the measures used did not allow for a distinction between psychopaths and non-psychopaths to be made (Miller et al., 2010; Verona et al., 2012- Study 1; Witt et al., 2010). Of the 12 studies that used PCL-R, PCL:SV or PCL:YV, only 7 studies reported how many participants met the criteria for psychopathy. Of these, only two studies directly compared psychopaths to non-psychopaths on measures of self-harm (Ates et al., 2011; Forouzan & Nicholls, 2015). The other studies that reported psychopaths in their sample did not directly compare psychopaths and non-psychopaths, but reported that psychopaths made up between 6% and 35% of their sample (Das et al., 2007; Gray et al., 2003; Gunter et al., 2011; Semiz et al., 2008; Storey et al., 2016).

Overall, the majority of studies used robust measures of psychopathy with methodologies that minimised bias. 13 out of the 15 studies minimised the risks of bias to an

acceptable standard (overall rating: ++). The remaining two studies addressed some, but not all sources of bias (overall rating: +).

Section 3: Self-harm measures

To measure self-harm, 10 of the 15 studies relied entirely on self-report. Of these, five studies used validated self-report measures, including the Schedule for Nonadaptive and Adaptive Personality (SNAP; Witt et al., 2010), the Suicidal Behaviours Questionnaire- Revised (SBQ-R) with one additional question specifically relating to self-harm (Verona et al., 2012- Study 1), the Lifetime History of Aggression Questionnaire (LHA; Verona et al., 2012- Study 2), the Aggression Vulnerability Scale (AVS; Gray et al., 2003) and the Deliberate Self-Harm Questionnaire- Short Form (DSHQ-SF; Miller et al., 2010). One study used the Semi-Structured interview for the Assessment of the Genetics of Alcoholism- Revised (SSAGA-II; Gunter et al., 2011). It is not clear from this paper what questions were asked in regards to self-harm, and what constituted self-harm. The remaining four studies gathered self-harm data using unvalidated questions as part of a semi-structured interview (Dhingra et al., 2015; Negredo et al., 2013; Semiz et al., 2008; Swogger et al., 2009). In one of these studies (Negredo et al., 2013) the questions asked were specific to certain methods of self-harm, and therefore individuals engaging in other forms of self-harm may have been given a lower score than they would have if other methods of self-harm were included. As all of these studies rely on self-report, they may not be accurate. Participants may over- or under-report self-harm, or they may be subject to recall bias whereby they cannot accurately recall their self-harm history.

Five studies did not rely on self-report data. Four of these studies gathered information related to incidents of self-harm from prison, hospital or youth centre records (Das et al.,

2007; Forouzan & Nicholls, 2015; Storey et al., 2016; Young et al., 2006). However, in one of these studies (Young et al., 2006) only incidents of self-harm which required medical attention were included, and therefore less severe incidents of self-harm would not have been included. The other three papers did not make clear what constituted self-harm. Additionally, as these papers relied on recorded incidents of self-harm, only incidents that were witnessed or reported to staff will be recorded, and therefore it may be that the true frequency of self-harm is higher than that found within the records.

Only one study used a combination of self-report and collateral information (Ates et al., 2011). This study included information obtained during a semi-structured interview, information from relatives, and a physical examination of scars. Finally, in 4 of the 15 studies, self-harm data was not available for all participants (Forouzan & Nicholls, 2015; Dhingra et al., 2015; Gunter et al., 2011; Storey et al., 2016), which may have impacted on the results.

Overall, the majority of studies showed some methodological issues in the measurement of self-harm. 11 out of the 15 studies addressed some, but not all sources of bias (overall rating: +). Three studies minimised the risks of bias to an acceptable standard (overall rating: ++). One study did not adequately address potential sources of bias (overall rating: -).

Section 4: Analyses

14 out of the 15 studies were found to have used appropriate analytic methods; the other study did not clearly explain the data analysis and therefore it was not possible to assess whether it was appropriate or not (Witt et al., 2010). Despite using appropriate statistical methods, five studies may not have been sufficiently powered to detect the association between psychopathy and self-harm. In three studies, this was due to small sample sizes (Forouzan & Nicholls, 2015, *N*=0-60 for each age group; Gray et al., 2003, *N*=34; Negredo et al., 2013, *N*=29). For

the other two studies, this was due to low base rates of self-harm. One study only found 10 incidents of self-harm (Das et al., 2007). Another study did not report the incidence of self-harm (Miller et al., 2010); however, as the participants were students in the USA, and as the lifetime prevalence of self-harm within this population is around 17% (Whitlock, Eckenrode, & Silverman, 2006) the incidence of self-harm within this study is likely to have been low. Therefore the small number of significant results across these studies may be due to Type II errors.

One study combined self-harm and suicide data to create a composite risk score for some parts of their analysis, which meant that the mediating effect of borderline personality disorder was not examined for self-harm and suicide separately (Verona et al., 2012- Study 2).

The majority of the studies reported the data clearly, and included the precise level of association, in addition to the p-values. However, one study only reported the odds ratios and confidence intervals for significant results, but not for non-significant results (Gunter et al., 2011). In another study, the results described in the text did not match those presented in the table (Semiz et al., 2008). In the same study, the results also showed that PCL-R Factor 1 and Factor 2 scores were significantly negatively correlated with self-harm, whereas the PCL-R total score was significantly positively correlated with self-harm. Although these results are not statistically impossible, they are theoretically improbable. The main author was contacted regarding these issues; however no response was received. Therefore, given the inconsistency between data presented in the text and in the table, and given the theoretically improbable results, it is not possible to accurately assess the results of this study.

Finally, one study reported the association between total PCL-R score and Factor 2 score and self-harm, but did not mention the association between Factor 1 and self-harm

(Young et al., 2006). It is not clear whether the analysis did not examine the link between Factor 1 and self-harm, or if no association was found.

Overall, the majority of studies analysed the data in an appropriate way and presented the data clearly. 13 of the 15 studies minimised the risks of bias to an acceptable standard (overall rating: ++). Two studies minimised some, but not all of the biases (overall rating: +).

Section 5: Total internal and external validity

Overall, 8 of the 15 studies demonstrated good internal validity, whereby all or most of the checklist criteria were fulfilled, and where they were not fulfilled, the conclusions were very unlikely to alter (overall rating: ++). Six studies demonstrated less internal validity, whereby some of the checklist criteria were fulfilled, and where they were not fulfilled or not adequately described, the conclusions were unlikely to alter (overall rating: +). Problems with internal validity were related to biases in the collection of self-harm data, PCL measures being used on samples that they had not been validated on, non-reporting of the prevalence of psychopathy, and studies being insufficiently powered to detect associations. One study had poor internal validity, whereby few or no checklist criteria were fulfilled, and the conclusions were likely or very likely to alter (overall rating: -). This was due to the fact that the numbers presented in the results table did not match the numbers presented in the text, and therefore it appears that the results may have been misreported, affecting the study's internal validity.

Overall, only 6 of the 15 studies demonstrated good external validity, whereby all or most of the checklist criteria were fulfilled, and where they were not fulfilled, the conclusions were very unlikely to alter (overall rating: ++). Nine studies demonstrated less external validity, whereby some of the checklist criteria were fulfilled, and where they were not fulfilled or not adequately described, the conclusions were unlikely to alter (overall rating: +).

Problems with external validity were related to failure to fully explain how participants were recruited, selecting participants from limited sites, and stringent exclusion criteria that mean that the results were not generalisable.

Table 5

Summary of quality appraisal ratings

Study	Section 1: Population	Section 2: Psychopathy measures	Section 3: Self-harm measures	Section 4: Analyses	Section 5: Total internal validity	Section 5: Total external validity
Gray et al., 2003	++	++	+	++	+	++
Young, Justice & Erdberg, 2006	++	++	+	++	++	++
Das et al., 2007	++	+	+	++	+	++
Semiz et al., 2008	+	++	+	+	-	+
Swogger et al., 2009	+	++	+	++	++	+
Miller et al., 2010	+	++	++	++	++	+
Witt et al., 2010	+	++	++	++	+	+
Ates et al., 2011	++	++	+	++	++	++
Gunter et al., 2011	+	++	+	++	+	+
Verona, Sprague & Javdani, 2012 (1)	+	++	+	++	++	+
Verona, Sprague & Javdani, 2012 (2)	++	++	++	++	++	++
Negredo, Melis & Herrero, 2013	+	+	+	++	+	+
Dhingra et al., 2015	+	++	+	++	++	+
Forouzan & Nicholls, 2015	+	++	-	+	+	+
Storey et al., 2016	++	++	+	++	++	++

Notes. '++' = Risks of bias are minimised for this aspect of the study, '+' = Some, but not all potential sources of bias were addressed, or it is not clear whether all sources of bias were addressed, '-' = Significant sources of bias persist, 'NR' = Study fails to report how sources of bias were, or might have been addresses, 'NA' = Not applicable for this study.

Summary of results and quality of studies

The studies varied in terms of what 'level' of psychopathy they measured. Ten studies measured the link between overall psychopathy score and self-harm[1]. Eleven studies separated psychopathy into Factor 1 and Factor 2 (Hare, 2003)[2]. Four studies separated psychopathy into its four facets: interpersonal, affective, antisocial and lifestyle (Hare, 2003)[3]. Each of these sets of results will now be reported.

Examining the association between total psychopathy score and self-harm

Ten studies examined the link between total psychopathy score and self-harm[4]. Four of these studies did not find a significant association between psychopathy and self-harm[5]. However, all four of these studies had small sample sizes or low rates of self-harm, which may have meant they were underpowered.

Five of the ten studies found a positive association between psychopathy and self-harm[6]. However, it appears that one of these papers may have misreported the results[7]. Out of the other four studies, three showed good internal and external validity[8], however one study's external validity may have been affected by using volunteers, and its internal validity is unclear, as the authors did not clearly explain the self-harm measure that was used[9].

[1]Ates et al., 2011; Das et al., 2007; Forouzan & Nicholls, 2015; Gray et al., 2003; Gunter et al., 2011; Negredo et al., 2013; Semiz et al., 2008; Storey et al., 2016; Witt et al., 2010; Young et al., 2006
[2] Das et al., 2007; Gray et al., 2003; Gunter et al., 2011; Miller et al., 2010; Negredo et al., 2013; Semiz et al., 2008; Storey et al., 2016; Verona et al., 2012- Study 1; Verona et al., 2012- Study 2; Witt et al., 2010; Young et al., 2006
[3] Das et al., 2007; Dhingra et al., 2015; Storey et al., 2016; Swogger et al., 2009
[4] Ates et al., 2011; Das et al., 2007; Forouzan & Nicholls, 2015; Gray et al., 2003; Gunter et al., 2011; Negredo et al., 2013; Semiz et al., 2008; Storey et al., 2016; Witt et al., 2010; Young et al., 2006
[5] Das et al., 2007; Forouzan & Nicholls, 2015; Gray et al., 2003; Negredo et al., 2013
[6] Ates et al., 2011; Gunter et al., 2011; Semiz et al., 2008; Young et al., 2006; Storey et al., 2016
[7] Semiz et al., 2008
[8] Ates et al., 2011; Young et al., 2006; Storey et al., 2016
[9] Gunter et al., 2011

Finally, one study showed a negative association between psychopathy and self-harm[10]; however this association was small (r=-0.15). In addition to this, the study's internal validity may have been affected by relying on self-report measures of psychopathy and self-harm, and its external validity may have been affected by the recruitment method, which was not clearly explained, and by the fact that only individuals with one of four personality disorders, or major depression were included in the study.

To conclude, of the ten studies that examined the link between total psychopathy score and self-harm, five found a positive association[11]. Although one of these may have misreported the results, the other four are of an acceptable quality. Four studies did not find an association between psychopathy and self-harm[12]. One study showed a small negative association between psychopathy and self-harm[13]; however, this study had potential problems with its internal and external validity. Therefore, overall, there is evidence that indicates that there may be a positive association between psychopathy and self-harm; however further research is required to determine whether the lack of significant results in some of the studies was due to small sample sizes and low rates of self-harm.

Examining the association between Factor 1, Factor 2 and self-harm

Eleven studies examined the link between Factor 1 and Factor 2 and self-harm[14]. Two studies found a negative association between Factor 1 and self-harm[15], whereas the remaining nine studies found no association. Of the two studies that found a negative association, one study's

[10] Witt et al., 2010
[11] Ates et al., 2011; Gunter et al., 2011; Semiz et al., 2008; Young et al., 2006; Storey et al., 2016
[12] Das et al., 2007; Forouzan & Nicholls, 2015; Gray et al., 2003; Negredo et al., 2013
[13] Witt et al., 2010
[14] Das et al., 2007; Gray et al., 2003; Gunter et al., 2011; Miller et al., 2010; Negredo et al., 2013; Semiz et al., 2008; Storey et al., 2016; Verona et al., 2012- Study 1; Verona et al., 2012- Study 2; Witt et al., 2010; Young et al., 2006
[15] Semiz et al., 2008; Witt et al., 2010

internal validity may have been affected by the use of self-reported psychopathy and self-harm, and its external validity may have been affected by the recruitment method, which was not clearly explained, and by the fact that only individuals with one of four personality disorders, or major depression were included in the study[16]. The other study appears to have misreported at least some of the data, and therefore the accuracy of this result is unclear[17]. Therefore, there is not enough evidence to support the notion that there is a link between Factor 1 and self-harm.

In regards to Factor 2, four of the eleven studies did not show a significant association between Factor 2 and self-harm[18]. Of these four studies, two had good external validity[19]; however the external validity of the other two studies may have been affected by using participants who had volunteered to take part[20], and by only using participants from one forensic hospital[21]. Additionally, all of the four studies had biases that may have impacted on their internal validity, including: using the PCL:JV, which is less reliable than the PCL:YV[22], and either not reporting what was included as self-harm, or only including some forms of self-harm[23].

Six studies found a positive association between Factor 2 and self-harm[24]. Five of these studies had good internal validity; however one study's internal validity may have been affected by using self-report measures of psychopathy and self-harm, which may be inaccurate[25]. Additionally, three of the six studies may have had biases that impacted on their

[16] Witt et al., 2010
[17] Semiz et al., 2008
[18] Das et al., 2007; Gray et al., 2003; Gunter et al., 2011; Negredo et al., 2013
[19] Das et al., 2007; Gray et al., 2003
[20] Gunter et al., 2011
[21] Negredo et al., 2013
[22] Das et al., 2007
[23] Gray et al., 2003; Gunter et al., 2011; Negredo et al., 2013
[24] Miller et al., 2010; Storey et al., 2016; Verona et al., 2012- Study 1; Verona et al., 2012- Study 2; Witt et al., 2010; Young et al., 2006
[25] Witt et al., 2010

external validity, by using unrepresentative samples[26]. Finally, one study found a negative association between Factor 2 and self-harm[27]; however as this study appears to have misreported at least some of the data, the accuracy of this result is unclear.

To conclude, there is not enough evidence to support the notion that there is a link between Factor 1 and self-harm. However, there is some evidence that there is a positive association between Factor 2 and self-harm.

Examining the associations between the four facets and self-harm

Four studies examined the link between each of the four facets (Interpersonal, Affective, Antisocial and Lifestyle) and self-harm[28]. In relation to the link between the Interpersonal facet and self-harm, two studies found no association[29], one study found a negative association[30], and one study found a positive association[31], but only in one of their two sample groups. All of these studies, apart from one, had some biases in their internal or external validity. Therefore, there is not enough consistent evidence to indicate a link between the Interpersonal facet and self-harm.

In terms of the relationship between the Affective facet and self-harm, one study showed a positive association; however the other three studies failed to find an association. The study that found a positive association had good internal validity; however only patients with certain diagnoses, and only those hospitalised for less than 21 days were included in the study, which may have impacted on the external validity of the study[32]. One of the three studies that showed no association between the Affective facet and self-harm had the same

[26] Miller et al., 2010; Verona et al., 2012- Study 1; Witt et al., 2010
[27] Semiz et al., 2008
[28] Das et al., 2007; Dhingra et al., 2015; Storey et al., 2016; Swogger et al., 2009
[29] Storey et al., 2016; Swogger et al., 2009
[30] Dhingra et al., 2015
[31] Das et al., 2007
[32] Dhingra et al., 2015

problem with external validity, but good internal validity[33]. One study had good external validity, but used a translated version of the PCL:YV which has not been validated on that sample, which they then modified, affecting the internal validity of that study[34]. The other study had good internal and external validity[35]. Therefore, overall there is not enough good quality evidence to indicate a link between the Affective facet and self-harm.

In relation to the Antisocial and Lifestyle facets, one study showed a weak positive association between both of these facets and self-harm[36], whereas the other three studies showed no association. Although this study had good internal and external validity, the fact that the associations were weak, and the lack of replication of these results across other studies means that there is not enough evidence to support the notion that there is a link between the Antisocial facet or Lifestyle facet and self-harm.

To conclude, only four studies examined the link between each of the four facets and self-harm. These studies showed inconsistent, and sometimes conflicting results. Therefore, there is not enough evidence to indicate a specific link between any of the four facets and self-harm.

[33] Swogger et al., 2006
[34] Das et al., 2007
[35] Storey et al., 2016
[36] Storey et al., 2016

Discussion

Cleckley (1976) believed that psychopaths were less likely than non-psychopaths to experience suicidality or self-harm. The results of this literature review did not support this idea, and in fact the evidence indicated that the opposite may be true: those who score higher on measures of psychopathy are more likely to self-harm. More specifically, the results indicated that those who score higher on Factor 2 items may be at an increased risk of self-harm. There is not enough evidence indicative of a link between Factor 1, or any of the four facets, and self-harm.

Recommendations for clinical practice

Clinicians working with individuals who meet the criteria for psychopathy should be aware that their psychopathic traits may increase, rather than decrease their risk of self-harm, particularly in those individuals who score high on Factor 2 items. This should therefore be considered when undertaking self-harm risk assessments. Additionally, when considering interventions aimed at reducing an individual's risk of self-harm, interventions that target Factor 2 traits may be of benefit. However, as this has not yet been empirically tested, further research into whether reduction of Factor 2 traits does reduce self-harm risk is required.

Recommendations for further investigation

Some of the studies that examined the link between total psychopathy score and self-harm failed to show any association. However, this may have been due to small sample sizes or low rates of self-harm. Therefore, further research is needed to examine the link between total psychopathy score and self-harm with larger sample sizes, to establish whether the lack of significant results was due to the studies being underpowered, or due to a 'true' lack of

association between psychopathy and self-harm. Only four studies examined the link between self-harm and each of the four facets of psychopathy. The results of these studies were inconsistent, and therefore further research is required to see whether any of the results obtained in previous studies are reliable across different samples and methodologies.

The current review also found that few of the studies that examined the link between psychopathy and self-harm contained, or reported, high numbers of psychopaths within their samples. Therefore, it is recommended that further research uses samples that contain higher numbers of psychopaths, and that this research directly compares psychopaths and non-psychopaths to see whether the results presented within this review are the same with more psychopathic samples.

Finally, the majority of the studies within this review used self-report measures of self-harm, which may not be reliable due to over- or under-reporting, or recall bias. Therefore, further research could be conducted using more objective measures of self-harm, such as observations or clinical records, and collateral information, for example from family members.

To conclude, further research in this area is required, and should include: large sample sizes with greater numbers of individuals who meet the criteria for psychopathy, multiple centres/settings, a well-describe population so that confounding factors such as borderline personality disorder can be considered, a validated measure of psychopathy such as the PCL-R or PCL:SV, and a valid measure of self-harm that incorporates self-report as well as collateral information.

Limitations of review

The main limitation of this review is the small number of studies that were found which examine this research question. Overall, only 15 studies were obtained and used in this review. Of these, some studies examined total psychopathy score, some examined Factor 1 and Factor 2, and some examined the four psychopathy facets. Small numbers of studies at each 'level' of psychopathy meant that finding reliable results was difficult. Additionally, only 4 of the 15 studies had good internal and external validity. In reviews with larger number of studies, those deemed of lower quality could be relied upon less; however due to the small numbers of studies in this review, results from those of poorer quality had to be relied upon.

Summary

This systematic literature search yielded 14 papers that examine the link between psychopathy and self-harm. The use of a quality appraisal checklist developed by NICE (2012) allowed for an appraisal of the quality of each study. This showed that most of the studies had good internal validity; however there were some biases that affected the external validity of some of these studies. The results showed that there may be a positive association between total psychopathy score and self-harm; however some studies failed to show this association and therefore further research is required with larger sample sizes to determine whether this was due to the small sample sizes and low rates of self-harm. The results showed a positive association between Factor 2 and self-harm, but failed to show a link between Factor 1 and self-harm. The results did not show consistent evidence for a link between any of the four facets and self-harm. Further research is required in this area to establish whether the results presented in this review are reliable.

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Chapter Two: Empirical Research Report

Do Scores on the HCR-20 and FAM Predict Frequency of Self-harm in Females within a Secure Psychiatric Hospital?

Abstract

Introduction: The Historical, Clinical, and Risk Management scales (HCR-20) and the Female Additional Manual (FAM) are violence risk assessment tools which are widely used within secure psychiatric services. Research has shown that violence and self-harm frequently co-occur, and that there is likely to be a link between them. Therefore, this study aimed to examine whether scores on the HCR-20 and FAM are related to frequency of self-harm.

Method: This prospective cohort study examined HCR-20 Version 3 and FAM scores for 89 female patients within a secure psychiatric hospital, and the frequency of self-harm for each participant within the following year.

Results: The results showed that higher mean total scores on the HCR-20, and also on the Historical and Clinical scales were associated with more frequent self-harm, both with and without the FAM items. The Risk Management scale was not associated. Eight items were positively associated with self-harm: (history of problems with…) mental disorder, personality disorder, violent attitudes, pregnancy at young age, (recent problems with…) violent ideation or intent, instability, low self-esteem and (future problems with…) treatment or supervision response. One item was negatively associated with self-harm: (history of problems with…) prostitution. The final risk judgement for self-destructive behaviour was also positively associated with self-harm.

Discussion: The HCR-20 and FAM are useful tools for assessing risk of self-harm, particularly the Historical and Clinical scales. However, not all items are independently

associated with more frequent self-harm. Final risk judgements are also an accurate indicator of frequency of self-harm, and therefore the process of completing the HCR-20 and FAM may aid accurate self-harm risk assessment. Further research needs to be conducted to examine whether the HCR-20 can also be useful in assessing risk of self-harm in males.

Introduction

The assessment of risk within offender populations is something that is important to clinicians, as well as society (Gray et al., 2003). The majority of formal risk assessment tools focus on assessing risk of violence; however, it is also important for inpatient mental health services to assess other risks, including risk of self-harm (Webster, Martin, Brink, Nicholls, & Desmarais, 2009). A review into the prevalence of self-harm within psychiatric inpatient settings found that between 1% and 69% of inpatients engaged in self-harming behaviours (James, Stewart, & Bowers, 2012). In particular, inpatients within forensic psychiatric units were more likely to self-harm compared to those in acute units and Psychiatric Intensive Care Units (PICUs), with prevalence rates in forensic units being between 17% and 69%.

The most obvious consequence of self-harm is to the physical health of the individual. Research has shown that between 8% and 13% of incidents of self-harm require invasive medical attention, such as suturing or surgical removal of a foreign body (Burrow, 1992; Low, Terry, Duggan, MacLeod, & Power, 1997; Mannion, 2009), with some incidents resulting in permanent disfigurement (Sweeny & Zamecnik 1981). There is also a risk of death, with one study showing that out of 1607 incidents of self-harm, 1% were potentially life-threatening and required the assistance of emergency services (Low et al., 1997). Additionally, one study found that 1% of those who harm themselves commit suicide in the following year (Gunnell & Frankel, 1994), and therefore the presence of self-harming behaviour indicates an increased risk of suicide. However, in addition to the consequences/risks for the individual, incidents of self-harm also impact negatively on staff by inducing feelings of anger, frustration and powerlessness (James et al., 2012). Therefore, effective assessment and management of self-harm within inpatient settings is vital.

There are a number of risk scales that have been developed to assess risk of self-harm, including: the Manchester Self-Harm Rule (Cooper et al., 2006), the ReACT Self-Harm Rule (Steeg et al., 2012), the SAD PERSONS scale (Patterson, Dohn, Bird, & Patterson, 1983) and the Modified SAD PERSONS scale (Hockberger & Rothstein, 1988). However, a review of these risk scales showed that they performed no better than clinicians' ratings of risk, and some performed considerably worse (Quinlivan et al., 2017). The authors concluded that self-harm risk scales have limited clinical utility, and that they should not be used to predict or to guide clinical management of self-harm.

Current guidance from the National Institute for Health and Care Excellence (NICE) for the assessment of self-harm risk states that risk assessments should include "identification of the main clinical and demographic features known to be associated with risk of further self-harm and/or suicide, and identification of the key psychological characteristics associated with risk, in particular depression, hopelessness and continuing suicidal intent." (Assessment of Risk section, 2004). The Structured Professional Judgement (SPJ) approach to risk assessment aims to do this by bridging the gap between actuarial risk assessments and unstructured clinical judgements, and is the most widely used approach to risk assessment within forensic settings (Doyle & Dolan, 2008). However, there are few structured professional judgement tools aimed at assessing risk of self-harm (Daffern & Howells, 2007). The Suicide Risk Assessment and Management Manual (SRAMM; Bouch & Marshall, 2003) aims to assess risk of self-harm; however there is limited research into its validity (O'Shea, Picchioni, Mason, Sugarman, & Dickens, 2014). The Short-Term Assessment of Risk and Treatability (START; Webster et al., 2009) is an SPJ tool which examines various types of risk, including self-harm; however research into the predictive validity of the START in regards to self-harm has yielded mixed results (O'Shea & Dickens, 2014).

The Historical, Clinical, and Risk Management (HCR-20; Douglas, Hart, Webster, & Belfrage, 2013) risk assessment tool is the 'gold standard' instrument for the assessment of risk of violence (Abidin et al., 2013), and is the most widely used risk assessment tool within medium-secure units in England (Khiroya, Weaver, & Maden, 2009). It is made up of 20 items that have been demonstrated to be related to risk of violence, and is split into three scales: the Historical scale (H), the Clinical scale (C) and the Risk Management scale (R). As the HCR-20 was developed based on research conducted with mostly all-male samples (de Vogel & de Vries Robbe, 2013), the Female Additional Manual (FAM; de Vogel, de Vries Robbé, van Kalmthout, & Place, 2014) was designed to be used alongside the HCR-20 when assessing risk of violence in females, capturing eight gender-specific risk-related items such as prostitution, parenting problems, and pregnancy at a young age.

Although the HCR-20 and FAM were not designed to assess risk of self-harm, research has shown a link between self-harm and violence (Nicholls, Brink, Greaves, Lussier, & Verdun-Jones, 2009; Nijman & Campo, 2002). Hillbrand (2001) summarised the literature on co-occurring aggression and self-harm, concluding that co-occurrence is common, indicating a strong link between the two behaviours, and that therefore risk assessments for both behaviours should occur jointly. A more recent systematic review of 123 studies also found that aggression and self-harm frequently co-occur, and that more research is required into the source and nature of this co-occurrence (O'Donnell, House, & Waterman, 2015). Furthermore, research has shown a link between self-harm and suicide (Hawton, Casañas i Comabella, Haw, & Saunders, 2013), and that violence and suicide may share as many as 23 psychosocial risk factors (Plutchik, 1994; Plutchik, van Pragg, & Conte, 1989). The frequent co-occurrence of violence and self-harm, and the indication that they may share a large

number of risk factors means that it may be the case that violence risk assessment tools, such as the HCR-20 and FAM, are also relevant to the risk assessment of self-harm.

There is limited research into the utility of the HCR-20 in assessing risk of self-harm (Gray et al., 2003), and to date, no study has examined the utility of the FAM in assessing risk of self-harm. However, the studies that have been conducted into the HCR-20 provide some evidence that the scores on the HCR-20 predict self-harm. For example, Abidin et al. (2013) found that the HCR-20, and each of its three subscales, predicted self-harm over the following six months in a secure psychiatric hospital. Similar results were also obtained by Fagan et al. (2009) who examined the predictive validity of the HCR-20 over a six month period in an Irish secure psychiatric hospital, and found that the HCR-20 total score, the Historical scale and the dynamic scale (sum of the Clinical and Risk Management scales) were predictive of self-harm. O'Shea et al. (2014) found that the HCR-20 total score, the Historical scale and the Risk Management scale predicted self-harm over the following three months; however their results did not show an association between the Clinical scale and self-harm. Another study aimed to examine the predictive validity of the HCR-20 in regards to more imminent self-harm (Daffern & Howells, 2007). This study only examined the Clinical scale, but showed that this did predict next-day self-harm in personality disordered inpatients within a high security psychiatric hospital, although the association was weak (AUC=0.66).

Despite the evidence for a link between scores on the HCR-20 and self-harm, not all studies have consistently found this association. Gray et al. (2003) examined the link between the HCR-20 and self-harm across two medium-secure psychiatric units, and found that the HCR-20 did not predict self-harm within the following three months. However, it is important to note that in this study the Risk Management scale was not included, as the researchers did not have enough information to rate items on this scale.

Due to the age of the studies discussed above, none of them used the latest version of the HCR-20: Version 3 (Douglas et al., 2013). One study used the HCR-20 Version 1 (Webster, Eaves, Douglas, & Wintrup, 1995) and four studies used the HCR-20 Version 2 (Webster, Douglas, Eaves, & Hart, 1997). Additionally, despite self-harm being more prevalent among females (Belknap & Holsinger, 2006; Claassen et al., 2006; Coid, Kahtan, Gault, & Jarman, 2000; Hawton, 2000; Livesley, 2003; Motz, 2008; Nijman & Campo, 2002; O'Loughlin & Sherwood, 2005), of the studies discussed above, two did not report the gender of their sample, and the other three studies were based on samples in which the majority of participants were male, with females only making up 6-31% of the sample. In the studies that did have females within the sample, the FAM was not used. Therefore, the current study will use a female sample, and will aim to examine the predictive validity of the latest version of the HCR-20 (Version 3) and the FAM.

Finally, the studies discussed above examined self-harm within a period of one day to six months following HCR-20 assessment. A meta-analysis examining the predictive validity of the HCR-20 showed that studies with longer follow-up periods had larger effect sizes (O'Shea, Mitchell, Picchioni, & Dickens, 2013), and therefore the current study will examine self-harm over a one year period following HCR-20 assessment.

Hypotheses

Based upon the results of previous research, it is hypothesised that higher mean HCR-20 scores, and higher mean scores on each of the scales will be associated with more frequent self-harm. Additionally, based upon previous research into risk factors for self-harm, it is also hypothesised that the following items will be found to be associated with an increased risk of self-harm: *history of problems with substance use* (see Larkin, Di Blasi, & Arensman, 2014;

Livesley, 2003), *history of problems with major mental disorder* (see Larkin et al., 2014), *history of problems with personality disorder* (see Lanes, 2009; Larkin et al., 2014), *history of problems with traumatic experiences* (see Fliege, Lee, Grimm, & Klapp, 2009; Gratz, 2003; Mangnall & Yurkovich, 2008), *history of problems with suicidality/self-harm* (see Larkin et al., 2014; Livesley, 2003), *recent problems with symptoms of major mental disorder* (see Fliege et al., 2009), *recent problems with instability* (see Adrian, Zeman, Erdley, Lisa, & Sim, 2011; Gratz, 2003), and *recent problems with low self-esteem* (see Hawton, Kingsbury, Steinhardt, James, & Fagg, 1999; Low, Jones, MacLeod, Power, & Duggan, 2000).

Method

Study design

This study was a prospective cohort study of inpatients within a secure forensic psychiatric hospital.

Setting

The study took place within a private hospital that provides secure inpatient psychiatric services across four sites in England. The four sites are made up of medium-secure, low-secure and lock/rehabilitation wards. Patients within the hospital include those detained under the Mental Health Act (MHA) 1983 (both criminal and civil sections) and voluntary (non-detained) patients.

Participants

Participants included all adult female patients who had at least one HCR-20 Version 3 and FAM completed, who remained in the hospital for one year following HCR-20 assessment (N=89). The mean age of participants at the time of risk assessment was 34.88 years (SD = 14.33). Information regarding ethnicity was only available for 59.55% of the sample (n = 53). Of these, 84.9% were white/Caucasian (n = 45), 9.43% were black/African/Caribbean (n = 5), 3.77% were Asian (n = 2) and one participant had mixed ethnicity of white and black Caribbean. Primary diagnoses included personality disorder (n = 37, 41.57%), schizophrenia (n = 34, 38.20%), substance misuse disorder (n = 7, 7.87%), mood disorder (n = 4, 4.49%), eating disorder (n = 3, 3.37%), Post-Traumatic Stress Disorder (PTSD; n = 2, 2.25%), Obsessive Compulsive Disorder (OCD; n = 1, 1.12%) and conduct disorder (n = 1, 1.12%).

The majority of participants (n = 51, 57.30%) resided in low secure wards, 32 (35.96%) were in medium secure wards and 6 (6.74%) were in locked wards. Most participants (n = 50, 56.18%) were admitted under Section 3 of the Mental Health Act (MHA) 1983 and 39 (43.82%) were admitted under forensic sections (part 3) of the MHA.

Measures

The most recent version of the Historical, Clinical, and Risk Management tool (HCR-20 Version 3; Douglas et al., 2013) and the Female Additional Manual (FAM) were used. See Table 6 for a list of HCR-20 and FAM items.

Table 6.

HCR-20 and FAM items

HCR-20	**FAM**
Historical scale (History of Problems With…)	
H1. Violence	H11. Prostitution
H2. Other Antisocial Behaviour	H12. Parenting Difficulties
H3. Relationships	H13. Pregnancy at Young Age
H4. Employment	H14. Suicidality/Self-Harm
H5. Substance Use	
H6. Major Mental Disorder	
H7. Personality Disorder	
H8. Traumatic Experiences	
H9. Violent Attitudes	
H10. Treatment or Supervision Response	
Clinical scale (Recent Problems With…)	
C1. Insight	C6. Covert/Manipulative Behaviour
C2. Violent Ideation or Intent	C7. Low Self-Esteem
C3. Symptoms of Major Mental Disorder	
C4. Instability	
C5. Treatment or Supervision Response	
Risk Management scale (Future Problems With…)	
R1. Professional Services and Plans	R6. Problematic Childcare Responsibility
R2. Living Situation	R7. Problematic Intimate Relationship
R3. Personal Support	
R4. Treatment or Supervision Response	
R5. Stress or Coping	

Scoring

Each item on the HCR-20 and FAM is given one of three ratings based on whether it is present for that individual: a rating of 'No' is given if a risk factor is absent, a rating of 'Possible/Partial' is given if the risk factor is possibly or partially present, and rating of 'Yes' is given if the risk factor is definitely present. According to the HCR-20 manual, items may be rated as 'Possible/Partial' when there is information indicating the presence of the item, but this information is "weak, contradictory, or inconclusive" (Douglas et al., 2013, pp.44). The ambiguity of these cases may hide any true association between the presence of risk factors and frequency of self-harm. Therefore, cases where there was some uncertainty, that is those rated as 'Possible/Partial', were grouped with cases rated 'No', and were given a numerical value of 0. Cases where the presence of the item was certain, (i.e. those rated as 'Yes') were given a numerical value of 1, for the purpose of statistical analysis.

For individuals who reside within hospital, the Risk Management scale can be rated based upon future problems if they remain in hospital ('*Institutional'*) or based on future problems if they are discharged into the community (*'Community'*; Douglas et al., 2013). Within the setting where this study took place, patients are typically given both an *Institutional* rating and *Community* rating, to reflect the fact that their risk may be different if discharged into the community. As the current study examined self-harm occurring within an inpatient setting, *Institutional* ratings were taken for each participant.

Finally, the FAM requires assessors to take into consideration all of the information examined with the HCR-20 and FAM to generate a final risk judgement for self-destructive behaviour, victimisation and non-violent criminal behaviour (de Vogel et al., 2014). These items are rated on a five-point scale, from 1 (low risk) to 5 (high risk). The association

between the final risk judgement for self-destructive behaviour and frequency of self-harm was also examined.

Ethical approval

The study was approved by the hospital's Quality Assurance Team (see Appendix C). As the study used routinely collected data to examine current use of a risk assessment tool, the Quality Assurance Team classified this research as a service evaluation, and therefore consent from participants was not required. Ethical approval was obtained from the University of Birmingham (see Appendix D).

Procedure

Demographic information

Information regarding each participant's age, ethnicity, primary diagnosis, level of security in which they reside and section of the Mental Health Act (MHA) 1983 under which they are detained were gathered from each participant's electronic clinical record.

HCR-20 and FAM

HCR-20 and FAM assessments are routinely completed for each patient by their clinical team within three months of admission, and are updated at least six-monthly thereafter. The HCR-20 and FAM are completed within a single Microsoft Word document, which is then uploaded onto each patient's electronic clinical record. Ratings from each participant's HCR-20 and FAM were retrieved from these documents and entered into an SPSS file, alongside each patient's demographic information and unique hospital number.

Some of the items within the data set were omitted where, according to the manual, they should not have been. According to the HCR-20 manual, items should only be omitted if there is insufficient information to code the item (Douglas et al., 2013). However, 11 participants had the FAM item "*history of pregnancy at young age"* omitted when the individual had never been pregnant. According to the FAM manual, in the case that an individual has never been pregnant, the item should be rated as 'No' (de Vogel et al., 2014). Similarly, 31 participants had the item *"future problems with problematic childcare responsibility"* omitted due to the individuals not having children. According to the FAM manual, if the individual is not expected to have any childcare responsibilities in the foreseeable future, the item should be rated as 'No' (de Vogel et al., 2014). In the above circumstances, items were re-rated as 'No'.

Self-harm data

Data relating to various types of risk, including self-harm, is collated for each patient and stored within a Microsoft Word or Excel document, referred to as a 'risk log'. There are two stages to this process. First, staff members record details of any risk-related incidents that have taken place, including self-harm, within each patient's electronic progress notes.

The second stage of this process varies slightly between wards: On 11 out of the 13 wards, approximately once a week, an Assistant Psychologist (AP; a psychology graduate supervised by a qualified psychologist) reads through each patient's electronic progress notes and copies details of any risk-related incidents into their risk log. They then code each incident dependent on the type of risk (verbal, physical against objects, physical against people or physical against self) and severity (mild to severe) using either the Modified Overt Aggression Scale (MOAS; Kay, Wolkenfield, & Murrill, 1988), the Overt Aggression Scale-

Modified (OAS-M; Sorgi, Ratey, Knoedler, Markert, & Reichman, 1991) or the Overt Aggression Scale- Modified for Neurorehabilitation (OAS-MNR; Alderman, Knight, & Morgan, 1997), depending on the scale deemed most suitable for that ward. The MOAS, OAS-M and OAS-MNR are all modified versions of the Overt Aggression Scale (OAS; Yudofsky, Silver, Jackson, Endicott, & Williams, 1986), and the definition of self-harm is consistent across these scales. Therefore an incident coded as self-harm on one scale would be similarly coded as self-harm on the other scales.

On the remaining two wards, incidents of self-harm are recorded and monitored using the electronic progress notes system. When staff members enter electronic progress notes, if the entry they are making contains risk-related information, they are required to tick a box highlighting the type of risk (e.g. self-harm) that the entry contains. It is then possible for clinicians to access a list of all of the notes that contain risk-related incidents, grouped by the type of risk.

In order to assess whether the two processes described above are being accurately completed (i.e. that the Assistant Psychologists are accurately copying and coding all incidents of self-harm, and that staff are consistently ticking the box to highlight that the entry contains an incident of self-harm), the researcher randomly selected a proportion of the sample (n=12, 15%, where the first method is used and n=4, 40%, where the second method is used) and read through three months of the participants' electronic progress notes, counting the number of self-harm incidents, as defined by the OAS (Yudofsky et al., 1986). A paired samples t-test and Pearson's correlations were used to examine the level of association between the frequency of self-harm obtained by the researcher and that contained within the risk log/risk-related incident list over the same three-month period.

For the wards on which the AP collates a 'risk log', the results showed a strong positive correlation between the frequency of self-harm recorded by the researcher, and that recorded within the risk logs, r=0.999, p<0.001. There was no significant difference between the frequencies recorded by the researcher and that contained within the risk logs. For the wards that collate risk-related information using the electronic risk-related incident list, the results also showed a strong positive correlation between the frequency of self-harm recorded by the researcher, and that recorded in the risk-related incidents list, r=0.990, p<0.01. Again, no significant difference was found between the frequencies recorded by the researcher and that contained within the risk-related incidents list. As both of these processes were reliable over a three-month period for a proportion of the participants, it is likely that the processes are reliable for all participants across the one year study period. Therefore, data regarding frequency of self-harm was gathered by counting the number of incidents coded as self-harm within each patient's risk log or electronic risk-related incidents list in the one year period following the HCR-20 and FAM assessment.

Statistical methods

Although Poisson regression would typically be used for count data, the self-harm data were over-dispersed, and therefore negative binomial regression was deemed more appropriate (Gardner, Mulvey & Shaw, 1995). Negative binomial regression was used to examine the association between frequency of self-harm and mean total score and mean scores on each of the three scales, with and without the FAM items. Negative binomial regression was also used to examine the association between each item on the HCR-20 and FAM and frequency of self-harm. Where a participant had any missing (i.e. omitted) data on a scale, their data was

excluded from the analysis of that particular scale. Therefore the participant numbers included in the analyses vary across the three scales.

Due to the total number of items and scales being examined within this study, there is an increased risk of type I errors. To reduce this risk of type 1 errors when conducting multiple comparisons, a correction (such as Bonferroni) could have been used.

Results

Of the 89 participants, 54 (60.67%) self-harmed at least once during the one year period. The highest number of self-harm incidents was 236, with a mean number of incidents of 24.3 (SD = 42.34). The results of the negative binomial regression are presented in Table 7.

HCR-20 Total Score

There was a significant positive association between mean scores on the HCR-20 and frequency of self-harm. This was true both with (B=5.10, $p<0.001$) and without the FAM items (B=4.23, $p<0.001$). The association was slightly stronger, though not significantly so, with the inclusion of the FAM items.

Historical Scale

There was a significant positive association between mean scores on the Historical scale and frequency of self-harm. This was true both with (B=3.35, $p=0.001$) and without the FAM items (B=3.57, $p<0.001$). The association was slightly weaker, though not significantly so, with the inclusion of the FAM items.

Item H12 (*history of problems with parenting difficulties*) had a large proportion of omitted items (44.9%), and therefore this item was removed from the analysis which examined individual items. Following this, 65 participants (73.03%) had no missing data on the Historical scale, and were therefore included in the analysis. The link between item H1 (h*istory of problems with violence*) and self-harm could not be examined due to lack of variance, as 63 of the 65 participants had this item rated as 'Yes'. Therefore this item was removed from the analysis.

Four items were significantly positively associated with frequency of self-harm: *history or problems with major mental disorder* (B=0.75, $p<0.05$), *history of problems with personality disorder* (B=1.87, $p<0.001$), *history of problems with violent attitudes* (B=0.79, $p<0.05$) and *history of problems with pregnancy at young age* (B=1.34, $p<0.005$). One item was significantly negatively associated with self-harm: *history of problems with prostitution* (B=-1.58, $p<0.005$).

Clinical Scale

There was a significant positive association between mean scores on the Clinical scale and frequency of self-harm. This was true both with (B=3.95, $p<0.001$) and without the FAM items (B=2.46, $p<0.001$). The association was slightly stronger, though not significantly so, with the inclusion of the FAM items.

Eighty-seven participants (97.75%) had no missing data on the Clinical scale, and were therefore included in the analysis of individual items. Three items were significantly positively associated with frequency of self-harm: *recent problems with violent ideation or intent* (B=1.06, $p<0.005$), *recent problems with instability* (B=1.64, $p<0.001$) and *recent problems with low self-esteem* (B=1.12, $p<0.001$).

Risk Management Scale

The Risk Management scale was not significantly associated with frequency of self-harm with or without the FAM items. Eighty-six participants (96.63%) had no missing (i.e. omitted) data on the Risk Management scale, and were therefore included in the analysis of individual items. One item was significantly positively associated with frequency of self-harm: *future problems with treatment or supervision response* (B=0.64, $p<0.05$).

Final Risk Judgement: Self-Destructive Behaviour

Seventy-five participants (84.3%) were given a final risk judgement for self-destructive behaviour. There was a significant positive association between scores on the final risk judgement for self-destructive behaviour and frequency of self-harm (B=0.75, $p<0.001$).

Table 7.

Results of negative binomial regression

				95% Wald Confidence Interval		Hypothesis Test	
Scale	**Item**	**B**	**Std. Error**	**Lower**	**Upper**	**Wald Chi-Square**	***p***
Total	Mean score without FAM	4.24	0.63	3.01	5.47	45.81	**<0.001**
	Mean score with FAM	5.10	0.71	3.72	6.48	52.30	**<0.001**
Historical (history of problems with…)	Mean score without FAM	3.57	0.96	1.68	5.46	13.74	**<0.001**
	Mean score with FAM	3.35	1.02	1.35	5.35	10.79	**0.001**
	H2- Other antisocial behaviour	0.42	0.38	-0.32	1.16	1.24	0.266
	H3- Relationships	0.55	0.72	-0.86	1.95	0.58	0.447
	H4- Employment	0.38	0.44	-0.48	1.24	0.73	0.392
	H5- Substance use	-0.20	0.36	-0.90	0.50	0.32	0.570
	H6- Major mental disorder	0.75	0.36	0.04	1.47	4.27	**0.039**
	H7- Personality disorder	1.87	0.50	0.88	2.86	13.78	**<0.001**
	H8- Traumatic experiences	0.21	0.83	-1.41	1.83	0.06	0.801
	H9- Violent attitudes	0.79	0.36	0.08	1.50	4.77	**0.029**
	H10- Treatment or supervision response	-0.14	0.44	-1.01	0.73	0.10	0.748
	H11- Prostitution	-1.58	0.47	-2.49	-0.66	11.44	**0.001**
	H13- Pregnancy at young age	1.34	0.46	0.44	2.25	8.48	**0.004**
	H14- Suicidality/self-harm	1.18	0.66	-0.12	2.47	3.18	0.074
Clinical (recent problems with…)	Mean score without FAM	2.46	0.53	1.41	3.50	21.16	**<0.001**
	Mean score with FAM	3.95	0.60	2.76	5.13	42.79	**<0.001**
	C1- Insight	-0.32	0.28	-0.88	0.23	1.31	0.253
	C2- Violent ideation or intent	1.06	0.31	0.45	1.67	11.49	**0.001**
	C3- Symptoms of major mental disorder	0.44	0.30	-0.15	1.04	2.13	0.145
	C4- Instability	1.64	0.46	0.73	2.55	12.45	**<0.001**
	C5- Treatment or supervision response	0.14	0.34	-0.52	0.80	0.18	0.675
	C6- Covert/manipulative behaviour	0.28	0.25	-0.20	0.77	1.32	0.250
	C7- Low self-esteem	1.12	0.27	0.59	1.65	17.43	**<0.001**
Risk Management (future problems with…)	Mean score without FAM	-0.20	0.40	-0.98	0.57	0.26	0.608
	Mean score with FAM	-0.75	0.47	-1.67	0.18	2.52	0.112
	R1- Professional services and plans	0.05	0.28	-0.50	0.61	0.04	0.850
	R2- Living situation	0.53	0.35	-0.15	1.20	2.30	0.129
	R3- Personal support	-0.22	0.33	-0.86	0.43	0.44	0.508
	R4- Treatment or supervision response	0.64	0.32	0.00	1.27	3.90	**0.048**
	R5- Stress or coping	-0.08	0.36	-0.80	0.63	0.05	0.823
	R6- Problematic child care responsibility	1.03	0.53	-0.01	2.07	3.74	0.053
	R7- Problematic intimate relationship	0.08	0.25	-0.41	0.57	0.10	0.746
Final Risk Judgement: Self-destructive behaviour		0.75	0.09	0.56	0.93	65.08	**<0.001**

Note. p-values where $p<0.05$ are in bold font.

Discussion

This study aimed to examine whether scores on the HCR-20 and FAM were related to frequency of self-harm in females within a secure psychiatric setting.

HCR-20 Total Score

The results showed that those obtaining a higher mean score on the HCR-20 self-harmed more frequently in the following year. This was true both with and without the FAM items, though the association was slightly stronger with the inclusion of the FAM items. The association between HCR-20 scores and self-harm is consistent with the majority of previous research (see Abidin et al., 2013; Fagan et al., 2009; O'Shea et al., 2014) which also found that total HCR-20 scores predicted self-harm; though these results are different from one study (Gray et al., 2003) which found that the HCR-20 total score did not predict self-harm. The results of the present study indicate that the HCR-20 may be a useful tool for assessing risk of self-harm, in addition to its already established utility in assessing risk of violence. This study also indicates that inclusion of the FAM items may add to the clinical utility in the prediction of self-harm.

Historical Scale

The results showed that individuals obtaining a higher mean score on the Historical scale self-harmed more frequently in the subsequent year. This was true both with and without the FAM items, though the association was slightly weaker when the FAM items were included. The finding that the Historical scale is associated with self-harm is consistent with the majority of previous research (see Abidin et al., 2013; Fagan et al., 2009; O'Shea et al., 2014) which also found that total Historical scale predicted self-harm; though these results are different from

one study (Gray et al., 2003) which found that scores on the Historical scale were not related to self-harm.

The finding that including the FAM items reduced the strength of association between the HCR-20 and self-harm is likely to be due to the fact that the FAM item *history of problems with prostitution* was significantly negatively associated with frequency of self-harm. This negative association is inconsistent with previous research that found that female prisoners with a history of prostitution were more likely to self-harm (Roe-Sepowitz, 2007). It is not clear why the results of this study were different, but it may be due to the fact that this study was based on an inpatient sample, rather than on prisoners, and there may be differences between these two groups.

There were four items on the Historical scale that were significantly positively associated with frequency of self-harm: (history of problems with…) *major mental disorder, personality disorder, violent attitudes* and *pregnancy at young age.* It was hypothesised that having a history of major mental disorder or personality disorder would be associated with more frequent self-harm, due to the fact that, as previously discussed, having a mental illness or personality disorder has been shown to be related to an increased risk of self-harming behaviours (see Lanes, 2009; Larkin et al., 2014).

Although it was not hypothesised that having a history of violent attitudes would be associated to more frequent self-harm, this result is unsurprising, given the strong link between violent attitudes and actual violence (see Douglas et al., 2013), and the link between violence and self-harm, discussed earlier (see Lanes, 2009; Nicholls et al., 2009; Nijman & Campo, 2002; O'Donnell et al., 2015).

The finding that having a history of pregnancy at a young age is positively associated with frequency of self-harm is interesting, as this has not been explored as a potential risk

factor for self-harm within previous studies. Research has shown that younger mothers experience more socio-economic deprivation, more mental health problems and less human and social capital (Moffitt, 2002). The partners of young mothers were also found to be less reliable and supportive and more antisocial and abusive *(ibid).* All of these factors may increase an individual's risk of self-harm. Another explanation for the association between pregnancy at a young age and self-harm is that women who are aged 19 or under at the time of conception are more likely to experience an ectopic pregnancy or still birth than women aged 20-34 (Andersen, Wohlfahrt, Christens, Olsen, & Melbye, 2000) and the trauma of this may increase a woman's risk of self-harm.

It was also hypothesised that *history of problems with substance use, history of problems with traumatic experiences* and *history of problems with suicidality/self-harm* would be positively associated with self-harm; however they were not. In regards to *history of problems with substance use,* previous research into risk factors for self-harm has shown that those who have substance misuse problems are more likely to self-harm (see Larkin et al., 2014; Livesley, 2003). It is not clear why the current study did not find an association between substance misuse and self-harm. However, it indicates that, within secure psychiatric services for females, clinicians should be cautious about assuming an association between substance misuse and risk of self-harm, unless there is a clear functional link between the two behaviours.

In regards to *history of problems with traumatic experiences*, as previously discussed, there is a plethora of research showing that experiencing childhood abuse, neglect or significant loss/separation increases an individual's risk of self-harm in later life (see Fliege et al., 2009; Gratz, 2003; Mangnall & Yurkovich, 2008). Therefore, it is surprising that this study did not find a link between traumatic experiences and self-harm. This may have been

due to a lack of variance in scores on this item, as 91% of participants had this item rated as 'Yes'. Therefore, this study may have failed to find an association between traumatic experiences and self-harm due to the high numbers of participants with a history of trauma.

In regards to *history of problems with suicidality/self-harm,* there was a positive association between this item and self-harm which was approaching statistical significance (p=0.074). However, there was also a lack of variance in scores on this item, with 88% of participants having this item rated as 'Yes'. This may have impacted on the statistical power or the analysis, and therefore, the lack of statistical significance on this item may have been due to the lack of variance in scores, rather than due to a true lack of association between a history of suicidality/self-harm and current self-harm frequency.

Clinical Scale

The results showed that those obtaining a higher mean score on the Clinical scale self-harmed more frequently in the following year. This was true both with and without the FAM items, though the association was slightly stronger when the FAM items were included. The finding that the this scale was associated with frequency of self-harm is consistent with the results obtained by Abidin et al. (2013) and Daffern and Howells (2007) who also found that this Clinical scale predicted self-harm. However, this result is inconsistent with O'Shea et al. (2014) and Gray et al. (2003) who found that the Clinical scale did not predict self-harm. Fagan et al. (2009) grouped the Clinical scale and the Risk Management scale together in their analyses, so it is not possible to compare their results to those obtained in this study.

There were three items on the Clinical scale that were significantly positively associated with frequency of self-harm: (recent problems with…) *violent ideation or intent, instability* and *low self-esteem.* It was hypothesised that instability and low self-esteem would

be associated with more frequent self-harm. The HCR-20 description of instability includes self-harming behaviour (Douglas et al., 2013), and the description also includes other aspects of instability that have been shown to be related to risk of self-harm, including problems with emotion regulation (Adrian et al., 2011; Gratz, 2003), lack of planning (Dir, Karyadi, & Cyders, 2013), anger (Sakelliadis, Papadodima, Sergentanis, Giotakos, & Spiliopoulou, 2010) and impulsivity (Mangnall & Yurkovich, 2008; Swahn et al., 2012). In regards to low self-esteem, as previously discussed, research has identified low self-esteem as a risk factor for self-harm. In the FAM manual, de Vogel et al. (2014) noted that it is important to consider low self-esteem when assessing risk of self-harm. This is consistent with the results of this study.

It was not hypothesised that *recent problems with violent ideation or intent* would be associated with more frequent self-harm, as this item refers to violence against others; however a significant positive association was found. An explanation for this finding is that discussed within the hostility model of self-harm, which states that individuals use self-harm because they feel unable to overtly express anger and hostility (Herpertz, Sass, & Favazza, 1997), and therefore they redirect anger onto an acceptable source: i.e. themselves (Bennum, 1984). This is consistent with a study conducted by Ross and Heath (2003) which found that over two thirds of their sample of adolescents reported feeling hostility towards others before self-harming. Therefore, the association between violent ideation and self-harm found in the present study may be due to individuals experiencing anger, hostility and violent ideation, but feeling unable to express this, and therefore directing it towards themselves in the form of self-harm.

It was also hypothesised that *recent problems with symptoms of major mental disorder* would be associated with more frequent self-harm; however this was not found to be the case.

This is a surprising finding, as previous research has consistently found a link between mental disorder and self-harm (see Larkin et al., 2014), and the current study found that a history of major mental disorder or personality disorder was related to more frequent self-harm. Furthermore, the HCR-20 description of symptoms of major mental disorder cites self-harming behaviour as an indicator of the presence of this item. An explanation for this finding may be that individuals who have suffered mental disorder in the past may have been at risk of using self-harm as a coping mechanism, and even when they are no longer suffering from symptoms of mental disorder, may still use self-harm to regulate or cope with negative emotions. Clinicians rating the HCR-20 may therefore have decided that, in the absence of other indicators of symptoms of mental disorder, self-harm was not enough to warrant a rating of 'Yes'.

Risk Management Scale

There was no significant association between mean scores on the Risk Management scale and frequency of self-harm with or without the FAM items. This is inconsistent with the results obtained by Abidin et al. (2013) and O'Shea et al. (2014) who both found that the Risk Management scale predicted self-harm. Fagan et al. (2009) grouped the Clinical scale and the Risk Management scale together in their analyses, so it is not possible to compare their results to those obtained in this study, and Gray et al. (2003) did not include the Risk Management scale in their study. Therefore, there is only limited, inconsistent evidence into whether scores on the Risk Management scale are associated with self-harm.

Despite the mean score on the Risk Management scale not being significantly associated with frequency of self-harm, one item was significantly positively associated: *future problems with treatment or supervision response.* This is an interesting result, as the

item *recent problems with treatment or supervision response* from the Clinical scale was not associated with frequency of self-harm, indicating that individuals who are currently non-compliant or non-responsive to treatment/supervision do not self-harm more frequently, but those for whom treatment/supervision is likely to be a problem in the future do self-harm more frequently. A possible mediating factor between future treatment/supervision response and self-harm may be hopelessness. Regardless of whether an individual is currently engaging in and responding to treatment and supervision, when they talk about future treatment and supervision plans, individuals who feel hopeless may present as lacking motivation, or as believing that future interventions will not be able to help them, resulting in the clinician rating this item as 'Yes'. Research has also shown a link between feelings of hopelessness and self-harm (Gray et al., 2003; Larkin et al., 2014; Livesley, 2003; McLaughlin, Miller, & Warwick, 1996), and the NICE (2004) guidance cites hopelessness as one of the key psychological characteristics associated with risk of self-harm. Therefore, an individual who is experiencing hopelessness may be more likely to receive a rating of 'Yes' on the item *future problems with treatment or supervision response* and be likely to self-harm more frequently.

Final Risk Judgement: Self-Destructive Behaviour

The final risk judgement for self-destructive behaviour was positively associated with frequency of self-harm. This indicates that, after completing the HCR-20 and FAM assessments, individuals that are rated as being a higher risk of self-harm do so more frequently than those rated as being a lower risk of self-harm in the following year. It may the case that the process of completing the HCR-20 and FAM, and considering a range of factors that may to be related to risk of self-harm guides clinicians' thinking and increases the

accuracy of their risk judgements. Alternatively, they may have made the same risk judgements if they had not gone through the process of completing the HCR-20 and FAM. It is not possible to explore whether this is the case within the current study; though this is an interesting question that could be of clinical significance, and therefore requires further research.

Clinical Implications

This study indicates that the HCR-20 may be a useful tool for assessing risk of self-harm in females within a secure psychiatric setting, and that also using the FAM items may add to this clinical utility. In particular, higher numbers of ratings of 'Yes' on the Historical or Clinical scale indicate that an individual may be likely to self-harm more frequently, and this should be considered when assessing an individual's self-harm risk.

However, it is important to note that although a higher numbers of ratings of 'Yes' overall may indicate an increased risk of frequent self-harm, the majority of items on the HCR-20 and FAM were not found to be independently associated with more frequent self-harm, and one item, *history of prostitution* was found to be negatively associated with frequency of self-harm. Eight items were found to be independently associated with an increased frequency of self-harm: history of major mental disorder, history of personality disorder, history of violent attitudes, history of pregnancy at a young age, recent violent ideation or intent, recent instability, recent low self-esteem and future problems with treatment/supervision response. Therefore, when assessing risk of self-harm, it is important to consider these items in particular, and how they may increase an individual's risk of self-harm.

Finally, this study showed that the final risk judgement for self-destructive behaviour is a good predictor of frequency of self-harm. As this risk judgment forms part of the FAM, and as using the FAM increases the overall association between the HCR-20 and self-harm, it is recommended that the FAM is used alongside the HCR-20 when assessing risk in females, and that final risk judgements for self-destructive behaviour are used to assess self-harm risk, and to guide self-harm risk management.

Limitations

There were some limitations of the current study. Firstly, only patients that remained within the hospital for the one year period following the date of their HCR-20 and FAM assessment were included in the study. There may have been differences between these individuals, and individuals who were discharged or transferred during this period, and therefore the sample may not be fully representative of all female inpatients within secure hospitals. Secondly, the study took place within a single private hospital, and therefore the sample may not have been representative of patients within other secure psychiatric settings, for example those within NHS hospitals, or those detained within high-secure settings.

Another limitation of the study was regarding the length of study period and the validity of ratings. Within the setting in which this study took place, HCR-20 assessments are routinely updated six-monthly; however there are also some circumstances that would trigger an earlier re-assessment, such as a significant change in clinical presentation or risk. Due to the six-monthly reassessment, the Clinical scale is rated based on problems within the previous six months, and the Risk Management scale is rated based on problems that may occur in the next six months. As the current study used a study period of one year following HCR-20 assessment, ratings on the Clinical and Risk Management scales may change during

this time, and therefore the ratings may not be valid for the second six months of the study period.

A final limitation of this study is that the items *history of problems with violence* and *history of problems with parenting difficulties* were omitted from the analysis which examined the association between self-harm and the individual items, due to a lack of variance in scores, and large numbers of omitted items, respectively. Therefore it was not possible to examine the association between these two items and frequency of self-harm.

Recommendations for Future Research

Recommendations for future research include examining whether the results of this study are replicated in other populations, such as patients detained within high-secure hospitals, patients within the community, prisoners, and males. This would show whether the results of this study are specific to women detained within this private secure psychiatric setting, or whether the results are generalisable to other populations.

In this study, nearly all of the participants had a history of violence, and therefore, due to lack of variance, it was not possible to examine the association between the item *history of problems with violence* and self-harm. Within other populations, such as a forensic population within the community, there may be more variance on this item, and therefore this may improve upon this study by being able to examine the link between this item and self-harm.

As previously discussed, when rating the Risk Management scale with inpatients, items can be given an 'institutional' rating and a 'community' rating, in recognition of the fact that an individual's risk may be different within a hospital setting compared to if they are discharged. As this study only included participants who remained in hospital for the one-year

follow-up period, further research could examine those who are discharged within that period, and whether the 'community' ratings given are predictive of future self-harm after discharge.

Finally, this study showed that the final risk judgement for self-destructive behaviour was a good predictor of frequency of self-harm within the subsequent year. This may be due two reasons. It may be that clinicians' clinical judgements of risk of self-harm are accurate, without the need of any structured processes. Alternatively, it may be that process of completing the HCR-20 and FAM, and considering a range of factors that might be relevant to the risk of self-harm, may help clinicians come to an accurate risk judgement, without which their judgement would have been less accurate. Further research could explore whether unstructured clinical judgements of risk of self-harm are more or less accurate than clinical judgements made after completion of the HCR-20 and FAM.

Conclusions

This study aimed to examine whether scores on the HCR-20 and FAM predict frequency of self-harm in females within a secure psychiatric hospital. The results showed that higher mean total scores on the HCR-20, and also on the Historical and Clinical scales were associated with more frequent self-harm, both with and without the FAM items. The Risk Management scale was not associated. There were eight individual items that were positively associated with frequency of self-harm, and one that was negatively associated. The final risk judgement for self-destructive behaviour was also positively associated with frequency of self-harm.

This is the first study to examine the link between the latest version of the HCR-20 and self-harm, and the first study to include the FAM. The study had a relatively large number of participants across a range of levels of security, with a range of diagnoses. The results of

this study are broadly in keeping with that of previous research that indicates that the HCR-20 is likely to be related to self-harm.

Overall, this study demonstrates that the HCR-20 and FAM are useful tools for assessing risk of self-harm, and that, having gone through the process of completing the HCR-20 and FAM, the final risk judgement for self-destructive behaviour accurately predicts those who will self-harm more frequently over the subsequent year. Therefore, this study demonstrates the clinical utility of the HCR-20 and FAM in assessing risk of self-harm in females within a secure psychiatric setting. Further research is required to examine whether the HCR-20 is also useful in assessing risk of self-harm within other populations.

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Chapter Three: Public Domain Briefing Document

This document provides an overview of the thesis submitted in partial fulfilment of the requirements for the degree of Doctorate of Forensic Clinical Psychology (ForenClinPsyD) at the University of Birmingham. This document summarises a literature review and an empirical paper both written in preparation for submission to peer-reviewed journals.

Literature Review: Is there a Link between Psychopathy and Self-harm?

Background

Psychopathy is a term used to describe individuals who have emotional, interpersonal, and behavioural problems such as seeing themselves as better than others, being callous, being manipulative, having shallow/limited emotions and being impulsive (Hare, 2003). A great deal of research has examined psychopaths, and has shown that they commit crimes from a younger age, commit more types of crimes, and offend more frequently (Dolan & Doyle, 2000; Harris, Rice, & Cormier, 1991). However, there is less research into whether psychopathy is related to other behaviours, such as self-harm. Therefore, this review aims to explore what research has been conducted into the link between psychopathy and self-harm, and whether there are certain aspects of psychopathy that are more linked to self-harm than others.

Method

A systematic search of articles published from 1974 to 2016 was conducted to find research investigating the link between psychopathy and self-harm. The quality of the articles was examined using a quality appraisal checklist developed by the National Institute for Clinical Excellence (NICE; 2012). This checklist asks a number of questions about the study in order to assess its internal validity (how well the study examines what it aims to examine) and the external validity (how well the study can be applied to other groups of people).

Results

Fourteen articles were found that looked at the link between psychopathy and self-harm. One article included two separate studies, and therefore in total there were 15 studies. Most of the studies had good internal validity, indicating that they had fulfilled all or most of the checklist criteria. However, the majority of studies had some problems with their external validity, indicating that there may be issues with generalising the results of the studies to other groups of people.

Overall, it was not clear whether psychopaths were more or less likely to self-harm. Although some studies showed they were, some studies showed they were not. However, some studies looked at which particular aspects of psychopathy might be associated with self-harm. The studies that did this showed that the interpersonal difficulties and emotional deficits were not associated with self-harm, whereas the behavioural problems were associated with self-harm (i.e. individuals with more of the behavioural features of psychopathy were more likely to self-harm than those with less behavioural features).

Conclusions

This review shows that there may be a link between psychopathy and self-harm. Specifically, individuals who have more of the behavioural characteristics of psychopathy, such as being impulsive, committing a range of different crimes, and becoming bored easily, are more likely to self-harm. Therefore, when mental health professionals are assessing risk in psychopaths, they should take into consideration that those with more behavioural characteristics of psychopathy may be at an increased risk of self-harm.

Empirical Research: Do Scores on the HCR-20 and FAM Predict Frequency of Self-Harm in Females within a Secure Psychiatric Hospital?

Background

Within forensic mental health settings, self-harm occurs frequently, with up to 69% of inpatients reporting having self-harmed (James, Stewart, & Bowers, 2012). A number of tools have been developed to support mental health professionals in assessing an individual's risk of self-harm. However, the tools that have been developed have been found to be fairly weak at predicting who is likely to self-harm (O'Shea, Picchioni, Mason, Sugarman, & Dickens, 2014; O'Shea & Dickens, 2014; Quinlivan et al., 2017).

The Historical, Clinical, and Risk Management (HCR-20; Douglas, Hart, Webster, & Belfrage, 2013) violence risk assessment tool is widely used within inpatient forensic mental health services (Khiroya, Weaver, & Maden, 2009). It is made up of 20 items that are known to be linked to risk of violence. As this risk assessment was designed based on studies of males, there is also a Female Additional Manual, which is designed to be used alongside the HCR-20 when assessing risk of violence in females (FAM; de Vogel, de Vries Robbé, van Kalmthout, & Place, 2014). The FAM contains an additional 8 items that are specifically relevant to females. Although the HCR-20 and FAM were designed to assess risk of violence, not self-harm, there are strong links between violence and self-harm (Nicholls, Brink, Greaves, Lussier, & Verdun-Jones, 2009; Nijman & Campo, 2002), and the two behaviours often co-occur (Hillbrand, 2001; O'Donnell, House, & Waterman, 2015). Therefore, the HCR-20 and FAM might also be useful for assessing risk of self-harm. This study therefore aims to examine whether scores on the latest version of the HCR-20 (Version 3) and FAM are related to frequency of self-harm in females within a secure psychiatric hospital.

Method

The study took place within a charitable organisation that provides secure inpatient psychiatric services across four sites in England. All female patients within the four hospitals that had at least one HCR-20 and FAM completed, and who remained in hospital for one year after these risk assessments were included in the study. Overall, there were 89 participants.

The study examined the HCR-20 and FAM risk assessment tools. These tools are split into three scales: the Historical scale, which looks at past problems, the Clinical scale, which looks at current/recent problems, and the Risk Management scale, which looks at potential future problems (Douglas et al., 2013). Table 8 below shows the items that make up each of these scales, including the additional items from the FAM. Each item is rated as 'Yes' if it is present, or 'No' if it is not present. Items can also be rated as 'Possible/Partial' if there is some evidence that it is present, but the evidence is "weak, contradictory, or inconclusive" (Douglas et al., 2013, pp.44). However, as these cases are ambiguous, in this study they were grouped with 'No'. Only cases where the item is clearly present were counted as 'Yes'. At the end of the assessment the FAM also asks the rater to make a 'final risk judgement' in regards to the individual's risk of 'self-destructive behaviour' i.e. self-harm. This is scored on a 5-point scale from 1 (low risk) to 5 (high risk). This study also examined whether the final risk judgement was predictive of more frequent self-harm.

Table 8.

HCR-20 and FAM items

HCR-20	**FAM**
Historical scale (History of Problems With…)	
H1. Violence	H11. Prostitution
H2. Other Antisocial Behaviour	H12. Parenting Difficulties
H3. Relationships	H13. Pregnancy at Young Age
H4. Employment	H14. Suicidality/Self-Harm
H5. Substance Use	
H6. Major Mental Disorder	
H7. Personality Disorder	
H8. Traumatic Experiences	
H9. Violent Attitudes	
H10. Treatment or Supervision Response	
Clinical scale (Recent Problems With…)	
C1. Insight	C6. Covert/Manipulative Behaviour
C2. Violent Ideation or Intent	C7. Low Self-Esteem
C3. Symptoms of Major Mental Disorder	
C4. Instability	
C5. Treatment or Supervision Response	
Risk Management scale (Future Problems With…)	
R1. Professional Services and Plans	R6. Problematic Childcare Responsibility
R2. Living Situation	R7. Problematic Intimate Relationship
R3. Personal Support	
R4. Treatment or Supervision Response	
R5. Stress or Coping	

The study involved collecting each participant's HCR-20 and FAM scores, and then waiting for one year to see how many times each participant self-harmed during that 12-month period. Self-harm data is routinely collected for all patients, and therefore self-harm data was collated by accessing the document/list where the data is stored and counting the number of incidents of self-harm for each patient.

Results

Overall, individuals with higher average scores on the HCR-20 self-harmed more frequently in the following year. This was true without the additional eight FAM items, and when they

were included. When broken down into the three scales, the results showed that individuals with higher average scores on the Historical and Clinical scales self-harmed more frequently in the following year. Again, this was true without the FAM items, and when they were included. Average scores on the Risk Management scale were not linked to frequency of self-harm.

When looking at individual items, eight items were found to be positively associated with self-harm (i.e. those for whom the item was present self-harmed more frequently): history of major mental disorder, history of personality disorder, history of violent attitudes, history of pregnancy at a young age, recent violent ideation or intent, recent instability, recent low self-esteem and future problems with treatment/supervision response. One item was found to be negatively associated with self-harm (i.e. those for whom the item was present self-harmed less frequently): history of prostitution.

Higher scores on the final risk judgement self-destructive behaviour, which is rated after the HCR-20 and FAM assessment, were also associated with more frequent self-harm.

Conclusions/Discussion

This study has shown that individuals who obtain more 'Yes' ratings on the HCR-20 and FAM are likely to self-harm more frequently. This is particularly true of the Historical and Clinical scales. This study has also identified eight items that are related to more frequent self-harm, and one item that is related to less frequent self-harm. Therefore, although the tool as a whole might be useful for assessing risk of self-harm, it is important that mental health professionals do not assume that any one item on this is linked to an increased risk of self-harm. Individuals who were given a higher score for the final risk judgement for self-destructive behaviour self-harmed more frequently in the following year, and therefore this

rating is a helpful guide as to which patients may require more support or ongoing management plans for their self-harming behaviour. Further research is required to see whether the HCR-20 is related to self-harm within a male sample.

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Appendices for Volume I

Appendix A. Full table of quality appraisal ratings

	Section 1: Population				Section 2: Psychopathy measures			
	Source population well described?	Eligible population or representative of the source population?	Selected participants representative of the eligible population?	Psychopathy group: selection bias minimised?	How many/ what proportion of the sample were psychopaths?	Measure of psychopathy based on a sound theoretical basis?	Confounding factors identified and controlled?	Applicable to the UK?
Gray et al., 2003	++	+	++	NA	+	++	++	++
Young et al., 2006	++	++	++	NA	NR	++	++	++
Das et al., 2007	++	++	+	NA	+	++	+	+
Semiz et al., 2008	++	+	+	NA	++	++	+	++
Swogger et al., 2009	++	++	-	NA	NR	++	++	++
Miller et al., 2010	+	-	+	NA	NA	++	+	++
Witt et al., 2010	++	+	+	NA	NA	++	+	++
Ates et al., 2011	++	++	+	++	++	++	+	++
Gunter et al., 2011	++	++	-	NA	+	++	++	++
Verona et al., 2012 (1)	+	-	+	NA	NA	++	+	++
Verona et al., 2012 (2)	++	++	+	NA	NR	++	++	++
Negredo et al., 2013	++	-	+	NA	NR	++	++	+
Dhingra et al., 2015	++	++	-	NA	NR	++	++	++
Forouzan & Nicholls, 2015	++	+	-	+	++	++	++	++
Storey et al., 2016	++	++	++	NA	+	++	+	++

	Section 3: Self-harm measures			Section 4: Analyses			Section 5: Summary		
	Self-harm measures and procedures reliable?	Self-harm measurements complete?	All the important outcomes assessed?	Study sufficiently powered to detect an intervention effect?	Multiple explanatory variables considered in the analyses?	Analytical methods appropriate?	Precision of association given or calculable? Association meaningful?	Study results internally valid?	Findings generalisable/ externally valid?
Gray et al., 2003	+	++	NR	-	++	++	++	+	++
Young et al., 2006	+	++	+	++	++	++	+	++	++
Das et al., 2007	+	++	NR	-	++	++	++	+	++
Semiz et al., 2008	-	++	++	++	+	++	-	-	+
Swogger et al., 2009	-	++	++	++	++	++	++	++	+
Miller et al., 2010	+	++	++	+	++	++	++	++	+
Witt et al., 2010	+	++	++	++	++	+	++	+	+
Ates et al., 2011	+	+	++	++	+	++	++	++	++
Gunter et al., 2011	+	+	NR	++	++	++	+	+	+
Verona et al., 2012 (1)	-	++	++	++	++	++	++	++	+
Verona et al., 2012 (2)	+	++	++	++	+	++	++	++	++
Negredo et al., 2013	-	++	-	-	++	++	++	+	+
Dhingra et al., 2015	-	+	++	++	++	++	++	++	+
Forouzan & Nicholls, 2015	NR	+	NR	-	+	++	++	+	+
Storey et al., 2016	+	+	NR	++	++	++	++	++	++

Appendix B. Quality appraisal checklist for each study

Gray et al., 2003

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- inpatient mentally disordered offenders
1.2	Is the eligible population or representative of the source population?	+	Only included medium secure units- perhaps different in high and low secure
1.3	Do the selected participants represent the eligible population?	++	All participants admitted over a two-year period were included
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	+	6% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Interview and information from records was used
2.5	Is the setting applicable to the UK?	++	British population was used
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Measure was created for this study, but showed good reliability and validity
3.2	Were the self-harm measurements complete?	++	SH data was available for all participants
3.3	Were all the important outcomes assessed?	NR	It is not clear what was included as self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	-	Only 34 participants- may not have been powerful enough
4.2	Were multiple explanatory variables considered in the analyses?	++	PCL-R Total score, Factor 1 and Factor 2 were analysed separately
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	All relevant data was reported, in addition to p-values
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter

Young et al., 2006

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- individuals in prison psychiatric treatment
1.2	Is the eligible population or representative of the source population?	++	Eligible population were all admitted for psychiatric evaluation/treatment
1.3	Do the selected participants represent the eligible population?	++	Participants were randomly selected from all individuals admitted
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NR	Proportion of sample that exceeded the cut-off for psychopathy not reported
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Raters were blinded, no other biases identified
2.5	Is the setting applicable to the UK?	++	PCL-R has been validated on a US population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Data was collected from records: may miss SH that staff were unaware of
3.2	Were the self-harm measurements complete?	++	SH data was available for all participants
3.3	Were all the important outcomes assessed?	+	Only SH that was severe enough to require medical attention was included
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Relatively large sample was used (N = 242)
4.2	Were multiple explanatory variables considered in the analyses?	++	Factors found to be related to SH were then entered into logistic regression
4.3	Were the analytical methods appropriate?	++	Appropriate methods used, and a correction was used for multiple analyses
4.4	Was the precision of association given or calculable? Is association meaningful?	+	Does not report whether F1 was not studied, or found to be unrelated to SH
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	All checklist criteria fulfilled

Das et al., 2007

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- institutionalised adolescent offenders
1.2	Is the eligible population or representative of the source population?	++	Eligible population came from two sites- one secure and one semi-secure
1.3	Do the selected participants represent the eligible population?	+	Not clear what inclusion/exclusion criteria were or how Ps were recruited
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	+	14% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:YV is well validated
2.4	How well were likely confounding factors identified and controlled?	+	Some items on PCL:YV modified- may introduce a bias
2.5	Is the setting applicable to the UK?	+	PCL:JV less reliable and lower inter-rater reliability than the PCL:YV
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Does not state how SH data collected- assume same procedure as violence
3.2	Were the self-harm measurements complete?	++	Data was collected for all participants
3.3	Were all the important outcomes assessed?	NR	It is not clear what was included as self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	-	Only 10 incidents of self-harm occurred, so unlikely to be powerful enough
4.2	Were multiple explanatory variables considered in the analyses?	++	All PCL:YV Factors and Facets were analysed separately
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	ρ-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter

Semiz et al., 2008

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- male offenders
1.2	Is the eligible population or representative of the source population?	+	Not clear whether all eligible individuals were offenders
1.3	Do the selected participants represent the eligible population?	+	Inclusion criteria were not clear
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	++	35% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	+	Not clear whether results impact on inclusion in military- could introduce bias
2.5	Is the setting applicable to the UK?	++	PCL-R has been validated on a Turkish population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	-	Self-report may not be reliable, and no validated measure used
3.2	Were the self-harm measurements complete?	++	All participants completed the interview
3.3	Were all the important outcomes assessed?	++	Questions covered all forms of self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Relatively large sample was used (N = 105)
4.2	Were multiple explanatory variables considered in the analyses?	+	No additional explanatory variables were considered
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	-	Results reported in text and in table do not match- not clear which is correct
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	-	Some checklist criteria fulfilled; however results appear to have been misreported and therefore conclusions are likely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Swogger et al., 2009

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- civil psychiatric patients
1.2	Is the eligible population or representative of the source population?	++	Three civil psychiatric sites were used
1.3	Do the selected participants represent the eligible population?	-	Only some diagnoses included. Patients hospitalised for >21 days excluded.
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NR	Proportion of sample that exceeded the cut-off for psychopathy not reported
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:SV is well validated
2.4	How well were likely confounding factors identified and controlled?	++	File data was also used
2.5	Is the setting applicable to the UK?	++	PCL:SV has been validated on a US population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	-	Self-report may not be reliable, and no validated measure used
3.2	Were the self-harm measurements complete?	++	All participants completed the interview
3.3	Were all the important outcomes assessed?	++	Questions covered all forms of self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 810)
4.2	Were multiple explanatory variables considered in the analyses?	++	Study examined independent effects of four psychopathy facets
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	z-scores, odds ratios, confidence intervals, and p-values reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Miller et al., 2010

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	+	Source population unclear- general population?
1.2	Is the eligible population or representative of the source population?	-	Undergraduate students unlikely to be representative
1.3	Do the selected participants represent the eligible population?	+	Not clear how sample was recruited
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NA	Measured used are not able to distinguish psychopaths and non-psychopaths
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	Tools used are validated
2.4	How well were likely confounding factors identified and controlled?	+	Measures rely on self-report
2.5	Is the setting applicable to the UK?	++	US population likely to be similar to the UK
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Measure relies on self-report
3.2	Were the self-harm measurements complete?	++	All partcipants completed all measures
3.3	Were all the important outcomes assessed?	++	Measures covers all form of self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	+	Large sample size, however base rate of SH not reported & likely to be low
4.2	Were multiple explanatory variables considered in the analyses?	++	Factor 1 and Factor 2 were considered separately
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Witt et al., 2010

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Adequately described in cited paper (Gunderson et al., 2000)
1.2	Is the eligible population or representative of the source population?	+	Not clear who the eligible population were and how they were recruited
1.3	Do the selected participants represent the eligible population?	+	Only four personality disorders and major depression included
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used.
2.2	How many/ what proportion of the sample were psychopaths?	NA	NEO-PI-R not able to distinguish psychopaths and non-psychopaths
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	NEO-PI-R constructs of FD and IA were used, and are validated
2.4	How well were likely confounding factors identified and controlled?	+	Self-report: may not be reliable
2.5	Is the setting applicable to the UK?	++	US population likely to be similar to the UK
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Self-report may not be reliable
3.2	Were the self-harm measurements complete?	++	All participants completed the SNAP
3.3	Were all the important outcomes assessed?	++	SNAP covers various types of self-harming behaviour
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 733)
4.2	Were multiple explanatory variables considered in the analyses?	++	Dependency between FD and IA was accounted for in analyses
4.3	Were the analytical methods appropriate?	+	Inadequate information about analytic method
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Ates et al., 2011

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- men with antisocial PD not in prison
1.2	Is the eligible population or representative of the source population?	++	Military service is compulsory for all men in Turkey- therefore representative
1.3	Do the selected participants represent the eligible population?	+	Nine individuals did not consent; however participants appear representative
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	++	Assessed using PCL-R and split into psychopaths and non- using US cut-off
2.2	How many/ what proportion of the sample were psychopaths?	++	48% were psychopaths, resulting in fairly equal groups
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	+	Not clear whether results impact on inclusion in military- could introduce bias
2.5	Is the setting applicable to the UK?	++	PCL-R has been validated on a Turkish population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Collateral information gathered, but no formal measure used
3.2	Were the self-harm measurements complete?	+	Not clear whether collateral information was available for all participants
3.3	Were all the important outcomes assessed?	++	Questions about all aspects of self-harm were covered
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Relatively large sample was used (N = 116)
4.2	Were multiple explanatory variables considered in the analyses?	+	No additional explanatory variables were considered
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter

Gunter et al., 2011

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- individuals in community correction
1.2	Is the eligible population or representative of the source population?	++	Eligible population were those attending the community corrections office
1.3	Do the selected participants represent the eligible population?	-	Participants volunteered for the study- likely to introduce bias
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	+	13% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:SV is well-validated
2.4	How well were likely confounding factors identified and controlled?	++	Interview and information contained within records was used
2.5	Is the setting applicable to the UK?	++	PCL:SV has been validated on a US population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Not clear what the SSAGA-II asks about self-harm and whether it is valid
3.2	Were the self-harm measurements complete?	+	One participant did not complete all measures- not clear which, or why
3.3	Were all the important outcomes assessed?	NR	It is not clear what was included as self-harm within the SAGA
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 337)
4.2	Were multiple explanatory variables considered in the analyses?	++	PCL:SV Total score and Factors 1 and 2 were considered individually
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	+	Odds ratio and confidence interval was given, but only for significant results
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Verona et al., 2012 (1)

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	+	Source population unclear- general population?
1.2	Is the eligible population or representative of the source population?	-	Undergraduate students unlikely to be representative
1.3	Do the selected participants represent the eligible population?	+	Not clear how sample was recruited
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NA	PPI-S and SRP-II not able to distinguish psychopaths and non-psychopaths
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	Tools are well-validated
2.4	How well were likely confounding factors identified and controlled?	+	Self-report: may not be reliable
2.5	Is the setting applicable to the UK?	++	US population likely to be similar to the UK
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	-	Self-report may not be reliable, and no validated measure used
3.2	Were the self-harm measurements complete?	++	All participants completed the measures
3.3	Were all the important outcomes assessed?	++	Question allowed for all forms of self-harm to be taken into account
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Relatively large sample was used (N = 318)
4.2	Were multiple explanatory variables considered in the analyses?	++	Examined the impact of gender on psychopathy factors and SH
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	Detailed results provided, as well as p-values
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Verona et al., 2012 (2)

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- offenders in prison and the community
1.2	Is the eligible population or representative of the source population?	++	Eligible population all offenders in prison or community
1.3	Do the selected participants represent the eligible population?	+	Not clear how participants were recruited
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NR	Proportion of sample that exceeded the cut-off for psychopathy not reported
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:SV is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Collateral information used in addition to interview
2.5	Is the setting applicable to the UK?	++	PCL:SV has been validated on a US population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Self-report may not be reliable
3.2	Were the self-harm measurements complete?	++	All participants completed the LHA
3.3	Were all the important outcomes assessed?	++	LHA accounts for all types of self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 459)
4.2	Were multiple explanatory variables considered in the analyses?	+	Looked at gender and BPD with composite suicide/SH risk, not SH alone
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter

Negredo et al., 2013

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- mentally disordered offenders
1.2	Is the eligible population or representative of the source population?	-	Eligible population only taken from one forensic hospital
1.3	Do the selected participants represent the eligible population?	+	Not clear how many participants did not give consent or were excluded
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NR	Proportion of sample that exceeded the cut-off for psychopathy not reported
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:SV is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Semi-structured interview, as well as file information was used
2.5	Is the setting applicable to the UK?	+	PCL:SV has not been validated on a Spanish population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	-	Self-report may not be reliable, and no validated measure used
3.2	Were the self-harm measurements complete?	++	All participants completed the semi-structured interview
3.3	Were all the important outcomes assessed?	-	Questions only asked about specific forms of self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	-	Only 29 participants- may not have been powerful enough
4.2	Were multiple explanatory variables considered in the analyses?	++	Study examined correlations of each Factor and Total score separately
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Dhingra et al., 2015

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- civil psychiatric patients
1.2	Is the eligible population or representative of the source population?	++	Three civil psychiatric sites were used
1.3	Do the selected participants represent the eligible population?	-	Only some diagnoses included. Patients hospitalised for >21 days excluded.
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	NR	Proportion of sample that exceeded the cut-off for psychopathy not reported
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL:SV is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Semi-structured interview, as well as file information was used
2.5	Is the setting applicable to the UK?	++	PCL:SV has been validated on a US population
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	-	Self-report may not be reliable, and no validated measure used
3.2	Were the self-harm measurements complete?	+	Some did not complete SH measure- reasons unclear
3.3	Were all the important outcomes assessed?	++	All types of self-harm accounted for in the questions
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 871)
4.2	Were multiple explanatory variables considered in the analyses?	++	Study examined independent effects of four psychopathy facets
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	Odd ratios were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

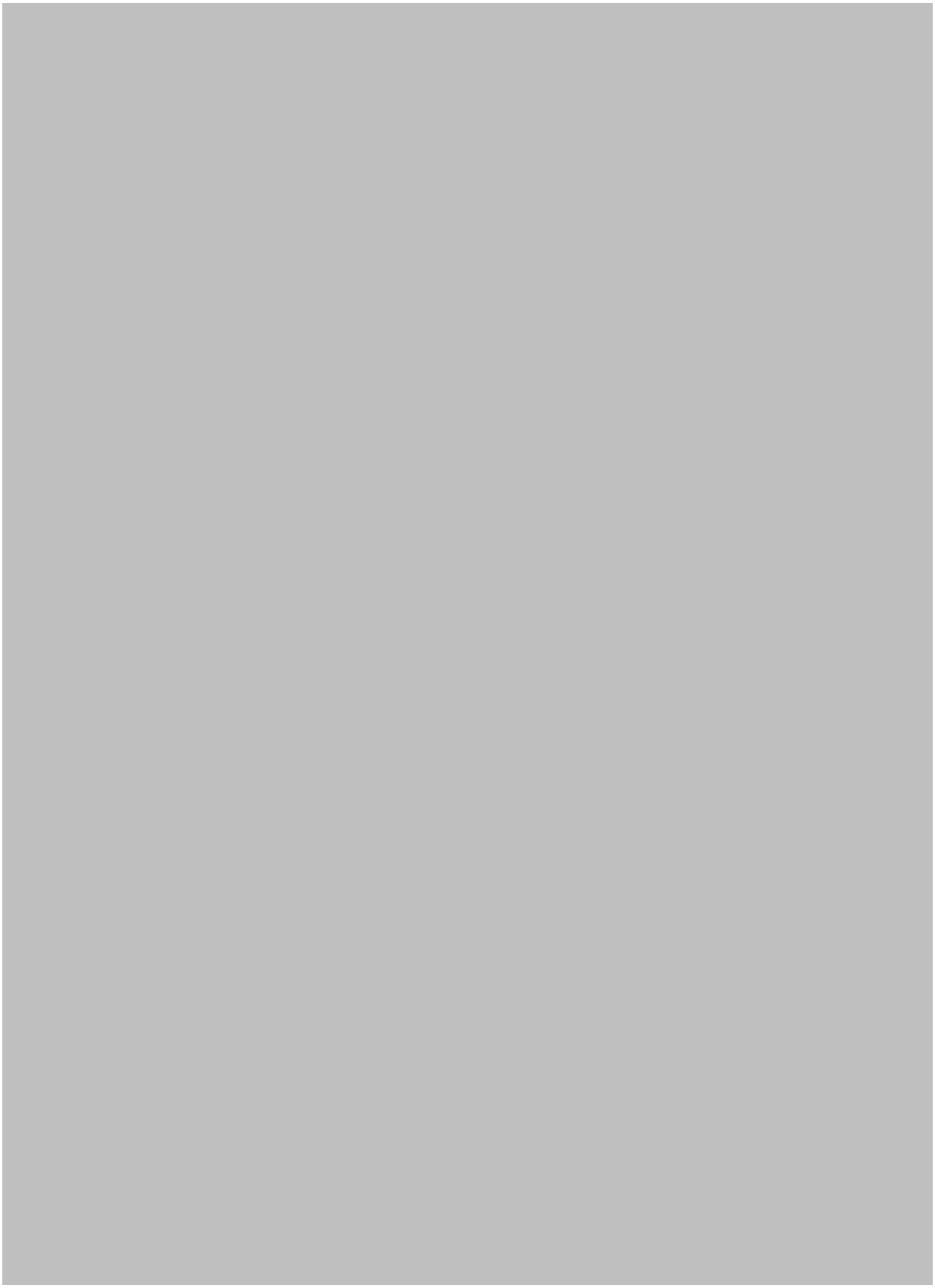
Forouzan & Nicholls, 2015

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- females
1.2	Is the eligible population or representative of the source population?	+	Participants had all been taken into care as a child- may not be representative
1.3	Do the selected participants represent the eligible population?	-	Many eligible participants declined, moved away, or did not take part
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	+	Assessed using PCL-R; however cut-off of 25 was used, rather than 30
2.2	How many/ what proportion of the sample were psychopaths?	++	41.5% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	++	Interview and information contained within records was used
2.5	Is the setting applicable to the UK?	++	Canadian population likely to be similar to the UK
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	NR	Protocol for collecting self-harm data was unclear
3.2	Were the self-harm measurements complete?	+	Not complete for every participant at every age
3.3	Were all the important outcomes assessed?	NR	It is not clear what was included as self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	-	Self-harm data was only available for 0-60 participants in each age group
4.2	Were multiple explanatory variables considered in the analyses?	+	No additional explanatory variables were considered
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	phi values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	+	Some checklist criteria fulfilled and conclusions unlikely to alter

Storey et al., 2016

		Rating	Comments
Section 1: Population			
1.1	Is the source population well described?	++	Source population well-described- serious male offenders
1.2	Is the eligible population or representative of the source population?	++	Participants were men being assessed for prison classification
1.3	Do the selected participants represent the eligible population?	++	All men being assessed over one-year period were included
Section 2: Method of selection of psychopathy group			
2.1	Selection of psychopathy group. How was selection bias minimised?	NA	No psychopathy group used
2.2	How many/ what proportion of the sample were psychopaths?	+	17% of participants scored above the cut-off for psychopathy
2.3	Was the measure of psychopathy based on a sound theoretical basis?	++	PCL-R is well validated
2.4	How well were likely confounding factors identified and controlled?	+	File reviews were used, but participants were not interviewed
2.5	Is the setting applicable to the UK?	++	Canadian population likely to be similar to the UK
Section 3: Outcomes			
3.1	Were the self-harm measures and procedures reliable?	+	Data was collected from records- may miss SH that staff are unaware of
3.2	Were the self-harm measurements complete?	+	Self-harm data was not available for 4 participants- not clear why
3.3	Were all the important outcomes assessed?	NR	It is not clear what was included as self-harm
Section 4: Analyses			
4.1	Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	Large sample was used (N = 375)
4.2	Were multiple explanatory variables considered in the analyses?	++	Factors 1 and 2, and all four facets were analysed separately
4.3	Were the analytical methods appropriate?	++	Appropriate methods used
4.4	Was the precision of association given or calculable? Is association meaningful?	++	r-values as well as p-values were reported
Section 5: Summary			
5.1	Are the study results internally valid (i.e. unbiased)?	++	Most checklist criteria fulfilled and conclusions very unlikely to alter
5.2	Are the findings generalisable to the source population (i.e. externally valid)?	++	All checklist criteria fulfilled

Appendix C. Letter of ethical approval from the research site



Appendix D. Letter of ethical approval from the University of Birmingham