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The Implementation of Violence Risk Assessments into Forensic Psychiatric Care in Scotland

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AUTHOR DECLARATION

I herewith declare that the work presented in this thesis has been composed by me. This research presented is my own and has been conducted under the joint supervision of Professor Lindsay D.G. Thomson and Dr Lisa A. Marshall. This thesis has not been submitted for any other degree or professional qualification.

Name Gabriele Vojt

Date 2nd December 2013

Signature ________________

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Preface

The assessment and management of violence risk are issues at the forefront in clinical practice in the mental health and criminal justice systems. Risk related judgements have significant consequences for the individual such as the ongoing detention of patients, the identification and allocation of resources for intervention and treatment aimed at reducing reoffending. While a wealth of research has been published on this topic, the majority of these studies are based on risk ratings and judgements provided by researchers, with tools often completed for the purpose of research. This approach can be advantageous, e.g. in terms of controlling confounding factors or the systematic assessment of inter-rater reliability. Yet, there is evidence that completing a risk assessment in real life is a different matter when compared to the laboratory like conditions set up in research. In other words, the extent to which research findings on risk are applicable to clinical reality may be limited.

The primary focus of this thesis is to examine and discuss the predictive validity of structured professional judgement tools for violence and sexual violence following systematic implementation in a high secure hospital in Scotland. This means that in contrast to existing research, this study assesses the performance of such risk assessment instruments when completed by clinicians for the purpose of informing care and treatment, i.e. risk management. In this way, the present research bridges the gap between laboratory based, controlled research and real life, complex clinical practice. Additionally, this thesis also adds to the ongoing clinical - actuarial debate in the literature by exploring the predictive power of clinical and dynamic risk factors in addition to assessing the validity of a risk assessment tool for imminent aggression. As such, this thesis adds to the considerable knowledge base established to date.

The first chapter provides a general introduction to the thesis topic outlining the background, rationale and some of the inherent complexities associated with risk assessment in vivo. The second chapter summarises the results of a systematic literature review on the predictive validity of the violence and sexual violence risk assessment tools under investigation in this thesis. This is followed by the methodology outlining the research process and the measures employed. Chapter four introduces the patient sample recruited in this study in detail, with a comparison to other research studies in terms of forensic and psychiatric history, background information, and admission details. Chapter five illustrates the systematic implementation of risk assessment tools integral to the thesis

study including the appropriate literature background as well as the role of the present thesis in the implementation process. Chapter six and seven are empirical research studies examining the predictive validity of the HCR-20 and the RSVP following implementation, while chapter eight examines the predictive power of psychometric measures, i.e. dynamic variables, in the sample. While the risk assessment tools discussed in chapter six and seven focus on long term risk following implementation, chapter nine describes the predictive power of a risk assessment tool for imminent violence within 24 hours of assessing psychiatric inpatients, in a pilot study. Though each chapter contains an individual introduction and discussion of the specific aspect presented in that particular chapter, all findings are drawn together with an overall discussion and conclusion to the study in chapter ten. The thesis is concluded by recommendations, references and supporting material in the appendix.

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Abstract

Background. A central role of mental health professionals within the criminal justice and forensic mental health system is the assessment, management and communication of an individual's risk of future violence (Webster & Hucker, 2007). The current methodology favoured by clinicians is the structured professional judgement (SPJ) approach (Farrington, Joliffe & Johnstone, 2008). These instruments act as guides in clinical practice in that practitioners are encouraged to apply clinical judgement on the relevance of empirically validated risk factors to each client. In this way, identified risk factors can be directly used to inform individual care and treatment, i.e. risk management. Yet, research on SPJ tools is typically based on retrospective or pseudo-prospective designs, which lack in ecological validity. Furthermore, findings are based on risk assessments completed by researchers rather than clinicians. This is an issue as risk ratings differ significantly depending on professional background (de Ruiter & de Vogel, 2004).

Aims. This thesis presents five studies with the aim of examining the link between violence risk assessment and management in vivo. This includes two studies focussing on the predictive validity of SPJ tools following clinical implementation; a description of the implementation procedure; a traditional research study on the predictive power of dynamic risk factors and a pilot evaluation of a short term risk assessment tool for imminent inpatient violence.

Methodology. The primary research site was the State Hospital, the high secure psychiatric facility for mentally disordered offenders in Scotland and Northern Ireland. The research population consisted of 115 male forensic patients who were followed up across different risk settings for a mean of 31 months. The SPJ instruments under investigation were the HCR-20 (Webster et al, 1997), the SVR-20 (Boer, Hart, Kropp et al, 1997) and the RSVP (Hart et al, 2003). All assessments were exclusively completed by clinicians and resulted in active risk management strategies. Additionally, the predictive validity of dynamic risk factors was examined through psychometric measures of anger, impulsivity, psychiatric symptoms, unmet needs and imagined violence. The risk of imminent violence was assessed with the Dynamic Appraisal Situational Appraisal – Inpatient Version (DASA-IV, Ogloff & Daffern, 2006).

Results and Conclusions. Findings indicate that clinically implemented SPJ tools are not predictive of future violence, both within and outwith secure settings. Comparison with a

previous study at the State Hospital implies that the implementation process of the HCR-20 facilitated the knowledge transfer from assessment to management, and therefore incidents were prevented. This noted the results also highlight that clinicians may accept risk tools into practice when these have not been scientifically scrutinised. This was the case with the RSVP in that there is little published data on the psychometric properties of this tool, yet its introduction replaced the SVR-20 across the State Hospital. With regards to dynamic risk factors, the severity and chronicity of psychiatric symptoms were the strongest predictors of violence. This is further corroborated by the finding that the DASA-IV predicted violence within 24 hours of ratings provided. All findings are discussed in the context of previous research and the experienced obstacles of implementing changes within NHS settings. Clinical implications and recommendations for violence assessment and management are provided in the light of acknowledged limitations.

Publications. To date, results of the SPJ tools and the DASA-IV as well as an outline of the implementation process have been published or are currently under review as:-

1. Vojt, G., Thomson, L.D.G. & Marshall, L.A. (2013). The predictive validity of the HCR-20 following clinical implementation: Does it work in practice? *Journal of Forensic Psychiatry & Psychology, 24 (3)*, 371 – 385.

2. Vojt, G., Marshall, L.A. & Thomson, L.D.G. (2012). Researching violence risk at the State Hospital. *The British Psychological Society: Division of Clinical Psychology, 6*, 28 – 32.

3. Vojt, G., Slesser, M., Marshall, L.A. & Thomson, L.D.G. (2011). The clinical reality of implementing formal risk assessment and management measures within high secure forensic care. *Medicine, Science and the Law, 51 (4)*, 220 – 227.

4. Vojt, G., Marshall, L.A. & Thomson, L.D.G. (2010). The assessment of imminent inpatient aggression: A validation study of the DASA-IV in Scotland. *Journal of Forensic Psychiatry and Psychology, 21 (5),* 789 – 800

CHAPTER 1

GENERAL INTRODUCTION

A central role of mental health professionals within the criminal justice and forensic mental health system is the assessment, management and communication of an individual's risk of future violence and recidivism (Webster & Hucker, 2007). Research has established that a large proportion of criminal violence is committed by a small but persistent group of offenders. The accurate identification of such individuals, the risk factors associated with offending among this group when compared to other less chronic groups, are therefore crucial in terms of saving financial and human costs. Parallel and interrelated to this has been the rise of evidence based practice; the pronounced need and demand to utilise and implement interventions and measures that have withstood rigorous and systematic scientific investigations. This impetus for evidence based clinical practice has had a direct influence on the development of violence risk assessments. A risk assessment is a statement of the likelihood that the outcome of interest, i.e. violence, will take place in the future. While the process leading up to such an estimate is also referred to as risk assessment, interventions designed to prevent the event are described as risk management. Violence risk assessments have evolved considerably over the years, and more recently due to a paradigm shift in practice and research from risk prediction to risk prevention (Douglas & Kropp, 2002). It is within the realm of the latter that this thesis takes place. The purpose of the present chapter is to introduce the rationale and to set the context for this thesis.

1.1 Introduction

Violence, independent of its form or function, has been labelled as one of the core problems in society to such an extent that the World Health Organisation has declared it a public health issue (Krug, Dahlberg, Mercy et al, 2002). Yet, the total economic and psychological impact of violent crime at the individual and societal level is difficult to estimate (Demyttenaere, Bruffaerts, Posada-Villa et al, 2004). In the UK, Dubourg and Hamed (2005) calculate that the approximate total cost of crime against individuals and households adds up to £36.2 billion per year with 67% of these costs associated with interpersonal violence; serious violence including homicide and wounding (37%), sexual offences (23%) and minor assaults (7%). These figures, however, are based on a variety of sources, which are not necessarily compatible and which have been criticised for

involving ad hoc judgements (Dolan, Loomes, Peasgood et al, 2005). This notwithstanding, increased attention and resources are channelled towards understanding the burden and risks associated with violence, assessing the efficacy of risk factors and interventions, and implementing successful interventions on a broad scale.

Despite such attempts to prevent violence and crime, the reconviction rate in the forensic population has been noted as relatively stable at 35 – 40% within 3 - 6 years of release across the US, Canada, Europe, Australia, Scandinavia, Japan and Malta (Baumer, Wright, Kristinsdottir et al, 2002; Grann, Danesh & Fazel, 2008). Though this matches recent statistics in Scotland (Scottish Government, 2012), there are claims that violent crime has decreased by 40% over the past ten years. Yet, the Scottish Crime and Justice Survey (2011) estimate that about 61% of crimes are not reported to the police for reasons such as respondents' beliefs that the criminal incident was too trivial to report (40%) or that the police would be unable to change the situation (17%). This particularly applies to the reporting of sexual violence in that only 11% of serious sexual assaults such as rape are believed to be reported through official channels (Chaplin, Flatley & Smith, 2011). This is unfortunate on multiple levels in that not only does this affect health services, e.g. the long term psychological and physical effects of unreported victimisation financially outweigh those of reported crimes, but under-reporting also directly widens the gap between the known and the true base rate of violence. The latter term refers to the average rate of violent behaviour in the population or in the samples studied assuming that these represent the wider population with similar attributes. Statistically, the difference between the assumed and the actual base rate may impact on research evidence relating to the effects of interventions or prevention programmes. This, however, is a difficult matter per se as evidence suggests that it is a relatively small cohort of individuals who are responsible for a disproportionally large variance of criminal violence and repeat offending. The identification of members of this particular group is a pronounced quest among researchers and practitioners alike. In an attempt to establish differentiating factors, offending populations are compared to non-offending controls from the public, though research also considers differences between specific groups of offenders. This, it is assumed, has the potential to contribute to the understanding of violent behaviour, the possible correlates and causal factors associated with violence. As a consequence of this, corresponding management strategies can be put into place to keep the public safe and promote desistance from offending (Sapouna, Bisset & Conlong, 2011).

In addition to these difficulties inherent in the study of violent individuals, there seems to be a divide between the facts and figures underpinning criminal and violent offending and the measures the public considers essential to its safety.

Violence and mental disorder

According to Monahan (1992) 'throughout history and in all known societies people have believed that mental disorder and violence were somehow related.' (p.511). While this is true to some extent as the statistical and clinical relationship between mental disorder and violence is consistent the actual likelihood of experiencing severe violence such as homicide at the hands of a mentally disordered person is relatively small (Nilsson, Wallinius, Gustavson et al, 2011). Epidemiological studies clarify this further by establishing that the *absolute* risk of violence posed by persons with mental disorder is small. However, the *relative* risk of violence increases with mental disorder, especially in the presence of active psychosis and substance abuse (Steadman, Mulvey, Monahan et al, 1998; Elbogen & Johnson, 2009). While this clearly indicates that not all individuals with mental disorder are violent, Smith, Reddy, Foster et al (2011) express concern that the stigmatisation of mentally disordered people as potentially dangerous may contribute to the criminalisation of this group. The issue of stigmatisation seems grounded in that the public's opinion of mental disorder and violence has been noted to be averse. Douglas and Webster (1999) attribute this to selective media attention on recidivism rates of patients previously detained in secure settings, and the assumed failure of clinicians to intervene appropriately. This is endorsed by Szmukler and Rose (2013) who highlight that social and political groups including the mass media seem to focus on some risks but not others. While Slovic (2000) argues that the focus on specific risks taps into the fear of the unknown (i.e. mental disorder), of equal significance is that some risks or adverse events are seen as being capable of management. It is this implication of unnecessary loss and damage that is thought to contribute to the psychological phenomenon of moral outrage (Szmukler & Rose, 2013). The impact of moral outrage on public demand for change on political proceedings cannot be denied when considering reforms to legislation across countries. For example, since 1994 in the UK, formal public inquiries are routinely required into homicides committed by people with mental disorder (Department of Health, 1994). Such inquiries typically provide recommendations for future clinical practice. These, in turn, frequently point to the need for more diligent assessment of risk.

The assessment of risk of harm to others

Practically, risk assessment refers to the process of collating, evaluating, interpreting and synthesising information relevant to the assessment of the behaviour under investigation. In this thesis, this behaviour refers to violence, both physical and sexual. When attempting to understand the concept of risk assessment, one automatically stumbles across the apparent difficulties in describing the terms 'risk' and 'violence'. That is, there is no universally agreed definition for either. Risk, for example, was conceptualised as 'dangerousness', which in turn was related to unpredictability until the early 1990s (Scott, 1977). This is further marred by the fact that research on violent behaviour has been, and often still is, dominated by measuring risk, and incidentally violence, as either present or absent. This said, definitions of violence range from inpatient misbehaviour (Hildebrand, de Ruiter & Nijman, 2004) to threats and actual physical and sexual violence (Webster, Douglas, Eaves et al, 1997). Frequently, violence is limited to a measurement of official violent criminal recidivism; when an act has been identified, processed and incurred a conviction. However, recidivism rates are unreliable, and rely on age, type of offender and length of follow-up.

For the purpose of this thesis, the definition of violence employed considers any event involving physical contact with a victim, any sexual event (including exposure and touching) and any episode of physical aggression towards property (including fire setting) as violence (Thomson, Davidson, Brett et al, 2008). Risk is understood as a probabilistic concept, which is further shaped by attributes pertaining to the nature, frequency, severity and imminence of adverse events (Mulvey & Lidz, 1995). This then means that a violence risk assessment is 'the process of evaluating individuals to characterise the likelihood they will commit acts of violence and develop interventions to manage or reduce that likelihood' (p.356). Kropp, Hart and Lyon (2002) clarify that risk assessments are therefore speculative, albeit based on structured information, regarding a person's propensity to act violently. This requires that sufficient and relevant information are used to infer such a judgement. In a risk assessment tool, this information is typically expressed in the form of risk factors. A risk factor is a variable that precedes and increases the probability of the outcome occurring (Offord & Kraemer, 2000). When applied to violence, this is thought to include the onset, frequency, persistence and duration of offending (Kraemer, Stice, Kazdin et al, 2001).

1.2 Risk factors

The research literature on violence risk is shaped by the clinical - actuarial debate (Mehl, 1954; Hilton, Harris & Rice, 2006). This refers to the competing advocates of historical and dynamic risk factors in the aetiology of violence and offending. For example, established historical risk factors are static in nature and may refer to past behaviours such as previous violence, criminal history or age at first offence. In contrast, dynamic risk factors are thought to respond to fluctuations in a person's risk of violence. Typically, this includes clinical symptoms of mental ill health or antisocial attitudes. The consensus to date is that historical risk factors are statistically superior to dynamic risk factors (Buchanan, 2008), yet due to the static nature of such variables, practitioners are limited in utilising this information in clinical decisions. In general, the study of risk factors has its limitations. Studies attempting to predict who might be at risk for violence have typically focussed on single risk factors, or considered a combination of risk factors but analysed the effects in isolation. While advanced statistics allow to attach weights and significance to risk variables relative to others, when and how individual influences operate is not yet accounted for.

Violence risk factors

Buchanan, Binder, Norko et al (2012) summarise that evidence available to date suggests that risk factors for violence among mentally disordered people reflect the correlates of violent offending in the general public. This is largely based on the meta-analysis conducted by Bonta, Law and Hanson (1998) who claimed that the most salient risk factors for violence are younger age and male gender (Bo, Abu-Akel, Kongerslev et al, 2011), lower socioeconomic status (Swanson et al, 2006), substance misuse problems (Monahan, Steadman, Silver et al, 2001) and early onset of offending (Loeber & Farrington, 2000). Adverse developmental factors have also been linked to later offending in that childhood maltreatment, e.g. physical abuse or neglect, can have a negative impact on attachment to others (Hill & Nathan, 2008). In other words, the effects of mental disorder on violence are argued to be minor as historical factors are the prime markers that differentiate between violent and non-violent offenders. Yet, Douglas, Guy and Hart (2009) review the relationship between mental disorder such as psychotic illnesses and violence as significant, both statistically and clinically. This is further endorsed in a meta-analysis by Fazel, Gulati, Linsell et al (2009) on 20 studies (n = 18 423) between 1970 and 2009. The authors observe that psychotic disorders increase

the risk of violence in male patients (ranging from none to a seven fold) and even more so in female patients (ranging from four to 29 fold). Of particular interest is that serious violence perpetrated by psychotic individuals seems to take place prior to contact with mental health services (Wallace, Mullen & Burgess, 2004) or in other words, in the absence of treatment (Large & Nielssen, 2008). This implies that active clinical symptoms may play a crucial role in the association between violence and psychosis.

The impact of clinical symptoms

The potential role of positive psychotic symptoms such as hallucinations, thought disorders and delusions in violent behaviour has been widely documented across research studies (Elbogen & Johnson, 2009; Fresan, Apiquian, de la Fuente-Sandoval et al, 2005; Laajasalo & Haekkaenen, 2006). Typically, the severity of such symptoms seems to correlate with the recorded severity of violent behaviour (Foley, Browne, Clarke et al, 2007). Though command hallucinations are perhaps of particular interest given the instructive nature inherent to this symptom, research evidence on its role is inconclusive. For example, McNiel, Eisner and Binder (2000) report that there is a 2.5 fold increase in violence due to command hallucinations, yet Shawyer, Mackinnon and Farhall (2003) report evidence to the contrary. Arguably, the relationship between command hallucinations and violence may not be linear. For example, Barrowcliff and Haddock (2006) suggest that there may be a range of mediating factors influencing individual compliance with command hallucinations. Similar inconsistencies apply to the relationship between delusions and violence. For example, there is evidence that persecutory delusions increase the risk of violent behaviour (Chow & Ng, 2007). This is typically explained by referring to the physiological reaction to feelings of threat and danger, i.e. the fight-or-flight response (Teasdale, Silver & Monahan, 2006). Ironically, the latter also explains contradictory evidence by Teixeira and Dalgalarrondo (2009) who argue that persecutory delusions may lead to avoidance of others, and therefore act as a buffer against violence. Though the authors base this statement on a sound study comparing delusional violent males with a matched control group of delusional non-violent men, the impact of previous violence nor the level of insight are considered. Arguably, the manner in which such delusions are interpreted may contribute to the decision whether violence is employed. However, assessing such manner may not be an option considering the evidence on threat/control-override (TCO) symptoms. This is a specific constellation of psychotic symptoms referring to feelings of being threatened and

controlled by outside forces to such a degree that any resistance to using violent methods is effectively overridden (Link & Stueve, 1992). Though there is some support for this theory (Walsh, Buchanan & Fahy, 2002), Stompe, Ortwein-Swoboda and Schanda (2004) reported that TCO symptoms did not contribute to explaining the variance of violence over and above other established risk factors.

Sexual violence risk factors

The literature cites risk factors for sexual offending similar to those listed for violent offending (Harris, Fisher, Veysey et al, 2010). This is explained by the fact that sex offenders are typically diverse in their offending career. This resonates with traditional criminological theorists who posit that sex offending is one of many expressions of antisocial behaviour, which in turn is thought to indicate a general construct of deviance (Gottfredson & Hirschi, 1990). While Maniglio (2010) asserts that a host of non-specific risk factors including exposure to domestic violence, removal from family and parental loss contribute to the aetiology of sex offending, Seto and Lalumiere (2010) claim these are moderating rather than contributing variables. Instead, these authors point to a specific set of risk factors conducive to sex offending such as deviant sexual fantasies and childhood trauma.

Sexual deviance is thought to refer to sexual behaviour that lies outwith the norms and practices of the relevant society or culture (Bancroft, 1989). Though deviant sexual fantasies are a key factor in sexual offending (Hanson & Morton-Bourgon, 2005), Bartels and Gannon (2011) query the foundation of this concept referencing evidence that male non-offenders have high rates of sexual fantasies involving children or forceful coercion of women. Considering then that deviant sexual fantasies may be intrinsic to human nature, the defining difference between sex offenders and non-sex offenders is thought to be the frequency, duration and intensity of engagement with such fantasy material (Gee, Waard, Belofastov et al, 2006). Ward and Hudson (2000) elaborate that the repeated use of deviant sexual fantasies can create implicit offence scripts through rehearsal. These repetitively occurring deviant fantasies may stem from early negative experiences, especially sexual victimisation. Ward and Beech (2006), for example, suggest an inability to psychologically cope with adverse events during childhood may lead to the use of masturbation to sexual deviant thoughts as a way of dealing with psychological distress. Indeed, Seto and Lalumiere (2010) conclude in a meta-analysis that child abuse is a specific risk factor for sexual offending with prevalence rates of sexual abuse five times

higher in adolescent sex offenders than non-sexual offenders and non-offenders. More specifically, Simons, Wurtele and Durham (2008) suggest that sexual abuse during childhood may be more prevalent among child molesters, while early experiences of physical violence may be more influential amongst rapists. However, Whitaker, Le, Hanson et al (2008) report no statistical difference in type of childhood abuse between rapists and child molesters in a meta-analysis on 89 studies between 1990 and 2003. Instead, the authors concede that, if at all, child molesters seem to have more extensive histories of both, sexual and physical abuse, when compared with matched non-offending controls. This noted, research on risk factors in sexual offending should be interpreted with caution as studies often lack statistical power due to small sample sizes. Data collection is typically based on self report, which is associated with poor recall, social desirability bias and cognitive distortions in relation to the sex offence and the victim (Stinson, Becker & Sales, 2008).

Psychopathy

Psychopathy is a clinical construct of individuals who exhibit risk-responsive traits such as grandiosity, superficial charm and manipulation of others with little to no regret or remorse. This is typically linked to an unstable and antisocial lifestyle characterised by criminal versatility (Hare, 1991). The construct of psychopathy is pertinent to the assessment of risk for various reasons. Historically, psychopathy was regarded as the single most important risk factor for future violence (Salekin, Rogers & Sewell, 1996) though the primary relevance of the concept emerges when considering its implications for treatment. For example, Hildebrand and colleagues (2004) conclude that psychopathy is associated with poor intervention response. Though the factor structure and the impact of this on violence is currently under debate in the literature, a range of standardised risk assessment tools include this concept as a stable risk factor.

1.3 The development of violence and sexual violence risk assessment tools

The literature frequently labels the development of successive generations of risk instruments as the evolution of risk assessment. This term does seem fitting because each generation strives to utilise the most advanced methods available at the time in order to better understand the risk of recidivism. The understanding of risk and the aetiology of criminal behaviour develop in tandem with the academic field, which in turn is thought to impact on clinical practice. When considering risk assessment approaches in practice,

there appear to be three prevalent generations pertaining to unstructured clinical judgement, actuarial assessment and structured professional judgement. Though there are further subcategories in each of these methodologies, these are not of practical consideration to this thesis.

The evolution of risk assessment approaches in practice

Historically, risk assessments were based on unstructured clinical judgements regarding an individual's propensity to be dangerous. These decisions and estimates involved clinical experience and interpretation of a person's presentation, and were therefore likely to be influenced by confounding variables such as emotions or socially established biases. In other words, risk factors employed in the assessment are thought to be highly variable across time, settings and clients. This is not to say that unstructured clinical judgement is inevitably inaccurate or invalid (Hanson & Morton-Bourgon, 2004), yet the general consensus is that this methodology is lacking reliability, validity and transparency (Monahan, 1981). The shortcomings identified in the assessment of risk at that time were also reflected in the literature on treatment effectiveness with offenders. Notably, the 'nothing works' literature proposed that treatment was ineffective. This had a remarkable impact on the allocation of resources, both in research and practice, and gave rise to a punitive approach across the forensic system. However, advances in statistics and research methodologies such as the introduction of meta-analysis allowed a re-examination of treatment data, which accumulated in Lipsey's (1992) evidence that some types of rehabilitation did result in a reduction in reoffending. This was further elaborated on in the formalised Risk-Need-Responsivity (RNR) model (Andrews, Bonta & Hoge, 1990; Andrews & Bonta, 2006). This model proposes that a person's risk of violence can be reliably assessed, the focus should be on dynamic risk factors and needs, and based on these interventions ought to be matched to the risk level identified. This call for evidence based assessments and treatment gave rise to actuarial risk assessment tools. These instruments essentially consist of empirically derived predictors and correlates of violence. Risk factors are typically quantified through classifications, assigned weights or ratings, and are validated against violence. Otto and Douglas (2010) summarise actuarial tools as consisting of 'objective, mechanical, reproducible combination of predictive factors, selected and validated through empirical research against known outcomes' (p.5). Due to the lack of clinical opinion, the tools are thought to be systematic, impartial and transparent (Mossman, 2000). Perhaps most importantly, the actuarial approach provides

a relative index of risk of offending based on comparisons with similar others, e.g. those who share similar ratings or scores on structured risk assessments. This, it is argued, allows meaningful categorisation of individuals as high, medium or low risk (Cumming & McGrath, 2005). Though there is an extensive body of research underlining the superiority of actuarial tools when compared to unstructured clinical judgement (Buchanan, 2008), the former measures are linked to the base rates of violence. Recidivism rates, however, are thought to be flawed not only due to under-reporting but also because a person's propensity to offend may change considerably across time, settings and upon completion of treatment programmes (Polaschek, 2012). In other words, the identification of risk factors and predictors of violence is subject to possible flaws in data accumulation depending on the methodology employed. Yet, the most poignant criticism of actuarial tools is that these assessments are limited in utility for clinical practice (Dolan & Doyle, 2000); the extent to which risk factors can inform management is debatable. When viewed within the philosophy of the RNR model then, actuarial instruments may accurately predict violence, yet the selected risk factors are not dynamic and do not inform the level nor nature of interventions to be employed. Hart, Michie and Cooke (2007) further argue that while actuarial tools may predict violence at a group level, this does not apply at an individual level.

The distinction between research and clinical practice is important here. While in research groups of individuals are typically the object of interest, in clinical practice the focus is on the individual rather than a group of patients. Furthermore, researchers may be interested in statistical prediction, the role of the clinician, however, is not to predict but to prevent and to manage. The insensitivity of actuarial measures to individual change and clinical practice led to the development of structured professional judgement (SPJ) tools. These tools are seen as the synthesis of the actuarial and the clinical unstructured approach with the primary purpose of guiding clinical decision making. This is because while the SPJ methodology utilises empirically validated and clinically relevant risk factors, the approach allows professional flexibility to consider idiosyncratic characteristics of individual cases. This enables attending to important risk features such as imminence, duration, severity, targets, nature and management (Ogloff & Davis, 2005). While actuarial proponents highlight clinical opinion as inherently inaccurate, the SPJ philosophy attempts to optimise clinical practice by facilitating an evidence based and structured formulation of individual case information. For example, the Historical Clinical Risk Management Scale (HCR-20, Webster, Douglas, Eaves et al, 1997) is a

widely used SPJ risk assessment. The tool consists of ten historical, five clinical and five risk management items. While these include empirically validated risk factors of violence (e.g. previous violence), the HCR-20 developers also considered items of clinical relevance (e.g. lack of insight) as well as items reflecting the legal literature (e.g. failure to adhere to supervision). For the purpose of clinical discussion, each risk item can be scored as either present (2), possibly present (1) or not present (0). If the HCR-20 was used in an actuarial manner, then clinical opinion of a patient's risk of violence would be solely based on the HCR-20 score. However, when used in the appropriate SPJ manner, the HCR-20 serves as a 'reminder' to clinicians to anchor judgement along known risk factors. Though primarily developed for mentally disordered offenders, researchers have successfully applied the HCR-20 within correctional settings (Cooke, Michie & Ryan, 2001; Belfrage, Fransson & Strand, 2000) and with civil psychiatric patients (Louw, Strydom & Esterhuyse 2005). While SPJ guidelines are thought to have improved the consistency and transparency of decision making, proponents of the actuarial side claim that the addition of clinical judgement invalidates attempts to accurately identify violent individuals. Furthermore, the completion of SPJ tools is time consuming and requires allocation of resources and manpower. Arguably, the philosophy underlying the SPJ approach may be sound; risk factors directly inform risk management and thereby guide effective care and treatment, yet the actual translation of risk information into feasible risk strategies lacks in guidance and protocols. In response to the latter, an advanced form of SPJ tools has recently emerged, which merges the assessment process with the case planning. This integration creates an accessible system of interventions and monitoring strategies. Though highly commendable, this hybrid of the SPJ method is currently in its infancy and has yet to be scientifically scrutinised.

1.4 The clinical reality of risk assessment: The role of settings and resources

Recommendations across the UK (Department of Health, 2007; Royal College of Psychiatry, 2008) as well as recent guidelines in Scotland (RMA, 2011) stipulate that risk assessment measures need to contain information that is valuable in the development of appropriate and responsive risk management strategies. This favours the SPJ approach in professional practice. Farrington, Joliffe and Johnstone (2008) published a review and meta-analysis based on risk assessment tools used specifically in Scotland. The SPJ approach was identified as the most popular and clinically preferred methodology in a

survey among practitioners. This seems to be at odds with the results of a recent survey on the value attached to risk assessment among 300 health care staff in mental health trust in England (Hawley, Gale, Sivakumaran et al, 2010). The report suggests that little information was used from risk tools to inform practice. Szmukler and Rose (2013) document similar results from an unpublished online survey among the Royal College of Psychiatrists in 2007. Less than half of the 1937 respondents indicated the use of risk assessment tools in clinical decision making. While these figures may be concerning, none of these studies provided any information on subgroups in the respective samples. Of particular interest may be the difference between general and forensic psychiatry. This is because in forensic settings, accurate and diligent assessment of risk is crucial in that clinical decisions such as extending detention and allocating resources in terms of treatment needs are linked to the assessment outcome.

Forensic psychiatric settings

It is not surprising to find that it is typically within secure psychiatric settings that risk assessment and management plans are foremost formalised and put into place. The allocation of resources for interventions in such facilities is further influenced by the population residing in such settings. That is, high secure hospitals are typically those receiving the greatest proportion of financial support (Wolff, 2002). This makes clinical sense as individuals thought to require the restrictions and observations associated with maximum psychiatric care are associated with more needs (Thomas, Leese, Dolan et al, 2004). Spitzer and colleagues (2006) point out that forensic patients are frequently subjected to a multitude of traumatic and adverse lifetime experiences, which Timmerman and Emmelkamp (2001) report to be more severe when compared with non-mentally ill prisoners. This is further reflected in prevalence rates of psychiatric and medical comorbidity (e.g. Druss & Walker, 2011). For example, the prevalence rates of substance abuse among individuals with schizophrenia is high with figures ranging between 47% to 60% (Regier, Farmer, Rae et al, 1990) across epidemiological (Sinclair, Latifi & Latifi, 2006) and longitudinal prospective studies (Applebaum, Clark-Robbins & Monahan 2000). These findings have important clinical implications in terms of treatment needs, but also in reference to effective risk management among forensic psychiatric populations.

The State Hospital

The setting of interest in this thesis is The State Hospital, the high secure hospital for Scotland and Northern Ireland. At the conception of this thesis, the State Hospital held approximately 240 patients, the majority of whom were male (The State Hospitals Board for Scotland Annual Report, 2005/06). All patients are detained under mental health or criminal legislation. Admission to the State Hospital requires the professional agreement that the person's mental disorder is linked to a future risk of harm to others. Though some patients are admitted in the absence of a formal conviction, these will have displayed seriously violent and/or sexually aggressive behaviour in less secure settings to such a degree that high security measures are deemed necessary. Though the State Hospital is administered by its own health board, the nature of the patient population is of such high risk that the Scottish Government is involved in decisions on detention, suspension of leave and discharge. Following the recommendations published in the MacLean report (2000) on the need for systematic and standardised risk assessment and management of seriously violent and sexual offenders, the State Hospital proposed and successfully secured funding to formally implement SPJ risk assessment tools into practice. This is to ensure that patients are not detained in secure facilities longer than is medically and therapeutically necessary. While this makes economic and clinical sense, the question is whether such resources are used intelligently to decrease the risk of violence, promote recovery, and ensure appropriate public protection. In other words, the question is whether the risk assessment tools advocated under the SPJ umbrella are effective in practice with mentally disordered offenders.

1.5 Summary

The literature testifies that the assessment and management of serious violent and sexually violent offenders is high on the political and practical agenda. Even though risk assessment has been viewed as an inexact science (Dolan & Doyle, 2000), in reality clinicians are required to provide a clear rationale in their decisions on clinical care, extension of detention or discharge. For better or worse, such rationales are typically grounded in the world of evidence based research. The apparent difference between statistically accurate and clinically applicable risk assessment information is of particular interest to this thesis. Accurate identification of possible aggressors is an important aspect within mental health and criminal justice systems. However, equally salient is the extent to which risk information reflects clinical reality and can be applied to effect

change. These attributes are commonly associated with dynamic risk factors, which are thought to respond to fluctuations in a person's risk of violence. Typically, this includes clinical symptoms of ill mental health, antisocial attitudes, impulsive personality traits but also associating with pro-criminal peers. Though the past decade has seen an increase in research evidence supporting the relevance of dynamic risk factors to clinical practice, this seems minor when compared to the empirical base of static risk variables (Philipse, Koeter, van der Staak et al, 2005).

There are multiple limitations to risk research methodologies to date. A fundamental problem is the evaluation of the accuracy of risk assessment without releasing indivduals who are deemed as risky into the community (Litwack, 2001). Given the population, a true randomised control trial is ethically impossible, and as detention periods are typically lengthy in forensic care, the most accessible manner of obtaining data is to appraise how risky people were at the point of discharge. This means that researcher do not predict but postdict the risk of violence. The important point is that these shortcomings are recognised and considered when making a judgement on the suitability of a risk tool in practice. However, this endeavour seems tricky given the fact that the laboratory like controlled background of traditional research does not reflect the multi-disciplinary reality of working within clinical and forensic settings. This disconnect has been identified by various researchers including Douglas and Skeem (2005), and Hart and Boer (2010) who repeatedly point out that applied research is required; studies that tap into the clinical reality of conducting risk assessment measures in forensic mental health and criminal justice systems. This is not to say that traditional research is not valuable. Quite in contrast, it is in the interest of various stakeholders to ensure that any risk tool that is to be implemented into practice has an established psychometric record. Within the context of this thesis, this then leads to the question as to how do SPJ risk assessment tools perform among offenders with mental disorder. In particular, this thesis seeks to establish the predictive validity of SPJ tools following clinical implementation across a high secure setting. Furthermore, the predictive properties of dynamic risk factors are assessed and discussed in terms of utility in risk management. As such, this thesis investigates the applied science of risk assessment within the clinical reality of working with high risk forensic populations.

CHAPTER 2

LITERATURE REVIEW

As described in the previous chapter and recommended by current clinical guidelines for mental health professionals (Department of Health, 2007; Buchanan, Binder, Norko & Swartz, 2012), the assessment and management of violence risk are regarded core competencies. These instruments are designed to aid in the assessment of risk for antisocial behaviour such as general and sexual violence, and criminal offending. In addition to their utility in psychiatric settings, risk assessment tools are increasingly requested by courts and correctional agencies (Skeem & Monahan, 2011). As risk assessments are used to inform and shape medical and legal decisions of direct importance to treatment, individual liberty and public safety (Tyrer, Duggan, Cooper et al, 2010), research investigating the efficacy or the predictive validity of these tools is of considerable relevance. This chapter continues from the previous chapter in that the primary question is that of how violence and sexual violence risk assessments tools under the SPJ methodology perform in practice. While this question is addressed in this chapter in a systematic literature review, the verdict of relevant meta analyses and the statistical concept of predictive validity will be described beforehand.

2.1 Introduction

Best practice guidelines stipulate that any tool or measure applied to clinical practice ought to demonstrate acceptable psychometric properties. This includes concepts such as reliability and validity. While the former describes the consistency of a measure, the latter refers to the extent to which an instrument measures what it claims to measure. In reference to validity, of particular importance to risk assessment is the extent to which the tool predicts future violence. In other words, if the tool is used in the absence of implementation or intervention, the question arises whether this tool differentiates between violent and non-violent individuals with an acceptable degree of accuracy. As discussed in the previous chapter, violence risk assessment approaches developed in tandem with increasing knowledge, i.e. access to information. This also includes the refinements in statistical analysis. The statistical approach currently favoured when examining the predictive validity of a risk assessment instrument, and indeed risk factors in general, is the Receiver Operating Characteristics analysis.

Receiver Operating Characteristics Analysis

The advantages of using Receiver Operating Characteristics (ROC) analysis in determining the accuracy and predictive power of a risk assessment tool have been repeatedly underlined by various researchers such as Douglas, Otto, Desmarais et al (2012) since Mossman advocated this method in 1994. This is because ROC analysis is thought to be independent of the base rate of the outcome variable. This statistic identifies the most accurate cut-off point on a tool and provides an index of the sensitivity and specificity of this particular cut off point. In the case of risk assessment, this refers to an instrument's ability to accurately predict who will and who will not engage in the criterion variable such as violently reoffend in the future. Sensitivity describes the probability that a test will accurately identify a reoffender while specificity is the probability that a test will accurately detect a non-reoffender. In this way, sensitivity refers to the true positive rate, while the specificity allows calculation of the false positive rate (1 – specificity). Of particular interest is the area under the curve (AUC) in ROC analysis, which provides a global summary of the tool's overall accuracy. AUC also has immediate practical meaning in that it represents the probability that a randomly selected reoffender has a higher score than a randomly selected non-reoffender. Practically, if the value of the area under the curve yields .75, this means that there is a 75% probability that a randomly selected reoffender will score above the cut-off point for reoffending on the predictor, while a randomly selected non-reoffender will accordingly score below the given cut-off point. In general, an AUC of .50 represents a chance prediction, implying that the tool has no significant predictive properties whereas an AUC of 1.0 indicates perfect prediction. When interpreting AUCs in the language of effect sizes, any AUC exceeding .65 is considered a moderate effect size while those exceeding .70 are thought to indicate a large effect size (Rice & Harris, 2005).

Buchanan (2008) points out that ROC analysis also allows the calculation of the 'number needed to detain' (NND) which is the number potentially wrongly detained in order to prevent actual violence. This statistic is analogous to the number needed to be treated, which is used to quantify the impact and consequences of interventions in clinical medicine (Cook & Sackett, 1995). Of further interest are the negative and the positive predictive value, which correspond with the concepts of sensitivity and specificity. The positive predictive value is the proportion of people predicted by the tool to be reoffenders and who turn out to be reoffenders. Conversely, the negative predictive value is the

proportion of people predicted to be reoffenders and who are indeed reoffenders. For these to be calculated, the base rate needs to be known, and the AUC of the test applied. These statistical terms are of incredible import as the majority of papers and reviews discussing the predictive value of SPJ tools tend to report AUC outcomes.

Systematic reviews and meta analyses on the predictive validity of risk assessment tools

To date, no single risk assessment tool has proved superior predictive validity. While it is generally accepted that actuarial measures may be the most accurate (Buchanan, 2008), recent meta analyses and systematic reviews report that actuarial and SPJ instruments yield similar levels of predictive power. For example, Campbell, French and Gendreau (2009) conducted a meta-analysis comparing risk instruments and other psychological measures on their ability to predict future violence in adults in both inpatient and community settings. Notably, instruments designed specifically to assess sexual offending were excluded. Instead, the authors focused on actuarial tools such as the Violence Risk Appraisal Guide (VRAG, Harris, Rice & Quinsey, 1993) and SPJ instruments including the HCR-20 (Webster et al, 1997). Based on 185 effect sizes from 88 studies conducted between 1980 to 2006, Campbell, French and Gendreau (2009) report that there was little variation among the mean effect sizes of all tools. This noted, tools primarily comprised of dynamic factors produced slightly better effect sizes for violent recidivism while those with static factors seemed to be better predictors for institutional violence. The HCR-20, in particular, was noted to produce the largest mean effect size for the latter type of violence. While this seems at odds with the ethos of the HCR-20 and the fact that the tool contains an equal number of dynamic and static risk items, inspection of the included studies point to several methodological biases. For example, only one third of effect sizes (30.7%) were based on forensic psychiatric cohorts while the majority referred to prison samples. Furthermore, the research included in this meta-analysis typically reported the HCR-20 in the manner of an actuarial tool, i.e. in the absence of the final risk judgment.

Yang, Wong and Coid (2010) report similar results in that of nine commonly used risk assessment tools, all performed with moderate efficacy in the prediction of violence (AUC = .65 to .71) with the HCR-20 yielding the largest predictive validity. Inclusion in this meta-analysis required that studies described more than one tool and reported predictive validities. This resulted in a pool of 28 studies published between 1999 and 2008 and included the HCR-20, the VRAG and the PCL-R. The authors concluded that when the

focus is on prediction, risk instruments are essentially 'interchangeable' (p.759). Indeed, a large proportion of variance in predictive power (85%) was attributed to methodological qualities of papers rather than the different tools. That is, age, length of follow up time, conceptualisation of violence and violence outcome as well as gender impacted on the efficacy reported. This is confirmed by Singh, Grann and Fazel (2011) who posit that the predictive validity of tools varies according to age, gender and ethnic background. This particular meta-regression focussed on nine most commonly used risk assessment measures which included the HCR-20, the SVR-20 and the VRAG. Data were pooled from 68 studies with a total of 25 980 participants in 88 samples across 13 countries including the US, UK and Europe. While substantial differences in predictive power were found between tools, this was explained on the basis of each risk tool's development purpose. In other words, instruments developed for specific populations were generally better in predicting associated outcomes than more generic tools aimed at general offending.

Fazel, Singh, Doll et al (2012) add that the utility of risk instruments significantly influences the predictive validity. In this systematic review and meta-analysis, the efficacy of the same risk assessment tools investigated by Singh, Grann and Fazel (2011) were assessed except that tools were further divided according to target of prediction of violent offending, sexual offending or general offending. The review identified 73 samples, with a total of 24847 research participants across 13 countries. While risk measures aimed at predicting future violence performed best with a median AUC of .72, the authors postulate that this was largely moderated by demographic and methodological factors including setting and type of future violence. More importantly perhaps, the results were seen to indicate that if the purpose was to inform care and treatment, most tools performed moderately well in identifying those at high risk. However, if used to inform decisions on sentencing, release or discharge, the authors concluded that the tools were limited. This was particularly true for samples or settings where the base rate of violence was low. In terms of clinical implications, Fazel et al (2012) caution that risk instruments should not be used in isolation but rather as an integral part of the wider assessment process. While the UK, in particular forensic psychiatry, is advocated as an example for this approach, there is no description or example of how, if at all, this approach affects practice and in reference to risk management.

Application to this thesis

As indicated in the previous chapter, the State Hospital successfully proposed to formally implement SPJ risk assessment tools into practice. The SPJ tools chosen were the HCR-20, the SVR-20 and the RSVP. This is not to say that other SPJ or actuarial tools were not completed in addition to these three instruments. However, the systematic and structured translation of risk factors into risk management for each patient was embodied in the hospital wide implementation of these particular tools. This was because the definition of violence employed by the HCR-20 captured the complexities of the State Hospital population while the SVR-20 and the RSVP acknowledged the more specific needs of sex offenders, in particular those diagnosed with a mental disorder.

Given the outcomes of meta analyses and systematic reviews published to date, various researchers propose that the decision of which instrument to implement is not dependent on its psychometric properties (as most perform similarly) but instead relies on the tool's clinical utility (Yang, Wong & Coid, 2010). While this may be true, it is imperative that clinicians are aware of the methodological shortcomings of the tools that are to be applied. Despite the large body of research cited, the proportion of studies focussing on the predictive validity of SPJ tools with mentally disordered offenders, in particular those residing in high secure care, has not been formally reviewed to date. In order to set the scene for this thesis, a systematic literature review was conducted with the following question in mind:-

> What is the predictive validity of the HCR-20, the SVR-20 and the RSVP in mentally disordered offenders?

The methodology including search strategy and process, as well as the results and implications of findings to date are described and discussed in detail in the following sections.

2.2 Method

Search strategy employed in literature review

Step 1: Databases

For a clinical perspective, Medline and Embase were searched under Ovid while PsycInfo and CINAHL were searched under EBSCO. For a social perspective, ASSIA was searched.

Search terms

1	(risk and (ment* disorder* offend* or ment* ill* offend* or psychiatr* offend* or forensic* patient* or sex offend* or forensic* psychiatr*))
2	HCR-20
3	SVR-20
4	RSVP

All searches were conducted in the same manner in that the research student chose the advanced search option and utilised multi-field searches. All search terms were applied to 'all fields', i.e. the search was not restricted to the title or abstract of a paper. This was to ensure that even those studies where the predictive validity of the SPJ tools under investigation was not the main focus would be considered. No specific map terms were identified to ensure that all searches were conducted in a standardised manner; databases differed in map terms and hence subjective judgement would have been required to decide on what map term represented search terms. While Medline and Embase only include peer-reviewed journals, searches on EBSCO and ASSIA were limited to peer-reviewed journals to establish sufficient quality of papers received. Initially, all searches were conducted separately, i.e. for search terms 1 to 4. This enabled the database to carry out the combination of search terms, e.g. (1) AND (2) rather than the research student manually entering search terms, which in turn minimised possible spelling errors. Results were restricted to papers published between 1 January 1995 and 31 August 2013.

Step 2: Analysis of relevance of papers

The abstracts of all papers identified were analysed according to set inclusion and exclusion criteria.

Inclusion criteria

Only empirical studies outlining the predictive validity in terms of receiver operating characteristic analysis, odds ratio or regression coefficients were considered. Given the nature of the thesis population only studies describing forensic psychiatric patients were included. Furthermore, only studies available in English or in German (the research student is proficient in both languages) were selected for the literature review. While one may argue that this introduced systematic bias into the review process, Moher, Pham, Lawson et al (2003) state that the effect of excluding non-English papers is minimal.

Exclusion criteria

In terms of exclusion criteria, any study not indicating the predictive validity of a measure was omitted as were studies discussing non-mentally disordered offenders (e.g. civil psychiatric patients or prisoners), as well as all studies where the outcome was not violence, or violence-related. Furthermore, research on learning disabled populations and female psychiatric offenders were excluded. The decision to narrow results to male mentally disordered offenders arose ad hoc in that though the research student attempted to include female and learning disabled offenders in her studies, the clinical teams responsible for these populations in the State Hospital opposed participation (see chapter 5 in the implementation process). That is, the clinicians in question emphasised that the implemented SPJ tools were not applicable to female nor learning disabled offenders in the State Hospital at the time of study conception. There is some evidence for this in the research literature. For example, Nedopil (2009) claims that while risk factors may be similar for men and women, the underlying motivation for offending and the needs associated with this behaviour differ greatly. Clinically, this is likely to impact on the provision and prioritisation of treatment and interventions. Likewise, Fitzgerald, Gray, Alexander et al (2013) call for an abbreviated version of the HCR-20 for learning disabled offenders implying that the risk factors in the standard HCR-20 do not match with the risk factors important to this population. As all SPJ tools under investigation are designed for adult populations only, there was no need to filter out studies on young people, i.e. under the age of 18 years.

Step 3: Hand searches of references

The references of the final sample of papers deemed relevant to the research question were hand searched, as were published systematic reviews and/or meta analyses provided these applied.

2.3 Results

The literature search yielded a total of 363 studies. Of these, 294 included the HCR-20, 64 were associated with the SVR-20 and 5 were related to the RSVP. Table 1 outlines the number of hits for each search strategy.

Table 1 Number of hits for search strategies employed in literature review

Database	**Database provider**	**Number of total hits for (1)**	**Number of total hits for (2)**	**Number of total hits for (3)**	**Number of total hits (4)**	**(1) and (2), i.e. HCR-20**	**(1) and (3), i.e. SVR-20**	**(1) and (4), i.e. RSVP**
Medline	Ovid	10,262	78	51	395	51	10	0
Embase	Ovid	16,933	147	33	481	94	18	2
PsycInfo*	EBSCO	10,068	157	28	330	100	24	3
CINAHL*	EBSCO	2,763	22	3	36	15	2	0
ASSIA*	ASSIA	4,055	55	10	3	34	10	1

* limited to peer reviewed only

Following application of the inclusion and exclusion criteria to retrieved abstracts, removal of duplicates and inclusion of any relevant hand searched papers, the final sample included 43 empirical studies with 38 independent samples. Of these, 36 focussed on the HCR-20 while three described the predictive validity of the SVR-20 (one of these included both the HCR-20 and the SVR-20). Results showed that there are no published studies on the predictive validity of the RSVP to date. The key characteristics of each study (e.g. sample size, length of follow-up time, AUC results) are described in appendix one.

Structure of literature review

The identified papers were categorised according to setting of outcome variable of inpatient vs community violence. In each section, papers were grouped according to retrospective, prospective and pseudo-prospective research design. Utilising a prospective research design means that all risk assessment tools were completed either at point of admission or at the beginning of the respective study period. In contrast, retrospective studies were based on historical file information for both, the completion of the relevant tool and the collection of outcome data. The term 'pseudo-prospective design' describes research studies where the authors completed risk assessments tools on retrospective, historical data such as case notes but then followed participants up in real time.

Across inpatient and community violence, findings of UK studies are discussed and then compared to results of non-UK studies. The latter were conducted across a wide range of countries including Brazil, Sweden, Denmark, the Netherlands, Germany, the US and Canada. Given the locus of this thesis, i.e. mentally disordered offenders in high secure settings, findings from high secure hospitals as well as true prospective or implementation studies are discussed in more detail. Figure 1 and 2 illustrate the number of studies reviewed in each of these categories. Notably, five studies included both inpatient and community violence.

Figure 1 Number of inpatient studies according to location and research design

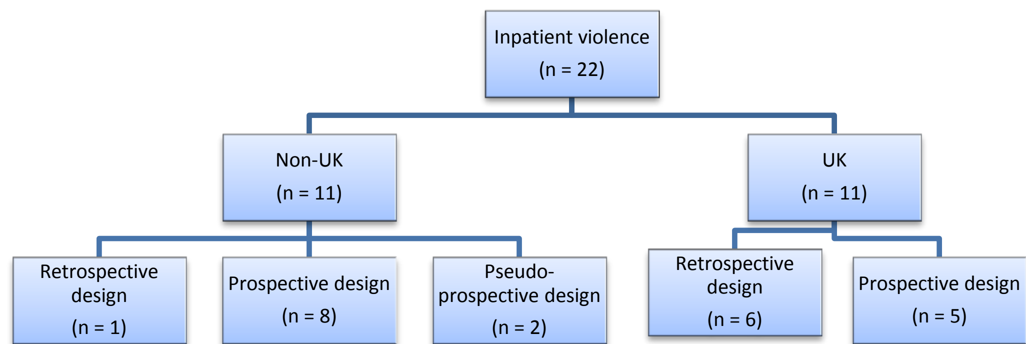
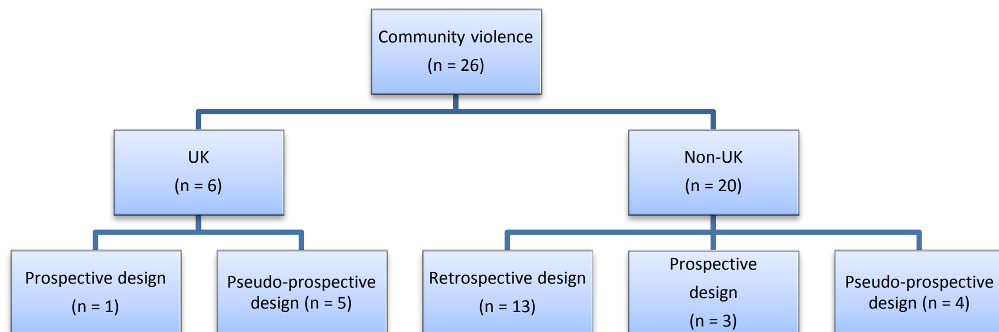


Figure 2 Number of community studies according to location and research design



2.4 Review and discussion of the literature

The predictive validity of SPJ tools in inpatient settings

Across all studies, authors typically highlighted that the raters were trained in the relevant measures and that SPJ ratings were completed blind to the outcome data. The latter were frequently collected by a different person(s) who in turn were blind to the SPJ rating. While violence was frequently defined in line with the HCR-20 manual; 'the actual, attempted or threatened harm to a person or persons' (Webster et al, 1997, p. 24), inpatient studies often incorporated standardised measures such as the Overt Aggression scale (Yudofsky, Silver, Jackson et al, 1986) to categorise inpatient incidents. This resulted in a variety of distinct behaviours ranging from 'physical violence against staff', 'physical violence against peer patients'; 'sexual harassment' to 'threats and antisocial behaviour'. Almost all studies, however, reported results based on physical, non-physical and 'any violence' (all incidents). Research focussing on violence in the community commonly selected recidivism in national reconviction registers as outcome variable. This was often categorised as general, violent and any recidivism.

UK inpatient violence

Across UK research, the HCR-20 total and all subscales generally predicted inpatient violence across retrospective and prospective studies. There was a relatively consistent pattern across findings implying that the dynamic variables of the HCR-20 were the strongest predictors of inpatient violence. That is, the clinical and/or the risk management scale typically outshined historical factors across several analyses including ROC analysis, logistic or cox regression models. This applied to short term (Daffern & Howells, 2007) as well as long term predictions (Dolan & Fullam, 2007). While significant, the level of accuracy achieved was generally within the moderate range. This is because variations in predictive power arise when the components of inpatient violence are examined separately. For example, though Grevatt, Thomas-Peter and Hughes (2004) confirm that the clinical scale was the best predictor of *any* inpatient violence (AUC = .72) this was not the case when analysis focussed on physical violence against others. Instead, the import of clinical factors in physical violence seemed to be only significant when patients were categorised according to chronicity of incidents. That is, clinical symptoms predicted violence solely in those who had aggressed against others on at least three occasions. Yet, logistic regression analyses implied that only verbal aggression could be

predicted and by the clinical scale. Similarly, Fitzgerald, Gray, Alexander et al (2013) highlight that none of the HCR-20 scales nor the final risk judgement predicted physical violence in a sample of 45 patients in medium secure settings. However, when analysis isolated incidents of serious violence, the total HCR-20 scale, the risk management scale and the final risk judgement were predictive (AUC = .79, .81 and .90 respectively). The authors explain the lack of clinical significance in their results by referring to the diagnostic make up of their sample. That is, the majority of participants (65%) had a personality disorder diagnosis (primary or secondary), and hence low predictive validity of the clinical scale should have been expected.

There is, however, further research suggesting that historical factors are also important in the prediction of inpatient violence over short follow-up periods. For example, Doyle, Dolan and McGovern (2002) establish that the historical scale was a good predictor of inpatient violence in a sample of mostly mentally ill inpatients (67%). This was true for any violence and those incidents deemed to be serious over a follow-up period of three months. Arguably, the authors only used the historical scale of the HCR-20 and concede that the clinical and the risk management scale may have improved predictive accuracy. Yet, Gray, Fitzgerald, Taylor et al (2003) report that the historical and the clinical scale performed equally well over a follow-up period of three months. The authors declare that the composite score of historical information and clinical factors in the HCR-20 was consistently the best predictor across several outcome categories including physical violence and any violence. McKenzie and Curr (2005) come to similar conclusions in that while the clinical scale of the HCR-20 was generally a significant predictor of violence, the historical scale yielded equally high efficacy though only in a group of high risk patients. While in both studies, clinical symptoms were strong predictors, McKenzie and Curr (2005) caution that this was due to sample characteristics. That is, the participants were members of a challenging behaviour group with acute disorder. Likewise, though Gray and colleagues report that psychiatric symptoms were highly predictive (AUC = .84), these particular assessments were conducted within two weeks of admission, i.e. when symptoms are likely to be high. While this makes sense, Thomson, Davidson, Brett et al (2008) posit that clinical symptoms maintain their predictive power for inpatient incidents over and above the admission period. This noted, this particular study took place in the State Hospital and therefore describes a special group of high risk forensic patients.

Inpatient violence in high secure settings in the UK

In line with most other inpatient studies, Thomson et al's (2008) study was retrospective in nature in that tools were completed for the purpose of research. While this study utilised the historical scale of the HCR-20 only, clinical symptoms were collated from patients' case notes. Perhaps most importantly, Thomson et al (2008) found that historical factors were good predictors of future violence in the form of recidivism while clinical symptoms of severity and chronicity were predictive of inpatient aggression. The import of clinical symptoms in high risk groups is further exemplified in the work by Macpherson and Kevan (2004). This is perhaps not surprising given that results are also based on the State Hospital population. Yet, there are important differences in the research design. This particular study was prospective and all HCR-20s were rated by the lead clinician and discussed by the relevant clinical teams. The results showed that the clinical scale was the only component of the HCR-20 that predicted violence across all categories (AUCs > .65). Further analysis showed that clinical factors were associated with an odds ratio of greater than 2.5 for any violence. Macpherson and Kevan (2004) note in terms of utility, this establishes the clinical HCR-20 scale as highly important. These results are reflected in a similar study by Langton, Hogue, Daffern et al (2009) in a high secure hospital in England. All HCR-20s were completed as part of routine clinical practice. That is, all measures were completed within multi-disciplinary teams and were based on file information and interviews. While both the clinical and the risk management scales were predictive at 12 month follow up, the final risk judgement outperformed all HCR-20 subscales across all outcomes. This also applied when aggressors were categorised according to chronicity of inpatient incidents. Given the clinically grounded focus of these studies, these findings seem to imply that the information collated in the HCR-20 was perhaps not effectively operationalised. This noted, the entire sample consisted of personality disordered offenders, which suggests that clinical issues are perhaps less relevant in such a population. This seems a valid argument given that in a preceding study, Daffern and Howells (2007) documented similar results. In particular, while the latter found that the clinical HCR-20 scale reached statistical significance in the prediction of imminent inpatient aggression, the effect was minor to moderate (AUC = .63).

Non-UK inpatient violence

In contrast to UK studies, research on inpatient violence elsewhere clearly mark the dynamic scales as superior to historical factors. This was particularly true for incidents of

physical violence against others (e.g. De Borba-Telles, Folino & Taborda, 2012). This said, predictive accuracy typically sat within the moderate range though the clinical scale reached large effect sizes (AUCs ranged between .67 and .75). The import of the risk management scale varied across studies though was consistently related to physical violence in McDermott, Edens, Quanbeck et al's (2008a) and McDermott, Quanbeck, Busse et al's (2008b) research. When all incidents deemed as violent were considered, the total HCR-20 scale was often the best predictor and yielded moderate to high predictive values. This, however, was generally due to the dynamic rather than the historical composite of the HCR-20. Indeed, papers that included the final risk judgement, i.e. the use of clinical judgment when considering all HCR-20 risk items, noted that this outperformed the HCR-20 total and subscales, at times exceeding AUC = .90 (de Vogel & de Ruiter, 2005). Corroborating evidence for the impact of clinical factors was presented in the form of additional risk instruments with a dynamic focus or psychometric measures. For example, McDermott et al (2008a; 2008b), Abidin, Davoren, Naughton et al (2013) and Fagan, Papconstantinou, Ijaz et al (2009) highlight a significant impact of active positive symptoms on the predictive validity of the HCR-20. Of further interest is the study by Wilson, Desmarais, Nicholls et al (2013) who examined the predictive validity of the HCR-20 over one year with the clinical and risk management items being updated every three months. The results implied that the dynamic factors of the HCR-20 were better predictors in the short term while historical variables seemed more predictive in the long term. This noted, incremental analysis demonstrated that clinical items were the strongest predictors irrespective of follow-up time and date of completion in relation to incidents.

Similar to the UK studies, there appears to be a diagnosis effect. Tengstroem, Hodgins, Mueller-Isberner et al (2006) demonstrated that the clinical HCR-20 items were only predictive in individuals with schizophrenia and mental retardation. This is confirmed by Dernevik, Grann and Johansson (2002) in so far that the historical scale of the HCR-20 was the best predictor of inpatient aggression in personality disordered individuals in Sweden. This study, however, is different in that the design was prospective and participants were followed up as they moved from high secure conditions to the community. Of note is that historical factors were of little relevance to those PD patients requiring intensive risk management. Instead, clinical factors predicted incidents and accordingly, higher clinical scores were associated with higher risk management levels. The risk management scale was a poor predictor across all analyses and management

levels; this was thought to indicate that the HCR-20 was used as intended. Akin to Macpherson and Kevan (2004) though, there is no description of how risk information may have been used in practice, and hence this speculation is not open to further exploration.

The predictive validity of SPJ tools in community settings

UK recidivism

In England and Wales, Gray and colleagues conducted a series of four studies focussing on the ability of the HCR-20 to predict future reconvictions. All studies employed a pseudo-prospective research design and collected outcome date from samples discharged from medium secure facilities. The results firmly establish that the total HCR-20 and the historical factors were predictive of violent and general recidivism, albeit typically with moderate efficacy. The clinical scale was consistently a poor predictor (Gray et al, 2007). For example, this was observed across several lengths of follow-up time of six months, one year, two years and five years post discharge (Gray et al, 2008). This also applies to high risk patients in that Thomson and colleagues (2008) report from a longitudinal study that the historical aspect of the HCR-20 was a good predictor for general and violent recidivism over a follow up period of 8 – 10 years. Similarly, Ho, Thomson and Darjee (2009) used the historical part of the HCR-20 in a sample of patients discharged from a medium secure hospital in Scotland. This study is different from others in that access to official registers of recidivism was denied, and therefore data on reconvictions were based on patients' files. Accordingly, though the historical scale was a significant predictor of violent incidents in the community, the scale's ability to predict minor and serious violent reconvictions was less impressive. Similarly, Dolan and Khawaja (2010) examined the predictive accuracy of the HCR-20 on self reported violence and recidivism in the community. The historical scale performed best with a large effect size (AUC = .78) for self reported violence though neither the total nor the subscales were predictive of serious violent recidivism.

Despite this fairly robust pattern, research by Gray and colleagues (2004; 2011) underline that findings may be greatly influenced by diagnosis. The results of the former two studies reflect conclusions on inpatient violence; the HCR-20 seems to be better suited to psychotic or mentally retarded populations rather than cohorts with personality disorder and/or substance abuse. Dolan and Blattner (2010) could have added further weight to

this statement in their discussion on the ability of the HCR-20 to predict outcomes in the community. Of interest were incidents of readmission and recidivism among a group of dischargees from forensic psychiatric settings. The majority of participants (67%) had a primary diagnosis of schizophrenia. Given the fact that readmission often occurs when individuals relapse and in an attempt to prevent violence, it is not surprising that the clinical subscale was an excellent predictor of this outcome (AUC = .91). Though the authors note that of those discharged to the community 21% were reconvicted, it is unfortunate that these data are not analysed separately.

Non-UK recidivism

Hilterman, Philipse and de Graf (2011) cite evidence from a study on the HCR-20 having purposefully selected a sample of 78 reoffenders who they matched to a sample of 117 non-reoffenders in the Netherlands. The outcome variable of interest was general and serious recidivism. The latter was defined as any prison sentence exceeding four years for an offence of a violent or sexual violent nature. The results imply that the HCR-20 was a modest predictor for both serious and general recidivism. The authors note that historical factors and the final risk judgement yielded the highest accuracy. Similar conclusions are published by de Vogel, de Ruiter, Hildebrand et al (2004). Across several analyses, the total HCR-20 scale and the final risk judgement were the strongest and most consistent predictors of general and violent recidivism. Of the total HCR-20 scale, the historical factors were the most influential of the three subscales. Stadtland and Nedopil (2005) in Germany corroborate these conclusions in that the historical factors were the strongest predictors of recidivism regardless of diagnostic status. In fact, clinical variables did not reach statistical significance in either ROC or survival analyses. While these results applied to all Axis I diagnoses, the HCR-20 was reported to be a poor predictor of offenders with personality disorder. Yet, Grann, Belfrage and Tengstroem (2000) applied the historical HCR-20 scale to a mixed research cohort of 111 schizophrenic and 293 personality disordered offenders in Sweden. The outcome variable was violent recidivism over a follow up period of two years in the community. For the full cohort, the historical scale was a good predictor (AUC = .71) with .71 sensitivity and .61 specificity. Of interest is that the historical scale was more accurate in the PD than in the schizophrenia group. This is not to say that these authors discredited the effect of the historical scale. Indeed, Tengstroem (2001) revisited this topic with a focus on schizophrenic offenders. The results highlight that the historical scale predicted violent recidivism with a large

effect size (AUC = .76) over a mean follow up time of seven years. Tengstroem (2001) opines that perhaps the effect of historical factors may increase in the long term. While there is counter evidence (Strand, Belfrage, Fransson et al, 1999) implying the historical scale is a poor predictor of violent recidivism, this is not based on appropriate prediction analyses but difference testing (Mann Whitney U test). In other words, Strand et al's conclusions are not supported by their analyses.

This said, there is an argument for the impact of clinical variables. Michel, Riaz, Webster et al (2013) note that in schizophrenia cohorts across Sweden, Canada, Finland and Germany the total HCR-20 scale and the final risk judgement were most consistently predictive across 24 months follow-up. While the historical scale was most predictive in the short term, the clinical scale tended to be predictive in the long term. The question arises as to how the clinical items measured at baseline could predict recidivism two years later. One explanation may be that the clinical items that contributed the most predictive power ('negative attitudes' and 'impulsivity') may have been resistant to intervention, and hence there was no change in these items. There is also evidence that dynamic factors are predictive of recidivism in samples of PD offenders. For example, de Vries, de Vogel and Douglas (2013) report on a sample of 188 violent and sexually violent offenders discharged into the community in the Netherlands. The sample was noted to be fairly homogenous with predominantly PD offenders and only a minority of psychotic individuals (15%). Results showed that the HCR-20 predicted recidivism in the short and the long term, though there was a decline in efficacy across time (de Vries, de Vogel & de Spa, 2011). Regardless of length of follow-up, the dynamic scales were the strongest predictors. Dernevik, Grann and Johansson (2002) note similar results in relation to a sample of predominantly personality disordered offenders. While the HCR-20 total score was a good predictor of reconviction (AUC = .84), this was primarily due to the clinical scale (AUC = .79) rather than the historical factors. It is important to note Dernevik and colleagues employed a prospective approach which may have enabled more accurate assessment of clinical variables such as negative and antisocial attitudes. Perhaps this also explains the importance of dynamic factors in de Vries, de Vogel and Douglas's (2013) study. That is, the dynamic scales may have maintained predictive power due to personality characteristics prevalent in the PD sample. This said, the latter combined the HCR-20 clinical and the risk management across all analyses. Therefore, it is possible that the risk management scale may have accounted for most of the predictive power rather than isolated clinical items.

Recidivism in high risk groups

In Canada, Douglas, Ogloff and Hart (2003) published three papers describing different aspects of predictive validity using the same sample of 100 male forensic patients. All participants had been discharged from high secure services into the community and were followed up for a mean of 2.1 years. The outcome variable was recidivism derived from national reconviction records and community violence as documented in district legal and clinical files. In other words, the outcome variable also included self-reported violence. While the total and all HCR-20 subscales were predictive of outcomes, the authors note that the final risk judgement was the most consistent and strongest predictor across physical, general and any violent outcomes. This, however, did not apply to specific risk judgements on the nature of violence (minor vs severe) (Douglas & Ogloff, 2003b). Douglas and Ogloff (2003a) argue that this may be related to rater confidence. Further exploration indicated that indeed those risk judgements based on high confidence consistently predicted violence with greater accuracy. Likewise, those judgements associated with low confidence typically failed to predict violence. While this was most pronounced for the final risk ratings, these findings also applied to the clinical and the historical scales. The authors, however, make a very good point by highlighting that confidence is a multi-faceted construct and may have been influenced by external factors such as the quality of file information or interview data.

True prospective implementation studies

De Vogel and de Ruiter (2006) report of a prospective research study where the HCR-20 was completed by researchers but also clinicians. While this approach reflects the methodology employed in other studies such as Macpherson and Kevan (2004) or Langton et al (2009), it is important that the HCR-20s completed in de Vogel and de Ruiter’s study were described as purposefully implemented. Not only were the individual group ratings analysed, but the authors also asked raters to discuss and reach consensus on ratings for every patient. Though the HCR-20 and its subscales were typically predictive of inpatient violence, the consensus ratings consistently outperformed HCR-20 ratings provided by individuals. This, however, is concerning. If all risk information had been communicated to nursing teams with the aim of informing care and treatment, then the HCR-20 nor the consensus ratings should have been predictive. In the absence of corroborating evidence, such as a reduction in violent behaviour, it is difficult to interpret this finding further. For example, Pedersen, Ramussen and Elsass (2012) describe the impact of implemented

HCR-20s on inpatient and community violence in Denmark. Though the findings show that the HCR-20 was predictive of future violence, the AUC values were noted to be lower when compared to previous research by the same authors. It is argued that this diminished validity implies that the HCR-20 might have been used as intended, i.e. to inform risk management. Pedersen and colleagues (2012) underline this statement by referring to a drastic reduction in the frequency of violence when comparing the implementation results with those of a previous publication on the same population. Notably, the latter study utilised a retrospective design; that is the completed HCR-20s were not applied to clinical practice.

The predictive validity of the HCR-20 in non-Caucasian cohorts

Across the literature, there appear to be only two studies reporting the predictive validity of the HCR-20 to non-Caucasians. Yet, ethnic minorities are overrepresented in forensic psychiatric settings (Coid, Kahtan, Gault et al, 2000). There are concerns that risk factors may be different between Caucasian and other ethnic groups, though it is equally suggested that perhaps the prevalence and import of risk factors differ by ethnic background. This then raises the question as to whether SPJ tools should be utilised with ethnic minorities. Given the limited data pool, the answer is inconclusive. While in the US Fujii, Tokioka, Lichton et al (2005) report a moderate effect of ethnicity on predictive validity, Snowden, Gray and Taylor (2010) state that there were no differences in the predictive accuracy when comparing a group of white with black patients in the UK. This said, Fujii et al's samples of ethnic groups (Asian-Americans, Euro-Americans and Native Hawaiians) seemed different in terms of age, proportion of females and base rate of violence. Quite in contrast, Snowden and colleagues' work describes groups similar in age, proportion of males and primary diagnosis. The authors indicate that the total HCR-20 was the best and the clinical scale the poorest predictor of recidivism.

The predictive validity of the SVR-20

The predictive efficacy of the SVR-20 was assessed in three retrospective studies. All participants were male, aged in their thirties and were identified with a mental disorder. The outcome variable of interest was typically sexual recidivism though two studies in Scandinavia (Netherlands and Sweden) included non-sexual violent and general recidivism. Data were collated from national reconviction registers.

Sjoestedt and Langstroem (2002) report the SVR-20 was a poor predictor of sexual violent recidivism in a sample of 51 male rapists in Sweden. The only SVR-20 subscale to be associated with an increased risk of violent non-sexual recidivism was psychosocial adjustment. While this may be disconcerting, there are various limitations to this study. Though the authors rightly avoid presenting ROC results due to variations in follow up time, Sjoestedt and Langstroem (2002) present poor interrater reliability on the SVR-20 despite repeated training sessions and consensus meetings. In conclusion, the authors call for further validation research of the SVR-20 before the tool is clinically used. Dietiker, Dittman and Graf (2007) express similar sentiment in their paper on 64 forensic psychiatric sex offenders in Switzerland. Though the SVR-20 turned out to be a significant predictor of sexual recidivism (AUC = .89), the authors clarify that the tool is of insufficient clinical value due to high values in sensitivity (.84) and specificity (.77) at a cut-off point of 12.5. The same conclusion is documented in reference to the HCR-20 which was highly predictive (AUC = .92) but lacked in acceptable sensitivity and specificity. Unfortunately, the authors fail to provide a definition of what might be acceptable sensitivity and specificity. Further, findings are not interpreted within the wider context. For example, the main purpose of this particular study was to cross-validate an in-house risk assessment tool, which was already routinely implemented. In other words, the population under investigation was risk managed at the time of study conception. This, coupled with the low base rate of 6% and the fact that all recidivists were child molesters, implies that the statistics may be flawed and do not present an accurate picture of the SVR-20 nor the HCR-20.

Quite in contrast, de Vogel, de Ruiter, van Beek and Mead (2004) document the SVR-20 as a good predictor of recidivism in a sample of 122 mentally disordered sex offenders in the Netherlands. This included rapists and child molesters, who did not differ significantly in their SVR-20 ratings. The authors therefore chose to present results based on the full sample. Sexual recidivism was predicted with AUCs ranging between .68 (psychosocial scale) to .80 (total SVR-20 scale). The instrument was also able to predict nonsexual violent recidivism and general reconviction albeit with diminished accuracy. It was, however, the final risk judgement that yielded the highest efficacy for sexual recidivism (AUC = .83), and was consistently and most strongly related to all recidivism categories. The authors conclude that the SVR-20 was superior in predictive accuracy if it was used in the SPJ manner rather than numerically. This noted, caution is required as

this sample was a select group of sex offenders with severe psychological problems, yet the authors failed to provide any information on diagnosis.

2.5 Summary

In general, the HCR-20 was a valid predictor performing with moderate to large efficacy across different countries. While higher predictive values were notably uncommon so were AUC values associated with minor efficacy. The findings highlight a common pattern in that clinical variables seem to be better suited to predicting inpatient incidents while historical factors perform better in the long term, which typically applies to recidivism. Gray and colleagues (2004) rather aptly argue that such results are to be expected given that clinical symptoms are typically stable upon decisions to discharge a person. The final risk judgement, i.e. the epitome of the SPJ approach, typically outperformed the total and the subscales of the HCR-20. While statistically this may be true, the extent to which the final risk judgement is applicable and relevant to clinical practice, i.e. care and treatment, is not clear. This notwithstanding, these findings led several authors to conclude that the SPJ methodology was of clinical value and utility across a range of settings. Indeed, the incremental value of the HCR-20 as a representative of the wider SPJ methodology was evinced in several studies comparing this tool to actuarial measures (Tengstroem, 2001) and unstructured clinical judgement (de Vogel, de Ruiter, Hildebrand et al, 2004). In line with the inclusion criteria set in the literature review, the proportion of male participants in each research study ranged between 75 and 100 per cent. The samples were typically noted to be in their thirties with only few exceptions (Abidin et al, 2013, Grevatt, Thomas-Peter & Hughes, 2004; McDermott et al, 2008a and 2008b). In most papers participants were of Caucasian background (> 60% of proportion of sample). This, however, is not representative of the ethnic make-up of mentally disordered offenders. Yet, the evidence published to date is limited and inconclusive on the impact of ethnicity on the predictive validity of the HCR-20. In terms of forensic history, more than 80% of each cohort was noted with a previous violent conviction or a history of violent behaviour. Likewise, most papers documented that the majority of respondents had an index offence. This was often exemplified as culpable homicide, murder, manslaughter, sexual offences against adults or children, assaults causing injury and arson. Given that all respondents resided in or were discharged from forensic psychiatric hospitals, it is not surprising that all were diagnosed with a mental disorder.

There were, however, considerable variations in the HCR-20's predictive power according to diagnosis, in particular psychosis and antisocial personality disorder. Considering the generally high levels of psychiatric comorbidity (28% to 65% across reviewed studies), it is concerning that at times the HCR-20 demonstrated poor efficacy for either disorder. Of further interest was that almost all papers reported interrater reliability coefficients of the HCR-20. It was a common pattern that while historical factors were rated with very high interrater reliability, consistency in ratings of the clinical and especially the risk management scale varied considerably (de Vogel & de Ruiter, 2005). Considering the series of papers by Douglas and colleagues on the impact of confidence, or the quality of data used to complete the HCR-20, few if any authors at all considered the extent to which subjective judgement may have affected predictive validity. Furthermore, a multitude of studies, commonly conducted outwith the UK, failed to clarify the security background of inpatient settings. This is unfortunate given research evidence that risk level of patients predicted inpatient violence (Abidin et al, 2013). This was further confirmed by Dernevik, Grann and Johansson (2002) and Tengstroem et al (2006) who noted that the total HCR-20 score decreased in line with security level. Though most referred to the HCR-20 manual in terms of violence definition, those studies that included verbal aggression, threats and antisocial behaviour documented higher base rates. In comparison, incidents of serious violence were rare across inpatient settings, which makes sense considering the security features. This was further related to the choice and availability of sources for outcome data. Recidivism data were typically derived from official registers only. Within inpatient settings, researchers also often used singular sources such as information bulletins or electronic hospital recording systems. The majority of papers highlighted this as a limitation and pointed out that a large number of incidents are typically not reported. Indeed, de Vogel and de Ruiter (2006) remark that the special incident system used to collate violent inpatient incidents in their study only contained information deemed as 'the most important' across the research site (p.326).

2.6 Limitations of literature review

The inclusion criteria for this literature review were rather broad. In practical terms, studies were reviewed when the majority of the sample were male and mentally disordered. When samples were mixed, relevant papers were only included if statistical results were presented separately. This means papers were reviewed even when the results of interest were not the main focus of the paper. While this allowed reflection on

the many different factors impacting on the predictive validity of SPJ instruments, it was at times difficult to find a common denominator across studies. For example, the majority of the studies discussed utilised risk ratings produced by one single assessor. There were some exceptions, however, such as Macpherson and Keevan (2003) who analysed risk ratings generated through clinical team discussion. While the level of accuracy is thought to increase when multiple decision makers are involved, this is not the case when multiple disciplines with different levels of experience contribute to the decision making process (Murray & Thomson, 2010). It is therefore possible that comparing findings between studies that used group decisions vs single rater decisions, and arguably implementation studies vs pure research oriented studies is not appropriate. This noted, the findings of the present literature review compare favourably with a recent systematic review and meta analysis on the predictive validity of the HCR-20 when applied to inpatient violence (O'Shea, Mitchell, Picchioni et al, 2013). Results are based on 20 individual studies published between 1995 and 2013 with a total of 2067 inpatient participants. Notably, this included both, forensic and civil psychiatric samples from a range of countries. While the HCR-20 was found to have moderate to large effect sizes in the prediction of inpatient violence, this was moderated by type of violence as well as methodological, demographic and clinical variables. The dynamic risk items were noted to be most predictive in samples with high proportions of schizophrenia, Caucasians and individuals highlighted as high risk. In contrast, predictive efficacy was markedly reduced when samples contained higher proportions of patients with personality disorder. This said, most reviews including the present literature review are likely to be affected by publication bias. The grey literature including conference papers, unpublished dissertations as well as work rejected by journals are rarely included.

2.7 Implications for this thesis

Based on this literature review, there is a remarkable dearth of research linking risk assessment and management. That is, systematic implementation studies on SPJ tools are practically non-existent across high secure care. Of further concern is that the only studies examining the predictive validity of the SVR-20 were conducted in non-UK samples of mentally disordered offenders. Additionally, none of these studies considered inpatient sexual violence but exclusively focussed on recidivism. It was equally disquieting that there are no validation studies on the RSVP considering that the tool is cited to be used widely (Hart & Boer, 2010). Moreover, though clinical variables in the HCR-20 were

frequently linked to inpatient violence, this is not universally applicable. Arguably, the HCR-20 was not designed with inpatient violence in mind, yet it is typically in inpatient settings where risk of harm is first assessed. The question therefore arises as to whether there are additional clinical factors that may be useful to the prediction of violence in mentally disordered offenders. Related to this issue is the observation that though studies described the prediction of inpatient incidents, literally only one paper addresses the relationship between structured clinical assessment (the clinical HCR-20 scale) and imminent inpatient violence (Daffern & Howells, 2007).

2.8 Aims of this thesis

This thesis aims to assess the predictive validity of SPJ tools on violence and sexual violence risk following clinical implementation across a high secure setting in Scotland, the State Hospital. Furthermore, the efficacy of clinical variables different to those measured by SPJ tools in the prediction of violence will be investigated. This thesis also presents the pilot validation of a structured clinical risk assessment tool for imminent aggression.

2.9 Research questions of this thesis

1. What is the predictive validity of the HCR-20, the SVR-20 and the RSVP when implemented across clinical care in high secure setting in Scotland?

2. What is the predictive validity of dynamic risk factors of impulsivity, anger, imagined violence, unmet needs and psychiatric symptoms?

3. What is the predictive validity of a structured clinical risk assessment tool in the prediction of imminent inpatient violence?

CHAPTER 3

METHODOLOGY

This chapter summarises the methodology and measures used in this thesis. As described in the previous chapter, this study included three SPJ tools, i.e. the HCR-20 (Webster, Douglas, Eaves et al, 1997), the SVR-20 (Boer, Hart, Kropp et al, 1997) and the RSVP (Hart, Kropp, Laws et al, 2003), which were implemented into clinical practice during the time of the research. This meant that these measures were exclusively completed by clinicians rather than the research student. In addition to the collection of completed SPJ measures, the research student administered psychometric measures in an interview setting with each participant. These measures assessed state trait anger and impulsivity, psychiatric symptoms, unmet needs and violent fantasies. The research student also developed a background data collection tool to code respondents' file information. The results of this thesis are described in separate yet interlinked chapters. While the current chapter provides an overview of every measure used, each of the following chapters (chapters 4 to 9) contains a separate methods section to focus attention on the procedure and measures relevant to the study aspect discussed therein.

3.1 Participants

Pre-data collection

Ethical approval

Ethics approval was granted by the Multi Centre Research Ethics Committee (MREC) Lothian and the State Hospital Research Board. While the validation of implemented SPJ tools was classified as a service evaluation; no patient consent was required for the collection of completed risk assessments, the investigation of dynamic measures was reliant on the patient's consent and collaboration.

Power Analysis

A power analysis was conducted based on guidance by Cornish (2006) and following statistical expert advice at the University of Edinburgh. A sample size of 100 participants was required to detect a statistical difference between recidivists and non-recidivists' HCR-20 and PCL-R scores at power .80. The analysis used the standard deviations

reported in previous research on similar samples (HCR-20: Cooke, Michie & Ryan, 2001; PCL-R: Tengstroem, Grann, Langstroem et al, 2000).

Setting

The State Hospital is the high secure psychiatric facility for Scotland and Northern Ireland. The primary focus at the State Hospital is the assessment and management of risk, which is reflected in the admission criteria. Patients are admitted because of a major mental disorder, and the risk of harm posed to others as a consequence of their mental health needs. Patients are transferred to lower secure settings by a process of clinical team decisions and ministerial agreement for those on restriction orders. A restriction order is made by a court in conjunction with a hospital based compulsion order in cases where there is a significant link between an individual's mental disorder and future risk of harm to others. This order ensures careful scrutiny and control of patients as they progress, if appropriate, through mental health services from secure hospital care towards the community. This means that while a restricted patient's Responsible Medical Officer (RMO) is in charge of the patient's care and treatment, any decision regarding the patient's leave, transfer and discharge is made by the Scottish Ministers, or the Mental Health Tribunal.

Sample

During data collection (2005 – 2007), there was an average of 202 patients resident at the hospital. Of these, 159 (78.7%) were approached for inclusion in the research study. Of those approached, six patients (3.8%) were thought to be unable to give informed consent by their Responsible Medical Officer (RMO) and 38 patients (23.9%) declined to participate in the research study.

The final sample consisted of 115 patients (response rate: 72.3%), all of whom were identified with a valid SPJ instrument and management plan. Of these, the majority (n = 109, 94.8%) had an HCR-20 completed while 23 patients had a sexual violence SPJ tool completed. There was an overlap between the HCR-20 and RSVP/SVR-20s in 17 participants. Six patients (5.2%) had an RSVP in isolation. The mean age was 39 years (sd = 10.74) ranging from 20 to 66 years. The median age was also 39 years. Further information on participants' background is provided in the next chapter.

3.2 Measures

This thesis utilised a variety of measures including the SPJ tools of interest, the short term risk assessment tool and the psychometric instruments. The rationale for choosing those particular psychometric measures is further explained in chapter 9 (psychometrics). Table 2 describes the SPJ instruments under investigation and provides a breakdown of all the items.

Table 2 Description of SPJ measures and items

Measure	Subscales/Domains	Items
HCR-20	Historical	Previous Violence, Young age at first violent incident, relationship instability, employment problems, substance use problems, major mental illness, psychopathy, early maladjustment, personality disorder, prior supervision failure
	Clinical	Lack of insight, Negative attitudes, Active symptoms of major mental illness, Impulsivity, Unresponsive to treatment.
	Risk management	Plans lack feasibility, Exposure to destablisers, Lack of personal support, Non-compliance with remediation attempts, Stress.
SVR-20	Sexual Violence	High density, Multiple sex offence types, Physical harm to victims, Weapons/threats of death in sex offences, Escalation in frequency or severity of sex offences, Extreme minimisation/denial, Attitudes that support or condone sex offences.
	Psychosocial Adjustment	Sexual deviation, Victim of child abuse, Psychopathy, Major mental illness, Substance abuse problems, Suicidal/homicidal ideation, Relationship problems, Employment problems, Past nonsexual violent offences , Past nonviolent offences, Past supervision failure
	Future Planning	Lacks realistic plans, Negative attitude toward intervention
RSVP	Sexual Violence History	Chronicity, Diversity, Escalation, Physical Coercion, Psychological Coercion
	Psychological Adjustment	Extreme minimisation, attitudes that support or condone sexual violence, problems with self awareness, problems with stress or coping, problems resulting from child abuse
	Mental Disorder	Sexual Deviance, Psychopathic personality disorder, major mental disorder, substance misuse, violent or suicidal ideation
	Social Adjustment	Problems with intimate relationships, problems with non-intimate relationships, problems with employment, non-sexual criminality

Measure	Subscales/Domains	Items
	Manageability	Problems with planning, problems with treatment, problems with supervision
PCL-R		Glibness/superficial charm, Grandiose sense of self-worth, Need for stimulation/ proneness for boredom, Pathological lying, Conning/manipulative, Lack of remorse or guilt, Shallow affect, Callous/lack of sympathy, Parasitic lifestyle, Poor behavioural control, Promiscuous sexual behaviour, Early behavioural problems, Lack of realistic long-term goals, Impulsivity, Irresponsibility, Failure to accept responsibility, Many short-term marital relationships, Juvenile delinquency, Revocation of conditional release, Criminal versatility
PCL:SV		Superficial, Grandiose, Manipulative, Lacks remorse, Lacks empathy, Does not accept responsibility, Impulsive, Poor behavioural controls, Lacks goals, Irresponsible, Adolescent antisocial behaviour, Adult antisocial behaviour

These tools, as well as the psychometric measures, are described in more detail in the following sections. In particular, the reliability and validity of each instrument is considered within the context of previous research.

Historical Clinical Risk Management – 20 Scale (Webster, Douglas, Eaves et al, 1997)

The Historical Clinical Risk Management – 20 Scale (HCR-20) is a structured professional judgement tool consisting of 20 empirically validated risk factors. Ten of these are historical, five clinical and five refer to risk management. By definition, the historical factors are static such as history of previous violence, whereas the clinical factors are dynamic and open to intervention. The five risk management items are particularly useful for mapping out risk management strategies in patients' current and potential future environments by considering items such as stress or lack of personal support. Each item can be scored as 0 (not present), 1 (partially or possibly present) or 2 (definitely present) according to case-specific information and clinical judgement. The total maximum score can range from 0 to 40. If insufficient information is available, an item can be omitted (Webster et al, 1997).

Reliability and Validity. The HCR-20 total and subscales have been reported with good internal consistency in forensic populations (Belfrage, 1998; Claix & Pham, 2004; Dunbar, Quinones & Crevecoeur, 2005). Douglas and Reeves (2010) suggest that the interrater reliability (IRR) of the HCR-20 is good to excellent with the median IRR levelling at .85 across 36 identified studies,. According to Cicchetti and Sparrow (1981) and Landis and Koch (1977) interrater reliability coefficients exceeding .60 are seen as 'good' or 'substantial; while those exceeding .74 or .81 respectively are referred to as 'excellent' or 'almost perfect'. In relation to forensic psychiatric settings, the IRR median ranges between good and excellent (HCR-20 total: .82, H scale: .83, C scale: .74, R scale: .68). The generally lower interrater agreement on the clinical and the risk management scales are thought to be due to the increased subjectivity required to rate these items (Rufino, Boccaccini & Guy, 2010).

The predictive validity of the HCR-20 has been extensively discussed in the previous chapter with findings clearly implying that there is a relationship between the tool and future violence. Consequently, studies on concurrent validity are relatively rare. When reported, however, the relationship between the HCR-20 and other violence measures ranges from moderate to good. For example, McNiel, Gregory, Lam, Binder et al (2003) document that the HCR-20 total scale correlated moderately with the Psychopathy Checklist: Screening Version (r = .61). Yet, Douglas and Webster (1999) report that the historical scale of the HCR-20 was related to the Psychopathy Checklist Revised (r = .71) while the clinical and risk management scale of the HCR-20 were cited to correlate with psychiatric symptoms (r = .63 and r = .59 respectively). In addition, the HCR-20 correlated with actuarial measures of violence, i.e. the Violence Risk Appraisal Guide (r = .62) (Douglas & Webster, 1999).

Sexual Violence Risk-20 Scale (Boer, Hart, Kropp et al, 1997)

The Sexual Violence Risk – 20 Scale (SVR-20) is a structured clinical risk assessment scheme for specifically evaluating the risk for sexual violence. Like the HCR-20, the tool consists of 20 items which are divided into three domains pertaining to psychological adjustment, history of sexual offences and future plans. Ratings are assigned in a manner similarly to the one employed for the HCR-20 by using a three point scale ranging from 0 (not present) to 2 (definitely present). The total score ranges from 0 to 40.

Reliability and validity. Initial interrater reliability studies reported poor to fair ICCs with a mean of .36 across items, however, this was thought to be due to including raters without sufficient SPJ training (Sjoestedt & Langstroem, 2002). This is not surprising given research evidence on the necessity of training and its impact on the quality of completed SPJ tools (Reynolds & Miles, 2009). De Vogel, de Ruiter, Hildebrand et al (2004) argue that interrater agreement improved in their sample when raters were grouped according to presence/absence of clinical experience in that those with such experience had better interrater agreement across the SVR-20 (ICC = .68). Interrater reliability improves further (ICC > .84) when IRR was calculated on the total scale and subscale scores rather than across all items (Rettenberger & Eher, 2007). More recently, Hart and Boer (2010) cite a study by Watt and Jackson (2008) who concluded that interrater reliability across items ranged between moderate to excellent (ICC = .62 to .98).

Similar to the HCR-20, the predictive validity of the SVR-20 is referred to in the previous chapter with results implying a clear relationship between the tool and violence. While there are few studies on the concurrent validity of the SVR-20, these are generally positive (Hart & Boer, 2010). For example, correlation with an actuarial sex offender tool yielded values of r = .78 (Rettenberger & Eher, 2007) and r = .72 (Zanatta, 2005). The SVR-20 also correlates highly with the HCR-20 at r = .85 in a German study by Dietiker, Dittmann and Graf (2007). The SVR-20 is thought to be the most extensively validated SPJ tool on sexual violence to date (Hart & Boer, 2010) despite the relatively limited knowledge of its psychometric properties.

Risk for Sexual Violence Protocol (Hart, Kropp, Laws et al, 2003)

The Risk of Sexual Violence Protocol (RSVP) is a structured clinical instrument designed to assess the risk of sexual recidivism amongst sex offenders. The tool is based on the SVR-20, though while the latter was developed for use by a range of professionals, the RSVP is specifically to be used for specialist management and treatment oriented evaluations of sex offenders (Hart & Boer, 2010). The RSVP contains 22 static and dynamic variables which are divided into 5 sections: history of sexual violence, psychological and social adjustment, mental disorder and management. While these are empirically established risk factors, the clinical context of the assessment allows the addition of factors deemed relevant to the individual. This also ties in with the coding scheme in that the relevance as well as the presence of each risk factor are rated across a

timeline of past, present and possible future behaviour. Ratings are made on a three-point scale similar to the HCR-20 and the SVR-20 ('N' = no, '?' = possibly or partially, and 'Y' = yes). The total score ranges from 0 to 44 on the recent, current and future ratings provided no additional individual risk factors are included in the assessment.

Reliability and validity. Though the RSVP is used in clinical practice, there are few validation studies of the RSVP to date (see previous chapter). Hart and Boer (2010) summarise interrater reliability results from unpublished studies (Hart, 2003; Watt, Hart, Wilson et al, 2006; Watt & Jackson, 2008) suggesting that ICCs range greatly between .50 and .95 at item level. However, when total and domain scores are used, interrater agreement is generally good to excellent with ICC > .90 (Hart & Boer, 2010). This noted, these findings are typically based on ratings given by two researchers. Sutherland, Johnstone, Davidson et al (2012) reported a wide range of poor to good interrater reliability (ICC = .05 - .74) across items when the tool is completed by several clinicians. In terms of concurrent validity, Hart and Boer (2010) cite results by Jackson and Healey (2008) who indicated that the SVR-20 and the RSVP correlated significantly on all domains and subscales suggesting these are equivalent, i.e. measuring the same construct of sexual risk. The RSVP also correlated with an actuarial risk assessment tool for sexual violence at r = .45 (Hart, 2003).

Psychopathy Checklist – Revised (Hare, 1991)/ Psychopathy Checklist: Screening Version (Hart, Cox & Hare, 1995)

Neither the Psychopathy Checklist – Revised (PCL-R) nor its shorter screening version the Psychopathy Checklist: Screening Version (PCL:SV) are risk assessment tools per se, rather these are diagnostic checklists to measure psychopathy. This construct refers to a set of personality characteristics (e.g. impulsivity, sensation seeking and disregard for social norms) which are highly predictive of future violence across several settings (Leistico, Salekin, DeCoster et al, 2008; Guy, Edens, Anthony et al, 2005). The PCL-R is a 20 item measure; each item is rated on a three-point scale ranging from 0 (absent) to 2 (present). Initially, the PCL-R was thought to contain a two factor structure; factor 1 refers to affective and interpersonal traits, while factor 2 describes an antisocial and impulsive lifestyle. In recent years, however, the psychometric properties of the PCL-R including its factor structure have been under debate (Vitacco, van Rybroek, Rogstadt et al, 2005; Weaver, Meyer, van Nort et al, 2006). Several researchers claim that the

predictive power of the PCL-R largely stems from one factor only namely antisocial behaviour (Walsh & Kosson, 2008).

The PCL:SV is a 12 item screening scale based on a subset of PCL-R items and mirrors the two factor structure originally reported on the PCL-R. The tool strongly correlates with the PCL-R (Hart et al, 2003), and validation studies confirm that the PCL:SV is associated with increased violence (Swogger, Walsh, Homaifar et al, 2011). The cut-off scores of the PCL-SV are used to indicate whether a comprehensive PCL-R assessment is required. At the time of data collection for this thesis, either measure was a requirement in the completion of the HCR-20, the SVR-20 and the RSVP.

Novaco Anger Scale (Novaco, 1994)

The Novaco Anger Scale (NAS) is a standardised, self-report measure designed to assess an individual's propensity towards anger. The NAS consists of 48 items which are divided into three subscales according to cognitions (e.g. justification), arousal (anger intensity and duration) and behavioural indicators (verbal and physical aggression). A total and subscales score are calculated based on a predetermined weighing process as described by the manual. Each item is rated on a three point Likert scale requiring respondents to indicate the extent to which given statements apply to them (never true, sometimes true, always true).

Reliability and validity. The NAS is thought to be one of the most validated anger measures to date (Baker, van Hasslet & Sellers, 2008). The tool was developed and validated in the State Hospital. Novaco (1994) reports high internal consistency for the total scale (α = .97), good test-retest reliability (r = .86), and good concurrent validity with other anger related measures such as the State-trait anger expression inventory (Spielberg, 1988) and the Buss-Durkee hostility inventory (Buss & Durkee, 1957) (r = .84 and r = .82 respectively). Further studies have supported these findings by indicating good test-retest reliability in non-clinical, clinical and correctional samples. In particular, Mills, Kroner and Forth (1998) report high reliability and validity from two samples of general and violent offenders in Canada (r = .78 to .91). Internal consistency reported across the three subscales were α = .95, .95 and .96 respectively. Good concurrent validity was recently confirmed in a study by Baker, van Hasselt and Sellers (2008).

Barratt Impulsiveness Scale (Patton, Standford & Barratt, 1995)

The Barratt Impulsiveness Scale - II (BIS-II) is a 30 item self-report scale with a three factor structure of cognitive (e.g. attention), motor (e.g. impetuousness) and non-planning impulsivity (e.g. lack of future planning). Researchers typically report the total and each subscale score to indicate impulsivity. The BIS was primarily designed for research purposes rather than clinical intervention. Impulsivity is thought to be a dimension of personality; trait impulsivity is defined as a tendency to respond to internal and external stimuli in a reckless manner without consideration for possible consequences (Patton, Stanford & Barratt, 1995). This underpins the scoring process as respondents are asked to indicate the extent to which set statements apply to them on a four point Likert scale ranging from 1 (rarely/never) to 4 (almost always/always). Some items are reverse scored to avoid response bias.

<u>Reliability and validity</u>. Internal consistency has been reported as excellent (α = .79 - .83) across different study groups including undergraduates, substance abuse patients, psychiatric patients and prisoners (Patton et al, 1995; Dom, Hulstijn & Sabbe, 2006). Findings also imply that forensic populations score significantly higher on impulsivity than any other study group. Further studies have established that the BIS-II is related to aggressive behaviour (Grisso et al, 2000), especially in personality disordered offenders (Gordon & Egan, 2011). Yet, validation studies on mentally ill offenders are lacking despite the link between impulsivity and recidivism (Dolan & Anderson, 2002). To date there appear to be only three studies outlining mixed findings (Wang & Diamond, 1999; McDermott, Edens, Quanbeck et al, 2008a). For example, Haden and Shiva (2008) suggest that the BIS-II may be unsuitable for use on mentally disordered offenders as factor analysis showed a different structure to the tool (consisting of two domains only). Though a large sample was used in this study (n = 425), these were almost exclusively members of minority groups, yet the authors do not seem to consider a possible culture effect.

Brief Psychiatric Rating Scale (Ventura, Green, Shaner et al, 1993)

The Brief Psychiatric Rating Scale (BPRS) is a clinical assessment tool with the primary purpose of assessing treatment change across a range of psychopathological symptoms. This instrument was initially developed by Overall and Gorham (1962). Since then the BPRS has been expanded from 16 to 24 items reflecting advances in understanding

clinical symptoms associated with mental disorder, in particular schizophrenia (e.g. Lukoff, Nuechterlein & Ventura, 1986). Clinical ratings are given on a seven point Likert scale ranging from 1 (absent) to 7 (extremely severe) with ratings of 4 and above indicating clinical levels of severity. The scale should be administered by a clinician or an adequately trained researcher as ratings are based on interview and observational data (Ventura et al, 1993). The BPRS was designed to produce a total score indicating an overall level of psychiatric symptoms, however, individual items and subscales can also be examined.

Reliability and validity. All BPRS versions have been extensively researched and found to possess good internal consistency, interrater reliability and validity in psychiatric populations (Greenwood & Burt, 2000; Ventura et al, 1993; Panos, 2004). Research on the utility of the BPRS on forensic inpatients is, however, relatively sparse. Fitzpatrick, Chambers, Burns et al (2010) note that the instrument is feasible for use in forensic mental health settings as the BPRS predicts violence in mentally disordered offenders in the UK (Gray, Fitzgerald, Taylor et al, 2003). Indeed, concordance rates amongst mental health professionals in forensic settings showed an overall good picture ranging from .60 to .98 across all items (Greenwood & Burt, 2000). This noted, the scale's concurrent validity has been questioned as the BPRS seems to under-diagnose psychiatric disorders when compared with other clinical diagnostic tools (Corrado, Cohen, Hart et al, 2000). Factor analysis of the 24 item BPRS shows the subscales of depression-anxiety, psychosis, negative symptoms and activation (Velligan, Prihoda, Dennehy et al, 2005). Though previous research has postulated a six item structure similar in nature to Velligan et al's (2005) model, the latter was consistent across several demographics (age, gender, ethnicity, level of education), clinical factors (diagnosis, phase of illness) and across time in a sample of 1440 forensic outpatients.

Camberwell Assessment of Needs – Forensic Short Version (Slade, Thornicroft, Loftus et al, 1999)

The Camberwell Assessment of Needs – Forensic Short Version (CANFOR-S) is a semi-structured interview schedule assessing an individual's needs across 25 life domains. This particular version of the CANFOR series was designed for research and routine clinical forensic practice. It is based on previous research evidencing that the needs of mentally disordered offenders are different from general psychiatric patients (Harty, Shaw, Thomas et al, 2004) and from the general population (Shaw, 2003). As a result, the CANFOR-S

includes items specific to offending behaviour such as a person's agreement with prescribed medication. Scoring is categorical in that, provided a need is present, the interviewee states whether this is met through intervention (1) or unmet (2), i.e. it poses a problem for the patient. The tool has the potential to be integrated into clinical care, e.g. in the care planning process (Simons & Petch, 2002) as the views on needs by patients can be compared with those held by service providers.

Reliability and validity. In terms of reliability, Long, Webster, Waine et al (2008) suggest that staff interrater agreement in a low and medium secure hospital is high (kappa = .93) indicating that the concept of need, though subjective, may be viewed in similar parameters by trained psychiatric nursing staff. Findings also confirmed the expectation that patients resident in low secure settings reported fewer needs than those in medium secure settings. In addition, staff and patients' ratings differed significantly on items relating to risk of harm to others, which makes clinical sense. Similar findings were recently reported cross-culturally (Segal, Daffern, Thomas et al, 2010; Romeva, Rubio, Guerre et al, 2010). Validation studies are rare, though Long et al (2008) document that the CANFOR – S domain of psychological distress correlated with several content matching BPRS subscales such as depression ($r_s = .59$). In addition, the same study found that the CANFOR-S domain of psychotic symptoms correlated with the BPRS subscale of hallucinations ($r_s = .68$).

Schedule of imagined violence (Grisso, Davis, Vesselinov et al, 2000)

The Schedule of imagined violence (SIV) consists of a set of eight structured questions with a range of response categories. This tool is based on self report and was specifically developed for the MacArthur study (Steadman, Mulvey, Monahan et al, 1998). The first question establishes the presence of violent thoughts and fantasies. If affirmative, subsequent questions are aimed at obtaining more information about the nature of reported violent thoughts. In detail, questions aim to elucidate data in relation to frequency, recency and intensity of violent cognitions as well as similarities in type of harm imagined, whether harm is target-focussed or general, and whether the seriousness of imagined violence changes over time (Grisso et al, 2000).

Reliability and validity. Findings from the MacArthur study indicated that the presence of violent fantasies at the time of hospitalisation was associated with an increased risk of violent behaviour post discharge into the community (Steadman et al, 1998). This is

confirmed by evidence in non-clinical settings, i.e. fantasising about aggression predicts actual violence (Guerra, Huesmann & Splinder, 2003). Theoretically, this links in with information processing models such as aggression-related cognitive schemas (Anderson & Huesmann, 2003). Yet, Gellerman and Suddath (2005) claim that the relationship between violent fantasies and violence is too inconsistent to draw any firm conclusions. Though based on a literature review, it is difficult to assess this claim as the parameters used to search and review the literature are unclear.

Background data collection tool

A detailed data collection tool was developed based on previous research at the State Hospital (Thomson, Bogue, Humphreys et al, 1997). This tool covers participants' demographic details (e.g. age, level of education, socio-economic background) as well as forensic, legal, psychiatric, health and personal history including details on other family members. All data required were collected from participants' case notes and hospital files. The tool and results from this tool are described in detail in the next chapter.

Outcome measure

The main outcome variable was any violence reported. The definition of violent incidents used in this thesis is based on previous research conducted in the State Hospital (Thomson et al, 1997). Box 1 displays the various definition groups of incidents collected.

Box 1 Definition of incident and conviction types

Incident: any violent event involving physical contact with a victim, any sexual event (including exposure and touching) and any episode of physical aggression towards property (including fire setting). This includes 'near miss' incidents, i.e. any event, which may not result in actual harm by definition, but has the potential to do so.

Serious incident: any violent event resulting in the death or injury to the victim requiring hospital treatment, any sexual event involving contact with the victim, and any fire setting.

Conviction: any conviction (including non-violent offences).

Violent conviction: any conviction for assault, serious assault, fire-setting/raising or contact sexual offence.

The definitions of incidents in box 1 are compatible with clinical practice and the criminal justice context of this study. Any incident ranging from indecent exposure, attempting to throw a chair at a member of staff or punching a peer patient to the body impacts on the perpetrator's care and treatment plan including his risk management strategies. This, in turn, has the power to influence clinical decisions on extension of detention, readmission and changes in intervention.

Sources of outcome measure

Several sources of data were used to approximate a realistic reflection of violence perpetrated by the sample (Steadman et al, 1998). Official reconviction data were derived from the Scottish Criminal Records Office (SCRO) and the case notes and files of all research participants were hand-searched to collect number and nature of incidents recorded while hospitalised or imprisoned. Findings were triangulated by consulting incident data collated in computerised incident reporting systems where available (e.g. Datix in the State Hospital). Patient self report and nursing staff's views on incidents during the follow-up period were also taken into account. Of further interest was the location and time at risk in each setting (high, medium, low secure, prison and the community).

3.3 Design and Procedure

This study employed a prospective design for both aspects of the study, i.e. the collection of completed SPJ tools and the administration of psychometric measures. While updated SPJ tools were collected throughout the study, psychometric measures were conducted at baseline and 12 month follow up. Purposive sampling was used, which is a 'systematic strategy of selecting participants according to criteria that are important to the research questions' (Barker, Pistrang & Elliott, 2002, p.1987). Due to the nature of the primary research topic, i.e. the predictive validity of implemented SPJ tools, only individuals able to give informed consent and with relevant SPJ tools completed or updated and discussed by the relevant multi disciplinary team were eligible for inclusion in the study.

Identification of study wards

Nine out of eleven wards were included in this research study. The female ward and the learning disability ward opted not to participate in the research study stating that the HCR-20 was not applicable to these populations. This perhaps worked out to the advantage of

the research study as the sample, by necessity, was less heterogenous than when a small number of female and learning disabled patients had been included.

All clinical teams on the relevant wards were informed about the research study including its role in the implementation process of SPJ tools at the State Hospital. The research student attended clinical team meetings on each ward in order to provide structured information for clinicians by giving a presentation on the aims of the research study, its overall function and the clinical utility of likely outcomes. Information about the study was also disseminated in writing (appendix 2). In addition, the research student established contact with all administrative staff to ensure that completed SPJ tools would be shared with her for the purpose of the research study.

Recruitment process

Identification of eligible research participants

The clinical led nature of this research study required all Responsible Medical Officers (RMOs) in the State Hospital to identify patients who met the inclusion criteria on their respective wards. Once permission to approach patients was given by the consultants, the research student liaised with psychiatric nursing staff on the wards to facilitate the recruitment process.

Recruitment strategy

The recruitment strategy varied according to the type of ward targeted. For example, admission to the State Hospital is typically involuntary, psychiatric symptoms are often severe (Thomson, Davidson, Brett et al, 2008) which may require increased monitoring and observation. Consequently, on the admission ward the research student established a relationship with gatekeepers to the effect that patients were exclusively recruited with the help of nursing staff. This meant that nursing staff initially approached patients, introduced the student and enquired if the patient was willing to speak to the student. On the rehabilitation ward, the research student approached patients without the help of nursing staff. This approach of adapting the recruitment process according to context has been used in similar research with vulnerable and challenging populations (Duncan, Williams, Johman et al, 2008).

Consent and confidentiality

All study participants were provided with an information sheet (appendix 3) and were told about the study, its purpose and the procedures involved verbatim by the research student. The researcher emphasised that all respondents could decline participation without any consequences for their care or legal rights. Those who agreed to take part in the study were asked to sign a consent form (appendix 4). This included the permission to access all patient files to collate a descriptive background of the sample and to follow-up incidents over the course of the study. Where consent was granted, an interview was arranged for a later date, though frequently patients completed the interview there and then. Of those who agreed to an interview at a later date, two patients (1.3%) opted to withdraw from the study.

Interview process

During the research interview and according to ethics guidelines (RCN, 2011), the research student employed an ongoing consent process by reminding patients that they did not have to answer any questions that may cause discomfort, and that they could withdraw from the study at any given point. In addition, the research student sought regular advice from the ward staff on the day of the interview regarding relevant research participants' mental state. Participants were notified that confidentiality would be breached if they stated clear threats against others, indicated clear intentions to harm themselves, or gave direct accounts of other harmful behaviour such as hostage taking.

Research interviews typically lasted 45 minutes to one hour. Notably, this included establishing rapport and explaining the study aims and process in detail. All questionnaires were administered by the research student in the same sequence (BIS-II, NAS, CANFOR-S, SIV and BPRS-E). While this perhaps added to the overall duration of interviews, this manner overcame potential issues of literacy, kept participants engaged and opened up a forum where any misunderstandings regarding scale items could be discussed. None of the participants were offered monetary incentives for their participation as this was against State Hospital policy.

Follow up of participants

For the psychometric interviews, all participants were approached 12 months post recruitment. Of the initial sample of 115 patients, 88 agreed to be re-interviewed

(response rate: 76.5%). Follow-up interviews were conducted using similar procedures employed during recruitment in that consultant psychiatrists were contacted first to obtain permission to speak to relevant patients. Of the total sample, 70 participants (60.9%) were discharged from the State Hospital during the study period. In these cases, the research student contacted the relevant patients' RMO not only to facilitate the psychometric aspect of the study, but also to enquire if any updated SPJ tools would be shared for the purpose of this research. All RMOs outwith the State Hospital were offered a copy of the research consent form signed by the patient. Once permission was granted by the RMO, the research student liaised with nursing staff before approaching participants to re-establish consent and, if applicable, conduct the interview. Follow-up of updated SPJ tools, and inspection of patient files to collect incident data occurred simultaneously.

3.4 Limitations of real world research

This study is high in ecological validity as the study design is intrinsically embedded within clinical practice. The clinical reality of this research meant that considerable difficulties were experienced. The clinically led design of this research required the collaboration from several professions in the recruitment and follow-up of suitable research participants and their implemented SPJ tools. Though all clinicians were aware of the implementation and the present research as a means of evaluating the implementation, it proved difficult to obtain completed SPJ tools. This was linked to administrative problems in that draft rather than the final versions of completed SPJ tools were filed. In addition, at times SPJ assessments were incomplete (e.g. subscales were missing) or filed inappropriately or indeed, altogether missing from patients' case notes. Similar to the problems encountered in locating SPJ tools, copies of the PCL-R or the PCL:SV were often not filed in patients' case notes despite the fact that these measures are integral to the HCR-20, the SVR-20 and the RSVP. Though the need for these measures as part of the research was clearly communicated to relevant clinicians, only 16 out of 115 (13.9%) participants were identified with an accessible psychopathy assessment.

Not only did these issues persist throughout the research study at the recruitment site, difficulties also extended into the wider forensic care network, in particular in reference to the collection of updated SPJ assessments. For example, of those discharged during the study period (n = 70), the case notes of only 19 participants (27.1%) contained a reference to an updated SPJ tool. Perhaps most disappointing was that though requested, updated

SPJ tools were received for only five research patients (26.3%). When there was no reference to an updated SPJ tool in patients' files, or no actual copy of an updated SPJ tool was received, the research student assumed that either the update did not exist or that it was not appropriately implemented (see chapter 5). Though the follow-up of three patients failed due to the lack of cooperation from the care facility the patients were transferred to, the response rate, both at baseline (72%) and follow-up (77%) was positive which may be attributable to the rapport established during recruitment.

CHAPTER 4

DESCRIPTIVE BACKGROUND TO THESIS SAMPLE

As discussed in chapter 1 and 2 of this thesis, the predictive validity of risk measures is inconsistent across populations, settings and cultures (Singh, Grann & Fazel, 2011; Farrington, Joliffe & Johnstone, 2008). One may expect this given the observation in the literature that risk tools based on particular group statistics may not translate well to other groups let alone the individual level (Hart, Michie & Cooke, 2007). This very much echoes the implicit complexities of psychiatric disorders as essentially neither mental disorder nor violence occurs in a vacuum. For example, Swanson, Holzer, Ganju et al (2006) postulate that violence, and therefore the risk of violence, takes place within a social-ecological framework. This involves the whole person with a particular life history, predispositions and state of health while interacting with a particular social surrounding (Monahan & Steadman, 1994). When applied to research on SPJ tools, this then implies that the background of the cohort under investigation merits special attention. This means that the risk factors and life events relevant to the person and the context in which the risk assessment and management take place must be taken into account.

4.1 Introduction

Psychotic disorders, in particular schizophrenia, are thought to be amongst the most debilitating illnesses with high prevalence rates of co-occurring illness and disability (Buckley, Miller, Lehrer et al, 2009). In particular, comorbidity of substance disorder is thought to be the rule rather than the exception (Barnett, Werners, Secher et al, 2007) with suggested levels at approximately 47% - 60% (Regier, Farmer, Rae et al, 1990). Though this is consistent across epidemiological and clinical studies (Merikangas, Ames & Cui, 2007), the possible relationship between schizophrenia and chronic substance misuse is obscured by several confounding factors. For example, Buckley et al (2009) observe that patients may use drugs and alcohol as a means to self medicate in order to alleviate psychotic symptoms or to counteract negative side effects of antipsychotic medication. Even in the absence of substance misuse, the intricate effects of schizophrenia are exacerbated by the high prevalence of medical comorbidity (Druss & Walker, 2011) and increased mortality in this population (Osborn, Levy, Nazareth et al, 2007). Research indicates that though the likelihood of suicide is increased in those with

schizophrenia (Pompili, Amador, Girardi et al, 2007), a substantial amount of variance in mortality is due to natural causes (Lambert, Velakoulis & Pantelis, 2003). This has led to the assumption that people with mental illness fail to seek medical help when required, yet studies examining the barriers to medical service uptake are rare. Though a recent review cited negative attitudes towards health care professionals and lack of motivation as the main deterrents (Roberts & Bailey, 2011), it has been suggested that people suffering from psychoses may not only lack insight into their own mental health but also their physical health (Phelan, Stradins & Morrison, 2001). This then implies that the problem at hand is not of a motivational nature per se but rather people with mental illness, in particular schizophrenia, lack awareness of risk factors for physical illness and lack the skills to prioritise or intervene accordingly (Buhagiar, Parsonage & Osborn, 2011). This is perhaps not surprising given the extent and often chronic nature of clinical symptoms associated with schizophrenia as described in chapter 1 of this thesis. Additionally, people with psychiatric illness may be disadvantaged in terms of access to medical services. This is plausible given the complex interaction between high psychiatric and physical comorbidity, lower education and lower socio-economic status, which in turn has been linked to poor access to health care (Andrade, Caravo-Anduage, Berglund et al, 2000). Moreover, the experience of stigma, both imagined and experienced, may stop people with mental illness from seeking help (Corrigan & Watson, 2002) regardless of personal health beliefs and attitudes.

Adverse experiences in psychiatric populations

In addition to the psychiatric and physical disabilities noted, childhood trauma is thought to be common in patients with mental disorder (Kessler, McLaughlin, Green et al, 2010). The term trauma in this context refers to adverse experiences, in particular sexual, physical and emotional abuse (Morgan & Fisher, 2007). A recent meta-analysis concluded that traumatic childhood experiences substantially increase the risk of psychosis (Varese, Smeets, Drukker et al, 2012). Considering research evidence showing that traumas tend to coexist (Edwards, Holden, Felitii & Anda, 2003) it follows then that this particular patient group is severely victimised. Yet, the results of individual studies are inconclusive. For example, in reference to sexual abuse during childhood, Chen, Murad, Paras et al (2010) report in a meta-analysis that there is no association between childhood sexual abuse and chronic schizophrenia. In contrast, Read, Os, Morrison et al (2005) claim there is a definite relationship between such abuse and psychosis,

specifically schizophrenia. Like most research on the relationship between trauma and psychosis, these two exemplary studies are methodologically flawed. The search strategy used by Chen et al (2010) resulted in the inclusion of only three studies on the link between childhood sexual abuse and schizophrenia. Likewise, Read and colleagues' (2005) review is based on a selection of studies with highly heterogeneous samples, often with chronic histories and without having given statistical consideration to the impact of other co-occurring disorders. This is an unfortunate shortcoming given the association between trauma events and an increased risk of comorbidity, in particular in reference to anxiety, depression and post-traumatic stress disorder (Garieballa, Schauer, Neuner et al, 2006).

While the literature appears to focus on studies outlining sexual and/or physical abuse as the outcome variable, Read et al (2005) posit that *any* adverse experience may be an important factor contributing to ill mental health in child- and adulthood. Varese et al (2012) confirm that experiences of neglect, loss and deprivation during childhood were significant predictors in developing psychosis. In addition, a recent longitudinal study in Denmark reported that individuals born prematurely are 1.6 to 2.5 times more likely to develop psychosis, bipolar disorder and depression (Nosarti, Reichenberg, Murray et al, 2012). The researchers infer that this may be due to alterations in brain development in response to birth complications. This is in line with Anda, Felitti, Bremner et al (2006) who extensively discuss the detrimental impact of all childhood trauma on the developing brain in reference to relationship skills, interactional style, attention span, problem solving and coping skills (Perry, 2002). Perry (2001) explains that the effects of trauma events are likely to be cumulative in that the frequency, severity and type of any trauma must be reflected on, especially in the presence of potential protective factors such as interpersonal contact.

Adverse experiences and violence

There is increasing acknowledgment of the additive role of adverse experiences in the occurrence of violence. In reference to forensic non-mentally ill populations, Hill and Nathan (2008) investigated childhood antecedents of serious violence in male non-mentally ill offenders in the UK. The authors found that exposure to domestic violence, rather than sexual or physical abuse, was a significant predictor for social and even more so, partner violence. However, Hill and Nathan (2008) point out that their sample size was relatively small (n = 54) and therefore their statistical results may be flawed.

Forensic psychiatric populations are different. Timmerman and Emmelkamp (2001) argue that forensic patients are subjected to proportionally more traumatic experiences, in particular of a sexual and physical nature, when compared to non-mentally ill prisoners. The literature confirms this in that high rates of neglect (59%), physical (52%) and emotional abuse (75%) are reported (Spitzer, Chevalier, Gillner et al, 2006). These findings have important clinical implications in terms of treatment needs, but also in reference to effective risk management among forensic psychiatric populations. In spite of this, there are few studies providing comprehensive data on the extent of multiple adverse life events in combination with psychiatric comorbidity and physical ill health in this group. An exception to this is Thomson, Bogue, Humphreys et al's (1997) in depth description of the patient population at the State Hospital. Patient case notes were coded in detail according to patients' demographic background, legal status, psychiatric and forensic history, substance misuse prior to hospitalisation, past medical history, admission details, social and personal histories including those of patients' families, the current diagnosis and clinical features. The latter were assessed in interview-administered assessments by a researcher. The authors summarise that this particular patient cohort is a 'very severely ill population whose disadvantages are compounded by adversities which have arisen from their earliest years' (p.282). For example, alcohol and drug intoxication (21%) were noted as frequent factors preceding the offence or the behaviour leading to admission. Equally, the majority of patients were identified with adverse childhood experiences (73%) and physical ill health (55%). Thomson and colleagues (1997) stress the accommodation of such factors in successful continuity of care and treatment across settings. Arguably, this also applies to the need for appropriate assessment of risk of harm in that these population aspects ought to be examined. Given the clinical led focus of the present thesis, this chapter will describe the demographic details of the study sample in detail.

4.2 Methods

Data collection

Information was collected from the files of all research participants provided written consent had been given to inspect all relevant case notes. This means that data collection proceeded in line with successful recruitment, which in turn was dependent on the receipt of completed SPJ tools as described in the previous chapter.

Data were collected using a data collection tool based on the results published by Thomson et al (1997). The research student added several questions to the data collection tool in accordance with the literature, e.g. detailed information on nature, severity and frequency of abusive experiences as well as age at onset of abuse. This extended data collection tool was piloted on the case notes of five research participants. Table 3 outlines the nature and depth of demographic data collected for this thesis.

Table 3 Nature and extent of data collected

	Nature of data	**Examples**
1.	Demographic data	Personal details, marital status, education, employment, socioeconomic status
2.	Adverse childhood experiences	Prenatal problems, physical abuse, sexual abuse, other adverse childhood events
3.	History of drug and alcohol abuse	Drug and alcohol consumption including age at first consumption of alcohol and drugs, extent of drugs used ever, mainly and prior to index offence
4.	Psychiatric history	Episodes of hospitalisation, first contact with psychiatry, first admission, mean length of time spent hospitalised
5.	Psychiatric history of family	Information on psychiatric diagnoses and hospitalisations of family members as well as partners.
6.	Medical history	Data on physical co-morbidities
7.	Negative life events	Description of negative life events during adulthood
8.	Forensic history	Number and nature of previous offences
9.	Index offence	Nature of index offence, victim of index offence, precipitants to index offence
10.	Current admission details	Description of source of referral, behaviour leading to admission, legal status, restriction status

The following results section is structured according to the headings and sequence of topics presented in table 3.

4.3 Results

Demographic details

As described in the previous chapter, the total sample consisted of 115 male patients. The mean age at time of data collection was 39 years (sd = 10.8) ranging from 20 to 66 years. The first language of all patients was English. The majority of respondents were of Scottish origin (n = 100, 87.0%), seven (6.1%) patients were born in England and five (4.3%) patients were born in Northern Ireland. Two patients (1.7%) were born outside of the UK (USA and Germany respectively).

Marital status

More than three quarters of the sample (n = 93, 80.9%) were single at the time of data collection. Sixteen (13.9%) were documented to be either divorced or separated. Only six (5.2%) were married or had been living with a partner prior to admission.

Education and occupation

Though the majority of respondents (n = 78, 67.8%) attended mainstream schooling, they often left school without educational qualifications (n = 51, 65.4%). About one quarter of the sample (n = 28, 24.3%) reported to have been transferred from mainstream to approved schooling at some point. Nine patients (7.8%) were directly admitted to an approved school. Table 4 presents the educational achievements reported for the total sample.

Table 4 Qualifications recorded for total sample

Qualification	**Number (%)**
No qualifications	82 (71.3%)
Standard grades	18 (15.7%)
Highers	8 (7.0%)
SVQ	5 (4.3%)
Honours degree	2 (1.7%)

Most respondents (n = 74, 64.3%) were either unemployed or worked in unskilled labour prior to admission to psychiatric care. In particular, of those with no educational qualifications (n = 82), the majority were either unemployed or working as labourers (n =

61, 74.4%). Information on participants' most recent occupation prior to admission are displayed in table 5.

Table 5 Participants' most recent occupation prior to psychiatric care

Occupational category	**Number (%)**
Unskilled labourer	55 (47.8%)
Semi-skilled profession	20 (17.4%)
Professional trade	14 (12.2%)
YTS training scheme	5 (4.3%)
Higher professional	2 (1.7%)
No employment history	19 (16.5%)

Occupational category and educational achievements correlated positively ($r_s = .226$, $p = .015$) implying that professional skill and responsibility increased in line with educational qualifications achieved.

Socio-economic status

Socio-economic status (SES) was derived from the father's occupation. Where this was not available, the maternal occupation was used instead (n = 5, 4.3%). Yet, for one quarter of the sample, no information was recorded; SES rates are based on three quarters of the sample (n = 83, 72.2%). These are summarised in table 6 according to the National Statistics Socioeconomic Classification system (ONS, 2010).

Table 6 Socioeconomic background of the study sample

National Statistics Socioeconomic Classification	**Number (%)**
Semi-routine and routine occupations	34 (29.6%)
Lower supervisory and technical occupations	29 (25.2%)
Intermediate occupations	10 (8.7%)
Small employers and own account workers	5 (4.3%)
Unemployed	3 (2.6%)
Higher managerial, administrative professional occupations	2 (1.7%)
Unknown	32 (27.8%)

Socio-economic data are also presented according to social class in table 3.4. Similar to the figures presented in table 7, the majority of participants (n = 59, 71.1%) came from a lower socio-economic background (groups III-M to V).

Table 7 Social class of research participants

Social class		Number (%)
I	Professional occupations	3 (2.6%)
II	Managerial and technical occupations	7 (6.1%)
III-N	Skilled occupations non-manual	11 (9.6%)
III-M	Skilled occupations – manual	26 (22.6%)
IV	Partly skilled occupations	19 (16.5%)
V	Unskilled occupations	14 (12.2%)
Unemployed		3 (2.6%)
Unknown		32 (27.8%)

Both, social class and SES were significantly associated with participants' education (r_s = .297, p = .006 and r_s = .243, p = .027 respectively) and occupational status as described in table 5 (r_s = .228, p = .039 and r_s = .257, p = .019).

Adverse childhood experiences

Prenatal complications

One in five respondents (n = 22, 19.1%) reported prenatal complications such as premature birth, low body weight or with the umbilical cord wrapped around the neck. Difficulties in reaching developmental milestones were recorded in the case notes of 17 (14.8%) participants. Of these, eleven (64.7%) had been identified with prenatal problems. This relationship was significant (χ^2 = 26.78, df = 1, p = .000).

Physical abuse

One third of the respondents (n = 39, 33.9%) reported to have been physically abused during childhood. Often, the abuse was perpetrated by an adult family member (n = 36, 92.3%), mostly the male caretaker (n = 27, 69.2%), i.e. father or stepfather. Of those who were subjected to physical abuse, half (n = 19, 48.7%) also experienced sexual abuse. This association was significant in that these types of abuses co-occurred (χ^2 = 11.56, df = 1, p = .001).

Sexual abuse

One third of the total sample (n = 33, 28.7%) were noted to have been sexually abused during childhood and/or early adolescence. The perpetrator was usually male (n = 31,

93.9%), an adult (n = 26, 78.8%) and often part of the wider family (n = 17, 51.5%). Table 8 describes the perpetrator within the family.

Table 8 Details of perpetrator of sexual abuse within the family

Perpetrator	Number (%)
Male relative (e.g. uncle)	8 (47.1%)
Father or stepfather	6 (35.3%)
Brother	3 (17.6%)

The majority of patients described the sexual abuse as a recurring experience (n = 18, 54.5%), especially when the perpetrator was a family member (n = 15, 83.3%). When the perpetrator was described as a stranger or a known person such as a neighbour, sexual abuse appeared to have been limited to one occasion (n = 8, 53.3%). For six patients (18.2%), no detailed information on the perpetrator was available.

Other adverse events

The majority of patients experienced some form of adverse event during childhood (n = 97, 84.3%) when sexual and/or physical abuse were controlled for. Of these, three in five (n = 68, 59.1%) were subjected to more than one type of adverse experience. The different types of negative life events are described in table 9.

Table 9 Description of participants' adverse childhood experiences

Other adverse experience	Number (%)
Parental separation/divorce	40 (41.2%)
Witnessed marital differences including domestic violence	39 (40.2%)
Prolonged separation from caretaker	35 (36.1%)
At least one parent alcoholic	34 (35.1%)
Victim of bullying	26 (26.8%)
Bereavement of significant person	13 (13.4%)
Neglect	13 (13.4%)

History of drug and alcohol use

Most respondents were reported to have consumed alcohol (n = 92, 80.0%) and/or drugs (n = 94, 81.7%) at some point in their life.

Alcohol consumption

The mean age at which participants reported to have had their first drink was 13.8 years (sd = 2.7, range: 8 – 23 years). The median was 14 years. Where information was recorded (n = 71, 77.2%), the drinking pattern was described as regular (41, 57.7%). One third (n = 26, 36.6%) of the sample had attended alcohol treatment in the past.

Drug consumption

The majority (n = 74, 78.7%) had used at least three different classes of substances at some point. Table 10 describes information collated on the types of drugs used by the sample according to these categories: drugs ever used, main drugs used and drugs used prior to index offence.

Table 10 Participants' use of drugs ever, mainly and prior to index offence

Drug class	**Description of drug**	**Ever used (n = 94)**	**Mainly used (n = 80)**	**Used prior to index offence (n = 33)**
Stimulant/ Depressant	Cannabis	91 (96.8%)	60 (65.9%)	15 (45.5%)
Opioid	Heroin	50 (53.2%)	21 (22.8%)	2 (6.1%)
	Painkillers (over the counter)	13 (14.1%)	--	2 (6.1%)
	Temgesics	11 (11.9%)	2 (2.5%)	--
	Dihydrocodeine	5 (5.4%)	2 (2.5%)	1 (3.0%)
	Derivatives	3 (3.2%)	1 (1.1%)	--
	Morphine	2 (2.1%)	--	--
Stimulants	Amphetamines	67 (71.3%)	18 (19.8%)	4 (12.1%)
	Ecstasy	50 (53.2%)	10 (11.0%)	3 (9.1%)
	Cocaine	38 (40.4%)	4 (4.4%)	4 (12.1%)
	Speed	22 (23.4%)	1 (1.1%)	1 (3.0%)
Hallucinogenics	LSD	52 (55.3%)	7 (7.7%)	2 (6.1%)
	Magic Mushrooms	34 (36.2%)	1 (1.1%)	--
	Benzodiazepines	53 (56.4%)	11 (12.1%)	5 (15.2%)
	Methadone unprescribed	14 (14.9%)	--	1 (3.0%)
	Methadone prescribed	13 (13.8%)	1 (1.1%)	2 (6.1%)
	Barbiturates	5 (5.3%)	--	--
Solvents		43 (45.7%)	4 (4.4%)	3 (9.1%)

The mean age at which patients reported to have taken drugs for the first time was 14.6 years (sd = 3.9, range: 9 – 30 years). The median was 14 years. Where information was available (n = 79, 84.0%), most patients reported Cannabis as their introductory drug (n = 53, 67.1%) while about one quarter (n = 19, 24.1%) had used solvents as their first drug. Information on opioid use was scarce (n = 20, 21.3%). Though where available, patients reported a mean age of 19.5 years (sd = 4.4, range: 11 – 31) when they first used an opioid substance, in all cases this was heroin. The median age for first heroin use was 19 years. When information was recorded (n = 60, 63.8%), about two in five patients (n = 26, 43.3%) reported to have had previous drug treatment.

Psychiatric background

Psychiatric diagnosis

The primary diagnosis of most participants (n = 107, 93.0%) was a psychotic illness. About two in five patients (n = 50, 43.5%) had a personality disorder either as primary, secondary or tertiary diagnosis. Forty-three respondents (37.4%) were noted with comorbidity of substance misuse disorder. Table 11 displays a breakdown of all primary, secondary and tertiary diagnoses in the sample.

Table 11 Number and nature of primary, secondary and tertiary diagnosis

Diagnosis (ICD-10[1], Loranger et al, 1997)		**Number (%)**
Primary diagnosis (n = 115)	Schizophrenia	92 (80.0%)
	Schizo-affective disorder	9 (7.8%)
	Personality Disorder	8 (7.0%)
	Dissocial	5 (62.5%)
	Schizotypal	1 (12.5%)
	Borderline	1 (12.5%)
	paranoid	1 (12.5%)
	Bipolar disorder	4 (3.5%)
	Drug induced psychosis	1 (0.9%)
	Brain damage leading to delusional disorder	1 (0.9%)
Secondary diagnosis (n = 80)	Substance misuse disorder	33 (41.25%)
	Personality disorder (all)	28 (35.0%)

[1] ICD-10 is the diagnostic system predominantly used in clinical practice in the UK.

Diagnosis (ICD-10[1], Loranger et al, 1997)		**Number (%)**
Secondary diagnosis (n = 80, 69.6%)	Personality disorder (subtypes)	
	Dissocial PD	20 (71.4%)
	Borderline PD	4 (14.3%)
	Mixed PD	2 (7.1%)
	Schizoid PD	1 (3.6%)
	Paranoid PD	1 (3.6%)
	Depressive disorder	6 (7.5%)
	Learning difficulty	5 (6.25%)
	Brain damage	2 (2.5%)
	Schizophrenia	2 (2.5%)
	Schizo-affective disorder	2 (2.5%)
	Paedophilia	1 (1.25%)
	Drug induced psychosis	1 (1.25%)
Tertiary diagnosis (n = 27, 23.5%)	Personality disorder (all dissocial)	15 (55.6%)
	Substance misuse disorder	10 (37.0%)
	Schizo-affective disorder	1 (3.7%)
	Social phobia	1 (3.7%)

Previous psychiatric treatment

Of those with a history of psychiatric treatment (n = 106, 92.2%), the majority had been inpatients (n = 92, 86.8%). Eight patients (7.5%) reported psychiatric treatment in prison and six (5.7%) reported outpatient contact only.

History of previous admissions

For those with inpatient experience (n = 92), the mean number of previous admissions was 6.6 (sd = 6.0, range: 1 – 29) with a median of 4 previous admissions. Of these, two in five (n = 38, 41.3%) had been admitted to the State Hospital before. The mean number of previous admissions to the State Hospital was 2.0 (sd = 1.8, range 1 – 11), the median number was one prior admission.

Length of time spent in psychiatric hospitals

Prior to the current admission to the State Hospital, the mean number of years spent under institutional care was 4.4 (sd = 6.5) ranging from two weeks to 31.5 years. The median was 12 months.

Considering the high percentage of patients with previous admissions to the State Hospital, the sample was split accordingly. Those with previous admissions at the State Hospital had spent approximately 8.1 years (sd = 8.3) in institutional care, ranging from 1 month to 31.5 years. The median was 5.6 years. In the absence of a previous admission to high secure care, the mean number of months spent as a psychiatric inpatient was 14.8 (sd = 20.4) ranging from 2 weeks to 8.4 years. The median was 5 months.

From first psychiatric contact to first admission

The date of first contact with psychiatric or psychological services was documented for 111 participants (96.5%). Initial contact with these services led to immediate admission for two in five patients (n = 48, 43.2%). For the remaining sample (n = 63, 56.8%), the mean length of time between first psychiatric contact and admission was 8.2 months (sd = 6.0, range: 1 – 32 months). The median was also 8 months.

Age at first ever admission

Approximately one in five patients (n = 20, 17.4%) were first admitted as teenagers (ages 12 to 17 years) to psychiatric facilities for young people. The mean age at first admission for the total sample, i.e. where information was documented (n = 111), was 24.9 years (sd = 8.0) ranging from 12 to 54 years. The median age was 23 years.

Psychiatric history of family

The majority of patients (n = 69, 60.0%) reported a psychiatric background in their family with a median of 2 relatives (range: 1 – 6; mean: 2.2, sd = 1.2). Table 12 describes the number of patients according to the number of relatives with psychiatric disorders.

Table 12 Number of patients with 1 – 6 relatives with psychiatric history

Relatives with psychiatric history	**Number (%)**
N = 1	26 (37.7%)
N = 2	22 (31.9%)
N = 3	8 (11.6%)
N = 4	10 (14.5%)
N = 5	2 (2.9%)
N = 6	1 (1.4%)

About half (n = 38, 55.1%) of those participants with mentally disordered family members were noted to have the same diagnosis as another member of the family. In addition, of those with two or more psychiatrically ill family members (n = 43, 62.3%), 23 respondents (53.5%) noted at least two family members had the same diagnosis.

Partner psychiatric background

One in five patients (n = 22, 19.1%) indicated their (ex) partner had a psychiatric illness. The median number of psychiatric partners was 1 ranging from 1 to 4 partners (mean: 1.3, sd = 0.7). Table 13 summarises the number of patients according to the number of partners dated.

Table 13 Number of patients with 1 – 4 partners with psychiatric history

(Ex) partner with psychiatric history	**Number (%)**
N = 1	18 (81.8%)
N = 2	3 (13.6%)
N = 4	1 (4.6%)

The diagnosis of (ex) partners was unknown for most (n = 15, 53.6%) though for ten (ex) partners (35.7%) the diagnosis was schizophrenia. One partner (3.6%) was thought to suffer from depression, another partner (3.6%) was described with bipolar disorder and one partner (3.6%) had a learning disability.

Medical history

The majority of the sample (n = 101, 87.8%) were identified with poor physical health. In addition, about three quarters of participants (n = 88, 76.5%) were noted to smoke during the time of data collection. Table 14 outlines and describes the number of patients with physical comorbidity.

Table 14 Number of patients with physical illness

Physical Illness	**Number (%)**
Longstanding treatment for physical illness	65 (56.5%)
Overweight	59 (51.3%)
Head injury requiring medical treatment	46 (40.0%)
History of epilepsy	33 (28.7%)
Due to withdrawal (e.g. clozapine)	16 (48.5%)

Physical Illness	**Number (%)**
Hep C	16 (13.9%)
High cholesterol	11 (9.6%)
Asthma	10 (8.7%)
Ulcer	8 (7.0%)
Diabetes	6 (5.2%)
High blood pressure	4 (3.5%)
Hep B	4 (3.5%)

Self harm and suicidal behaviour

Three in five patients (n = 76, 66.1%) were documented to have self harmed, and almost half of the sample (n = 55, 47.8%) had exhibited suicidal behaviour at some point. These were significantly associated ($\chi^2 = 28.98$, df = 1, p = .000) in that those who self harmed (n = 76) were also more likely to attempt suicide (n = 50, 65.8%).

Negative life events

The case notes of 65 patients (56.5%) reported multiple negative life events during adulthood. Most of these (n = 43, 66.2%) referred to the loss of a significant person. Sixteen respondents (24.6%) were identified to have suffered the sudden, unexplained death of a family member. In addition, eleven patients (16.9%) were noted to have been bereaved due to suicide by a significant other. Seven participants (10.8%) reported that a family member had been murdered, four patients (6.2%) described a fatal drug overdose in their family and fifteen patients (23.1%) had lost a family member to cancer (n = 9) or heart disease (n = 5).

Forensic history

The majority of participants had at least one offence prior to the index offence (n = 102, 88.7%) with a mean of 15 previous convictions (sd = 13.6, range: 1 - 58). The median was 10 previous convictions. About three quarters of participants (n = 83, 72.2%) had been previously convicted for breach of the peace and one quarter (n = 30, 26.1%) were identified with breach of bail or breach of probation. A large number of previous offences were violent in that 73 participants (63.5%) had been convicted of assaults and 19 (16.5%) had previous convictions involving serious violence including serious assault, murder and culpable homicide. Seventy-three (63.5%) respondents had engaged in acquisitive crimes such as theft and burglary and 14 (12.2%) had committed crimes of dishonesty. Previous

sexual crimes were noted for 12 participants (10.4%), these refer to lewd and libidinous practices (n = 5) and sexual assault (n = 5). About one third of the sample (n = 38, 33.0%) had been convicted for minor crimes such as vandalism and road traffic offences. One in five (n = 22, 18.3%) had a previous conviction for drug offences. In addition to previous offences, almost half of the sample (n = 52, 45.2%) were noted to have been violent in a hospital other than the State Hospital at some point.

Index offence

Sixteen patients had committed no index offence (13.9%). For the remaining sample (n = 99, 86.1%), the majority of index offences (n = 85, 85.9%) contained serious violence. Ten participants (10.1%) committed an index offence of a sexual nature; all of these included violent aspects except for one (lewd and libidinous practices). Four offences (4.0%) were coded as non-violent based on file information. The nature of the index offences is described in table 15.

Table 15 Nature and number of index offences

Index offence	**Number (%)**
Assault	20 (20.2%)
Attempted murder	16 (16.2%)
Culpable homicide	16 (16.2%)
Murder	16 (16.2%)
Serious assault	11 (11.1%)
Rape	5 (5.05%)
Breach of the peace	5 (5.05%)
Assault with intent to rape	4 (4.0%)
Robbery	2 (2.0%)
Attempted abduction	1 (1.0%)
Fire raising	1 (1.0%)
Lewd and libidinous practices	1 (1.0%)
Terrorist offence	1 (1.0%)

All index offences bar one (n = 98, 98.9%) involved a victim. The one person who did not have a specific victim was convicted of terrorist offences. Table 16 describes the relationship between perpetrator and victim of index offence.

Table 16 Relationship between perpetrator and victim

Victim	Number (%)
Known person (unrelated)	34 (34.7%)
Stranger	31 (31.6%)
Immediate family	12 (12.2%)
Spouse or partner	8 (8.2%)
Friend	8 (8.2%)
Relative	5 (5.1%)

Current admission details

Age at admission to the State Hospital

The mean age at admission to the State Hospital was 34 years (sd = 10.0) ranging from 17 to 63 years of age. The median age was also 34 years.

Time spent in high secure psychiatric care in current admission

Twenty-two (19.1%) patients were recruited on the admission ward, i.e. they were omitted from the analysis described in this paragraph. Of those who were inpatients, the mean length of time spent during the current admission was 6.4 years (sd = 6.3) ranging from 1 to 32 years. The median was 4 years. Proportionally, the majority of respondents (n = 50, 53.8%) had resided at the State Hospital for 1 – 4 years, one third (n = 29, 31.2%) had lived in the State Hospital for 5 – 10 years and there were nine participants (9.7%) whose files indicated their current detention had been 11 – 20 years to date. A small number of research patients (n = 5, 5.4%) had been in the State Hospital between 21 – 32 years.

Source of referral

About one third of respondents had been referred from the following settings, prison (n = 41, 35.6%), other psychiatric hospitals (n = 40, 34.8%) and court (n = 34, 29.6%). Of those admitted from a psychiatric hospital, most were admitted from NHS Greater Glasgow and Clyde Health Board. Table 17 summarises the number of patients admitted from each health board.

Table 17 Number of patients referred from health boards

Name of health board	**Number (%)**
NHS Greater Glasgow and Clyde	18 (45.0%)
NHS Lothian	9 (22.5%)
NHS Lanarkshire	4 (10.0%)
NHS Tayside	3 (7.5%)
NHS West London Mental Health	1 (2.5%)
Health Boards in Northern Ireland	2 (5.0%)
NHS Fife	1 (2.5%)
NHS Grampian	1 (2.5%)
NHS Highlands	1 (2.5%)

Behaviour leading to admission

The main reasons for admission to the State Hospital were coded as inpatient violence, deterioration in mental health or the index offence. The reasons for admission are described in table 18.

Table 18 Description of reason for admission in the sample

Behaviour leading to admission	**Number (%)**
Inpatient violence	39 (33.9%)
Deterioration in mental health	36 (31.3%)
Index offence	33 (28.7%)
Management problem	7 (6.1%)

Management problems were non-violent and refer to repeated absconding (n = 5, 71.4%), breach of conditional discharge (n = 1, 14.3%), and persistent use of drugs while in care (n = 2, 28.6%).

Admission due to index offence

Of the 33 patients who were admitted due to their index offence, almost all of these (n = 31, 93.9%) were classified as serious violence. Table 19 outlines the nature of index offences for those patients (n = 33) where the index offence was the primary reason for admission to the State Hospital.

Table 19 Nature of index offence leading to admission

Index offence leading to admission	**Number (%)**
Culpable homicide	8 (24.2%)
Attempted murder	6 (18.2%)
Assault	5 (15.2%)
Murder	5 (15.2%)
Serious assault	5 (15.2%)
Breach of the peace	2 (6.1%)
Rape	1 (3.0%)
Attempted rape	1 (3.0%)

The two patients who had been detained due to breaching the peace had not committed any physical violence but were noted to have been threatening. The presence and severity of psychotic symptoms at the time were seen as precipitants to possible risk of harm, and thus led to admission.

Precipitants to behaviour leading to admission

For 110 patients (95.7%) precipitants to the behaviour (including the index offence) leading to admission were noted in the files. These are displayed in table 20.

Table 20 Nature and number of precipitants to behaviour leading to admission

Precipitant	**Number (%)**
Psychosis	101 (91.8%)
Alcohol	35 (31.8%)
Drugs	33 (30.0%)
Failure to adhere to medication	26 (23.6%)
Change in medication	4 (3.6%)
Withdrawal symptoms	2 (0.2%)

Of those intoxicated with drugs, 15 (50.0%) were also intoxicated with alcohol and almost one quarter (n = 8, 24.2%) had failed to take their medication.

Legal status at admission

Most patients (n = 50, 43.5%) were admitted under the Criminal Procedure (Scotland) Act 1995. About one third (n = 40, 34.8%) were detained under the Mental Health (Scotland) Act 1984. Two in five (n = 21, 18.3%) participants were admitted under the Mental

Health (Care and Treatment) (Scotland) Act 2003 while three participants (2.5%) were admitted under the Criminal Procedure (Scotland) Act 1975. For one person (0.9%) admission details were not documented. Table 21 illustrates the specific sections patients were admitted under.

Table 21 Legal section leading to admission

Section at admission	**Number (%)**
Hospital Order	39 (34.2%)
Transfer for treatment direction	36 (31.6%)
Compulsion order with restriction order	10 (8.8%)
Hospital order with restriction order	7 (6.1%)
Compulsion treatment order	7 (6.1%)
Other (S25 CP (S) A 1995)	6 (5.3%)
Interim Compulsion Order	5 (4.4%)
Treatment Order	2 (1.8%)
Assessment Order	2 (1.8%)

Restricted status

More than half of the research sample (n = 64, 55.7%) were registered with a restriction order at the time of data collection.

4.4 Discussion

Schizophrenia is a debilitating mental illness characterised by severe and often chronic psychotic symptoms as well as high rates of comorbid psychiatric and physical diseases (Buckley et al, 2009). Particularly, the prevalence rates for schizophrenia in combination with substance misuse disorder are reported to be high (Fazel, Grann, Calrstroem et al, 2009). This in turn is thought to negatively affect physical illness which is associated with a host of other detrimental outcomes, such as impoverished living skills and an overall poor quality of life (Meijer, Koeter, Sprangers et al, 2009). In addition, the prevalence of traumas experienced during childhood and adulthood are suggested to be high (Kessler, McLaughlin, Green et al, 2010). In other words, schizophrenia rarely, if ever, occurs in isolation. Of particular interest are forensic psychiatric patients due to the potential link between the person's mental disorder and the risk of harm to others. This chapter described the background of the research sample recruited for the purpose of this thesis. The results imply that the population under investigation stands out with an extensive

forensic and psychiatric history, high levels of physical illness and substance misuse, and has experienced a range of negative life events from early childhood onwards.

Comparison to the State Hospital survey

Resemblance to Thomson et al's (1997) results from the State Hospital wide survey demonstrates the prevailing characteristics associated with chronically ill patients in high secure forensic care. Both research samples match up in terms of primary diagnosis (schizophrenia), forensic history, in particular in reference to number of previous offences (12 vs 15) and the nature of the index offence (predominantly violent), social class (III-M to V) and accordingly lower educational achievements. In addition, both studies report high levels of physical comorbidity, in particular in relation to chronic physical ill health (55% vs 57%), proportion of patients with prenatal problems (17% vs 19%), extent of adverse childhood experiences (73% vs 84%), the degree of self harm and suicidal behaviour (61% vs 66%) as well as admission details in terms of mean age at first ever admission (21 years vs 24 years) and mean number of previous admissions (5 vs 7) to psychiatric care in general.

Notwithstanding the foregoing, there are noteworthy differences between the two studies, yet these can be largely explained according to changes in documentation, in clinical practice, and changes in legislation. For example, Thomson and colleagues (1997) remark that 57% of their sample had at least two diagnoses while the current study found 70% of participants with psychiatric comorbidity. Likewise, the proportion of patients thought to use illicit substances in a harmful manner varies greatly across the two cohorts (47% vs 75%). This mismatch may be due to changes and improvements in documentation and assessment procedures over time though may equally well reflect increased rates of substance abuse across society. Either way, schizophrenia and substance misuse disorder was the most common combination in both cohorts. This endorses the association between these two disorders as evidenced in previous research (Fazel et al, 2009) and is perhaps further corroborated by the high prevalence of physical comorbidity in both studies given the association between substance misuse and increased physical disability (Hodgins, Larm, Molero-Samuleson et al, 2009). Similarly, the observed difference in readmission rate between Thomson et al's (1997) paper and this thesis (20% vs 40%) may be due to the often chronic nature of schizophrenia in this population. The fact that the former sample was younger than the latter (34 years vs 39 years) is therefore to be expected considering the length of time individuals are often detained for in high secure

settings (Furtado & Voellm, 2012). Still, one may argue that the disparity in source of referrals is peculiar in that Thomson et al (1997) identified fewer patients transferred from prison (20% vs 36%) and accordingly more patients admitted through the courts (44% vs 30%). This is in line with the difference found in the proportion of individuals admitted due to their index offence (49% vs 29%). This lack of correspondence between Thomson et al's (1997) and the thesis cohort may be because the research student did not have a psychiatric nor legal background. That is, documented sources of referral were accepted at face value. This noted, changes in legislation, in particular in reference to the Mental Health (Care and Treatment) (Scotland) Act 2003, may have equally contributed to the observed difference.

Negative life events in context

The prevalence rates of physical and sexual abuse recorded in Thomson et al's (1997) research is half of that found in the present sample (approximately 15% vs 30%). It is, however, assumed that this discrepancy is a matter of documentation and clinical consideration of the issue rather than a true reflection of prevalence rates. This seems plausible when considering the results of two recent trauma studies at the State Hospital (Scott, 2007; Austin, 2011). In line with previous research (Varese et al, 2012), both authors refer to higher prevalence rates than the ones reported in this thesis. Austin (2011) in particular asserts that three quarters of her sample of male forensic inpatients (n = 56) had been exposed to neglect, both physical (79%) and emotional (75%). Conversely, in this thesis the prevalence of neglect was only 14 percent. This difference is thought to be due to the current results being based on file information only while Scott (2007) and Austin (2011) respectively approached, assessed and interviewed patients in situ.

In addition to traumatic childhood events, more than half of the sample reported the loss of a significant other, often a member of the family. In particular, one quarter of these indicated the sudden and unexplained death of a family member, but perhaps more staggering was the prevalence of recorded suicides of significant others (17%) independent of fatal drug overdoses. In addition, almost half of the sample were noted to have exhibited suicidal behaviour themselves. These findings reflect other research (Pompili et al, 2007) and fit with official statistics in that the literature suggests that suicide rates in the general population increase according to severity of deprivation (Mok, Leyland, Kapur et al, 2012). In view of the socio-economic status and generally poor

education among participants, one may assume that patients and those close to them came from a similarly deprived background.

Application to this thesis

Clinically, the results presented in this chapter point towards a severely traumatised and disabled patient population who seem to have experienced multiple traumatic life events. This then, one may argue, has consequences for the efficacy of implemented violence risk assessments. Though SPJ tools require practitioners to consider clinically relevant information such as complex treatment needs, this is difficult if information is not communicated accurately. For example, Scott (2007) aptly pointed to the disparity between patients' account of trauma experiences and the trauma rates recorded in those patients' case notes. Arguably, the potential lack of clinical awareness of such traumas may negatively affect the process of risk assessment, formulation and management.

4.5 Limitations

There are two major shortcomings in the collection of background data; these relate to the data collection tool, and the source of information used. Due to the research student's lack of clinical qualifications, no information was collated on patients' medication. In addition, various aspects identified as important in the literature could not be coded in this thesis. For example, patients' case notes rarely contained in-depth information such as age at first traumatic experience, frequency and severity of traumatic event. This is very much linked to the second main limitation in that the results presented in this chapter are solely based on file information. This means that any errors and qualitative issues in documentation are unlikely to have been detected. By necessity, the research student assumed face validity of all facts presented. This is a great disadvantage as the extent to which file information are based on patient self report, third party report or administered assessment is not known. Notwithstanding these caveats, the findings presented are in line with previous research, both at the State Hospital and elsewhere, indicating that the sample is representative of patients living in high secure psychiatric care.

CHAPTER 5

THE IMPLEMENTATION OF FORMALISED SPJ TOOLS INTO CLINICAL PRACTICE

The implementation of evidence based research into practice has been a key aspect in the delivery of health services in the UK (Learmonth, 2000). However, the problem is that implementation efforts in health care are often riddled with obstacles that impede the desired change (Michie, Fixsen, Grimshaw et al, 2009). This disparity between knowledge and implementation, or research and application and policy is also amply illustrated in the risk literature. It is thought that this may be due to biased decision making processes. That is, Kahneman and Tverskey (1972) developed the well known concept of cognitive heuristics demonstrating that decision making is suboptimal because people do not follow normative strategies but rather cognitive short-cuts when making clinical decisions (McNeil, Pauker, Sox et al, 2000). This also ties in with the evidenced lack of validity and consistency when assessing risk of violence in an unstructured clinical manner (Monahan, 1981). The purpose of this chapter is to describe the implementation process but also the mutual relationship between the implementation and the thesis research studies.

5.1 Introduction

Implementation refers to the active and planned effort to mainstream a new intervention such as a guideline within a practice organisation (Greenhalgh, Robert, Macfarlane et al, 2004). Ongoing research attempts to unravel the dynamics of knowledge diffusion, integration and organisational performance inherent to the implementation process. Though recommendable, the complexity of abstract theories makes interpretation and application to real life settings difficult (May, 2006). This is supported by the number of implementation studies reporting inconsistent findings in transferring evidence into practice (Proctor, Lansverk, Aarons et al, 2009). For example, Burnes (2004) estimates that up to two thirds of organisations' efforts to implement interventions fail due to barriers at both, the organisational and the individual level. In the UK, a national evaluation of NICE guidelines found that the level of uptake was highly variable ranging from no change to significant changes in practice in line with the guidance (Sheldon, Cullum, Dawson et al, 2004). Similar results were reported by Michie, Piling, Garety et al (2007) regarding the impact of NICE guidelines on the management of severe mental

illness. This inconsistency may be because the implementation processes and related components are not well defined, which impacts on the results reported in the literature. This is particularly evident in the field of mental health. Perhaps this is not surprising when one considers that changes in healthcare organisations are often viewed as the most difficult and complex ones to achieve (Brooks, Pilgrim & Rogers, 2011) as diverse perspectives and interests of various stakeholders (patients and the government) and professions (clinicians and allied health professionals) require to be fused (Department of Health, 2011).

The implementation of violence risk assessment and management

The need to integrate violence risk assessments into clinical practice has been called for in various guidelines and recommendations (Department of Health, 2007; NICE, 2005). While research and practice encourage the use of structured professional judgement (SPJ) tools due to the potential to inform care and treatment, the predictive power of these risk measures varies greatly according to population, setting and culture studied (de Vogel & de Ruiter, 2005; Gray, Fitzgerald, Taylor et al, 2003; Dolan & Khawaja, 2004). The issue of imperfect risk prediction has been a focal point of debate since the 1980s (Doyle & Dolan, 2008) as is the extent to which findings at group level can be applied to individuals (Hart, Michie & Cooke, 2007). It is important to note here that there is a clear difference between research and clinical practice. While in research patterns among similar individuals are of interest, in clinical practice it is the individual that is the main focus. Nonetheless, the clinical reality is that that this leads to a moral conflict as clinicians are bound to assess risk using available risk assessment tools, which may restrict patients on false grounds. However, with the recent shift of focus from prediction to prevention, the task of risk assessment becomes intertwined with risk management, i.e. risk mitigation and minimisation, rather than probabilistic prediction. The aim of risk management is to use the information collected in violence risk assessments to directly inform an individually tailored care and treatment plan in such a way that recovery from illness and management of future risk is possible (Maden, 2005). This means that effective risk management requires the interpretation and implementation of violence risk assessment tools into professional practice (Lamont & Brunero, 2009; RMA, 2011; Department of Health, 2007; Royal College of Psychiatrists, 2008). The problem, however, is that there is a paucity of research and practical guidelines describing how to ensure that risk assessments directly inform risk management.

While multiple papers have been published on the implementation of risk assessments (Haque, Cree, Webster et al, 2008; Doyle, Lewis & Brisbane, 2008; Belfrage, 1998; Crocker, Braithwaite, Leferriere et al, 2011; Kroppan, Nesset, Nonstadt et al, 2011) the authors generally fail to give a clear, detailed account of how the implementation was achieved in terms of process and organisational procedures employed. This noted, a paper by Bhui, Outwaithe, Pereira et al (2000) described the implementation process, in particular the barriers encountered and the lessons learned, when attempting to introduce a risk assessment tool for short term violence in two psychiatric wards in London, UK. Yet, this particular implementation study failed in that staff did not complete the assessments. Accordingly, the number of incidents recorded did not decrease (Bhui, Outhwaite, Adzinku et al, 2001).

Quite in contrast, Crocker et al (2011) claim successful implementation of an SPJ tool into clinical practice. An earlier published report by Crocker et al (2008) briefly described the process, yet how exactly the violence risk assessment was incorporated into patients' care pathways and intervention plans was not outlined. Likewise, Wright and Webster (2011) describe the implementation of the HCR-20 across a high secure hospital in Canada. Though the authors outline key components and steps, and obstacles experienced, the process of translating risk factors into risk management strategies, i.e. the documentation, is not addressed. Interestingly though, Wright and Webster (2011) indicate that clinical teams demanded a 'blood-test model' (p.5) which stands in juxtaposition to the principles underpinning the SPJ approach. This is to say that clinical teams asked for an action guide on how to interpret cut off points using HCR-20 ratings and scores, in particular in reference to the final risk judgement. This need for clear, direct and practice-oriented guidelines, how exactly to blend the intervention into everyday practice, among clinicians has been highlighted by others (Michie et al, 2007; Sheldon et al, 2004). Gagliardi, Brouwers, Palda et al (2011) argue that this is because clinicians may be uncertain as to how to balance their professional judgement against the evidence in the light of each individual patient's care and needs. In the context of violence risk assessment tools, SPJ instruments provide guidance on how this may be done (Webster, Douglas, Eaves et al, 1997). However, in terms of real life implementation, the format and level of evidence provided may influence clinicians' attitude regarding the relevance and confidence in choosing to adhere to implemented guidelines.

Implementation models

Despite the documented reality of implementation problems, most change models advocate a linear and logical connection between continuing education, audit and research (Haines & Jones, 1994). Conversely, Kitson, Harvey and McCormack (1998) argue that successful implementation is dependent on the interplay between the nature of the evidence, the context in which the proposed change is to be implemented, and the mechanisms by which this change is facilitated. This emphasis of considering several aspects simultaneously and within a specific context is reflected in current (Brooks, Pilgrim & Rogers, 2011; Weiner, Belden, Bergnire et al, 2011) and previous implementation models and theories (Ambrose, 1978). The latter framework is based on the assumption that successful change relies on several interacting phases and stages; these refer to vision, skills, incentives, resources and action plan. Ambrose (1978) predicted that if any aspect of these stages and phases was lacking the implementation was destined to fail. Similarly, Fixsen, Panzano, Naoom et al (2008) suggest that implementation takes places in six stages, each consisting of several components, along a set timeline. These stages refer to exploration of the context, installation of the intervention, initial implementation such as a pilot, full implementation, innovation and sustainability.

This said, there is a general lack of considering the wider organisational, managerial and political influences (Denis, Hebert, Langley et al, 2002) which may impact on the context in which the implementation is to occur. When applied to the NHS, Dopson, Fitzgerald, Frelie et al (2002) argue that this process is likely to be 'messy, dynamic and fluid'. There is growing evidence that a process of adaptation to local need and context is the way forward, rather than adoption of a potentially inappropriate intervention. Indeed, the question is what works where and why (Institute of Medicine, 2007). Specifically, Kirsh, Lawrence and Aaron (2008) state that operational improvement within a specific context is challenging due to the limitations of the literature describing the improvement. For example, studies often fail to mention the rationale for the intervention, barriers tend to be presented in general terms and though the prospect of challenges is acknowledged, there rarely is any guidance on how to deal with such obstacles. This noted, there are exceptions such as Golden's (2006) model of healthcare organisational change. This model outlines stages based on: 1. identification of a performance gap, 2. determining the desired end state, 3. assessing readiness for change, 4. broadening support and

organisational redesign and 5. reinforcing and sustaining change. All stages are described and evidenced by using practical examples from an implementation effort in a multi-site hospital in Canada.

With the latter in mind, the dynamic processes and procedures employed and the problems experienced when implementing violence risk assessment and management measures into every day clinical practice across the State Hospital are described in detail. The aim of this implementation was to ensure that each patient had:

1. A structured risk assessment using an evidence based Structured Professional Judgement (SPJ) tool leading to a tailored risk management package included as part of the care and treatment planning paperwork.

2. A formal review of the risk assessment and management plans on (at least) an annual basis.

5.2 Description of the setting and context of the implementation

Definition of implementation, context and setting

Implementation, context and setting are concepts that are widely used in the literature and yet have inconsistent meanings. For the purpose of this chapter, implementation refers to the processes employed to assimilate the use of an intervention into an organisation (Rabin, Brownson, Haire-Joshu et al, 2008). In this thesis, this refers to the use of formalised risk assessment tools into the State Hospital. Context is defined as the circumstances surrounding the implementation effort, and the setting describes the environmental characteristics in which the implementation occurs (Davidoff, Batalden, Stevens et al, 2008).

Setting

The State Hospital is the high secure psychiatric hospital for Scotland and Northern Ireland. Patients are admitted because of a major mental disorder, and the link between their mental health needs and the serious risk of harm posed to others. Patients are transferred to lower secure settings by a process of clinical team decisions and ministerial agreement for those on restriction orders. At the time of implementation (2005/2006), the

hospital consisted of 11 wards including one female, one learning disability, one admission ward, two rehabilitation wards and six continuing care wards.

Patient Population

There were approximately 240 patients resident at the State Hospital at the time of implementation. Of these, the majority were male (95%). The average age was 40 years. Over 70% of patients had been convicted of offences prior to admission, and over 73% had reported adverse childhood experiences such as physical and/or sexual abuse (The State Hospitals Board for Scotland Annual Report, 2005/06). Schizophrenia was the primary diagnosis for most patients (70%, Thomson et al, 1997).

Legislative context of implementation

Politically, there is a growing demand for strategies to prevent serious violent crime specifically, and to reduce offending and reoffending more generally. In Scotland, the MacLean report (Scottish Executive, 2000) on serious violent and sexual offenders highlighted the need for systematic and structured risk assessment and management. This is further reflected in amended legislation (Criminal Justice (Scotland) Act, 2003, Management of Offenders (Scotland) Act, 2005 and Mental Health (Care and Treatment) Act (Scotland), 2003), and governance guidelines and arrangements (Multi-Agency Public Protection Arrangements, 2006; Risk Management Authority, 2004) in Scotland. The introduction of the Mental Health (Care and Treatment) (Scotland) Act (2003) in October 2005 included appeals against excessive security and this has contributed to the development of additional medium and low secure hospitals. It was expected that a large number of patients would be transferred from the State Hospital to less secure environments. Not only did this require for the systematic and structured sharing of information on risk factors, there was also a pronounced need to ensure that risk management strategies were set into place and applied to ensure realistic continuity of care and prevention of possible aggressive behaviour. In other words, the context of the implementation prescribed the need to apply violence risk assessment tools to clinical practice. Golden (2006) indicates that this identified gap between current organisational performance and determined or desired end state needs to be acknowledged as the organisation's vision.

Multi-disciplinary risk assessment and management in clinical practice

The shift of focus from risk prediction to risk prevention emphasises the need for care to be proactive rather than reactive (Thomson, 2000). In practice this means that all risk management information such as treatment planning, formulation and review documents need to be transparently clear to all staff involved in the treatment of patients (Morgan, 1998). As a consequence, the task of risk assessment and management is increasingly seen as a matter of multi-disciplinary team decision-making (Haque & Webster, 2012; RMA, 2011). This stance was adopted by the State Hospital within a care and treatment planning approach thereby allowing multi-disciplinary teams to provide realistic and collaborative care through the integration of assessment and management of risk (Lamont & Brunero, 2009). The completion of risk assessment in a team setting is thought to discourage clinicians from viewing the risk assessment as a complete process, but instead as part of a dynamic concept of management. Not only does this ensure that risk is viewed within a wide holistic framework it also enables the transfer from discussion into clear action points within an organisational system (Lamont & Brunero, 2009).

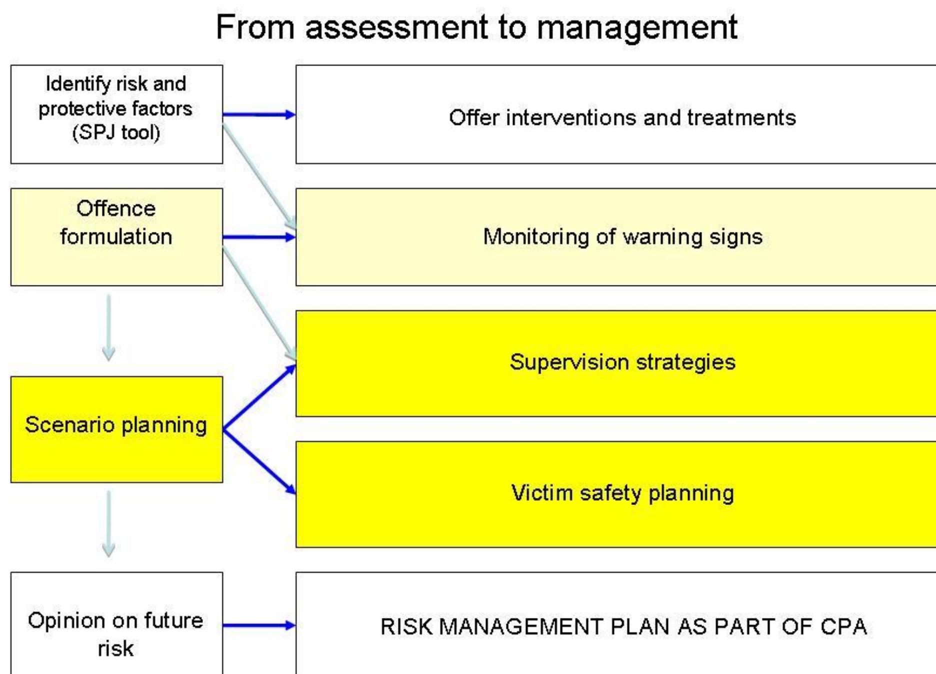
Adaptation

In line with guidance from the literature, the implementation had a core component that was crucial to achieve the designed impact, and peripheral elements that allowed adaptation, i.e. some aspects of the implementation process were shaped according to organisational structures (Kirsh, Lawrence & Aaron, 2008; Greenhalgh et al, 2004). In practical terms this meant that clinical teams developed different preferred approaches to the collaborative care and treatment planning process. However, the key implementation features of this framework were (see figure 3):-

- Team identifies an appropriately qualified person to complete a review of collateral information in a format that can be used in the future.
- Team identifies an appropriately qualified person to draft a structured professional judgement risk assessment including identification of risk factors, offence formulation and scenario planning using an agreed template and format.
- Draft risk assessment is brought to the clinical team for discussion by all MDT members.

- Team agree the risk factors, offence formulation and scenario plans and make risk management plans as part of the care and treatment planning process.
- Each key risk issue is linked to a risk management objective.
- Risk management objectives are conceptualised in terms of interventions and treatment, monitoring, supervision and victim safety planning.
- All objectives for the management of risk have a responsible person(s) linked to them.

Figure 3 Illustration of process from violence risk assessment and management



This process can be tailored to individual working practice, in particular in relation to how risk assessments are completed and discussed. For example, at the State Hospital, the ward psychologist on the admission ward completed the historical scale using file information. The clinical and risk scales were completed jointly by the clinical team based on their knowledge and experience of the patient. In contrast, other wards preferred a qualified risk assessor, either a member of the clinical team or an ‘expert’ outsider (for instance, when assessing sexual violence risk) to draft the entire risk assessment based on

file information and then discuss each item through clinical team discussion. The 'expert' outsider was a member of clinical staff at the State Hospital and was trained in the use of the relevant risk tool (i.e. the SVR-20 or the RSVP).

5.3 Description of the implementation process: Organisational redesign

Setting the scene

Leadership

Leadership has been repeatedly found to be a key factor in organisational change (Hall, 2007; Corrigan, Steiner, McCracken et al, 2001). The change leader is responsible for highlighting the benefits of the proposed change to all stakeholders and maintaining interest throughout the implementation. Golden (2006) summarises the ideal leader as a person with specific characteristics such as being influential, well respected and connected throughout the organisation, as well as being considered to have expertise, confidence and appear motivated and empathic towards others. This means that the leader can come from any level within the organisation, including management, front line supervisors and team leaders (Greenhalgh et al, 2004). This noted, Golden (2006) cautions that the change leader should not be the most senior executive as time, resources and sufficient knowledge of the implementation process are required.

At the State Hospital, the change leader was a Consultant Forensic Clinical Psychologist, was a Board Member of the Risk Management Authority, and had been involved in implementation projects in the Scottish Prison Service. In this way, the change leader had accrued internal as well as external respect, had direct access to governance and future planning in services, was knowledgeable and confident in terms of wider research evidence and provided opportunities for staff to give feedback on the process.

Challenges. Although mandatory, staff did not always follow the guidelines communicated by the change leader. It appeared that the ability to create relationships with key staff, and thereby connect with the organisational culture was vital to successful implementation. While this is reflected in previous research (Galbraith, 2001), in practical terms this means that the leader has to develop strategies to make staff feel valued and consulted, i.e. find the resources, choose key staff, and spend considerable time with staff outwith the implementation context.

Change team

Golden (2006) points out that while research links certain qualities in the change leader with successful implementation, the literature does not indicate that there should be only one leader. Instead, he suggests that a steering committee consisting of respected members of staff should be set up, whose role it is to maintain credibility and influence throughout the implementation. Indeed, Brooks, Pilgrim and Rogers (2011) posit that established allies within the system are as important as the change leader.

At the State Hospital, a clinical risk assessment and management strategy group was set up by inviting specific interested parties to assist and share their professional opinion on the implementation process. In line with practical guidelines, the strategy group consisted of highly regarded and skilled clinical staff from diverse backgrounds (psychiatry, psychology, nursing, occupational therapy, clinical effectiveness and information technology staff). The remit of this group was to push the change forward and to offer constructive advice. The change leader consulted the change team on any procedure and new care and treatment documentation suggested.

Challenges. Surprisingly, some members of the original strategy group were openly advocating against the use of standardised risk assessment measures, and did not appear to be in favour of the introduced risk management documentation. As Golden (2006) argues any organisational change is likely to meet opponents. He recommends that, if necessary, 'formal powers' should be employed to deal with these and members of the change team should be carefully selected (Pronovost, Berenholtz & Needham, 2008). As a result the change leader took a more proactive approach to the selection of the change team and chose specific and dedicated individuals who were able to promote the implementation effectively.

Senior organisational support

The literature cites resources such as funding, manpower and appropriate information technology (IT) and administrative support as key components of successful change; the lack of these has been associated with implementation failure cross-culturally, i.e. Canada, Europe, Australia and Japan (Drake, Bond & Essok, 2009). In order to ensure the availability of resources, as well as widening organisational support, it is imperative to secure senior organisational assistance.

As part of the strategic plan, the Chief Executive and the State Hospitals Board signed up to the implementation from the beginning. This was also intended to emphasise the future vision for the organisation. By doing so, the change leader succeeded in securing funding and resources. This enabled the change leader to use project management time flexibly, to pilot various models of training and manners of risk assessment completion, and to assess which one was most effective in assisting in the completion of risk assessment and management plans.

Pilot project

In research, the purpose of pilot studies is to identify barriers and potential problems in the applicability of research instruments or research protocols (Baker, 1994). The usefulness of a pilot also applies to implementation projects with the added advantage that conducting a pilot study can be used to demonstrate that the implementation is worth supporting.

Prior to implementing the risk strategy across the hospital, a stakeholder analysis was conducted to identify all staff groups and departments most likely to be affected by the implementation. A pilot group was established which piloted the implementation on three out of the 11 wards before the risk assessment and management changes were funded to be set in place across the entire organisation. This allowed the strategy group to assess barriers and incentives for uptake on wards and staff to familiarise themselves with the change. Based on the needs and problems staff identified, the implementation process was accordingly revised where appropriate.

Introducing the implementation

Care and Treatment documentation

Past research on practical implementation issues state that one of the essential strategies to ensure staff support is to build on existing practice and protocols, i.e. adapt rather than adopt (Hall, 2007). Consequently, changes were kept at an absolute minimum at the State Hospital. Where changes were necessary, training was provided on all documents and care and treatment processes integral to the implementation of SPJ tools and management strategies.

Training

The literature on training in violence risk assessment tools repeatedly highlights the benefits and impact of training on the quality and accuracy of risk assessments conducted (Reynolds & Miles, 2009; Belfrage, 1998). However, training on the risk assessment tool alone is not sufficient to enable optimal care and treatment; indeed, there is a need for training on how to translate the information collected in risk assessments into effective risk management plans for their clients. The implemented care and treatment process involved five essential stages to enable clinicians to produce defensible and appropriate risk assessments leading to a coherent risk management plan. This plan was designed to address the key risk management activities of intervention, treatment, supervision, monitoring and victim safety planning (Risk Management Authority, 2007):-

1. Review of all file information in order to obtain a thorough understanding of the person's background and past history.

2. Identification of risk factors relevant to SPJ tools used.

3. Understanding of the person's pattern of offending behaviour (formulation of offending or offence analysis).

4. Scenario planning on the nature (imminence, severity and likely victims) and likelihood of future violence in various settings (secure hospital, low secure settings, community).

5. Risk management plans linked to risk factors, offence analysis and scenario plans.

In line with research on successful implementation strategies, training was delivered through various means and learning activities to increase applicability to clinical practice (Corrigan, Steinert, McCracken et al, 2001). At the State Hospital, training packages were developed at two levels:-

<u>One day awareness training.</u> This training session was open to all qualified staff and aimed to establish an understanding of the principles and processes involved in violence risk assessment and management planning, so that staff could effectively contribute to the management of patients at risk.

Two full days. Key members of the clinical teams on each ward were encouraged to attend the full two day training on the HCR-20, risk management and the whole care and treatment planning paperwork (e.g. file review, identification of risk factors, formulation, scenario planning and risk management planning). The aim of this training was to introduce the use of the HCR-20 system of risk assessment and management as part of the patient's annual review.

Training outcome

The effectiveness of training was assessed in two separate evaluations; results indicated that there was a significant increase in trainees' knowledge post HCR-20 training (Hamill, 2007). These findings were replicated in a recent evaluation of risk assessment and management training at the State Hospital underlining the potentially positive impact of the training model used (Neil, 2010). However, the pre-training scores were relatively high suggesting that attendees already had a degree of knowledge or awareness of the violence risk assessment and management process.

External validation of training

According to Kitson, Harvey and McCormack (1998) successful implementation occurs when research evidence is high, the context receptive to change, and where facilitation to change uses both external and internal sources. Accordingly, the implementation, in particular the training on the procedures and process, was externally validated. Both the risk assessment and management system and the manner of training delivery 'train the trainers' were approved by the Risk Management Authority in Scotland, and the training is now offered to external organisations by the Forensic Network in Scotland. This training approach has been reported as effective in other papers (e.g. Sederer, 2009). Additional training sessions were provided at a later date to enable assessors to rate patients on the Psychopathy Checklist Revised (Hare et al, 1991) and International Personality Disorder Examination (Loranger, 1999), both are relevant to the completion of the HCR-20, the SVR-20 and the RSVP.

Challenges. Despite the training and efforts taken to ensure that the new care and treatment documentation fitted in with existing practice, some clinical teams consistently failed to adhere to the changes in the new documentation. This was evident at an administrative level (e.g. documents were not filed correctly and thus appeared to be

missing) and at a clinical level (e.g. clinical teams used outdated protocols and templates) despite the communicated need for attention to be paid to all aspects of the risk assessment process. It appeared that some clinical teams did not recognise the importance of the changes and in particular the need to translate risk issues into risk management plans. However, this situation was resolved when the medical director encouraged staff members to adhere to the newly introduced care and treatment documents. This was further facilitated when the organisation formally commissioned the change leader to write a detailed violence risk assessment and management policy which was subsequently approved and published. With hindsight, these steps are emphasised in the literature, in particular in reference to providing clear and accessible policies surrounding the change (Michie et al, 2007).

Another noteworthy obstacle experienced was the extent to which staff were able to introduce the concept of risk formulation as part of risk assessment and management. In terms of risk, the aim of formulation is to provide a holistic, psychological framework to understand the interaction between various factors, and identify underlying causal mechanisms (Lewis & Doyle, 2009). Though the Royal College of Psychiatrists (1996) stressed the importance of formulation in identifying the specific factors likely to increase and decrease risk, there appear to be no specific learning modules on how to achieve this.

Dissemination strategy

The most challenging aspects of organisational redesign is the dissemination strategy used (Forsner, Wistedt, Brommels et al, 2010). The dissemination strategy not only refers to the means by which the implementation message should be conveyed (i.e. implementation input through multiple channels) but also the communication style of the change leader (Shortell, 2006). In particular, the most change-supportive interactions are characterised by clearly and consistently communicated objectives, and the message is tailored to the audience and delivered by a credible, honest source (Simpson & Dansereau, 2007). Accordingly, Golden (2006) argues that ‘it serves no one to sugar-coat the truth’ (p.14); he recommends that the sacrifices staff are asked to make during the implementation phase should be openly acknowledged, thereby making staff feel valued and appreciated.

Throughout the implementation process at the State Hospital, the change leader provided guidance protocols on relevant procedures, gave support to all wards and encouraged all staff to discuss and share the problems they experienced. The change leader and other

members of the implementation team also attended the clinical team and multi-disciplinary meetings on each ward in person to receive feedback, to assess progress and problems outlined. In addition, question and answer sessions were set in place to assist clinical staff to adjust to the implementation. Consultants were invited to discuss their concerns and raise any issues. For example, some consultants thought that the new documentation was too time consuming and impacted on the clinical time available to spend with patients and clinical teams. As a result, the change leader invited all clinical teams and consultants to provide alternative solutions, and where feasible these led to revised protocols.

Sustainability

The crucial part of any implementation effort is to ensure the sustainability of the implementation (Hyde, Falls, Morris et al, 2003) and avoid the potential 'implementation-evaporation' effect (NHS Institute, 2007). It has been suggested that the factors that initially aid the implementation process are different in nature and impact from those that are important for the sustainability of the change (Martin, Currie, Finn et al, 2011). Though a recent systematic review assessed the sustainability of change across 125 studies, the authors concluded that to date the methods used to assess implementation fidelity were insufficient and inappropriate as very few studies used rigorous nor objective evaluation designs (Stirman, Kimberly, Cook et al, 2012).

Project management and Action Plan

In order to achieve sustainability, effective project management and action planning should go hand in hand (Hall, 2007). Both involve mapping out the likely sequencing of events, and attempting to stick to a set timeline. However, project management refers to the *tasks* required to be completed within this timeline whereas an action plan focuses on the *process*. While Ambrose (1987) postulates that an action plan is essential to organisational change, Golden (2006) argues that the most effective change leaders acknowledge the dynamic nature of organisational change and deal with events as they occur. This potential tension of striving for full implementation while providing flexibility to allow adaptation to the change requires a very specific set of management and interpersonal skills.

At the State Hospital, for instance, the change leader reviewed implementation plans and modified these in order to meet organisational needs. This was particularly evident when implementation plans were changed according to the training model piloted.

Governance Systems

Audits were conducted to act as incentives for adhering to the new risk assessment and management process (Hayward, Gyatt, Moore et al, 1997). According to Sederer (2009) 'what gets measured gets managed' (p.715), especially when measures are developed collaboratively and are seen as relevant. As part of the overall governance strategy, performance monitoring allows the organisation to make technical adjustments to the system and also to identify where additional organisational realignment is necessary.

At the State Hospital audits were conducted on annual care and treatment plans throughout the implementation. While the first audit was conducted by the psychology department in an attempt to assess all care and treatment plans across the hospital, in the following years the clinical effectiveness department were assigned this task. This resulted in a smaller number of care and treatment plans investigated within a specific time period. Table 22 outlines the results of these audits

Table 22 Number (%) of care and treatment plans completed according to implementation procedure

Year	No of care and treatment plans audited	No of HCR-20s completed	Formulation of offending behaviour	Scenario plans		Warning Signs
				Hospital	other	
1 (April 2007 – March 2008)	84	35 (42%)	24 (29%)	61 (73%)	35 (42%)	27 (32%)
2 (Nov 2008 – Jan 2009)	30	19 (63%)	18 (60%)	18 (60%)		25 (83%)
3 (Dec 2009 – Feb 2010	21	19 (90.5%)	16 (76%)	19 (90.5%)		19 (90.5%)
4 (Dec 2010 – Feb 2011)	27	26 (96%)	25 (92%)	26 (96%)		24 (88%)

Challenges. The findings of table 1 imply that staff seemed to experience difficulties in adhering to the newly introduced guidelines and suggested processes. It is thought that this lack of adherence to the new process may have been partly due to staff's perception that the audits were not official measurements even though outcomes were reported to the senior management team. This situation changed as soon as governance targets were set as part of the local delivery plan, i.e. as part of the controlled systems including the integrated care pathways process and key performance indicators. This noted, current results indicate that there is still room for improvement (e.g. in relation to documentation on warning signs).

Research

In addition to monitoring, research is a useful means to evaluate the process and outcome of implementation efforts (Hyde, Falls, Morris et al, 2003). As part of this thesis, the predictive validity of SPJ tools when implemented into clinical practice among mentally disordered offenders was investigated. The process of the research study leant further support to the results identified in the audit as problems in receiving and locating completed risk assessments were noted.

Challenges. Due to difficulties experienced in the process of obtaining completed risk assessment tools, the recruitment period took significantly longer than anticipated. When RMOs or the ward psychologist indicated that a patient had been risk assessed, the research student searched relevant files (provided patient consent had been given to do so) for valid SPJ tools in the absence of administrative support. Though time consuming, this enabled the identification of SPJ assessments that were missing, were incomplete, were only draft versions or had been filed randomly. The results of this are presented in detail in the next two chapters, though in general one can conclude that this research highlighted issues of great clinical concern. This is because the research site, i.e. the State Hospital, is its own health board, and is required to provide defensible, transparent and effective care and treatment. From an ethics stance, the absence of valid documentation of clinical decisions, assessments and reports is unacceptable.

5.4 Discussion

Clinicians routinely assess violence potential and make related management decisions in psychiatric emergency services, civil psychiatric hospitals, forensic settings, and

outpatient practice (Haque, Cree, Webster et al, 2008). It is unclear to what extent the guidelines used in this implementation are applicable to services where risk assessment measures and treatment plans are completed outwith the multi-disciplinary context. Though different risk settings may require different guidelines, the overarching principle is the same: there is a need to balance the risk to the public with the human rights of the forensic patient (Sen, Gordon, Adshead et al, 2007). This can only be achieved if risk is appropriately identified and risk management plans are put in place. In other words, violence risk assessments must be implemented and used in clinical practice. Ideally, in this way, the patient is given the opportunity to address his difficulties while staff are able to develop logical and coherent strategies to manage the risk presented. However, the literature has repeatedly shown that changes at an organisational level are notoriously difficult to achieve (Michie et al, 2007); the State Hospital proved to be no exception to this. The results of recent audits imply that adherence to the implemented care and treatment documentation required to ensure effective risk management is still not at 100 per cent. The process and results of the research study on the predictive validity of the HCR-20 (Chapter 6) and the sexual violence risk assessment tools (chapter 7) flagged up further procedural problems, at both an administrative and a clinical level. Perhaps this should have been expected as the nature of the implementation required the entire organisation to change. Though this task was apparent from the start, the potential impact of the organisational culture became clear during the implementation.

Organisational culture

Organisational culture refers to values, beliefs and norms created by individuals working in an organisation (Parmelli, Flodgren, Beyer et al, 2011). Though a change-receptive organisational culture is often cited as a key aspect of successful implementation (Brooks, Pilgrim & Rogers 2011), there is very little research on the dynamic interplay between individuals and the organisation, and how this interplay may impact upon both, individual and organisational change. This lack of knowledge is supported in the conclusions of a recent systematic review by Parmelli and colleagues (2011) who stated that available evidence to date did not highlight any effective, generalisable strategies for changing organisational culture. This said, Eccles, Hrisos, Francis et al (2009) posit that organisational change is interlinked with individual behaviour change. Consequently, the challenges experienced at the State Hospital may have been due to the failure to apply behavioural theories to the implementation process. This appears to be a common neglect

as in a review of 235 guideline developments and implementation studies, Davies, Walker and Grimshaw (2010) report that only a quarter were found to have used behavioural change theories. Social cognitive theories, in particular, are the models sought out to explain clinical behaviour of professionals. These models assume that intention and behaviour can be influenced by providing appropriate information concerning a particular behaviour. This noted, Godin, Belanger-Gravel, Eccles et al (2008) reviewed 76 studies with the conclusion that such theories explain only one third of behavioural variance. Perhaps this is because behavioural models fail to take account of the influence of human habit (Nilsen, Roback, Brostorm et al, 2012). Habits are automatic responses; they are context specific and are based on repetition of behaviour within this context. The work of clinicians is thought to be predominantly routine, i.e. habitual (Godin et al, 2008), and thus gaps in knowledge, skill, attitude or motivation may not be the reason for failed implementations but rather that health care professionals are prone to develop efficient and automatically activated responses in clinical practice. Similarly, Kothari, Rudman, Dobbins et al (2012) argue that clinicians use tacit knowledge in clinical practice. This type of knowledge is highly personal, subject based and intricate in nature (Mughal, 2010). It is thought to be context-specific and embedded within organisational routines. Tacit knowledge is therefore not influenced by the provision of scientifically sound research literature; a different set of implementation processes may be required to achieve the desired change.

Implementation climate

While organisational culture is thought to be socially constructed and stable, implementation climate refers to the perception rather than the attitude of employees (Weiner, Belden, Bergmire et al, 2011). Research has linked implementation success with a positive implementation climate (Holahan, Aronson, Jurkat et al, 2004). This, in turn, seems to result from high quality training, engaging employees in decision making and providing incentives. Though staff at the State Hospital were invited and encouraged to get involved in all aspects of the implementation and were trained in the risk measures and management packages, the organisation’s readiness for change was perhaps overestimated. While there are tools to assess organisational capacity to change (French, Thomas, Baker et al, 2009), these do not seem to tap into different aspects. Perhaps this is because it is often with hindsight that various obstacles and barriers to change become clear, i.e. assessment of relevant factors is retrospective and biased. This may be even

more complex when considering Peters (1992) who compares the NHS to a living organism that co-evolves with the environment. As a consequence, such organisations demonstrate non-linear behaviour, which means they are, by nature, unpredictable. Change cannot be planned though perhaps facilitated. The implementation literature defines the facilitator as an implementation expert who provides interpersonal support and helps to solve problems around the change efforts. As such, a facilitator is not necessarily the change leader. Kauth, Sullivan, Blevins et al (2010) report that the use of a facilitator significantly increased the appropriate utility of implemented guidelines, however, this result was based on self report only.

The role of this thesis research in the implementation process

Though papers add that research is an important component of the evaluation of any implementation, the process of this thesis impacted on the wider implementation. The research student highlighted procedural problems and issues of clinical significance such as the lack of filed documents and assessments, and in this way enabled the change team to take proactive measures. For example, clinical teams and administrative support workers were repeatedly reminded to adhere to the newly introduced care and treatment documentation. As described in the previous chapter, the research student liaised with staff in order to recruit patients for the research study. The task of engaging staff meant that both clinical teams and the nursing workforce were repeatedly reminded of the purpose, the intent and the underlying rationale of the implementation. In other words, the present research made the implementation visible. One cannot deny, however, that the implementation affected the research process in that there were difficulties in obtaining data, which delayed the recruitment process and limited the sample size eligible for the research studies described in the next two chapters.

5.5 Limitations

Given the frequently cited concerns by clinicians that SPJ tools are too time consuming (Wright & Webster, 2011, Maden, 2005), it is perhaps not surprising that the implementation of such instruments at the State Hospital was at times challenging. Yet, one may argue that the identification of risk factors and the setting up of appropriate risk management strategies is a useful way of spending clinical time. Indeed, to date there has been no investigation as to whether the time taken to complete risk measures negatively impacts on the actual time spent with patients. Though the present research study may

have had a positive impact on the implementation in some ways, the literature recommends that research and evaluations of any implementation should occur two years following the implemented interventions (Fixsen et al, 2008). This suggests that perhaps the commencement of the research study at the State Hospital was too soon, and the organisation may have required more time to get used to the new care and treatment documentation. This appears to be reflected in the audit results showing a positive trend of clinical teams increasingly adhering to the implemented format of completing risk measures and management plans. However, these audits were purely quantitative, and as such there is a lack of a qualitative assessment. For example, the extent to which identified risk factors were translated into risk management strategies is not known. This said, Vojt, Thomson and Marshall (2012 – 2013) are currently addressing this gap by assessing the quality of implemented SPJ tools and risk management plans across the State Hospital. This study also aims to investigate the clinical utility of implemented SPJ tools and the extent to which risk management plans, as part of the implementation, are used by treating staff in practice. Furthermore, Vojt, Marshall, Thomson et al (2012) conducted a qualitative study exploring the perception of risk management by mentally disordered patients across three different risk settings in Scotland. This is in line with Brooke et al (2011) who note that involving the service user was a suitable process-outcome factor in evaluating implementation efforts.

CHAPTER 6

THE PREDICTIVE VALIDITY OF THE HCR-20 FOLLOWING IMPLEMENTATION

The move from risk assessment to management requires a proactive approach to risk prevention. The task therefore is to assess risk factors associated with an increased likelihood of risk of harm in order to inform the management of potentially risky individuals. The translation of risk factors into management action points should in theory reflect that those individuals identified as high risk receive high treatment input in terms of monitoring strategies, range of appropriate interventions and scenario planning, i.e. risk management. Yet, implementation research discussed in the previous chapter indicates that the introduction of evidence based knowledge into clinical practice is characterised by obstacles and barriers at the micro and macro level in health care organisations. This may explain the dearth of literature on the evaluation and utility of violence risk assessment tools when introduced in clinical practice.

6.1 Introduction

While researchers and practitioners alike encourage efforts to bridge the gap between research and clinical practice (Douglas & Skeem, 2005), there is surprisingly little knowledge of the validity of the HCR-20 when applied in clinical practice. Though there are prospective studies arguing that risk information was used (Macpherson & Kevan, 2004; de Vogel & de Ruiter, 2006) as discussed in chapter 2 of this thesis, these generally lack description of the implementation process. As a result, the knowledge on SPJ tools gathered to date does not take a detailed account of clinical risk judgement and its consequences for treatment despite this being one of the main underpinnings of the SPJ methodology. Naturally, to address this disparity calls for a prospective, longitudinal research design within an ecologically valid context. There are, however, substantial methodological and ethical obstacles to such research endeavours. For example, Litwack (2001) quite rightly points out that the 'proper' scientific study of the accuracy of violence risk assessments would entail the discharge of individuals classified as dangerous into the community. Neither can truly randomised control trials be used to study the link between risk assessment and management as clinicians have a duty of care (Adshead, 1999). This means that while statistically, the focus is on prediction, the clinical function of a risk assessment is risk prevention, i.e. 'clinicians are bound, morally, ethically and legally […]

to prove themselves wrong when they predict violence; they must take every reasonable action to ensure that those at high risk for violence do not act violently' (Hart, 1998, p.123). As a consequence, the bulk of research on risk assessment tools is retrospective in design. That is, almost all research is conducted under near-optimal, laboratory like conditions which do not reflect clinical reality. For example, raters are typically researchers who are well trained in the relevant tool and are aware of the need to meet acceptable quality markers such as reliability, consistency and validity. External factors relevant to clinicians such as limited time or competing clinical work may not affect researchers. In addition, research raters are bound to assume face validity of information available given the lack of possibility to consult key staff on conflicting or missing file notes. It follows then that the ratings provided by researchers may be significantly different from those produced by clinicians as the relevant risk assessment is not used to inform clinical decision making and formulations.

Researchers and clinicians as risk assessors

The difference in ratings between researchers and clinicians is demonstrated in a study on the HCR-20 by de Ruiter and de Vogel (2004) in a Dutch forensic psychiatric setting. Sixty patients were assessed by a number of independent researchers and treating clinicians including treatment supervisors and nursing group leaders. The study found that researchers and clinicians rated patients significantly different on HCR-20 items and/or the final risk judgement. In addition, the authors document that the subjective opinion and feelings of clinicians influenced the direction of risk assessment ratings. For example, if clinicians indicated they felt controlled or manipulated by the patient, the final risk rating tended to be higher whereas if clinicians stated positive feelings in relation to the patient, the final risk rating was lower. De Ruiter and de Vogel (2004) explain these results by referring to the complexities of the therapeutic relationship between patient and clinical staff. This is further endorsed by Dernevik, Falkheim, Holmqvist et al (2001) in Sweden. In this research, 40 psychiatric nurses in a forensic unit gave significantly higher risk ratings than a group of independent HCR-20 experts. The latter were comparable to researchers in that they had no contact with patients and coded the HCR-20 on file information only. Dernevik and colleagues observed that nursing staff's perceptions of patients as 'helpful' were associated with lower HCR-20 scores while perceptions of closeness, i.e. familiarity, predicted higher risk ratings. The difference in risk ratings between clinical staff and researcher or experts was further examined in both studies. For

example, the clinician groups attended a one day workshop on the HCR-20 which led both papers to assume that the scoring instructions for some risk items were not well understood. In addition, de Ruiter and de Vogel (2004) note that while researchers used about two hours to complete an HCR-20, clinicians reported to need between 15 to 30 minutes only, often completing the tool based on personal knowledge and without consulting the person's file information. This may also explain the poor interrater reliability on some risk items reported in this study. While researchers demonstrated generally excellent interrater agreement, the intraclass coefficient (an index of interrater reliability) between the two clinical groups, and the clinical groups and the researchers, was particularly poor on the risk items of previous violence, early maladjustment, impulsivity, stress, noncompliance with remediation attempts and exposure to destabilisers. Nonetheless, De Ruiter and de Vogel (2004) assert that the conscientious use of the HCR-20 manual and scoring instructions should minimise any potential subjectivity during the rating process. Notably, the authors repeated this study and found that researchers and senior clinicians achieved similar levels of predictive validity. This, the authors mused, seemed to be primarily driven by the study focus being on the validity of consensus rather than on individual ratings (de Vogel & de Ruiter, 2006).

Individual differences among risk assessors

In spite of coding instructions provided in the HCR-20, individual differences among clinicians may significantly influence risk ratings. Sutherland, Johnstone, Davidson et al (2012) report on the interrater agreement between clinicians when using the Risk of Sexual Violence Protocol (RSVP; Hart, Kropp, Laws et al, 2003). This tool was described in more depth in chapter 3 of this thesis. Briefly though, it is an SPJ tool used when assessing sexual offenders. Although research on the tool is limited to date, it seems to be widely used in clinical practice (RMA, 2005). The study by Sutherland and colleagues (2012) required 28 clinicians with different professional backgrounds, levels of experience and training to complete the RSVP on six vignettes of different levels of complexity related to offence, risk and clinical factors. The authors report there was no relationship between years of clinical and/or forensic experience, confidence in using the RSVP and the extent of interrater agreement. The variation in interrater agreement persists even when clinicians within the same profession, i.e. similar training and background, complete the HCR-20. Keown and Buchanan (2002) found that senior psychiatrists scored the HCR-20 significantly lower than junior psychiatrists, in particular on the clinical and the

risk management scales, despite having been given the same clinical information. This said, the majority of HCR-20 studies evidence good to excellent interrater reliability (Douglas & Reeves, 2010), though perhaps this is because the intraclass coefficients reported are typically based on the total scale or the subscales. Given the nature of the SPJ approach, i.e. combining clinical judgement with empirical guidelines, one may expect some variation in interrater agreement at an individual item level. Indeed, Rufino, Boccaccini and Guy (2010) found that clinicians in Canada perceived several HCR-20 and PCL-R items as highly subjective to rate. Though the sample was relatively limited in that clinicians were nine clinical doctoral students, the risk items identified as most subjective mirror those mentioned by de Ruiter & de Vogel (2004). It seems that historical items bar early maladjustment and relationship instability were thought to be exempt from personal judgement whereas most clinical and risk management items were seen as requiring subjective judgement. Rufino and colleagues (2010) corroborated their findings pointing out that those risk items perceived to require significant subjective judgement were also those with the lowest interrater agreement. Yet, scoring subjectivity does not appear to influence predictive validity. The synthesis of published and unpublished studies on the HCR-20 indicates that the predictive effects of the HCR-20 subscales are almost identical in size, though the historical scale is generally the strongest predictor (Guy, 2008; Douglas & Reeves, 2010). Though reviews included prospective studies, a notable shortcoming is the lack of prospective studies on the HCR-20 when implemented into care.

The predictive validity of SPJ tools following implementation

To date, there appear to be two notable research efforts describing the predictive results of implemented violence risk assessment tools among mentally disordered offenders (Braithwaite, Charette, Crocker et al, 2010; Pedersen, Rasmussen & Elsass, 2012). Braithwaite et al (2010) report on the predictive validity of the Short-term Assessment of Risk and Treatability (START, Webster, Nicholls, Martin et al, 2006) following clinical implementation in Canada. The implementation of this particular SPJ measure was conducted and described by Crocker and colleagues (Crocker, Garcia, Israel et al, 2008; Crocker, Braithwaite, Laferriere et al, 2011). Through focus groups, the authors found that staff appeared to approve of the START, audits showed that assessments were conducted for the majority of patients (81%) and in credit to the implementation, the START continued to be used beyond the research study. Statistically, the START was predictive of physical aggression against others and other challenging behaviours, namely

suicide attempts and substance abuse. Clinical risk estimates based on the START did not predict any aggressive behaviour. Unfortunately, the clinical implications of these results are unexplored. Surprisingly, Braithwaite et al (2010) did not seem to consider the possibility that the tool might not have informed risk management. The fact that the START was able to predict aggressive behaviour, despite successful implementation as postulated by the authors, may imply that it did not achieve what it was meant to do, i.e. inform interventions in order to prevent aggression. Perhaps this is because the study was based on a small sample of 34 patients, and thus the statistics are likely to be flawed.

In contrast, in a recent implementation study on the HCR-20 in a forensic psychiatric hospital in Denmark, Pedersen, Rasmussen and Elsass (2012) report that the instrument performed with lower levels of efficacy over a follow-up period of 21 months (ranging from 11 to 33 months). Outcome data were incidents recorded in the hospital by nursing staff and official reconviction data. The sample consisted of 81 male psychiatric patients, of whom two in five (43%) were reconvicted during follow-up. The predictive validity of the HCR-20 subscales as well as the final risk judgement were reported as within the poor to moderate range (AUC = .56 to .68) when using reconviction as outcome variable. In terms of inpatient incidents, all HCR-20 scales were predictive of inpatient aggression, yet the effect size of the reported AUCs were thought to be lower than in the wider literature. The authors interpret these findings as indicating that the HCR-20 effectively informed risk management, and thus prevented incidents prior to their occurrence. This is based on the comparison to a previous, retrospective research study conducted on a similar cohort (Pedersen, Rasmussen & Elsass, 2010). In the prospective study, significantly fewer high risk patients reoffended when compared to the retrospective sample (67% vs 15%). Notwithstanding, Pedersen and colleagues (2012) concede that there are limitations to their implementation study such as relying on only two sources of outcome data, both of which are known to be affected by underreporting. In addition, Pedersen, Rasmussen and Elsass (2012) mention that the time gap between completion of risk assessment and incident may have affected the analysis. Given that the authors fail to refer to the implementation procedure, this seems to imply that the results reported are based on one single HCR-20 conducted at the beginning of the study. Yet, Douglas and Skeem (2005) point out that one should not presume 'that [risk] point estimates will remain valid indefinitely' (p. 348). This is to say that research also needs to consider updated risk assessments as these should be reviewed and revised in clinical practice (Haque & Webster, 2012).

The study presented in this chapter was conducted during the implementation of SPJ tools across the State Hospital. This means that the findings presented are embedded within the implementation process described in chapter 5 but are also influenced by the reality of conducting risk assessments in a clinically active environment. Similarly to Pedersen, Rasmussen and Elsass (2012), the predictive validity of the HCR-20 when used to inform care and treatment among mentally disordered offenders was assessed.

6.2 Methods

Design and Setting

This study was prospective and took place in the State Hospital as part of a hospital-wide clinical development, i.e. the implementation of SPJ tools into practice. While the State Hospital was the recruitment site, all research participants were followed up across less secure settings if discharged during the study period.

Power Calculation

A power analysis was conducted based on guidance by Cornish (2006) and following statistical expert advice at the University of Edinburgh. A sample size of 100 participants was required to detect a statistical difference between recidivists and non-recidivists' HCR-20 and PCL-R scores at power .80. The analysis used the standard deviations reported in previous research on similar samples (HCR-20: Cooke, Michie & Ryan, 2001; PCL-R: Tengstroem, Grann, Langstroem et al, 2000).

Participants

During data collection (2005 – 2007), there was an average of 202 patients resident at the hospital. Of these, 151 (74.7%) were identified with an up-to-date HCR-20. Six patients (4.0%) were thought to be unable to give informed consent by their Responsible Medical Officer (RMO) and 36 patients (23.8%) declined participation in the research. The final sample consisted of 109 male patients (response rate: 72.2%).

The mean age was 38.6 years (sd = 10.7) ranging from 20 – 66 years, with a median of 39 years. The majority of participants had at least one offence prior to the index offence (n = 96, 88.1%) with a mean of 15 previous offences (sd = 13.9, range: 1 – 58), and a median of 10 previous offences. The index offence typically involved violence (n = 87, 90.6%). Table 23 displays further demographics of the study sample.

Table 23 Demographics of study sample (based on file information)

Participant demographics		Number (%)
Diagnosis (based on ICD-10)	*Primary diagnosis*	
	Psychotic illness	101 (92.7%)
	Schizophrenia	86 (85.1%)
	Personality Disorder	8 (7.3%)
	Secondary diagnosis (n = 64)	
	Personality Disorder	26 (23.9%)
	Dissocial PD	16 (61.5%)
Childhood	Physical abuse	38 (34.9%)
	Sexual abuse	31 (28.4%)
	Other experience of adverse events (e.g. bullying or prolonged separation from care taker)	91 (83.5%)
Source of referral	Prison	39 (35.8%)
	Psychiatric hospital	39 (35.8%)
	Court	31 (28.4%)
Adult background	Single marital status	88 (80.7%)
	No educational qualifications	74 (67.9%)
	Alcohol and substance misuse history	70 (64.2%)
	Restricted legal status[2]	54 (49.5%)
	Previous violence in other hospitals	48 (44.0%)

The sample was representative of the wider State Hospital population in terms of age, primary diagnosis, proportion of patients with previous offences, and the mean number of previous offences (Thomson, Bogue, Humphreys et al, 1997).

Measures

Historical Clinical Risk Management – 20 Scale (Webster, Douglas, Eaves et all, 1997)

The Historical Clinical Risk Management - 20 Scale (HCR-20) comprises 20 risk factors, which are divided into 10 historical, five clinical and five risk management items. By definition, the historical factors are static such as history of substance abuse or previous violence, whereas the clinical factors are dynamic and open to intervention. Examples

[2]A restriction order ensures careful management of patients who are thought to be a serious risk to the public due to their mental disorder. Any decision regarding restricted patients' leave, transfer and discharge is made by the Scottish Government rather than the patient's Responsible Medical Officer (RMO). Decisions to vary or remove an order are taken by the Mental Health Tribunal for Scotland.

include impulsivity, negative attitude and major mental illness. The five risk management items are particularly useful for mapping out risk management strategies in patients' current and potential future environments by considering items such as stress or lack of personal support. Each item can be scored as 0 (not present), 1 (partially or possibly present) or 2 (definitely present) according to case-specific information and clinical judgement. While current best practice considers the relevance of each item, at the time of this study items were only scored for presence. The total maximum score is 40. If insufficient information is available, an item can be omitted. Though the presence of each HCR-20 item was rated by all clinical teams, as was standard practice at the time, these ratings were not applied to clinical practice at any point. Rather, the ratings assisted clinicians to focus and evaluate their clinical judgement in discussion with other clinical team members.

Demographic questionnaire

A questionnaire was developed, based on Thomson et al (1997), to code data from patients' hospital files. The questionnaire covers participants' demographic details (e.g. age, level of education, marital status) as well as forensic, legal, psychiatric, health and personal history including details of other family members. In addition, data were collected in relation to participants' index offence and/or behaviour leading to their current admission to the State Hospital.

Outcome measures

The main outcome variable was any violent incident (actual and near miss) recorded in a patient's hospital files, official reconviction data (Scottish Criminal Records Office), or hospital incident reporting systems (e.g. DATIX, IR1). Box 1 outlines the definitions used for incidents and convictions. Outcome data were triangulated by seeking patient self-report on incidents. However, few patients volunteered information in this respect.

Box 1 Definition of incident and conviction types

Incident: any violent event involving physical contact with a victim, any sexual event (including exposure and touching) and any episode of physical aggression towards property (including fire setting). This includes 'near miss' incidents, i.e. any event which may not result in actual harm by definition but has the potential to do so.

Serious incident: any violent event resulting in the death or injury to the victim requiring hospital treatment, any sexual event involving contact with the victim, and any fire setting.

Conviction: any conviction (including non-violent offences).

Violent conviction: any conviction for assault, serious assault, fire-setting/raising or contact sexual offence.

The definitions of incidents in box 1 are compatible with clinical practice and the criminal justice context of this study. Any incident ranging from indecent exposure, attempting to throw a chair at a member of staff or punching a peer patient to the body impacts on the perpetrator's care and treatment plan including his risk management strategies. This, in turn, has the power to influence clinical decisions on extension of detention, readmission and changes in intervention.

Procedure

All violence risk assessments in this study were undertaken as part of routine clinical practice. Eligible study participants were identified using two inclusion criteria: The risk assessment had been completed, discussed and signed off by the relevant clinical team, or the risk assessment had been updated and validated by the clinical team during the recruitment period; and the patient was considered to be able to give informed consent by their RMO. The clinical led nature of this study meant that recruitment of research participants was tied to the implementation of relevant patients' HCR-20 into clinical practice, i.e. all HCR-20s resulted in active risk management strategies as part of the patient's care and treatment plan. Recruitment of participants took place during face-to-face contact on the admission, continuing care and rehabilitation wards.

Following the RMOs' permission to approach patients, consent to use file information (for background information, collection of updated risk assessments and incidents recorded)

and to access reconviction data was sought from all eligible participants. All research participants were followed up over the duration of the study. As the recruitment process was conducted on a rolling basis, the length and settings of follow-up varied greatly across the sample. This means that follow up included those discharged to less secure setting; the researcher renewed consent to access files to collect data on incidents and updated HCR-20s. While official data collection, i.e. inspection of files and follow-up of updated HCR-20s, ceased in 2009, reconviction data were collected in April 2010 to allow for any intervals between arrest and conviction at the end of the study.

6.3 Results

HCR-20 profile

Table 24 shows the HCR-20 profile for the sample and compares this to the data from non-participants. When items were omitted the scale and subscales were pro-rated (Gray et al, 2008). In the thesis sample, when an assessment of psychopathy (n = 14, 12.8%) and/or a personality disorder (n = 8, 7.3%) on the historical scale had not yet been conducted, the research student divided the total by the number of valid ratings and multiplied the outcome by ten (Wright & Webster, 2011). None of the HCR-20s received had more than two items omitted.

Table 24 Descriptive statistics for the HCR-20

	HCR-20 interviewees (n = 109) Mean (sd), range	**HCR-20 non-respondents** (n = 36) Mean (sd), range
H scale	15.30 (2.7), 9-20	15.15 (3.7), 7-20
C scale	5.22 (2.4), 0-10	6.33 (2.3), 2-10*
R scale	4.70 (2.4), 0-10	5.97 (2.9), 0-10*
HCR-20 total	25.22 (5.1), 12-36	27.46 (5.9), 15-39*

* significant at $p < .05$

Non-respondents (n = 36) were associated with a higher overall risk of future violence than participants (U = 1504.5, p = .036). In particular, non-respondents were rated as clinically more unwell (U = 1441.0, p = .016) and requiring more intensive risk management (U = 1419.5, p = .012) than those who agreed to take part in the research.

Follow-up period

Research participants were followed up for a mean of 31.0 months (sd = 8.3; range: 1-47 months) post recruitment, i.e. the date of relevant patients' HCR-20 implementation. The median was also 31 months. Table 25 describes the number of patients followed up at set intervals.

Table 25 Categories of follow up time

Follow-up time	**Number (%)**
> 36 months	41 (37.6%)
24 – 36 months	58 (53.2%)
12 – 24 months	9 (8.3%)
1 month[3]	1 (0.9%)

During this time, 66 participants (60.6%) were discharged from the State Hospital. Of these, 54 (81.8%) resided in medium secure facilities at some point, 12 (18.2%) spent time in low secure settings and 11 (16.7%) were discharged to community living. Ten patients (15.2%) spent time in prison. The mortality rate was 2.7% (n = 3). One patient died due to a drug overdose while in a medium secure unit, and two patients died due to natural causes (cancer and pneumonia).

Updates on HCR-20s

Of the 109 participants with an HCR-20 at baseline, three quarters (n = 81, 74.3%) received an updated HCR-20 at some point during follow-up. Of these, 43 (53.1%) received an update within 12 months, 32 (39.5%) were updated within 24 months and for 6 (7.4%) patients the baseline HCR-20 was updated within 36 months.

The mean time between baseline and updated HCR-20 was 13.6 months (sd = 6.3) ranging from 2 to 34 months and with a median of 12 months.

[3] Follow-up time was limited as the care facility the patient was transferred to was unable to share the patient's files with the researchers. He was not discarded from the sample as statistical analysis showed that omitting this patient did not significantly change the results.

Setting of updates

Of the initial 81 HCR-20 updates, the majority (n = 76, 93.9%) were completed in the State Hospital. Four (4.9%) updated HCR-20s were completed in a medium secure unit and one (1.2%) was updated in a low secure setting. Forty-six patients (56.8%) were identified with a second updated HCR-20. Most were completed within the State Hospital (n = 44, 95.7%) and two (4.3%) were located in a low secure setting. Of these, 31 (67.4%) had a third updated HCR-20. All of these were found in the State Hospital bar one HCR-20 (3.2%) that had been updated in a medium secure unit.

Lack of updates

The majority of those without an HCR-20 update were transferred or discharged to a less secure setting (n = 11, 40.7%) or prison (n = 5, 18.6%). Eleven participants (40.7%) who had remained at the State Hospital during the follow up period failed to get an update.

HCR-20 scale inter-correlations

Unsurprisingly, the inter-relationships between the subscales and the total HCR-20 scale imply that all three subscales (historical, clinical and risk management) correlate with the total HCR-20 scale. The clinical and the risk management scale correlate significantly. Table 26 demonstrates the correlations coefficients among the total and subscales of the HCR-20.

Table 26 Inter-correlations between the HCR-20 total and subscales

	C scale	R scale	HCR total
H scale	.036	.140	.603***
C scale		.392***	.638***
R scale			.761***

***significant at $p < .001$

Prevalence of incidents

All incidents

In total, 234 incidents were committed by 46 (42.2%) research participants. Of all incidents, 185 (79.1%) involved violence against others, 32 (13.7%) were sexual incidents

and 17 (7.2%) were categorised as violence against property. The mean number of incidents was 5.0 (sd = 4.5) ranging from 1 to 24 incidents per person. The median was 3 incidents. The incidence rate of total violence was 0.9 per patient year in the study.

Serious incidents

Three incidents (1.3%) were classified as serious with two incidents (66.7%) occurring at the State Hospital (one categorised as violent and one as sexual), and one (33.3%) within a medium secure facility.

Clinical symptoms and incidents

The total number of incidents correlated significantly with the HCR-20 clinical scale (r_s = .408, p = .005) indicating that those with higher clinical scores were involved in more incidents.

HCR-20 and incidents

There was no significant difference in HCR-20 scores between those participants who perpetrated an incident and those who did not (H scale: U = 1336.5, p > .05; C scale: U = 1315.0, p > .05; R scale: U = 1433.0, p > .05; Total scale: U = 1438.0, p > .05). Table 27 presents the mean and standard deviations of each HCR-20 subscale and the total scale score.

Table 27 HCR-20 mean and standard deviation by incident group (violent/non-violent)

	Violent (n = 46) Mean (sd), range	**Non-violent** (n = 63) Mean (sd), range
H scale	15.09 (2.9)	15.46 (2.6)
C scale	5.43 (2.45)	5.06 (2.3)
R scale	4.63 (2.5)	4.75 (2.4)
HCR-20 total	25.15 (5.0)	25.27 (5.2)

Reconviction

The reconviction rate was calculated among the discharged sample as individuals discharged to less secure settings typically achieve periods of unescorted access to the community, i.e. opportunity to be reconvicted. This was because violent incidents

including those that are deemed as serious are rarely prosecuted while in psychiatric care (van Leeuwen & Harte, 2011).

The reconviction rate amongst the discharged sample was 7.6% (n = 5). None of the recidivists were subject to a restriction order. Of the eleven participants who resided in the community at some point, four (36.4%) reoffended within an average of 4.2 months (sd = 2.4). All offences were categorised as minor crimes (e.g. theft); none were documented as violent.

Readmission

Seventeen participants (25.8%) were readmitted to a psychiatric hospital, of whom about half (n = 8, 47.1%) were recalled to the State Hospital. The reasons for recall were absconding (n = 4, 23.5%), breach of discharge conditions such as consuming alcohol and/or illegal substances (n = 8, 47.1%) and deterioration of mental health (n = 5, 29.4%). The mean time from discharge to readmission was 6.2 months (sd = 4.4) ranging from 1 to 16 months.

Predictive validity of HCR-20

The efficacy of the HCR-20 was assessed using Receiver Operating Characteristic (ROC) analysis as this method is independent of the number of incidents. The area under the curve (AUC) is of particular interest as it indicates the probability that a randomly selected recidivist has a higher score on a given assessment than a randomly selected non-recidivist. In practice, values of .50 indicate a chance prediction while AUCs in the range of .70 - .80 are seen as indicating moderate to large effect sizes (Rice & Harris, 2005). Table 28 and 29 describe the AUC values and confidence intervals for each subscale and the total HCR-20 scale, and individual HCR-20 items.

Table 28 AUC (standard error) and confidence intervals for each HCR-20 sub- and total scale according to outcome

	Number of participants	H Scale		C scale		R Scale		Total HCR-20	
		AUC (se)	95% CI	AUC (se)	95% CI	AUC (se)	95% CI	AUC (se)	95 % CI
All incidents	46	.54 (.06)	.43 - .65	.55 (.06)	.43 - .66	.51 (.06)	.40 - .62	.50 (.06)	.39 - .61
Minor incident	43	.56 (.06)	.45 - .67	.52 (.06)	.40 - .63	.53 (.06)	.42 - .65	.54 (.06)	.43 - .65
Serious incident	3	.68 (.10)	.48 - .87	.79 (.14)	.52 – 1.00	.75 (.10)	.56 - .94	.86* (.05)	.76 - .96
Any conviction	5	.56 (.06)	.45 - .67	.61 (.15)	.31 - .91	.55 (.16)	.24 - .87	.60 (.14)	.33 - .87

*significant at $p < .05$

Table 29 AUC (standard error) and confidence intervals of individual HCR-20 items, forensic history, age and admission section with the outcome of all violent incidents

HCR-20 item	AUC (se)	95% CI
H1 Previous violence	.51 (.06)	.39 - .63
H2 Young age	.58 (.06)	.46 - .70
H3 Relationship instability	.61 (.06)	.49 - .73
H4 Employment problems	.57 (.06)	.45 - .69
H5 substance abuse	.53 (.06)	.40 - .65
H6 major mental illness	.52 (.06)	.40 - .65
H7 Psychopathy	.51 (.06)	.39 - .63
H8 Early maladjustment	.52 (.06)	.40 - .64
H9 Personality Disorder	.51 (.06)	.38 - .62
H10 Supervision failure	.59 (.06)	.47- .71
C1 Lack of insight	.51 (.06)	.39 - .63
C2 Negative attitude	.51 (.06)	.39 - .63
C3 active symptoms of mental illness	.54 (.06)	.42 - .66
C4 Impulsivity	.55 (.06)	.43 - .67
C5 unresponsive to treatment	.55 (.07)	.42 - .67
R1 Plans lack feasibility	.56 (.06)	.44 - .68
R2 Exposure to destabilisers	.59 (.06)	.48 - .71
R3 Lack of personal support	.56 (.06)	.44 - .68
R4 Noncompliance with remediation attempts	.56 (.06)	.44 - .68
R5 Stress	.56 (.06)	.44 - .68
Forensic history (according to file information)	.52 (.06)	.40 - .63
Age at admission to State Hospital	.59 (.07)	.45 - .73
Admission section	.60 (.06)	.49 - .71

For all incidents of violence, and all minor incidents of violence, the HCR-20 was a poor predictor in this study. For serious incidents, while the AUCs on all subscales are relatively high, only the HCR-20 total scale (AUC = .86) was a significant predictor (p = .034). The sensitivity was 1.0 and the specificity was .53 at a cut-off point of 25.5 (> HCR-20 total median). Forensisc history, age at admission and admission section did not differentiate between violent and non-violent research participants.

Cox regression analysis

Time at risk of incident (duration) was defined in months for each person. Each duration between baseline HCR-20 and first incident constituted one observation. Time dependent covariates were age at baseline and length of follow-up.

Time between baseline HCR-20 and first recorded incident

The mean time elapsed between implementation of HCR-20 and first incident was 10.8 months (sd = 8.9) ranging from 3 days to 36 months. The median was 8 months. The mode was 4 and 6 months (n = 5 respectively).

The cox regression model was nonsignificant for all and minor incidents (p > .05). Accordingly, none of the predictors (HCR-20 total scale, H scale, C scale, R scale, age, follow-up time) predicted incidents. This was also the case when follow-up time was categorised into specific intervals as described in table three. No analysis was conducted for serious incidents due to the small number (n = 3).

6.4 Discussion

In this clinical implementation study, the HCR-20 was not able to differentiate between violent and non-violent individuals. Indeed, there was no difference in the ratings of risk on the HCR-20 scale between aggressors and non-aggressors. Further analysis confirmed that the predictive accuracy of the HCR-20 was not maintained when the instrument was applied by clinicians and where the predictive validity was calculated to cover months or years and concerned non-serious violence across different risk settings including the community. The exception was the HCR-20 total scale which had good predictive power (AUC = .86) for serious incidents. However, the HCR-20 total scale was 'just' statistically significant (p = .034) despite the large predictive power. Though the clinical scale (AUC = .79) appeared to be the main contributor to the efficacy of the

total HCR-20 scale in the prediction of serious incidents, this was not statistically significant. Nonetheless, there appears to be some importance to clinical symptoms as those with higher clinical HCR-20 scores were involved in more incidents. However, great caution is advised when considering this finding (Cooke & Michie, 2014). Not only is the outcome variable in ROC analysis binary and therefore the total number of incidents per person is of no consequence, but the particular type of violence 'serious incidents' were rare events in the study sample (n = 3). In theory, ROC analysis is insensitive to the number of incidents, yet a low base rate is likely to increase the false positive error rate; the predictive accuracy of the tool is likely to be overestimated (Szmukler, Everitt & Leese, 2012).

These findings are atypical when considering the wealth of previous research on the HCR-20. Perhaps the various durations of follow-up time conflicted with the predictive power. However, despite controlling for length of follow-up time and established covariate factors such as age in cox regression analyses, the HCR-20 remained non-predictive of future incidents. This also did not change when HCR-20s updated prior to participants' first recorded incident following the implementation were included or when time between discharge to less secure settings and violent incidents was considered. Neither did prediction improve when the sample was split according to the source of referral, absence or presence of personality disorder or restriction order. This is perhaps not surprising given that the HCR-20 was not designed to predict inpatient violence, neither over the short nor the long term. Indeed, only a minority of the sample moved to the community while most of the participants spent the entire study period in secure care. This is, however, a problematic point in itself considering that it is usually inpatient settings where the HCR-20 is first and formally completed, and where interventions, treatment and risk management are put into place. Indeed, the information gathered in the HCR-20 are useful for treatment within inpatient settings. For example, individual problems with relationships (H3), employment (H4) and substance use (H5) can be targeted through appropriate psychological therapies and by attending placements facilitating education and employability.

HCR-20 predictive validity in context

If the HCR-20 is used as intended, i.e. to inform risk management, then empirically its predictive power should be low. That is, when the HCR-20 is embedded within the clinical and dynamic processes of risk identification, formulation and treatment, then

clinicians should be able to intervene prior to an incident occurring. Though this study found the HCR-20 to be a poor predictor of violence, one must consider other reasons for the present findings. For example, the HCR-20 may have been unsuitable given the inpatient setting. The question therefore is whether the results are due to particulars of the study sample or whether there is evidence suggesting that the HCR-20 resulted in effective risk management.

When comparing the present sample to previous research, the participants recruited for this study are representative of patients living in high secure psychiatric facilities. The prevalence of schizophrenia as well as the combination of several adverse experiences during childhood (such as abuse) and adulthood (such as drug and alcohol use) reflect the needs and problems this particular patient population is associated with (Thomson et al, 1997). In terms of HCR-20 scores, the sample was statistically higher in historical risk and lower in risk management needs than other similar cohorts (Thomson et al, 1997; Pedersen, Rasmussen & Elsass, 2012). For example, the study sample was identified with a mean risk management score of 4.7 (sd = 2.4) while other research from similar populations report average scores of 6.1 (sd = 2.3) (Murphy, 2007). Yet, this does not imply that the participants in this study were easy to manage as almost half of the sample had been cited to have been violent in less secure settings. Instead, the management and supervision strategies at the State Hospital are of such high resource and clinical input that clinicians may have seen the likelihood of risk on the risk management scale as relatively low.

The use of the HCR-20: clinical practice vs research

The utility of the HCR-20 in research and in clinical practice is perhaps best shown when comparing the present study to previous research at the State Hospital (Thomson, Davidson, Brett et al, 2008). The latter study was retrospective with a follow-up period of 8 – 10 years, and the risk instruments used were completed by a researcher. In line with Thomson et al's results, the present investigation found a significant correlation between clinical symptoms and frequency of incidents. While Thomson and colleagues reported clinical symptoms predicted inpatient violence and the historical scale was a good predictor for violent and general recidivism, the present study found that only serious incidents were predictable by the total HCR-20 scale. The prevalence of reconvictions (8%) and the proportion of patients involved in incidents (42%) in the present study was low, especially when compared to Thomson et al (2008) where three

quarters (n = 107, 76%) of the sample had been involved in inpatient violence and 15% (n = 20) were reconvicted. This is perhaps not surprising given the different follow-up times (31 months vs 8-10 years) though Thomson et al report that 60% of reconvictions occurred within two years of discharge to the community. Indeed, with time reconviction may be more likely as previous research on a sample of 171 State Hospital patients cited even higher reconviction rates of 30% (19% violent offences) over a longer follow-up period of 11.5 years (Allen & Thomson, 2000). Of importance is the disparity in the mean number of incidents reported in the present study (mean 5.0) and in Thomson et al's (2008) results (mean 11.4) as well as the total number of incidents. In the present study 234 incidents were documented across 31 months while Thomson et al reported 1823 over 8.74 years, i.e. approximately 538 incidents in 31 months. While the comparison between research studies is often limited due to different understandings of violence, these two studies used the same definition of incidents and violence. These results then, in combination with the low predictive power discussed, may indicate that the HCR-20 when systematically implemented into clinical practice guides effective risk management as intended. This interpretation reflects the conclusions of a similar implementation study of the HCR-20 in Denmark (Pedersen, Rasmussen & Elsass, 2012). However, the link between risk assessment and management is likely to be more complex as there are several confounding factors that require further attention such as the quality of risk assessments conducted in real life.

Quality of HCR-20s

Of interest is the extent to which the quality and accuracy of HCR-20s is influenced by the reality of clinical practice and implementation. For example, the prevalence of personality disorder (PD) diagnoses, both primary and secondary, collected from patient files in the present study (31%) is relatively low. This is unusual, especially when considering previous publications on this population reporting that amongst 60 State Hospital patients, 34 (57%) had a definite PD and 43 (72%) a probable PD diagnosis according to the International Personality Disorder Examination (Blackburn et al, 2003). Equally, Macpherson and Kevan (2004) report 41% (n = 38) of 86 consecutive admissions to the State Hospital were diagnosed with a personality disorder. Further inspection of the data revealed that the number of patients formally diagnosed with a PD and the number of patients identified with definite evidence for PD on the HCR-20 do not match up. While definite evidence for PD traits does not equal the diagnosis of a

personality disorder, it is worthwhile to mention that of those diagnosed with a primary PD, two (25%) were thought to display no PD traits on the HCR-20. Clinically, this is an important point. Previous research has repeatedly supported the strong association between PD diagnosis and violence (Fountoulakis, Leucht & Kkaprinis, 2008). The fact that in the present study the risk item of PD had relatively poor predictive power may imply that the completion of the HCR-20 in clinical practice is different, and potentially inaccurate, when compared to the completion by researchers.

6.5 Limitations

The generally low number of incidents recorded in the present study may be due to several reasons. For example, previous research has shown that typically a small number of patients are involved in a large number of incidents (Lussier, Verdun-Jones, Deslauriers-Varin et al, 2010). Perhaps, those who declined participation or were assessed as unable to provide informed consent in this study may have been exactly those patients thought to be chronically violent. Alternatively, the fact that about two in five research patients were resident in high secure settings throughout the study may be related to the lack of incidents due to the high level of management features. Additionally, due to the setting, incidents were typically minor in nature. It is unlikely that minor inpatient violence resembles the full extent of potential violence in the community. Indeed, inpatient residence has been identified as a protective factor against violence due to the provision of external professional care (de Vries, de Vogel & de Spa, 2011). Yet, this stands in stark contrast to the documented extent of inpatient violence (Woods & Ashley, 2007) and the apparent reduction in violent incidents found in comparison to Thomson et al's (2008) retrospective study. This noted, the clinical led nature of this study stipulated various lengths of follow-up times. Though survival analyses controlled for time, the impact of confounding factors such as changes in policy and procedures, e.g. Prevention and Management of Violence and Aggression (PMVA) could not be accounted for.

The research student was unable to assess the impact of final risk judgements or ratings of the relevance of risk items. Though a prominent topic in the research literature, this was not clinical practice at the time of study conception. In addition, the disparity identified in relation to the diagnosis of personality disorder suggests that there may be qualitative issues when the HCR-20 is applied and implemented in clinical practice. This is a clinical issue and perhaps implies that the main attraction of the HCR-20, i.e. its

potential for clinical application, is also one of the main obstacles. As described in the previous chapter, considerable time was required to adjust to changes in care and treatment documentation. This also interfered with the study's attempts at measuring changes in HCR-20 scores across time and settings. Though updated HCR-20s were collected, the majority of these were completed in the State Hospital at some point during the follow-up period, i.e. risk scores did not, and were not expected, to change dramatically. In addition, the facilities patients were discharged to rarely updated or implemented HCR-20s. Not only did this affect the research process and outcomes described here, it is also realistic to assume that the quality with which risk assessments and management plans were completed differ across as well as within settings given the problems experienced at the State Hospital. The full extent to which this may have impacted on the results reported here is unknown though preliminary analysis of early and late HCR-20s (based on the date at which the HCR-20 was completed during the data collection period) did not show any improvements in predictive accuracy. This is also a shortcoming Pedersen, Rasmussen and Elsass (2012) fail to discuss in reference to their results. This said, the limitations identified in the present study have led Vojt, Marshall and Thomson (2012 – 2013) to investigate the quality of the HCR-20s collected in this thesis.

6.6 Summary

The HCR-20 is a widely validated risk assessment tool, which has attracted much interest due to its potential application to clinical practice. Though previous research has established that the risk items listed in the HCR-20 are predictive of future violence, the question is how does one asses the effectiveness of the HCR-20 in informing risk management in clinical practice? Perhaps foremost, one needs to establish if the HCR-20 is valid when the risk assessment process is embedded within the complex reality of clinical practice. This is because if the tool still predicts violence when it is used as intended, i.e. to inform management and not merely to make predictions, important clinical issues pertaining to how clinicians complete the HCR-20 in practice may arise. The findings of the present study imply that the accuracy of HCR-20 may have suffered when applied to clinical practice. Nonetheless, comparisons with a previous retrospective risk study, with a similar sample at the State Hospital showed a reduction in the number of violent incidents. This seems to suggest that indeed, the HCR-20 when used as intended, i.e. as an aide memoire, effectively informs risk management.

CHAPTER 7

THE PREDICTIVE VALIDITY OF SEXUAL VIOLENCE SPJ TOOLS FOLLOWING IMPLEMENTATION

In contrast to the previous chapter on violence risk assessment instruments, the assessment of the risk posed by sexual offenders may be more complex in that this population is as likely to recidivate with a non-sexual violent offence as with a sexual offence (Munetz, Grande & Chambers, 2001). The extant literature relating to the causes of sexual offending, typologies and efficacy of risk assessments also highlights the diversity in violent recidivism in sexual offenders (Hanson & Morton-Bourgon, 2005). However, robust validation studies of sexual violence SPJ tools in mentally disordered sexual offenders are rare as described in chapter two of this thesis. Similar to the HCR-20 evidence base, studies of risk in non-psychiatric sexual offenders are typically based on ratings provided by researchers. This means that caution is required when inferring the extent to which such risk tools are valid in clinical practice.

7.1 Introduction

The impact, both financially and psychologically, of sexual offending is of such magnitude that professionals continuously strive to understand its origin and underlying motivations. Since the impetus of risk research in the late 1990s, there has been remarkable progress in the understanding of risk factors important in the assessment and management of sexually violent offenders. However, findings are limited as recidivism rates vary considerably according to the definition of sexual offending used, length of follow-up time and sample characteristics (Singh, Grann & Fazel, 2011). Additionally, sexual offenders are a highly heterogeneous group in terms of offending behaviour which can range considerably in frequency and type. At its most basic level, research distinguishes between sexual offenders according to victim age, i.e. rapists and child molesters (Jespersen, Lalumiere & Seto, 2009). The former are thought to resemble the characteristics of non-sexual violent offenders (Hanson, 2002). In contrast, child molesters meet criteria for specialist offending, in particular those who target extrafamilial victims, as recidivism rates are higher and reoffending continues at an older age with a higher frequency and more victims (Parton & Day, 2002). Accordingly, there is a host of risk related variables that mirror those of violent offenders such as employment problems as well as risk factors specific to sexual offenders (Hanson &

Morton-Bourgon, 2005). The latter include sexual deviance and an antisocial lifestyle associated with psychopathy and poor self-regulation. Practically, this means that assessment measures need to take account of both, specific risk factors for sexual and for violent offending.

Sexual offending and mental disorder

While some authors claim that severe mental illness does not contribute to sexual offending (Gordon & Grubin, 2004), a number of small scale studies provide counterevidence (Short, Lennox, Stevenson et al, 2012). Methodologically, most of these studies are flawed as many studies use the term 'serious mental illness' erroneously as an umbrella concept for axis I and axis II disorders. The exception to this is a relatively recent epidemiological study conducted by Fazel, Sjoestedt, Langstroem et al (2007) in Sweden. By examining the national register of psychiatric hospitalisations, crime records, hospital discharge diagnosis, demographics and socio-economic status between 1988 and 2000, these authors compared 8,495 sexual offenders with a random control group of male adults from the general population. The results indicate that sexual offenders were five times more likely to suffer from schizophrenia (or any psychotic disorder) when compared to the control group. While Fisher, Silver and Wolff (2006) propose that mental illness may have contributed directly to sex offending in their community study in the US, Fazel and colleagues (2007) suggest that instead of being the main drivers of the offence, psychotic symptoms may interact with other important factors present at the time of the offence. This is consistent with Sahota and Chesterman (1998a, 1998b) who found that although hallucinations and delusions may be present at the time of the offence, the underlying motivation for the offence mirror those of non-mentally ill sexual offenders, i.e. sexual frustration, anger, arousal and revenge. Though these findings are based on self report by a small sample of inpatient sexual offenders in the UK (n = 20), other researchers posit similar arguments (Hanson & Morton-Bougnon, 2005).

The association between mental illness and sex offending appears most pronounced in the presence of comorbid disorders in the form of paraphilia, substance misuse (Alden, Brennan, Hodgins et al, 2007), personality disorders, anxiety and depression (Whitaker, Le, Hanson et al, 2008). Ahlmeyer, Kleinsasser, Stoner et al (2003) agree that the psychopathology of sexual offenders is more complex than that of non-sexual offenders; in a sample of 695 sexual offenders, higher rates of chronic depression and anxiety were

noted amongst child molesters (n = 423) when compared to rapists (n = 223) and non-sexual offenders. The prevalence of psychotic disorders was almost nil which is not surprising given the study location, i.e. correctional settings, and when one considers the differences noted between sexual offenders in prison and those within the forensic mental health system (Moulden, Chaimowitz, Mamak et al, 2013). This is further endorsed by Harris, Fisher, Veysey et al (2010) who described the impact of psychotic symptoms as negligible when compared to the significantly higher rates of personality disorder and paraphilia in high risk sexual offenders within the US correctional system.

Sexual violence risk assessment and management

Regardless of the inconsistent link between mental disorder and sex offending, clinicians in forensic mental health settings are required to provide care and treatment that reduces the likelihood of recurring sexual violence. This, however, is a challenging endeavour as the research literature on appropriate risk assessment tools is fragmented and oppositional (Boer, 2006). Unlike the discussion on the HCR-20 in the previous chapter, there appears to be no single sexual risk instrument in the field with a well accepted superior predictive capability (Rettenberger, Boer & Eher, 2009). Arguably, SPJ tools seem ideal in clinical practice given the inclusion of dynamic, i.e. amenable to intervention, risk items. This is not to say that actuarial tools are not valuable. As Mercado and Ogloff (2007) summarise, general risk factors for recidivism per se appear to be largely stable and static (e.g. forensic history) in nature. It is, however, dynamic risk factors that differentiate between recidivists and non-recidivists due to individual responses to treatment, intervention and management. In other words, SPJ tools lend themselves to systematic and structured implementations across different settings. For example, the Sexual Violence Risk Management scale - 20 (SVR-20, Boer, Hart, Kropp et al 1997) is a well known and validated SPJ tool for sexual offending with moderate to good predictive validity in retrospective and prospective studies (Rettenberger, Boer & Eher, 2011). Of further interest is the Risk of Sexual Violence Protocol (RSVP; Hart, Kropp, Laws et al, 2003) which is also an SPJ tool and closely linked in content to the SVR-20. The RSVP was developed from the SVR-20 and includes guidelines on how to incorporate risk factors into risk management. The RSVP can also directly inform risk formulation (Craig, Browne & Beech, 2008). The risk factors included are based on empirical evidence, clinical expertise and legal criteria. From a clinical perspective, the implementation of the RSVP therefore may have face validity. Recent research by

Judge, Quayle, O'Rourke et al (2013) confirm that sex offending practitioners attach considerable value to assessments and management strategies delivered via the RSVP. Perhaps concerning then is that research on the RSVP is limited to date. While three unpublished studies (Hart & Boer, 2010) claim that the interrater reliability is good to excellent, these are based on file information on Canadian samples. Further, recent research in Scotland found that some of the RSVP items achieve poor to fair interrater agreement when coded by clinicians using vignettes (Sutherland, Johnstone, Davidson et al, 2012). Whilst the predictive validity of the RSVP has been summarised as being equivalent to that of the SVR-20 and actuarial tools (Hart & Boer, 2010), it appears that no descriptive data are available (Rettenberger & Hucker, 2011).

In summary, the complex nature of sexual violence and diverse characteristics of those who commit sexual offences present significant challenges for the assessment of violence risk. The extant literature (described in chapter 2) suggests that there is a dearth of research on the predictive validity of sexual violence SPJ tools. The present study therefore set out to investigate the predictive validity of the SVR-20 and the RSVP following clinical implementation.

7.2 Methods

Design and Setting

This study was prospective and took place in the State Hospital as part of a hospital-wide clinical development, i.e. the implementation of SPJ tools into practice. While the State Hospital was the recruitment site, all research participants were followed up across less secure settings if discharged during the study period.

Participants

During the time of data collection (2005 – 2008), a mean of 32 male sexual offenders resided at the State Hospital. Of these, 25 (78.1%) were identified as having a completed risk assessment using a sexual violence SPJ tool of interest in this thesis. Twenty-three patients (92.0%) agreed to participate in the research. Of these, 21 (91.3%) had an RSVP, two (8.7%) had an SVR-20 only; one person in the RSVP sample also had an SVR-20. In addition, 17 respondents (73.9%) were identified with an HCR-20.

Demographics

All participants were male. The mean age was 44.1 years (sd = 10.6) ranging from 24 to 61 years. The median was also 44 years. The sample had resided for a mean of 10.1 years (sd = 8.7) in the State Hospital, ranging from 1 to 32 years. The median length of time was 8 years. Table 30 provides further demographic details of the sample.

Table 30 Demographic details (based on file information)

Participant demographics		**Number (%)**
Diagnosis (based on ICD-10)	*Primary diagnosis*	
	Psychotic illness	19 (82.6%)
	Schizophrenia	18 (94.7%)
	Personality Disorder (all dissocial)	4 (17.4%)
	Secondary diagnosis (n = 16)	
	Personality Disorder	9 (56.3%)
	Dissocial PD	5 (55.6%)
	Learning Disability	2 (12.5%)
	Alcohol and substance misuse disorder	3 (18.8%)
	Paedophilia	1 (6.3%)
	Kleinfelter's Syndrome	1 (6.3%)
Childhood	Sexual abuse	10 (43.5%)
	Physical abuse	6 (26.1%)
	Other adverse experiences	19 (82.6%)
Adult background	Single	19 (82.6%)
	No educational qualifications	19 (82.6%)
	Restricted legal status	17 (73.9%)
	Excessive drug and alcohol use	13 (56.5%)
	Self harm	13 (56.5%)
	Suicidal behaviour	12 (52.2%)
	Violent behaviour in other secure hospital	10 (43.5%)

History of sexual abuse

Of the ten patients who reported childhood sexual abuse, the majority (n = 9, 90.0%) were abused by a male adult while one patient (10.0%) described sexual abuse by his adolescent brother. Where information was disclosed regarding severity of sexual abuse (n = 7, 70.0%), respondents exclusively described rape experiences; either by family members on multiple occasion (n = 4, 57.1%), by male strangers (n = 2, 28.6%) as a single event and one person (14.3%) described repeated rape by a male neighbour.

Index offence

The index offence was of a serious sexual and violent nature for the majority of participants (n = 19, 82.6%). This included actual (n = 6, 31.6%) and attempted rape (n = 7, 36.8%) as well as sexual assaults (n = 6, 31.6%). One third of index offences (n = 6, 31.6%) resulted in the death of the victim. Of those without sexual violent index offences (n = 4), one respondent disclosed a number of offences against children during treatment at the State Hospital. Another patient with a history of sexual violence against women was admitted due to repeatedly absconding from less secure settings. Two patients had previous sexual convictions against children or female adults.

Sexual offender subgroups

According to previous convictions and index offences, respondents were categorised as rapists (n = 15, 65.2%) or child molesters (n = 8, 34.8%). All identified rapists were diagnosed with psychosis, primarily schizophrenia while child molesters were identified with psychosis (n = 4, 50.0%) or antisocial personality disorder (n = 4, 50.0%).

Forensic background

The majority of the sample (n = 21, 91.3%) had at least one previous conviction. The mean number of previous convictions was 14.5 (sd = 12.8) ranging from 2 to 42 with a median of 10.0 previous offences. Most participants had convictions for acquisitive crimes (n = 16, 76.2%), breach of the peace (n = 16, 76.2%) and violent offences (n = 14, 66.7%) including minor and serious assaults.

Two in five (n = 9, 42.9%) were identified with a history of sexual convictions. In particular, there were six convictions (66.7%) for sexual assault mostly against children (n = 5, 83.3%), four convictions (44.4%) pertaining to lewd and libidinous practices and one previous conviction of sodomy against a child (n = 1, 1.1%).

Psychiatric background

The majority of respondents (n = 21, 91.3%) had previous admissions to psychiatric care, though two of these (9.5%) refer to treatment in prison. The mean number of previous admissions was 4.2 (sd = 4.7) ranging from 1 to 19, with a median of 2.5 previous admissions.

Measures

Sexual Violence Risk – 20 Scale (Boer, Hart, Kropp et al, 1997)

The Sexual Violence Risk – 20 Scale (SVR-20) is a SPJ tool designed for the assessment of sexual violence risk in adult sexual offenders. The tool consists of 20 items, divided into three domains pertaining to psychosocial adjustment (11 items), sexual offences (7 items) and future plans (2 items). Scale items are based on risk factors identified in the literature and through consultation with clinicians working in the relevant field. For example, the scale considers sexual and non-sexual forensic history, victimology, severity and escalation of crimes and possible risk factors affecting future management in less secure settings such as negative attitudes towards intervention. The SVR-20 is similar to the HCR-20 in rating and underlying rationale. For the purpose of research, items are coded on a three point scale ranging from 0 (absent), 1 (possibly present) to 2 (definitely present) depending on evidence and clinical judgement for each risk item. The total scale score ranges from 0 to 40. If insufficient information is available, an item can be omitted.

Risk of Sexual Violence Protocol (Hart, Kropp, Laws et al, 2003)

The Risk of Sexual Violence Protocol (RSVP) is a 22-item risk assessment tool for the assessment of future sexual violence in offenders. There are five risk domains comprising 1. sexual violence history, 2. psychological adjustment, 3. mental disorder, 4. social adjustment and 5. manageability. The RSVP provides clear guidelines on how to incorporate information into risk formulation by outlining risk scenarios and establishing risk management strategies based on the nature, imminence, severity and frequency of the likely sexual risk (Hart et al, 2003). Each item is rated as 'N' (not present), '?' (partially or possibly present) or 'Y' (definitely present) according to case-specific information and clinical judgement. The ratings are made for two different time frames; the rater codes if the risk factor was present more than one year prior to the evaluation (referred to as past ratings) and if the risk factor was present during the year prior to the RSVP assessment (referred to as recent ratings). Ratings are also made with regards to the relevance of risk factors in possible further offending (referred to as future ratings). If insufficient information is available, an item can be omitted. The RSVP allows the option of including case-specific risk factors to the tool in order to individualise management strategies and consider offending behaviour within a clinically relevant

context. Though the manual encourages a global case prioritisation rating (high/medium/low) and a final risk judgement (high/medium/low), this was not standard practice at the State Hospital during the study. Given the implementation context of this thesis, it is important to note that though clinical teams rated the presence and relevance of risk factors numerically, these ratings were only used to facilitate discussion among clinicians.

Historical Clinical Risk Management – 20 Scale (Webster, Douglas, Eaves et all, 1997)

The Historical Clinical Risk Management – 20 Scale (HCR-20) comprises 20 risk factors, which are divided into 10 historical, five clinical and five risk management items. The historical factors pertain to static variables such as previous violence, while the clinical factors are dynamic and responsive to changes (e.g. impulsivity). The five risk management items encourage the rater to consider risk factors relating to current and future circumstances such as lack of social support. For research purposes, each item can be scored as 0 (not present), 1 (partially or possibly present) or 2 (definitely present) according to case-specific information and clinical judgement. The total maximum score is 40. If insufficient information is available, an item can be omitted (Webster et al, 1997). Although designed as a tool for the assessment of interpersonal violence, the manual specifies that any sexual assault classifies as violence, and hence the HCR-20 is also applicable to sexual offenders.

Demographic questionnaire

A questionnaire was developed, based on Thomson, Bogue, Humphreys et al's (1997) study, to code data from patients' hospital files. The questionnaire covers participants' demographic details (e.g. age, level of education, marital status) as well as forensic, legal, psychiatric, health and personal history including details on other family members. In addition, data were collected in relation to participants' index offence and/or behaviour leading to their current admission to the State Hospital.

Outcome measure

The main outcome variable was any violent incident (actual and near miss) recorded in a patient's hospital files, official reconviction data (Scottish Criminal Records Office), or hospital incident reporting systems (e.g. DATIX, IR1). This included sexually

inappropriate and sexually violent behaviour. Box 1 outlines the definitions used for incidents and convictions. Outcome data were triangulated by seeking patient self-report on incidents; however, none of the participants volunteered information in this respect.

Box 1 Definition of incident and conviction types

Incident: any violent event involving physical contact with a victim, any sexual event (including exposure and touching) and any episode of physical aggression towards property (including fire setting). This includes 'near miss' incidents, i.e. any event, which may not result in actual harm by definition, but has the potential to do so.

Serious incident: any violent event resulting in the death or injury to the victim requiring hospital treatment, any sexual event involving contact with the victim, and any fire setting.

Conviction: any conviction (including non-violent offences).

Violent conviction: any conviction for assault, serious assault, fire-setting/raising or contact sexual offence.

The definitions of incidents in box 1 are compatible with clinical practice and the criminal justice context of this study. Any incident ranging from indecent exposure, attempting to throw a chair at a member of staff or punching a peer impacts on the perpetrator's care and treatment plan including risk management strategies. This, in turn, has the power to influence clinical decisions on extension of detention, readmission and changes in intervention.

Procedure

All RSVPs and SVR-20s in this study were undertaken as part of routine clinical practice. Patients were identified as eligible for this research if they were considered to be able to give informed consent by their Responsible Medical Officer (RMO). In addition, the clinical led nature of this study meant that recruitment of participants was tied to the implementation of individuals' sexual risk assessment tool into clinical practice; these had to be signed off by clinical teams ensuring that both the risk factors and resulting case management plan had been discussed and agreed on. This meant that the research process relied on clinical teams sharing the implemented risk tools with the research student. This proved to be difficult at times, and as a consequence the

recruitment period covered March 2005 to March 2008. The length of recruitment time is longer than that reported in the previous chapter on the HCR-20. This is due to the generally low number of sexual offenders and therefore completed sexual violence risk assessments in the patient population, as well as the problems outlined in relation to the implementation process in chapter five.

Following the RMO's permission to approach patients, written consent to use file information (for background information, collection of updated risk assessments and incidents recorded) and to access reconviction data was sought from all eligible participants. Recruitment of participants took place during direct face-to-face contact on the admission, continuous care and rehabilitation wards. All research participants were followed up over the duration of the study. As the recruitment process was conducted on a rolling basis, the length and settings of follow-up varied greatly across the sample. This means that follow up included those discharged to less secure settings and the researcher was required to renew consent to access files to collect data on incidents and updated SPJ tools. While official data collection ceased in 2009, reconviction data were collected in 2010 to allow for any intervals between arrest and conviction at the end of the study.

7.3 Results

SVR-20

Due to the small sample size of SVR-20s (n = 3) obtained during this study all further analyses in this chapter are based on the 21 RSVPs for statistical reasons. One of the three SVR-20 patients also had an RSVP and is therefore included in the following analyses.

RSVP profile

The RSVPs of four patients (19.0%) contained only presence ratings of risk factors in the past. As a consequence, all recent and future ratings are based on a reduced sample of 17 RSVPs. Table 31 depicts ratings grouped if present (definite and possible) across past, recent and future timescales.

Table 31 Number (%) of RSVP ratings across past, recent and future timescales

Domain/ Subscale	Item	Number of patients with presence of problems (%)		
		Past (n = 21)	Recent (n = 17)	Future (n = 17)
Sexual Violence History	Chronicity	17 (90.9%)	5 (29.4%)	14 (82.4%)
	Diversity	14 (66.7%)	1 (5.9%)	11 (64.7%)
	Escalation	16 (76.2%)	1 (5.9%)	12 (70.6%)
	Physical Coercion	20 (95.2%)	2 (11.8%)	17 (100.0%)
	Psychological Coercion	11 (52.4%)	3 (17.6%)	8 (47.1%)
Psychological Adjustment	Extreme minimisation	16 (76.2%)	12 (70.6%)	14 (82.4%)
	Attitudes that support or condone sexual violence	19 (90.5%)	13 (76.5%)	16 (94.1%)
	Problems with self awareness	21 (100.0%)	15 (88.2%)	17 (100.0%)
	Problems with stress or coping	21 (100.0%)	16 (94.1%)	17 (100.0%)
	Problems resulting from child abuse	15 (71.4%)	10 (58.8%)	11 (64.7%)
Mental Disorder	Sexual deviance	17 (80.9%)	11 (64.7%)	11 (64.7%)
	Psychopathic PD	10 (47.6%)	7 (41.2%)	7 (41.2%)
	Major mental disorder	18 (85.7%)	11 (64.7%)	16 (94.1%)
	Substance misuse	16 (76.2%)	--	15 (88.2%)
	Violent or suicidal ideation	19 (90.5%)	5 (29.4%)	16 (94.1%)
Social Adjustment	Problems with intimate relationships	21 (100.0%)	13 (76.5%)	16 (94.1%)
	Problems with non-intimate relationships	20 (95.2%)	14 (82.4%)	17 (100.0%)
	Problems with employment	21 (100.0%)	8 (47.1%)	17 (100.0%)
	Non-sexual criminality	16 (76.2%)	2 (11.8%)	15 (88.2%)
Manageability	Problems with planning	21 (100.0%)	15 (88.2%)	14 (82.4%)
	Problems with treatment	20 (95.2%)	12 (70.6%)	17 (100.0%)
	Problems with supervision	19 (90.5%)	5 (29.4%)	17 (100.0%)

Descriptively, the data indicate that the majority of the RSVP sample was rated with definite or possible past problems on all items with the exception of the item referring to psychopathy. The frequency of recent ratings on the sexual violence history domain (i.e., within the past year) was relatively low. In terms of future RSVP ratings, the data imply that almost all risk factors were seen as relevant in possible future offending.

Mean RSVP ratings

Similar to the previous chapter, when items were omitted the relevant domain score was pro-rated by dividing the total scale score by the number of valid ratings; this was then multiplied by the actual number of items in the domain. Table 32 describes the mean RSVP ratings across past, recent and future timescales.

Table 32 Descriptives for past, recent and future RSVP ratings (n = 17)

	RSVP past	RSVP recent	RSVP future
Mean (sd)	35.06 (6.4)***	16.47 (6.7)***	34.11 (5.3)
Range	15 – 41.9	3 - 25	18 - 39
Median	37.5	16.0	35.5
Mode	38.0	14.0	38.0

*** significant at $p < .001$

Past RSVP ratings, i.e. those referring to the presence of risk factors more than one year prior to the RSVP assessment, were significantly higher compared to recent RSVP ratings (t (16) = 11.813, p = .000). Past and recent RSVP ratings also correlated significantly (τ = .431, p = .020) implying that as presence ratings for past risk increased so did ratings for recent risk. No comparisons were conducted in reference to future ratings as these pertain to the relevance, rather than the presence, of risk items for possible future offending. However, the relevance of risk factors in the future correlated positively with presence of risk factors in the past (τ = .611, p = .002).

HCR-20 profile

The HCR-20 ratings of the current sample were compared with the HCR-20 profile of 92 State Hospital patients (who were part of the sample described in the previous chapter) with no history of sexual offending as illustrated in table 33.

Table 33 HCR-20 profile for the sex offending sample in comparison to the total HCR-20 sample (n = 92)

	RSVP sample (n = 17) Mean (sd), range	**Comparison sample** (n = 92) Mean (sd), range
H scale	15.41 (2.4), 10 - 18	15.28 (2.8), 9 - 20
C scale	5.29 (1.9), 2 - 9	5.21 (2.5), 0 - 10
R scale	5.41 (2.1), 2 - 8	4.56 (2.5), 0 - 10
HCR-20 total	26.12 (4.4), 20 - 34	25.05 (5.2), 12 - 36

The HCR-20s of the sex offending sample were comparable to the wider State Hospital population on the total and subscales scores ($p > .05$).

Follow up period

The mean follow-up time from the date of baseline RSVP to the end of the study was 23.9 months (sd = 11.1) ranging from 10 to 40 months. The median was 20 months. Table 34 describes the number of patients followed up at set intervals.

Table 34 Categories of follow up time

Follow-up time	**Number (%)**
< 12 months	2 (9.5%)
12 – 24 months	9 (42.9%)
24 – 36 months	5 (23.8%)
> 36 months	5 (23.8%)

During the study, eight patients (38.1%) were discharged to medium secure settings. The mortality rate in the sample was 9.5% (n = 2). Both deaths occurred due to natural causes, i.e. pulmonary embolus and cancer, in the State Hospital.

Updates of sexual violence risk assessments

Of the 21 RSVPs collected at baseline, 12 (57.1%) were updated at some point during the study. One third of these (n = 4, 33.3%) were updated within 12 months according to the implementation policy. Five (41.7%) were updated within 24 months and three (14.3%) were updated within 40 months. All updates took place within the State Hospital. The mean time between baseline and updated RSVP was 20.0 months (sd = 11.4) ranging from 6 to 40 months. The median was 16.5 months.

Lack of updates

The RSVPs collected for nine patients (42.9%) were not updated. Of these, four patients (44.4%) were discharged prior to the review date. The RSVP of five patients (55.6%) was not updated despite residing in the State Hospital for more than 24 months and 36 months, i.e. until the end of study period.

Prevalence of incidents following implementation of RSVP

All incidents

In total, 7 patients (33.3%) committed 33 incidents. Of these incidents, 8 (24.2.4%) were physically violent, 20 (60.6%) were of a sexual nature and 5 (15.2%) involved violence against property. All incidents were minor according to the definition used in box 1; there were no serious incidents nor any reconvictions. The mean number of incidents per aggressor was 4.71 (sd = 4.0) ranging from 2 to 13 incidents with a median of 3 incidents. The incidence rate for total violence was 0.8 per participant year in the study.

Sexual incidents

The 20 sexual incidents were committed by three patients (42.9% of perpetrators), of whom two were involved in almost all sexual incidents (n = 19, 95.0%). For both patients, sexual incidents were documented within one month of transfer from the State Hospital to medium secure settings. This translates to a rate of 4.8 sexual incidents per patient year in the study.

Relationships between variables and incidents

Relationship between RSVP and incidents. There was no relationship between the mean RSVP ratings (past, recent and future) and any outcome, i.e. the total number of incidents, total number of sexual incidents nor the total number of violent incidents. This was also true when applying point biseral correlation to the presence of incidents (both violent and sexual).

Relationship between HCR-20 and incidents. The total number of sexual incidents correlated significantly with the clinical HCR-20 scale (τ = .772, p = .041); those with higher clinical HCR-20 scores were involved in more sexual incidents. In particular,

lack of insight (C1) correlated with the total of sexual incidents (τ = .816, p = .049). Neither the historical, the risk management nor the total HCR-20 scale correlated with any outcome.

Relationship between violent and sexual incidents. The total number of violent incidents correlated negatively with the total number of sexual incidents (τ = - .839, p = .021) indicating that those who engaged in sexual incidents tended to commit fewer violent incidents.

Difference in HCR-20 and RSVP ratings between aggressors and non-aggressors

There was no statistical difference in ratings of the HCR-20 or the RSVP when comparing those who were and those who were not involved in incidents (p > .05). Table 35 summarises the mean and standard deviations on the RSVP subscales as well as the HCR-20 sub- and total scale according to incident group.

Table 35 RSVP and HCR-20 descriptives according to incident group

	Incident (n = 7) Mean (sd)	**No incident (n = 14) Mean (sd)**
RSVP past	35.43 (4.5)	32.64 (7.4)
RSVP recent	19.00 (5.4)	14.95 (7.1)
RSVP future	34.50 (3.4)	33.88 (6.3)
H scale	15.00 (1.8)	15.64 (2.7)
C scale	5.83 (2.0)	5.0 (1.9)
R scale	5.83 (1.7)	5.18 (2.4)
HCR-20 total	26.66 (3.6)	25.82 (5.0)

Predictive validity of the RSVP

The efficacy of the RSVP was assessed using Receiver Operating Characteristic (ROC) analysis as this method is thought to be unaffected by the base rate of incidents (Mossman, 1994). The area under the curve (AUC) is of particular interest as it indicates the probability that a randomly selected recidivist has a higher score on a given assessment than a randomly selected non-recidivist. In practice, values of .50 indicate a chance prediction while AUCs in the range of .70 - .80 are seen as indicating moderate to large effect sizes (Rice & Harris, 2005). Table 36 describes the AUC values and confidence intervals for each subscale and the total RSVP scale.

Table 36 AUC (standard error) and confidence intervals for past, recent and future RSVP ratings according to outcome.

	Number of participants	RSVP past		RSVP recent		RSVP future	
		AUC (se)	95% CI	AUC (se)	95% CI	AUC (se)	95% CI
All incidents	7	.60 (.14)	.32 - .88	.61 (.15)	.30 - .91	.55 (.15)	.26 - .84
Sexual incidents	3	.70 (.17)	.37 – 1.0	.59 (.17)	.26 - .92	.58 (.18)	.23 - .92
Discharge	8	.55 (.15)	.27 - .83	.61 (.16)	.30 - .91	.51 (.15)	.23 - .80

For all incidents, and incidents of a sexual nature, the RSVP was not a significant predictor in this study

Explorative survival analysis

The number of events and the base rate of sexual incidents in this study are very low, hence explorative survival analysis was conducted based on all incidents (n = 7) as the outcome variable. Time at risk of incident (duration) was defined in months for each person. Each duration between baseline RSVP and first incident constituted one observation.

Cox regression model: RSVP and all incidents

The mean time between the RSVP and first incident was 19.29 months (sd = 9.2) ranging from 10 to 39 months. The median was 15 months. Covariates were the RSVP subscales (past, recent and future) while length of follow-up was controlled as a time-dependent variable. The resulting model was not a significant fit to the data. None of the covariates used were predictive of incidents.

Predictive validity of the HCR-20

Given the significant relationship between the clinical scale of the HCR-20 and the total number of sexual incidents, the predictive validity of the HCR-20 was explored. Only the clinical HCR-20 scale predicted sexual incidents with a large effect size (AUC = .89, se = .08, 95% CI .74 – 1,0, p = .038) and 1.0 sensitivity and .79 specificity at a cut-off point of 5.5 (> HCR-20 clinical scale median). Yet, none of the individual clinical risk items were predictive of sexual incidents. Due to the small sample size of sexual perpetrators (n = 3), no survival analysis could be conducted to follow up this result.

7.4 Discussion

As described in chapter 2 of this thesis, there is a dearth of research on the predictive validity of the sexual violence SPJ tools under investigation in the present study. Although the SVR-20 has a good research evidence base, the present study found that the RSVP was more routinely used in clinical practice. The focus on the utility of the RSVP in case management may account for this. However, a sound validation history is also of critical importance when making risk management decisions. The present research study

raises possible concerns about the utility of the RSVP in clinical practice in identifying those at risk of sexual violence.

Main findings

The clinical anchor in RSVP ratings

Inspection of the RSVP ratings implied that these seemed clinically grounded in that the recent ratings were statistically lower when compared to the past ratings. The generally high past ratings may reflect the nature of the population; admission to a high secure setting implies a significant number needs and problems. Recent RSVP ratings were lower which may reflect the impact of risk management strategies given the significant period of time participants had been resident in the State Hospital (mean 10 years) and the well-managed and resourced nature of the environment. Despite care and treatment, however, the data imply that a large proportion of participants were thought to have ongoing problems in relation to most RSVP items. The presence of recent issues was most prevalent in risk factors referring to psychological and social adjustment as well as mental disorder. Though the relevance of risk factors was seen as present across almost all RSVP ratings, clinicians appear to have felt confident that interventions were appropriate and successful given that two in five sexual offenders were discharged to less secure settings.

Predictive validity of the RSVP

The findings of the present study indicate that the RSVP ratings did not differentiate those participants who were involved in incidents from those who were not, nor did ratings correlate with the total number of general or sexual incidents. Further analysis verified that the RSVP did not predict general nor sexual incidents when the instrument was applied by clinicians and where the predictive validity was assessed over various lengths of time and concerned minor inpatient incidents only. Critics may argue that this should have been expected given the point of implementation and therefore identification of risk factors should have led to tailored interventions, which in turn would have rendered the prediction as invalid. Perhaps puzzling then is the finding that the RSVP did not predict the discharge of patients despite its incorporated case management process. This noted, discharge may have resulted from the assertion that adequate risk management strategies were set in place; such data are not recorded in the RSVP.

A risk assessment conducted at baseline is unlikely to reflect changes across time and settings. However, when using RSVPs updated prior to an incident or discharge, there was very little change in scores and consequently, no change in predictive power. This was also observed when analysis controlled for possible confounding variables discussed in the literature, i.e. the presence of sexual or physical abuse, type of sexual offender (rapist or child molester) and presence of prior sexual offences. The length of follow-up time may have affected the predictive power, however explorative survival analysis on the RSVP scales further confirmed the lack of relationship between the tool and incidents. Yet, similar to the previous chapter, confounding factors such as changes in policies and procedures relating to violence were not controlled for during the different follow-up times.

Comparison with implemented HCR-20s

In contrast to the RSVP, the HCR-20 was related to sexual incidents with the clinical HCR-20 scale predicting the presence of non-serious sexual incidents. The item on lack of insight was a particularly strong correlate and accounted for 67% of the variance in minor sexual incidents. Although the HCR-20 and the RSVP both tap into a common denominator (sexual violence) and although the instruments share risk components pertaining to historical, clinical and future risk, perhaps there is a qualitative difference in how the clinical items are completed on the HCR-20 as opposed to the RSVP. This noted, lack of insight was not predictive of sexual incidents, rather the total score on the HCR-20 clinical scale was a good predictor. Yet, it seems advisable to apply caution to the validity of these results given the small sample size in this study (n = 21). Of great importance, however, is that almost all sexual incidents were committed by two individuals alone within one month of transfer to a less secure facility.

The impact of environment

The number of perpetrators and incidents is likely to be low within high secure settings as the management features may deter any sexually harmful behaviour in the first place. This is particularly pronounced in this study given that most of the sample remained within the confines of the State Hospital, and that the majority of sexual incidents occurred within a less secure environment. This is likely to account for the low predictive power of the RSVP in this population. The nature, frequency and possible severity of sexual incidents may differ between inpatient and the community settings where

monitoring and supervision are arguably less rigorous. In a secure environment such as the State Hospital, behaviours or other factors which indicate increasing levels of risk may be noticed at an early stage and therefore lead to more prompt preventative measures. In the present study recidivism rates also remained low in those patients who were discharged from the State Hospital; all participants continued to be subject to restrictions under the Mental Health Act and therefore to intense risk assessment and management strategies.

The quality of completed RSVPs

Difficulties in rating individual RSVP items may also account for the lack of predictive power. Many of the items are psychological in nature and require information from clients in order to provide accurate ratings (for example, self-awareness and attitudes that support sexual violence). Clinicians may have to apply substantive clinical judgement to rate these items. This seems likely given the evidence by Sutherland et al (2012) on the poor interrater agreement on some RSVP items among clinicians in Scotland. This may affect the extent to which risk factors in the RSVP inform care and treatment with accuracy. From a research perspective, this is perhaps further limited by the recommendation that a convergent approach should be adopted in clinical practice given the lack of a superior risk assessment methodology (Boer, 2006). When applied to the present sample, the implementation of the RSVP coincided with that of the HCR-20. Seeing how most research participants also had an HCR-20, clinicians may have viewed the documentation of RSVP information as repetition, which may have impacted on the quality. Additionally, it is presumed that the RSVP risk information were applied to case management planning as per policy; future research is required to explore this link in greater detail.

Clinical interpretation

Meaningful comparison to other cohorts is difficult as research on sexual offenders with mental illness is limited in general (Stinson & Becker, 2012). Though some data are available, samples are often pooled when describing background characteristics (Stadtland, Hollweg, Kleindienst et al, 2005). This noted, the current sample is representative of the wider State Hospital population in terms of sexual and physical abuse, forensic background, primary diagnosis, educational background and socioeconomic status, and therefore of mentally disordered offenders requiring high

secure care (see chapter 4). Equally, the HCR-20 scores imply that the sex offending sample were similar to the total HCR-20 sample, which in turn had been found to resemble the risk scores of research cohorts in other studies (see chapter 6). While the RSVP did not predict future sexual incidents, the HCR-20 did. When examining these results against the backdrop of other findings pertaining to the descriptive RSVP data, relationships between the respective tools and incidents as well as when considering the length of follow-up time, it seems that the RSVP may not be an efficient additional risk assessment tool for sexual incidents in psychiatric inpatient settings.

7.5 Limitations

Though the response rate was good (92%), the overall population eligible for this research was small. This seems a common problem in studies on mentally disordered sexual offenders, i.e. the generalisibility of the present findings may be limited even though the base rate of sexually inappropriate behaviour (14%) is in line with other research cohorts (Jones et al, 2007). Nonetheless, the results of the present study need to be interpreted with great caution. Though the statistics imply that the RSVP performed poorly, this is confounded by various limitations such as the small sample size and the limited amount of sexual violence possible in a restricted inpatient psychiatric setting. Furthermore, of those sexual incidents that did occur, all were documented as minor in nature, and therefore perhaps not consistent with serious sexual violence such as rape. This, however, is an issue as it is typically within inpatient settings were risk is first and foremost assessed. In the present study, most sexual incidents occurred after 12 months, by which point the baseline RSVP may have not been valid anymore. Yet, the clinical reality of this study underlined that RSVP updates were often not available or were conducted 24 to 36 months after the implementation of the baseline RSVP. Moreover, almost all sexual incidents were committed by two research participants only. While this matches the literature suggesting that it is typically a small group of chronic, persistent offenders who are involved in a large proportion of incidents, this may have greatly affected the statistical analysis employed. In the absence of a final risk judgment, it was not possible to explore the notion that risk may have been related to a combination of potent risk factors rather than specific scales or domains. This noted, the heterogenous nature of the population under investigation may mean that such a combination varies between individuals, and thus it may be challenging to identify statistical patterns.

7.6 Summary

In the absence of published data on the validity of the RSVP, this study provides some clinically useful data despite its small sample size. The RSVP did not predict sexual violence, which may be linked to a combination of practical and statistical factors affecting this research. While it is possible that the identified risk factors may have led to the successful implementation of appropriate risk management strategies, this cannot be verified as no research was conducted on the link between identified risk factor and documented clinical decision and strategy.

The disparity between the findings on the RSVP and the HCR-20 may be due to clinicians being over-cautious in their ratings of risk factors on the RSVP, perhaps because of the harmful nature and the societal reaction attached to sexual offending. Alternatively, the instructions on rating introspective risk factors including those pertaining to insight such as self awareness may have been qualitatively very different from the HCR-20. Clinical risk factors on the HCR-20 may have been more accessible or completed in a different manner from those in the RSVP. This, however, is based on assumptions as the RSVP has not yet been validated against the HCR-20. Perhaps most striking was the extent to which the clinical implementation context of this thesis affected the research process. Not only was recruitment tied to the implementation of the RSVP, which invariably affected the length of follow-up time, clinicians did not provide a case conceptualisation nor a final risk judgement rating. Though previous research has reported these to be of importance (de Vogel & de Ruiter, 2004), it appears that in clinical practice this was not documented at the time of study conception. As the implementation was hospital wide, no comparison group was available to further scrutinise the RSVP findings. In summary, the RSVP may have limited utility in predicting sexual violence in psychiatric inpatients settings due to the limited scope of sexual violence and existing risk management strategies. The tool may however have utility in other aspects of clinical practice, such as the development of risk formulation and identification of risk management strategies.

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CHAPTER 8

THE PREDICTIVE VALIDITY OF PSYCHOMETRIC MEASURES IN SECURE CARE

The overarching purpose of SPJ risk instruments is to guide and inform the management of harmful behaviour (Webster, Douglas, Eaves et al, 1997; Hart, Kropp, Laws et al, 2003). This places particular emphasis on those risk factors that are amenable to change and intervention, i.e. dynamic risk factors (Douglas & Skeem, 2005). Yet, research into dynamic risk factors is limited to date (Philipse, Koeter, van der Brink et al, 2004). This includes a lack of discussion on how to incorporate identified dynamic risk factors into the risk assessment – risk management process. Perhaps this is because this is a relatively recent development when compared to studies on historical factors. The aim of the present chapter is to assess the predictive validity of dynamic risk factors to the assessment of risk across inpatient settings.

8.1 Introduction

There is clear consensus across the literature that actuarial risk assessment tools, i.e. historical risk factors, are statistically superior to clinical or dynamic risk factors (Buchanan, 2008). The latter refer to individual attributes that are directly linked to criminal behaviour such as antisocial attitudes and values (Andrews & Bonta, 2010). The very nature of dynamic risk factors therefore provides opportunity for change and treatment. The theoretical and practical importance of such risk factors corresponds with the Risk-Need-Responsivity model (Andrews, Bonta & Hoge, 1990). The need principle outinles that criminogenic needs, i.e. individual needs related to reoffending, ought to be addressed as the cornerstones of effective intervention. Empirical evidence in meta analyses confirms that criminogenic needs are valid predictors of adult recidivism (Wong, Gordon & Gu, 2007; Hockenhull, Whittington, Leitner et al, 2012) as well as institutional violence (Gendreau, Goggin & Law, 1997). More recently, Best, Day, Campbell et al (2009) established that the presence of criminogenic needs was associated with lower levels of treatment engagement, treatment motivation and lower levels of psychosocial functioning. The literature frequently uses the term dynamic risk factor and crimongenic need interchangeably, yet there is a subtle difference. While dynamic risk factors are typically valid at group level, a criminogenic need such as substance abuse may be related to reoffending for one person but not for another person even though both individuals may

use substances. This mirrors Polascheck's (2006) caution regarding the applicability of needs research to serious violent offenders as though there may be face similarities, the underlying motivations and processes involved in offending are thought to be different from less risky offenders. This said, Landenberg and Lipsey (2005) report on a meta analysis of the effectiveness of standardised cognitive-behavioural treatment for high risk adults and adolescents. Of interest is that the addition of anger management and interpersonal problem solving skills to routine cognitive-behavioural programmes seemed to strengthen deterrence from reoffending.

Accordingly, the addition of needs and dynamic risk indicators to violence risk assessments has been found to predict recidivism across different offender populations (Simourd, 2004). For example, the Level of Service Inventory – Revised (Andrews & Bonta, 1995) is a violence risk assessment tool with good predictive power. The majority of items are dynamic and needs oriented in order to inform treatment, yet its applicability to forensic mental health has been questioned (Long, Webster, Waine et al, 2008). To some extent, this also applies to SPJ tools such as the HCR-20. Though dynamic risk factors are evident in the clinical and risk management scale, the predictive properties of these vary according to setting and outcome variable (Gray, Fitzgerald, Taylor et al, 2003; Gray, Snowden, Macculloch et al, 2004). This may be connected to the often complex and subjective nature of interpreting dynamic risks. Rufino, Boccaccini and Guy (2010) evince that clinicians deemed the clinical and risk management items of the HCR-20 as requiring substantive clinical subjectivity. Interrater reliability of these risk factors was poor despite using the HCR-20 manual when rating evidence. Alternatively, though the HCR-20 was developed on sound empirical evidence and by consulting experts on the clinical relevance of risk items, important risk factors may have been missed. This is exemplified in a study by McDermott, Edens, Quanbeck et al (2008a) who argue that measures of impulsivity, anger and psychiatric symptoms add incremental validity over and above the HCR-20 in predicting institutional violence. One may argue that this is not surprising given that the HCR-20 was not designed with institutional aggression in mind, yet dynamic risk factors have also been identified as excellent informer points in preventing recidivism (Folino, 2005).

Risk indicators in clinical practice

While best practice guidelines and management documents emphasise strategies and protocols to address risk of harm (Department of Health, 2007; NICE, 2007; RMA, 2011),

there is surprisingly little information on the risk cues deemed important by professionals in clinical practice. The few papers published on this topic, however, place importance onto dynamic risk factors. For example, Elbogen, Mercado, Scalora et al (2002) asked a large sample of clinicians (n = 134) to rate the relevance of over 50 risk cues derived from the HCR-20, the MacArthur study and a purely actuarial tool, the Violence Risk Appraisal Guide. Findings implied that the most relevant risk factors were behavioural and dynamic in nature (e.g. impulsive behaviour, violent fantasies) while the least relevant variables were predominantly demographic and historical, i.e. early maladjustment, work and social history. The perceived relevance of these risk factors did not differ according to discipline nor risk setting. These results are further supported in a similar survey by Odeh, Zeiss and Huss (2006) in the US. In contrast to Elbogen et al (2002), however, Odeh and colleagues created standardised patient narratives including a two year summary in terms of violent incidents. Based on these narratives, a sample of 80 clinicians consisting of psychologists, psychiatrists, social workers and nursing staff were asked to indicate a dichotomous prediction of future violence, a probabilistic estimate of future violence in percentages and a rating of the likely severity of future violence. In addition, clinicians were also asked to specify the information that had been most important in facilitating their decision about future violence. The authors concluded that clinical risk cues such as the presence of psychosis, paranoid delusions and noncompliance with medication were most utilised in the sample's decision making process. Similar to Elbogen and colleagues' results, professional occupation did not impact on the prediction of violence. This said, Odeh, Zeiss and Huss (2006) caution that though the top risk cues were, to some extent, related to the violence described in the patient protocol, they were not related to actual outcomes of violence, i.e. in real life. This seems to tie in with the finding that interrater reliability on each protocol and in reference to the prediction of future violence was poor.

These shortcomings aside, similar patterns have been identified in forensic setting. Sturdisson, Haggard-Grann, Lotterberg et al (2004) analysed the processes by which psychologists, nurses and social workers used risk factors in structured clinical assessments of forensic patients ready for community discharge. The results confirmed that clinical factors such as lack of insight, lack of treatment motivation, substance abuse, instability, pharmacological treatment and homicidal thoughts were perceived as more relevant than social factors such as lack of housing, family, economic situation, occupational skills and leisure activities. However, this cannot be seen as a universal truth as the relevance of each risk cue depends on the individual and the temporal context of the

rating, i.e. risk is dynamic and fluid. If at all, then these studies call for an investigation of the predictive properties of dynamic risk factors in clinical practice.

Dynamic risk factors and violence

Theoretically and practically, evidence points to a strong link between cognition and violence (Sestir & Bartholow, 2007; Wallinus, Johansson, Larden et al, 2011). The findings of the MacArthur risk assessment study are of interest in this respect (Grisso, Davis, Vesselinow et al, 2000). This prospective study considered the contribution of imagined violence to actual violent behaviour. A large cohort of psychiatric patients were recruited and followed up over 50 weeks upon discharge into the community. Results were compared to a control group of non-psychiatric individuals from the public. Of those psychiatric participants who reported violent thoughts (n = 246), 153 (62%) engaged in violent behaviour during the first follow-up period (10 weeks). In contrast, of the 90 controls (17%) from the community sample (n = 519) who admitted to violent thoughts, 34 (38%) engaged in violent behaviour. The authors concluded that patients with violent thoughts were statistically more likely to engage in violence than lay people in the public with violent thoughts. While the results suggest difference in violent cognitions, this appears to be largely influenced by the effect of ethnicity in that this relationship was strong for non-caucasian people but not for Caucasians. Also, self reported thoughts of violence appeared to be more prevalent amongst those with more severe psychiatric symptoms. Yet, the association between imagined and actual violence was weak in patients diagnosed with major mental disorders. Furthermore, critics have pointed out that while violent fantasies are not uncommon only a small proportion of individuals who fantasise act upon them. This has led researchers to suggest that the presence of violent cognitions is unlikely 'to be necessary or sufficient for […] aggression' (Prentky & Knight, 1991, p. 651). Arguably, it seems unlikely that violent fantasies and thoughts occur in a vacuum (Gellerman & Suddath, 2005).

There is a remarkable body of evidence pointing towards the difference in anger and impulsivity between those who offend and the non-offending public. Trait impulsivity is considered a tendency to respond to internal or external stimuli in a reckless manner while anger is seen as the individual's propensity to react angrily to situations. The contribution of these constructs to aggression across populations is well established and includes non-mentally ill offenders, forensic inpatients and general psychiatric patients in the community (Barratt, 1994; Novaco, 1994). Early research in the MacArthur study showed

that anger scores as measured by the Novaco Anger scale (NAS) were predictive of violence in the community (Monahan, Steadman, Silver et al, 2001). Doyle and Dolan (2006) confirm that NAS scores predicted violence in a sample of forensic inpatients in the UK. This is further endorsed by a recent meta analysis (Chereji, Pintea & David, 2012) reporting that anger impacts significantly on the occurrence of violence with a large effect size (d = .86). Likewise, research concludes that impulsivity is a robust correlate of offending (Lynam & Miller, 2004) and indeed a reliable predictor for aggression in forensic inpatients (Ferguson, Averill, Rhoades et al, 2005; Stanford et al, 2009). Violent offenders score higher on standardised impulsivity measures than those convicted of non-violent offences (Smith, Waterman & Ward, 2006). In particular, those with a diagnosis of antisocial personality disorder seem to be more impulsive than control groups (Gordon & Egan, 2011).

Basic needs

Glorney, Perkins, Adshead et al (2010) suggest that admission to high secure services implies that there is a host of generally unmet needs, which are not necessarily directly related to offending. Based on a sample 28 male forensic inpatients in a high secure setting in England, the authors identified eight prevalent need domains. These pertained to therapeutic engagement, risk reduction, education, occupation, mental health recovery, physical health, cultural and spiritual needs and care pathways management. Unmet needs were conceptualised as a failure to address a specific need due to lack of interventions or where the recipient does not respond to the intervention aimed at meeting this need. The most frequently identified unmet needs were offending and related behaviour such as anger management, violence and insight into risk related behaviours. This resonates with the Good Lives Model (Ward & Gannon, 2006) in that criminogenic needs and basic needs are intrinsically linked. Offending, it is suggested, is a method employed to secure basic but otherwise unattainable resources. For example, research in the late 1990s concluded that offenders with problems in employment, ill physical and/or mental health, family and finance issues were more likely to reoffend than other offenders and controls (Zamble & Quinsey, 1997). Equally, in a sample of 7,000 released offenders recidivism was associated with individual needs of accommodation, employment and substance misuse (May, 1999). While these findings make clinical sense, data on the prevalence of needs are often biased in so far that typically the views of clinicians are considered. For example, Glorney et al's (2010) results are based on a composite interpretation of a

structured needs assessment, the outcome of mental health tribunal reports and filed care and treatment plans. This is an unfortunate shortcoming given previous research emphasising the differences between staff and patients in the understanding of needs (Gallagher & Teeson, 2000). For example, Long et al (2008) note that the ratings of 36 forensic inpatients and staff differed significantly with regards to the risk of violence. While patients did not view this as a need or an issue, staff generally opined this as an unmet need, i.e. requiring intervention and prolonged detention.

The purpose of the present study was to investigate the predictive validity of dynamic risk factors and needs in a high secure forensic setting. In contrast to the previous chapters, a traditional research approach was chosen in that the research student administered psychometric measures, none of which led to clinical intervention and therefore did not interact with the implementation of SPJ tools.

8.2 Methods

Design and Setting

This study was prospective and took place in the State Hospital, the high secure psychiatric hospital for Scotland and Northern Ireland, as part of a hospital-wide clinical development.

Participants

As described in the descriptive chapter, the total sample consisted of 115 male patients. Of these, 109 had an HCR-20 and 21 had an RSVP of whom 17 (81.0%) also had an HCR-20.

The mean age at time of data collection was 39 years (sd = 10.8) ranging from 20 to 66 years. The majority of participants had at least one offence prior to the index offence (n = 102, 88.7%) with a mean of 15 previous convictions (sd = 13.6, range: 1 - 58). Table 37 displays further demographics of the study sample.

Table 37 Demographics of psychometrics study sample (based on file information)

Participant demographics		Number (%)
Diagnosis (based on ICD-10)	*Primary diagnosis* Psychotic illness Schizophrenia Personality Disorder	 107 (93.0%) 92 (80.0%) 8 (7.0%)
	Secondary diagnosis (n =79) Substance misuse disorder Personality Disorder Dissocial PD	 33 (41.25%) 28 (35.0%) 20 (71.4%)
Childhood	Physical abuse	39 (33.9%)
	Sexual abuse	33 (28.7%)
	Other experience of adverse events (e.g. bullying or prolonged separation from care taker)	97 (84.3%)
History of Self harm/Suicide	Self harm	76 (66.1%)
	Suicidal behaviour	55 (47.8%)
Source of referral	Prison Psychiatric hospital Court	41 (35.6%) 40 (34.8%) 34 (29.6%)
Adult background	Single marital status	93 (80.9%)
	No educational qualifications	82 (71.3%)
	Alcohol and substance misuse history	94 (81.7%)
	Restricted legal status[4]	64 (55.7%)
	Previous violence in other hospitals	52 (45.2%)

As noted in chapter 4 of this thesis, the sample was representative of the wider State Hospital population (Thomson, Bogue, Humphreys et al, 1997).

Reason for admission

Based on file information, one third of the sample (n = 39, 33.9%) were admitted due to inpatient violence in a less secure setting. Thirty-three patients (28.7%) were referred from the court due to their violent index offence, and for 31.3% (n = 36) deterioration in mental health was documented. A minority of seven individuals (n = 6.1%) were noted to

[4] A restriction order ensures careful management of patients who are thought to be a serious risk to the public due to their mental disorder. Any decision regarding restricted patients' leave, transfer and discharge is made by the Scottish Government rather than the patient's Responsible Medical Officer (RMO). Decisions to vary or remove an order are taken by the Mental Health Tribunal for Scotland.

have been admitted due to non-violent management problems such as repeated absconding or persistent use of drugs while in care.

Measures

HCR-20 (Webster, Douglas, Eaves et al, 1997)

The HCR-20 comprises 20 risk factors, which are divided into 10 historical, five clinical and five risk management items. The historical factors pertain to relatively static variables such as previous violence, while the clinical factors are dynamic and responsive to changes. The five risk management items encourage the rater to consider risk factors relating to current and future scenarios such as lack of social support. For research purposes, each item can be scored as 0 (not present), 1 (partially or possibly present) or 2 (definitely present) according to case-specific information and clinical judgement. The total maximum score is 40. If insufficient information is available, an item can be omitted (Webster et al, 1997).

Barratt Impulsiveness Scale (Patton, Standford & Barratt, 1995)

The Barratt Impulsiveness Scale (BIS-II) is a 30 item self-report scale with a three factor structure of cognitive (e.g. attention), motor (e.g. impetuousness) and non-planning impulsivity (e.g. lack of future planning). Researchers typically report the total and each subscale score to indicate impulsivity. The BIS was primarily designed for research purposes rather than clinical intervention. Impulsivity is thought to be a dimension of personality; trait impulsivity is defined as a tendency to respond to internal and external stimuli in a reckless manner without consideration for possible consequences (Patton, Stanford & Barratt, 1995). This underpins the scoring process as respondents are asked to indicate the extent to which statements apply to them on a four point Likert scale ranging from 1 (rarely/never) to 4 (almost always/always). Some items are reverse scored to avoid response bias.

Though the HCR-20 contains a risk item on impulsivity (C4), it is recommended that raters use a standardised scale to assess impulsivity given that it is a multi-faceted concept. The extent to which this suggestion is applied by clinicians, however, is not known. The BIS-II was used in this thesis as it is one of the most widely used and validated impulsivity measures (Stanford et al, 2009). It seemed particularly applicable given practical considerations, i.e. this instrument was routinely used at the State Hospital

to evaluate treatment and interventions such as the anger management programme at the time of this thesis.

Novaco Anger Scale (Novaco, 2003)

The Novaco Anger Scale (NAS) is a standardised, self-report measure designed to assess an individual's propensity towards anger. The NAS consists of 48 items which are divided into three subscales according to cognitions (e.g. justification), arousal (anger intensity and duration) and behavioural indicators (verbal and physical aggression). A total and subscales score are calculated based on a predetermined weighing process as described by the manual. Each item is rated on a three point Likert scale requiring respondents to indicate the extent to which given statements apply to them (never true, sometimes true, always true).

The NAS was chosen for this study as the tool was developed and validated on the State Hospital patient population, i.e. normative data are available for comparisons. Additionally, the NAS is routinely used to evaluate anger interventions at the State Hospital and hence seemed more fitting than other less validated anger measures such as Buss-Durkheim measure.

Brief Psychiatric Rating Scale (Ventura, Green, Shaner et al, 1993)

The Brief Psychiatric Rating Scale – Expanded Version (BPRS-E) is clinical assessment tool with the primary purpose of assessing treatment change across a range of psychopathological symptoms. This instrument was initially developed by Overall and Gorham (1962). Since then the BPRS has been expanded from 16 to 24 items reflecting advances in understanding clinical symptoms associated with mental disorder, in particular schizophrenia (e.g. Lukoff, Nuechterlein & Ventura, 1986). Clinical ratings are given on a seven point Likert scale ranging from 1 (absent) to 7 (extremely severe) with ratings of 4 and above indicating clinical levels of severity. The scale should be administered by a clinician or an adequately trained researcher as ratings are based on interview and observational data (Ventura et al, 1993). The BPRS was designed to produce a total score indicating an overall level of psychiatric symptoms, however, individual items and subscales can also be examined.

While the HCR-20 requires a rating of the presence of current clinical symptoms, the severity nor the frequency of symptoms are directly evidenced in the assessment; the

extent to which these aspects inform the rating is not known. The expanded version of the Brief Psychiatric Rating Scale was applied in this thesis because recent studies support its clinical utility and validation across a range of psychiatric and forensic samples with schizophrenia (Kopelowicz, Ventura, Liberman et al, 2008). While the Positive and Negative Syndrome Scale (PANSS) is routinely used in the assessment of psychiatric symptoms, Foley, Browne, Clarke et al (2007) criticise that the positive and the general psychopathology scales of the PANSS measure hostility, poor impulse control and tension and lack of insight. These are inherent aspects of violent behaviour and therefore regardless of mental state, violent individuals will score high on these psychopathology scales. The PANSS therefore may not be an appropriate tool if the topic under investigation is the relationship between psychiatric symptoms and violence.

Camberwell Assessment of Needs – Forensic Short Version (Slade, Thornicroft, Loftus et al 1999)

The Camberwell Assessment of Needs – Forensic Short Version (CANFOR-S) is a semi-structured interview schedule assessing an individual's needs across 25 life domains. This particular version of the CANFOR series was designed for research and routine clinical forensic practice. It is based on previous research evidencing that the needs of mentally disordered offenders are different from general psychiatric patients (Harty, Shaws, Thomas et al, 2004) and from the general population (Shaw, 2003). As a result, the CANFOR-S includes items specific to offending behaviour such as a person's agreement with prescribed medication. Scoring is categorical in that, provided a need is present, the interviewee states whether this is met through intervention (1) or unmet (2), i.e. it poses a problem for the patient. Some items can be omitted depending on the research population. In particular, items on future accommodation, needs with transport, child care, risk of sexual offending and arson have the option of being rated as not applicable. The tool has the potential to be integrated into clinical care, e.g. in the care planning process (Simons & Petch, 2002) as the views on needs by patients can be compared with those held by service providers.

Scales specifically designed to assess treatment needs in mentally disordered offenders are the CANFOR-S (Thomas, Harty, Parrott et al, 2003) and the Needs for Care Assessment Schedule (Brewin, Wing, Mangen et al, 1987). In contrast to the latter, the CANFOR-S is less time consuming and is thought to be useful in planning care and treatment (Long, Webster, Waine et al, 2008). In addition, the CANFOR-S had been used in an earlier

study in the State Hospital (Thomson, Doyle, Miller et al, 1999) and hence appropriate comparison data are available.

Schedule of imagined violence (Grisso, Davis, Vesselinov et al, 2000)

The Scheduled of Imagined Violence (SIV) consists of a set of eight structured questions with a range of response categories. This tool is based on self report and was specifically developed for the MacArthur study (Steadman et al, 1998). The first question establishes the presence of violent thoughts and fantasies. If affirmative, subsequent questions are aimed at obtaining more information about the nature of reported violent thoughts. In detail, questions aim to elucidate data in relation to frequency, recency and intensity of violent cognitions as well as similarities in type of harm imagined, whether harm is target-focussed or general, and whether the seriousness of imagined violence changes over time (Grisso et al, 2000).

Violent cognitions are often assessed using implicit measures, i.e. indirectly tapping into attitudes and beliefs in favour of offending and violence. These are often employed in investigations of offence supportive cognitions in sex offenders though also high risk violent offenders (Polaschek, Bell, Calvert et al, 2010). However, implicit measures may be biased by various factors such as context, social motives and shifts in attention. Given the mental health context of this thesis, the SIV was chosen for this study due to its proven clinical applicability in the MacArthur study. While there are various other self report measures such as the Normative Beliefs about Aggression scale (Huesmann & Guerra, 1997) or the revised 16 item Expagg scale (Campbell, Muncer, McManus et al, 1999), these are largely validated on university students or non-mentally ill offenders.

Demographic questionnaire

A questionnaire was developed, based on Thomson, Bogue, Humphreys et al (1997), to code data from patients' hospital files. The questionnaire covers participants' demographic details (e.g. age, level of education, marital status) as well as forensic, legal, psychiatric, health and personal history including details of other family members. In addition, data were collected in relation to participants' index offence and/or behaviour leading to their current admission to the State Hospital.

Outcome measures

The main outcome variable was any violent incident (actual and near miss) recorded in a patient's hospital files, official reconviction data (Scottish Criminal Records Office), or hospital incident reporting systems (e.g. DATIX, IR1). 'Near miss' incidents refer to any event which may not result in actual harm by definition but has the potential to do so. Box 1 outlines the definitions used for incidents and convictions. Outcome data were triangulated by seeking patient self-report on incidents. However, few patients volunteered information in this respect.

Box 1 Definition of incident and conviction types

Incident: any violent event involving physical contact with a victim, any sexual event (including exposure and touching) and any episode of physical aggression towards property (including fire setting). This includes 'near miss' incidents, i.e. any event which may not result in actual harm by definition, but has the potential to do so.

Serious incident: any violent event resulting in the death or injury to the victim requiring hospital treatment, any sexual event involving contact with the victim, and any fire setting.

Conviction: any conviction (including non-violent offences).

Violent conviction: any conviction for assault, serious assault, fire-setting/raising or contact sexual offence.

Procedure

Recruitment of participants

All participants included in the HCR-20 (chapter 6) and RSVP (chapter 7) studies were asked to participate in psychometric assessments. According to the criteria outlined in these two previous chapters, research participants were required to have an up-to-date risk assessment tool completed, discussed and signed off by the relevant clinical team, and the patient was thought to be able to give informed consent by their RMO. Research participants were recruited in tandem with the collection of risk assessment tools, i.e. between March 2005 and March 2008. Following the RMOs' permission to approach patients, consent to use file information for background information, incidents recorded and to access reconviction data was sought from all eligible participants. Additionally,

clinical symptoms documented by nursing staff were collected as a proxy measure of the chronicity of psychiatric symptoms. Patients were categorised as 'chronic' if the total number of months with documented psychiatric symptoms exceeded the median of the study period for the relevant individual. Recruitment of participants took place during direct face-to-face contact on the admission, continuing care and rehabilitation wards. The researcher maintained contact with all study participants throughout the research project. While the frequency and nature of incidents were collected during the study period, reconviction data were collected in April 2010.

Consent and confidentiality

All study participants were provided with an information sheet and told about the study, its purpose and the procedures involved verbatim by the research student. It was emphasised that all respondents could decline participation without any consequences for their care or legal rights. Those who agreed to take part in the study were asked to sign a consent form. This included the permission to access all patient files to collate a descriptive background for the sample and to follow-up incidents over the course of the study. Where consent was granted, an interview was arranged for a later date, though frequently patients completed the interview there and then. Of those who agreed to an interview at a later date, two patients (1.3%) opted to withdraw from the study.

Interview process

During the research interview and according to ethics guidelines (RCN, 2011), the research student employed an ongoing consent process by reminding patients that they did not have to answer any questions that may cause discomfort, and that they could withdraw from the study at any given point. In addition, ward staff were routinely consulted on the day of the interview regarding relevant research participants' mental state. Participants were notified that confidentiality would be breached if they stated clear threats against others, indicated clear intentions to harm themselves, or gave direct accounts of other harmful behaviour such as hostage taking.

Interview characteristics

Research interviews typically lasted 45 minutes to one hour. Notably, this included establishing rapport and explaining the study aims and process in detail. All questionnaires were administered by the research student in the same sequence, i.e. BIS-II,

NAS, CANFOR-S, SIV and lastly the BPRS-E. While this perhaps added to the overall duration of interviews, this manner overcame potential issues of literacy, kept participants engaged and opened up a forum where any misunderstandings regarding scale items could be discussed. None of the participants were offered monetary incentives for their participation as this was against State Hospital policy.

Follow up of participants

All participants were approached 12 months post recruitment. Of the initial sample of 115 patients, 88 (76.5%) agreed to be re-interviewed. Follow-up interviews were conducted using similar procedures employed during recruitment in that consultant psychiatrists were contacted first to obtain permission to speak to relevant patients. All RMOs outwith the State Hospital were offered a copy of the research consent form signed by the patient. Once permission was granted by the RMO, the research student liaised with nursing staff before approaching participants to re-establish consent and, if applicable, conduct the interview. The time elapsed between baseline and follow up interview was on average 12.1 months (sd = .42) ranging from 11 to 13 months.

Setting of interviews

At baseline, the majority of interviews (n = 109, 94.8%) took place within the State Hospital. However, due to the difficulties described in chapters three and five (methodology and implementation), the psychometric assessments of six (5.2%) patients were conducted in less secure settings (four in a medium secure facility and two in a low secure setting). Equally, the majority of interviews (n = 70, 79.5%) at follow-up were conducted in the State Hospital. Twelve patients (13.6%) agreed to be re-interviewed in medium secure facilities and six (6.8%) were interviewed in low secure settings.

All interviews in this study were conducted by the research student. The student was not involved in the care and treatment of participants; she was not a member of any clinical teams. All interviews were conducted on a voluntary basis. This means that the research student did not offer any monetary nor material incentives for participation in the study. All study participants were made aware of this.

8.3 Results

Correlations between criterion measures

Table 38 demonstrates the inter-relationships between criterion measures. Spearman's rho correlations and point biseral correlations (due to the dichotomous nature of the SIV) were conducted.

The BPRS-E total and the clinical scale of the HCR-20, the total HCR-20 scale and total needs as rated by staff and by patients respectively correlated significantly (all $p < .05$). Total needs as rated by staff and by patients correlated significantly ($p < .001$), the clinical scale of the HCR-20 correlated significantly with staff's ratings of total needs ($p = .005$). Patients' ratings of needs were related to the clinical HCR-20 scale, the risk management scale and the total HCR-20 scale. The NAS and the SIV respectively were only related to total needs as rated by patients. The BIS total and the historical scale of the HCR-20 were not related to any other measure.

Table 38 Spearman's rho correlation between criterion measures and the HCR-20 subscales

	NAS total	**BPRS-E total**	**Total needs staff**	**Total needs patients**	**Violent thoughts**	**H scale**	**C scale**	**R scale**	**HCR-20 total**
BIS total	.148	.077	.062	.058	-.066	-.092	.026	.049	-.007
NAS total		.116	.128	.243*	-.184	.061	.026	.105	.114
BPRS-E total			.357**	.259**	-.160	-.041	.414***	.082	.193*
Total needs staff				.542***	-.081	.016	.225*	.117	.142
Total needs patients					-.247*	.049	.267**	.195*	.229*
Violent thoughts						.076	-.096	.106	.047

*** significant at p < .001
** significant at p < .01
* significant at p < .05

Correlation between CANFOR-S and BPRS-E

Patient rated CANFOR-S needs of psychological distress correlated significantly with BPRS-E ratings of suicide (rho = .286, p = .002), anxiety (rho = .249, p = .007) and depression (rho = .269, p = .004). The same statistical pattern emerged when correlating psychological distress as rated by staff with these BPRS-E items.

Psychotic symptoms as rated by patients on the CANFOR-S correlated significantly with BPRS-E hallucinations (rho = .215, p = .022). This also applied to staff rated CANFOR-S psychotic symptoms and BPRS-E hallucinations (rho = .334, p = .000) but also BPRSE-E suspiciousness (rho = .598, p = .000).

Prevalence of incidents

All incidents

Of the total sample of 115 mentally disordered offenders, 43 (37.4%) were involved in a total of 224 incidents during the study period. The majority of these incidents (n = 175, 78.1%) were categorised as violent, while 33 (14.7%) were of a sexual nature and 16 (7.2%) consisted of violent acts against property. The mean number of incidents was 5.21 (sd = 4.6) per perpetrator, ranging from 1 to 24 incidents. The median was 3.0 incidents. The incidence rate for total violence was 0.65 per patient year in the study.

Serious and minor incidents

Of the 224 incidents, three (1.3%) were deemed to be serious. These were perpetrated by three patients (7.0%) while the remaining 40 perpetrators (93.0%) engaged in minor incidents only. This is to say that those patients who were involved in a serious incident did not engage in minor violence prior nor post the serious incident.

Differences in the number of incidents to previous chapters

The total and the mean number of incidents reported are different from the number of incidents documented in the HCR-20 and RSVP chapters because the date of the psychometric interview did not necessarily correspond with the date of the implementation of the relevant patient's risk assessment information. This delay was due to organisational and communication problems described in the implementation and the methodology chapters (chapters three and five) in this thesis.

Follow-up time

The prospective, clinical led nature of this study meant that research participants were followed up for varying lengths of time, i.e. the recruitment was tied to the implementation of each patient's SPJ tool. Table 39 displays the categorisation applied to the length of follow-up time in this study.

Table 39 Length of follow up time in categories

Length of follow up time	**Number (%)**
< 12 months	6 (5.3%)
12 – 23 months	42 (36.5%)
24 – 36 months	65 (56.5%)
> 36 months	2 (1.7%)

Impulsivity Profile

In the absence of official norms, table 40 shows the descriptive data on impulsivity in the thesis sample and compares this to the published impulsivity scores of 425 forensic psychiatric inpatients in the US (Haden & Shiva, 2008). A total score of 72 on the BIS-11 is thought to imply high impulsivity (Standford, Mathias, Dougherty et al, 2009). It is suggested that total BIS scores ranging from 52 to 71 are within the normal limit of impulsivity while those scoring under 51 are either over-controlled or dishonest in their answers (Helfritz & Stanford, 2006).

Table 40 BIS-II mean (standard deviation), median and range for the full sample

	Mean (sd)	**Median**	**Range**	**Haden & Shiva (2008) Mean (sd)**
BIS total	71.59 (4.1)	72.0	64 – 84	69.34 (13.6)
BIS attention	20.99*** (3.1)	21.0	14 - 29	17.59*** (4.6)
BIS motor	23.98 (2.9)	24.0	16 - 31	24.75 (5.6)
BIS nonplanning	26.59 (3.5)	27.0	17 - 35	27.00 (6.7)

*** significant at $p < .001$

While the study sample was representative of other research in terms of total, motor and non-planning impulsivity ($p > .05$), research participants in this thesis scored significantly higher on attention impulsivity than the comparison group (t (523) = 7.02, $p = .000$).

Anger Profile

Table 41 presents the descriptive anger scores for the total sample (n = 100) on the NAS total and each subscale and compares these to norms published in the NAS manual (Novaco, 1994).

Table 41 NAS mean (standard deviation), median and range of scores

	Mean (sd)	Median	Range	Novaco (2003) Mean (sd)
NAS total	71.91*** (16.0)	68.5	48 - 129	82.45*** (18.8)
NAS cognitive	26.07*** (5.8)	25.0	16 - 45	28.7*** (5.8)
NAS arousal	22.87*** (5.5)	21.5	16 - 43	27.8*** (6.8)
NAS behaviour	22.97*** (5.8)	22.0	16 - 43	27.8*** (7.5)

*** significant at $p < .001$

The study sample reported significantly lower scores on the total NAS scale (t (223) = - 4.46, p = .000) and all subscales (NAS cognitive t (223) = - 3.38, p = .000; NAS arousal t (223) = - 5.87, p = .000; NAS behavioural t (223) = - 5.30, p = .000) when compared to the norms.

Imagined Violence Profile

Of the total sample, 53 (46.1%) reported to have ever experienced violent fantasies. This included 24 (45.3%) who did engage in violence while 29 patients (54.7%) with violent cognitions did not engage in violence during the study. Table 42 displays the number (%) of patients who reported violent fantasies during their life time, and how recent these violent fantasies were.

Table 42 Number (%) of patients with violent fantasies ever and within two months prior to the baseline interview

	Incident (n = 43)	No incident (n = 72)
Violent fantasies ever	24 (55.8%)	19 (44.2%)
Of these, violent fantasies within the past 2 months	14 (58.3%)	10 (41.7%)

There was no statistical association between violent cognitions and actual violent behaviour ($\chi^2 = 2.62$, df = 1, p > .05). This was also the case when analysis focussed on

those with violent fantasies within the two months prior to the interview ($\chi^2 = 2.19$, df = 1, $p > .05$).

Needs profiles rated by patients and staff

There were significant differences in the total number as well as met and unmet number of needs when comparing staff ratings with those of patients. Table 43 presents the mean and median ratings between staff and patients.

Table 43 CANFOR-S profile for patient and staff ratings

	Patients' ratings		**Staff's ratings**	
	Mean (sd)	**Median**	**Mean (sd)**	**Median**
Met need	1.75*** (1.8)	1.0	2.80*** (2.4)	3.0
Unmet need	8.89*** (5.2)	8.0	4.75*** (4.0)	4.0
Total need	10.70*** (5.2)	10.0	7.88*** (4.6)	7.3

*** significant at $p < .001$

Staff reported overall fewer needs when compared with patients' account on the number of total needs (Z = - 5.52, p = .000). In contrast to staff's perspective, patients viewed fewer needs as met (Z = - 4.98, p = .000), and significantly more needs as unmet (Z = - 7.33, p = .000).

Interrater reliability on patient and staff CANFOR-S ratings

An interrater reliability analysis using Cohen's Kappa statistic was performed to determine level of agreement and consistency between patients' and staff's view on needs. Weighed Kappa coefficients of < 0 are considered to indicate poor agreement, 0.0 – 0.20 slight agreement, 0.21 – 0.40 fair agreement, 0.41 – 0.6 indicate moderate agreement, 0.61 – 0.8 imply significant agreement while 0.81 – 1.0 are seen as almost perfect agreement (Landis & Koch, 1977).

The mean weighed kappa coefficient across all need domains was fair at k = .37 (se = .034) ranging from .001 (risk of sex offences) to .67 (basic education). Particularly poor was agreement on perceived risk of sex offences (k = .001, se = .007, p > .05) while the agreement on perceived risk to others was categorised as fair (k = .26, se = .08, p = .000).

Differences in psychometric measures for violent vs non-violent research patients

As illustrated in table 44, patients who aggressed had significantly higher mean scores on anger (U = 910.0, p = .036), in particular on the cognitive subscale (U = 807.0, p = .005). Violent patients also reported a higher mean number of total needs (U = 1094.5, p = .009), in particular more unmet needs (U = 1128.5, p = .014). This was reflected in staff's ratings in that staff perceived violent patients to have more needs (U = 1145.0, p = .020), including unmet needs (U = 899.5, p = 000). Psychiatric symptoms also differed significantly between those who did and those who did not engage in violence during the study (U = 649.5, p = .000).

Table 44 Psychometric measures by incident group

		Incident (n = 43)	**No incident (n = 72)**
		Mean (sd)	**Mean (sd)**
Impulsivity	BIS total	71.07 (3.9)	71.93 (4.2)
Anger	NAS total	76.54** (18.5)	68.69** (13.3)
	NAS cognitive	28.17** (6.2)	24.61** (5.0)
	NAS arousal	23.93 (6.4)	22.13 (4.8)
	NAS behaviour	24.44 (6.9)	21.95 (4.7)
Psychiatric symptoms	BPRS-E total	63.14*** (16.6)	46.21*** (9.1)
Needs rated by staff	Total needs	9.12* (4.7)	7.13* (4.4)
	Unmet needs	6.51*** (4.1)	3.69*** (3.6)
Needs rated by patients	Total needs	12.34** (5.3)	9.73** (5.0)
	Unmet needs	10.46* (5.3)	7.94* (5.0)

*** significant at p < .001
** significant at p < .01
* significant at p < .05

Relationship between psychometrics and incidents

Given the inter-correlations outlined between anger, total needs as rated by staff and patients respectively and the BPRS-E as demonstrated in table 37, zero-order partial correlations were conducted controlling for these relationships. Only the BPRS-E correlated significantly with the presence of incidents at r = - .502 (p = .000).

Predictive validity of psychometric measures

The predictive validity of the NAS, CANFOR – S rated by staff and patients, and BPRS-E psychiatric symptoms were assessed using Receiver Operating Characteristic (ROC) analysis as this method is independent of number of incidents. The area under the curve (AUC) is of particular interest as it indicates the probability that a randomly selected recidivist has a higher score on a given assessment than a randomly selected non-recidivist. In practice, values of .50 indicate a chance prediction while AUCs in the range of .70 - .80 are seen as indicating moderate to large effect sizes (Rice & Harris, 2005). Table 45 describes the AUC values and confidence intervals for the NAS, CANFOR-S and BPRS-E.

The BPRS-E was a significant predictor for all and minor incidents (p = .000), as were total needs rated by staff (p = .020) and rated by patients (p = .009) respectively. Anger was a significant predictor for all incidents (p = .036). None of the psychometrics predicted serious incidents nor reconvictions.

Table 45 AUC (standard error) and confidence intervals for the BPRS-E, the NAS and the CANFOR-S scale (staff and patients) according to outcome

	Number of participants	NAS total		BPRS-E total		CANFOR-S total (staff)		CANFOR-S total (patients)	
		AUC (se)	95% CI	AUC (se)	95% CI	AUC (se)	95% CI	AUC (se)	95% CI
All incidents	43	.62* (.057)	.51 - .74	.79*** (.046)	.70 - .88	.63* (.053)	.53 - .73	.65** (.053)	.54 - .75
Minor incidents	40	.59 (.058)	.48 - .71	.78*** (.047)	.69 - .87	.63* (.054)	.53 - .74	.63* (.053)	.53 - .74
Serious incidents	3	.78 (.082)	.62 - .94	.68 (.206)	.28– 1.0	.51 (.112)	.29 - .73	.67 (.195)	.29 - .10
Reconviction	5	.64 (.178)	.29 - .99	.66 (.091)	.48 - .84	.72 (.072)	.58 - .86	.70 (.104)	.49 - .90

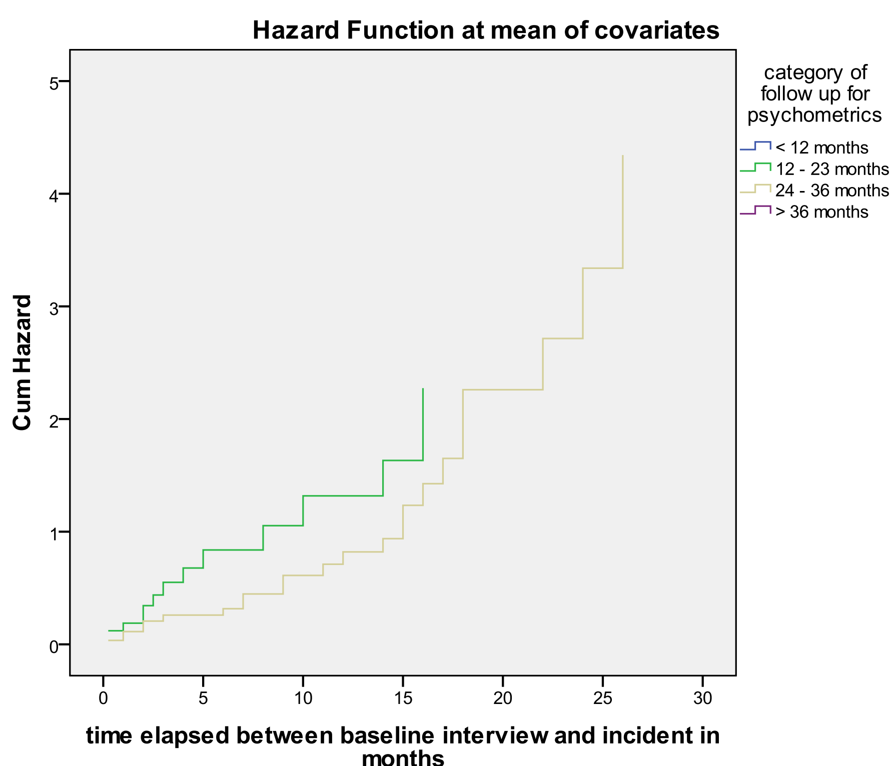
***significant at $p < .001$
**significant at $p < .01$
*significant at $p < .05$

Cox proportional hazards regression

Time between baseline interview and first recorded incident

The mean length of time between date of psychometric data collection and incident was 10.43 months (SE = 1.26), 95% CI 7.97 – 12.90, and the median was 9.0 months (SE = 2.70). Graph 1 displays the hazard curves for the sample from date of psychometric interview to first recorded incident according to the length of follow-up categorised in table 38.

Graph 1 Time elapsed between psychometric interview and first recorded incident in months.



Comparative analysis of the mean length of time between baseline interview and incident was not affected by length of follow-up time (Log rank Mantel-Cox $\chi^2 = 6.214$, df = 3, p = .102) when categorised according to table 38. This was also the case when using the Breslow test (p = .082) and Tarone-Ware test (p = .087).

Cox regression model

Time at risk of incident (duration) was defined in months for each person. Each duration between baseline interview and first incident constituted one observation. Covariates were BPRS-E total, CANFOR-S total needs rated by staff, CANFOR-S total needs rated by patients, and NAS total. Age was added as a time dependent variable while length of follow-up time was controlled.

For all incidents, the -2 log likelihood model was a significant fit of the data (χ^2 = 14.905, df = 2, p = .001), and graphic illustration of the model confirmed that the assumption of proportionality was met. Backward conditional method was used to eliminate nonsignificant covariates. The final step as demonstrated in table 46 shows that only the BPRS-E total score (p = .000) and total needs as rated by staff (p = .033) were significant contributors to the prediction of violence.

Further explorative cox regressional analyses

While these results also apply to cox regression analysis with minor incidents as the outcome variable, i.e. BPRS-E significantly predicted incidents (OR = 1.049, p = .001) as did total needs as rated by staff (OR = .886, p = .030), the model was not valid as the assumption of proportionality was not met.

Similarly, when conducting further explorative analysis on the subscales of the BPRS-E and total needs rated by staff, the -2 log likelihood model did not fit the data (χ^2 = 6.369, df = 3, p = .095); the model was no better than chance in predicting the outcome. Covariates used were positive symptoms, negative symptoms, agitation-mania and depression of the BPRS-E, and met and unmet needs as rated by staff. Though agitation-mania was a significant predictor of violence (p = .040) with OR = 2.313, the confidence intervals were large (CI 95% 1.038 – 5.156) implying this was not a valid predictor.

Table 46 Cox proportional hazards regression with covariates age, NAS total score, CANFOR-S total needs rated by staff, CANFOR-S total needs rated by patients and BPRS-E total score.

Step	Covariate	Beta	SE	P value	Exp (B)	Exp (B) 95% CI
1	Age	.001	.001	.386	1.001	.998 - .1.004
	NAS total	-.004	.010	.724	.996	.976 - .1.017
	Total needs staff	-.113	.063	.075	.893	.789 – 1.011
	Total needs patients	.006	.041	.886	1.006	.928 – 1.090
	BPRS-E total	.046	.014	.001	1.047	1.018 – 1.077
2	Age	.001	.001	.391	1.001	.998 – 1.004
	NAS total	-.003	.010	.743	.997	.977 - .1.017
	Total needs staff	-.111	.062	.073	.895	.792 – 1.010
	BPRS-E toal	.045	.014	.001	1.047	1.018 – 1.076
3	Age	.001	.001	.419	1.001	.998 – 1.004
	Total needs staff	-.119	.057	.037	.888	.793 - .993
	BPRS-E total	.046	.014	.001	1.048	1.020 – 1.076
4	Total needs staff	-.117	.055	.033*	.889	.798 - .990
	BPRS-E total	.049	.014	.000***	1.050	1.022 – 1.078

*** significant at $p < .001$

* significant at $p < .05$

Comparison between baseline and follow-up data on psychiatric symptoms, needs and imagined violence

Of the initial 115 research participants, 88 (76.5%) agreed to a follow-up interview. Statistical comparison between the attrition and the follow-up sample showed that these did not differ on any of the psychometric measures. Rather, discontinuation with the research study was associated with discharge prior to the follow-up interview ($\chi^2 = 15.29$, df = 1, p = .000).

All analyses in this section are within-subject, i.e. only the baseline and follow-up data of the 88 patients who agreed to participate throughout the entire study period are included in these analyses.

Psychiatric symptoms

The severity of psychiatric symptoms as assessed on the BPRS-E reduced significantly during the study period (Z = - 6.24, p = .000). Table 47 describes the mean and median ratings on the total BPRS-E total scale.

Table 47 Mean and median BPRS-E across follow-up

	Baseline		**Follow-up**	
	Mean (sd)	Median	Mean (sd)	Median
BPRS-E total	52.64*** (15.0)	48.0	43.27*** (9.3)	41.0

**significant at p < .001

Despite the reduction in the severity of psychiatric symptoms at follow-up interviews, the BPRS-E differentiated between aggressive (mean BPRS-E = 49.52, sd = 11.4) and non-aggressive inpatients (mean BPRS-E = 39.88, sd = 5.8) at follow-up (U = 394.5, p = .000).

Chronicity of psychiatric symptoms

Forty-seven (40.9%) research participants were categorised with chronic psychiatric symptoms if the total number of months documenting active psychiatric symptoms in the nursing notes exceeded the median number of months of follow-up. Those with chronic psychiatric symptoms were more likely to aggress than those thought to be non-chronically psychiatric ($\chi^2 = 11.508$, df = 1, p = .001).

Imagined violence

In terms of pervasive imagined violence, table 48 outlines the number of patients with reported violent thoughts at both, baseline and follow-up interview in reference to violence.

Table 48 Number (%) of patients with reported violent thoughts across follow-up

	Incident Number (%)	**No incident Number (%)**
Imagined violence at baseline and follow-up	11 (64.7%)	6 (35.3%)
No imagined violence at baseline and follow-up	24 (33.8%)	47 (66.2%)

Crosstab analysis confirmed that imagined violence reported at both, baseline and follow-up interview, was significantly associated with actual violence (χ^2 = 5.468, df = 1, p = .019). This was also true when applying Fisher's Exact test for small samples (p = .027).

Needs

As demonstrated in table 49, the mean number of unmet and total needs decreased significantly between baseline and follow-up patient ratings. Conversely, table 50 depicts staff ratings of met needs which increased significantly from baseline to follow-up ratings while unmet and total needs remained similar.

Table 49 CANFOR-S as rated by patients across follow-up

	Patients' ratings baseline		**Patients' ratings follow-up**		**Significance**
	Mean (sd)	Median	Mean (sd)	Median	
Met need	1.86 (1.9)	1.5	1.91 (1.6)	2.0	Z = -.903, p = .366
Unmet need	8.64*** (4.7)	8.0	6.61*** (4.4)	6.0	Z = -4.046, p = .000
Total need	10.55*** (4.8)	10.0	8.55*** (4.5)	8.0	Z = -3.844, p = .000

*** significant at p < .001

Table 50 CANFOR-S as rated by staff across follow-up

	Staffs' ratings baseline		Staffs' ratings follow-up		Significance
	Mean (sd)	Median	Mean (sd)	Median	
Met need	3.06* (2.5)	3.0	3.85* (2.7)	3.5	Z = -2.119, p = .034
Unmet need	4.73 (4.1)	4.0	3.91 (4.1)	2.0	Z = -1.459, p = .145
Total need	8.12 (4.7)	7.3	8.08 (5.3)	7.1	Z = -.163, p = .871

* significant at $p < .05$

Impact of implementation of risk assessment tools on needs

Those with an implemented HCR-20 which was updated at 12 months follow-up as per policy (n = 35) were rated with significantly more met needs (mean = 4.60, sd = 2.8) than those whose HCR-20 had not been updated within the 12 months (n = 53) at follow-up (mean = 3.34, sd = 2.5). This only applied to staff ratings (U = 685.0, p = .037).

8.4 Discussion

While dynamic risk factors have been repeatedly identified as ideally suited in informing interventions, i.e. risk management, research testifying to the predictive validity of such factors is limited. This notwithstanding, the few papers that have been published suggest that dynamic risk items add incremental validity to structured violence risk assessment tools (McDermott, Edens, Quanbeck et al, 2008a). Perhaps more importantly, clinical and behavioural risk cues are routinely used by clinicians when estimating the risk of harm in practice (Odeh, Zeiss & Huss, 2006; Sturdisson, Haggard-Grann, Lotterberg et al, 2004).

Main findings

The results of the present study add to previous research by affirming that dynamic risk factors, in particular psychiatric symptoms, individual needs and anger differentiate between violent and non-violent research participants. In terms of predictive power, ROC analysis confirmed that anger, psychiatric symptoms as well as needs rated by staff and patients predicted incidents with a moderate effect size. The finding that none of the measures predicted serious incidents nor reconvictions is reflected in the literature. The present results replicate previous research at the State Hospital which established dynamic risk factors as good predictors of institutional rather than community-based violence

(Thomson, Davidson, Brett et al, 2008). Likewise, Gray and her research team in England evinced that the predictive properties of the clinical and the risk management scale were limited to inpatient violence only (Gray, Fitzgerald, Taylor et al, 2003; Gray, Snowden, Macculloch et al, 2004; Gray, Taylor & Snowden, 2008). The present study endorses these findings as the severity of psychiatric symptoms emerged as the strongest predictor across a range of analyses. Not only did the total BPRS-E score predict all and minor incidents with a large effect size (AUC = .79), the sensitivity (.64) and specificity (.78) at a cut-off point of 52.5 were of a reasonable level given that these were administered by a researcher rather than a clinician. Additional correlational analysis revealed that most of the measures employed tapped into a common, shared phenomenon with the BPRS-E as the only independent significant predictor of violence. This was also the case when controlling for time dependent variables, i.e. age and length of follow-up time, in that the odds of violence multiplied with every incremental step in the severity of psychiatric symptoms, albeit only minimally (OR = 1.050).

Chronicity of psychiatric symptoms

Though the link between psychiatric disorders and violence is well documented in the literature (Douglas, Guy & Hart, 2009), the relationship between dynamic risk factors per se and the outcome variable is likely to fluctuate over time. In the context of the present study, the recruitment of participants was intrinsically linked to the implementation of SPJ tools. This is likely to have biased the sample in that the implementation proved to be least problematic on the admission ward. This explains the finding that the sample was highly symptomatic at baseline, and hence the strong predictive power of psychiatric symptoms. This said, follow-up of participants at 12 months also showed that those who aggressed were more symptomatic than those who did not. Critics may be right to argue that this was perhaps coincidental. However, access to clinical notes by nursing staff allowed the categorisation of participants' psychiatric symptoms into groups of chronic vs. non-chronic. That chronicity was associated with violence leaves little doubt that clinical symptoms play an important role in the synthesis of violence (Thomson et al, 1997). The theme of chronicity extended to violent cognitions. While the schedule of imagined violence did not differentiate between violent and non-violent research patients, those identified with pervasive violent thoughts were more likely to aggress than those without pervasive thoughts.

The diversity of needs in clinical practice

The present study identified a remarkable disparity in the number of needs reported by staff and patients. Interestingly though, a shared pattern emerged in that both staff and patients considered the same areas as needs, and viewed less needs as met and more needs as unmet. The statistical difference in the number of needs stems from the finding that staff regarded needs, though present, as met through interventions while patients thought of these needs as unmet despite interventions. For example, while patients informed that they did not think themselves a risk of violence to others, staff typically disagreed. This seems a particular marker of forensic psychiatric populations and has been flagged up in similar research cohorts (Thomson et al, 1999; Segal, Daffern, Thomas et al, 2010). Arguably, congruence is not necessary considering that the emphasis of rehabilitation is on therapeutic co-operation and collaboration. This is an important point when considering that the likelihood of violence increased the fewer needs were perceived by staff. At face value, this stands in contrast to Segal and colleagues' (2010) observation that needs as assessed by the CANFOR-S are unrelated to violence in forensic inpatients. However, the explanation for the present finding may lie within the possible utility and function of needs assessments. That is, instead of directly informing risk estimates, the main benefit of the CANFOR-S is its potential to facilitate conversation and thereby strengthen the therapeutic alliance. This, in turn, is associated with a decrease in inpatient violence (Meehan, McIntosh & Bergen, 2006).

Implications for clinical practice

Best practice guidelines (Department of Health, 2007) stipulate that the assessment and management of needs over and above those identified as essential to care and treatment are among the cornerstones of high-quality care. While Slade, Leese, Cahill et al (2005) suggest that meeting unmet needs should be the primary starting point for mental health care, McQueen and John-Smith (2006) quite rightly question the clinical purpose of meeting needs with respect to relevant outcome variables. Though there appears to be an overall effect of needs on quality of life, the statistics underpinning this relationship show that the effect of meeting needs on improving quality of life is negligible. Instead, McQueen and John-Smith (2006) argue, the relationship between quality of life and need may be mediated by other variables most notably psychiatric illness. Yet, in the present study, the severity of psychiatric symptoms explained only 25% of the variance (see partial correlations) in incidents implying that there are further, potentially more relevant

factors contributing to violence. Perhaps the current study exemplifies the struggle between research and clinical practice in arriving at a common denominator. The intrinsic relationship between needs, disability, disadvantages and psychiatric disorder is well documented (Thomas et al, 2004; Buckley, Miller, Lehrer et al, 2009). Those with more severe and/or chronic mental disorders are identified with more needs than those whose disorder appears less chronic (Thomson et al, 1999; Long et al, 2008). The co-existence of these diverse needs, however, presents a problem in that the research base to date seems fragmented and inconsistent. This is perhaps because the prevalence of disorders and that of needs may coincide as well as interact (Joska & Fisher, 2005).

In the present study, the scores on almost all measures had improved at the 12 month follow-up stage. Though one may argue that this should be expected given the resources available, the data also imply that the implementation of the SPJ tools, in particular the revised paperwork, may have worked as intended, i.e. guided care and treatment. This is based on the finding that of those patients whose SPJ tool (typically an HCR-20) was updated, the number of met needs as rated by staff increased significantly. Of further interest is that patient-rated needs correlated with the dynamic scales of the HCR-20. Bearing in mind that the HCR-20 was implemented, i.e. identified risk factors were targeted through interventions, it is perhaps not surprising that needs as rated by patients were not predictive of inpatient violence.

Self report measures in forensic populations

Neither violent cognition nor impulsivity distinguished between those who aggressed and those who did not. While previous research has indicated that the role of cognition is perhaps contextual, the results on impulsivity as well as anger merit more attention. This is because the total and subscale scores of both measures are significantly lower when compared to similar research cohorts (e.g. Novaco, 2003; Baker, Van Hasselt & Sellers, 2008). The NAS scores identified in this thesis remind of data published by Doyle and Dolan (2006) on a sample of 94 violent forensic male inpatients. Perhaps the explanation for these results is linked to the fact that these are based on self report. Ferguson et al (2005), for example criticise the use of self report measures with forensic samples due to this method's vulnerability to social desirability bias. Indeed, qualitative interviews with forensic inpatients suggest that this group may attempt to create positive impressions in the hope to move on (Dixon, 2012; Coffey, 2011). Yet, a number of researchers argue that self report measures are astonishingly accurate among forensic patients and offenders,

including sensitive topics such as one's risk of violence to others (Skeem, Manchak, Mulvey et al, 2013). Critics, however, point out that honesty may only be a strategy to create false rapport to staff in order to diminish the severity of one's index offence (Mills & Kroner, 2005).

Perhaps the fault in the present study lies in the poorly defined outcome variables of impulsivity and anger. For example, reactive violence is thought to have a stronger relationship to impulsivity than instrumental violence (Dolan & Fullam, 2004) as does non-mediated violence (Felthous, Weaver, Evans et al, 2009). The particulars of the present thesis sample could not be matched up to any publications on impulsivity on forensic inpatient populations. Either the demographics of the sample differ significantly in respect to diagnosis and culture (Haden & Shiva, 2008), the comparison sample is limited in size (Enticott, Ogloff, Bradshaw et al, 2008) or lack in clinical variables (Smith, Waterman & Ward, 2006). This point of heterogenity is supported by a recent systematic review on the psychometric properties of the BIS-11 suggesting that while the total score seems stable across time, the three-factor structure is not consistent across populations (Vasconcelos, Malloy-Diniz & Correa, 2012). Alternatively, the BIS-11 and the NAS may have not been appropriate measures for the purpose of this study given that both are routinely used in evaluations of interventions at the State Hospital.

8.5 Limitations

The findings discussed in this study are based on measures administered by a non-clinical research student. Given evidence cited in previous chapters pertaining to the difference in risk ratings between clinicians and researchers (de Ruiter & de Vogel, 2004), the absence of interrater reliability in this study may be seen as a limitation. Yet, correlations between psychiatric symptoms, needs and the HCR-20 evince that psychiatric ratings by the researcher are grounded in clinical reality. At the same time though, these very correlations are testimony to the methodological problems in disentangling the effects of dynamic risk factors on violence. While the comparison between baseline and follow-up data, in particular in relation to perceived needs, are encouraging, this study failed to control for the therapeutic relationship between staff and patients. This is perhaps not a shortcoming per se, as this study did not use engagement with services or uptake of treatment as an outcome variable. Nonetheless, if needs are related to inpatient violence, and given the remarkable difference on needs between staff and patients, then a more focussed research study on the role of the therapeutic alliance is called for. This

notwithstanding, this study clarified the severity and chronicity of psychiatric symptoms as important predictors of violence. While this is not to say that the BPRS-E may be an appropriate risk assessment tool, the results add momentum to the question as to how dynamic risk factors can be applied in a practical, meaningful manner. Arguably, of need is a structured assessment tool designed with the purpose of informing the management of inpatient violence through clinical factors.

8.6 Summary

The findings of this study support the role of dynamic risk factors in inpatient violence, which opens up avenues for risk intervention and prevention of incidents. This particularly refers to the identification of psychiatric symptoms in terms of severity and chronicity as good predictors of inpatient violence. These results reflect pervious research, in particular a recent systematic review and meta regression by Witt, van Dorn and Fazel (2013). The authors confirm that dynamic risk factors such as psychiatric symptoms appear to be better predictors in inpatient settings than in the community. It is important to note that the present results are based on the ratings of a non-clinical research student. It is possible that a clinician may have rated individuals differently for the purpose of care and treatment, which could affect the predictive power of the BPRS-E in clinical practice. While the present findings suggest that there is merit in utilising clinical variables in risk management, the tool requires time and training to be completed accurately. As such, it is perhaps not particularly suited to the daily risk management of inpatient violence. Equally, the BPRS-E is not a risk assessment tool per se, and hence the question arises as to how exactly the tool could and should be used in the management of inpatient violence.

CHAPTER 9

THE PREDICTIVE VALIDITY OF A SHORT TERM RISK ASSESSMENT TOOLS IN HIGH SECURE CARE

The primary research focus with forensic patients is that of determining when they might be safely discharged into the community. However, the majority of the sample under investigation in this PhD remained within secure settings. Within inpatient facilities, assessing the risk of imminent violence is therefore clinically of as much interest as the consideration of long term outcomes (Doyle & Dolan, 2006). Crocker, Braithwaite, Laferriere et al (2011) argue that a large proportion of violent acts committed by individuals with schizophrenia typically occur within secure settings rather than the community. However, most risk tools focus on community violence, and are typically completed by clinicians rather than frontline nursing staff. The findings of the previous chapter underline the importance of clinical variables in the occurrence of inpatient violence. The aim of this chapter therefore is to introduce and validate the Dynamic Appraisal of Situational Aggression – Inpatient Version (DASA-IV, Ogloff & Daffern, 2006). This is a short term risk assessment tool consisting of dynamic variables, and was designed to be used by nursing staff.

9.1 Introduction

Inpatient aggression and violence are common in health services, especially in psychiatric settings (Woods & Ashley, 2007). Inpatient violence refers to the actual, attempted or threatened harm towards others within an institutional setting. This may include physical, verbal and/or sexual aggression. Not only does the experience of violence cause personal distress and injuries to staff and patients alike (Frueh, Knapp, Cusack et al, 2005; Foster, Bowers & Nijman, 2007), the health organisation itself suffers from inpatient violence through economic and manpower loss, i.e. sickness absence and high staff turnover (Garcia, Kennett, Quraishi et al, 2005; Bowers, Stewart, Papadopulos 2011). This is reflected in official statistics on NHS absenteeism and sickness rates, e.g. the average rate of sickness leave is 5.2% for mental health nurses as opposed to 4.3% for nurses in primary care trusts (NHS, 2010). The impact of increased sickness rates such as poor or limited staffing can result in more adverse events occurring (Bowers, Allan, Simpson et al, 2005), in particular when wards rely on temporary staff who may be unfamiliar with the patient group and routines.

Consequences of inpatient aggression

Hankin, Bronstone and Koran (2011) estimate the annual cost for patient aggression and violence in psychiatric facilities in the UK to be £820 per incident in 2003 (based on data supplied by Comptroller and Auditor General, 2003). Given the suggested levels of violence against health care workers, the extent of financial costs is perhaps not surprising (Doyle & Logan, 2012). Official statistics such as those published by the Healthcare Commission (2005, 2007) reported a total of 95,501 assaults against NHS staff. It is suggested that almost three quarters (71%) of nursing staff will experience inpatient violence within any 12 months. Similar figures are suggested in the National Audit of Violence (Healthcare Commission, 2005), and papers by Abderhalden, Needham, Friedli et al (2002) and Skellern and Lovell (2008). While Duxbury (1999) implies that general and mental health nurses are exposed to similar types of inpatient aggression, nursing staff working in psychiatric settings are cited to be at greater risk of being assaulted than any other nursing profession (Turnbull & Paterson, 1999; Foster, Bowers & Nijman, 2007), e.g. the odds for a psychiatric nurse to be attacked are three to one when compared with general nurses (NHS, 2002). In the UK, Nijman, Bowers, Oud et al (2005) report that about one in six psychiatric nurses (16%) claimed to have experienced at least one violent incident committed by psychiatric patients over the previous 12 months. This study was a cross-sectional survey of 148 nursing staff across various psychiatric wards in London. Almost one quarter (22%) of the respondents had indicated they had used sick leave as a consequence. Though this increase in sick leave was not significant, the experience of severe physical aggression was the strongest predictor for requesting sick leave. Nijman et al (2005) point out that the number of severe physical violent events was the highest for those nurses working with compulsorily admitted patients. Working with this particular patient group was also associated with an increased likelihood of experiencing humiliation, aggressive inpatient behaviour, and regular verbal abuse including threats. This is mirrored in a recent international review by Bowers et al (2011) who report that patients in forensic settings are likely to be more violent than those in other settings. Of the studies reviewed, the mean proportion of violent incidents was 45.8% in forensic facilities, compared to 25.6% in acute and 20.8% in general hospitals. This predominance of inpatient violence in forensic environments was evident in all countries reviewed (Australia, Canada, Germany, Israel, Italy, Netherlands, Norway, Sweden, Taiwan, UK and US). This is perhaps to be expected considering that violent behaviour is typically an admission criterion to forensic services (Coid, Kahtan, Gault et al, 2001).

However, though episodes of aggression seem frequent in psychiatric wards, about three quarters of these are thought to be limited to verbal abuse only with little risk of serious injury (Cornaggio, Beghi, Pavone et al, 2011). Yet, Foster et al (2007) concluded in their UK study that one in ten psychiatric nurses are likely to get seriously attacked over any 12 month period. There is ample evidence, based on both quantitative and qualitative studies, that has linked the experience of verbal and physical aggression with increased stress (Currid, 2009), burnout (Jenkins & Elliott, 2004) and adverse psychological coping (Inoue, Tsukano, Muraoka et al, 2006) amongst psychiatric nurses. At an extreme end, inpatient violence has been associated with post traumatic stress disorder among clinical staff (Irwin, 2006; Linsley, 2006). Arguably, this may affect the therapeutic relationship between staff and patients, and thus the quality of care and treatment provided (Bowers et al, 2011). This also applies to the experience of verbal aggression, especially if exposure to threats, swearing and abuse is frequent, as this may result in emotional difficulties and changes in staff attitude when working with aggressive patients (Cornaggio et al, 2011). This noted, it is difficult to account for the possible effects of verbal aggression on psychiatric care as nurses may see verbal abuse as an integral part of their job and thus are unlikely to document it (Foster et al, 2007).

Prevalence of inpatient aggression

The rates and prevalence of inpatient aggression vary greatly across, as well as within, settings, professions and population characteristics. Factors such as the under-reporting of assaults, incomplete and inconsistent operational definitions of the outcome variable, the lack of distinction between major and minor assaults as well as between verbal and physical violence and the different lengths of observation make it difficult to compile a clear picture of violent psychiatric inpatients (Hankin, Bronstone & Koran, 2011). For example, Palmstierna and colleagues found an average of 13 incidents per patient per year on a Swedish acute admission ward (Palmstierna & Wistedt, 1995; Palmstierna, Huitfeldt & Wistedt, 1991) while Nijman, Murris, Merckelbach et al (1999) report approximately 20 incidents per admission bed per year on similar wards. Nijman, Palmstierna, Almvik et al (2005) report a median of eight incidents, and a mean of nine incidents per psychiatric patient per year on acute admission wards in a Europe wide review. The authors point out that across studies, the frequency of incidents ranged between 0.4 to 33.2 per year, depending on type of ward and country involved. Most incidents were considered minor though 10 – 20 per cent of incidents lead to physical harm such as bruises and one to five

per cent required the victim to seek treatment in hospital. However, when high risk groups were included, such as those suffering from schizophrenia, residing in forensic settings or with involuntary admissions to hospital, the annual number of incidents rose to 40.2 incidents per patient per year.

Risk factors for inpatient aggression

Similar to the inconsistencies of prevalence rates of inpatient aggression, there is no consensus regarding antecedents of inpatient aggression within the research literature. For example, Johnson (2004) in her systematic review of 27 studies concluded that there was no consistent pattern of factors preceding inpatient aggression. While some of these studies identified verbal threats as warning signs, other studies claimed that about 40% of incidents were unprovoked; factors preceding the assault seemed absent. Contrary to this opinion, Hankin, Bronstone and Koran (2011) claim that violent events are preceded by specific behavioural warning signs such as agitation, anger or hostile behaviour. In support of this, Owen, Tarantello, Jones et al (1998) in Australia identified agitated behaviour as a precursor in 82% of 752 severe violent inpatient incidents in a prospective study. Staff retrospectively reported more warning signs exhibited, in particular by a high risk group of repeatedly violent and aggressive inpatients. However, the problem with using retrospective designs is the likelihood of results being flawed by recall bias and hindsight. Crowner, Peric, Stepcic et al (2005) avoided the potential pitfalls of such biases and used an observational design. Fifty-nine videotaped incidents on a psychiatric inpatient ward were analysed. It was found that 60 per cent of these incidents were preceded by overt provocative and/or threatening patient behaviour.

In addition to behavioural warning signs, the literature outlines other contributing factors to inpatient violence. These may be environmental in nature such as overcrowding (Virtanen, Vahtera, Batty et al, 2011), lack of activities and lack of access to outside space (Bowers et al, 2011), staff characteristics such as skills and competencies and staff personalities (Needham, Abderhalden, Halfens et al, 2005), and failed communication between staff and patients. In reference to the latter, Duxbury and Whittington (2005) explain that nursing staff typically attribute violence to patient-internal factors, i.e. as a consequence of mental illness (Duxbury, 1999) while patients emphasise that poor communication and staff factors such as limit setting underpin violent incidents. This disparity in understanding is further exemplified in a study by Haggard-Grann and Gumpert (2005) who interviewed psychiatric out – and inpatients regarding their view of

triggers and antecedents to violence. Not only did the research elicit that patients felt they clearly communicated, either directly or indirectly, the imminence of violence, the data indicated that violence seemed to arise when patients were frustrated and did not understand professionals' motives for limit setting and restrictions imposed. Similar results including the function of violent inpatient behaviour were reported in an analysis of 502 aggressive incidents by Daffern, Howells and Ogloff (2006).

Risk assessment tools for inpatient aggression

Given the scope of inpatient aggression, several guidelines and checklists have been published to aid clinicians' ability to predict imminent violence amongst psychiatric inpatients (NICE, 2005; Healthcare Commission, 2005). These typically focus on static risk factors, i.e. those not subject to change such as previous violence, age, length of hospitalisation and gender. The evidence base underlying these factors is inconsistent with studies outlining positive, negative and no significant associations between variables and violence (Johnson, 2004). The exception to this is perhaps the presence of previous violence which seems to be a widely accepted risk factor for violence in any setting (Steinert, 2002). However, regardless of the results of empirical studies investigating the link between these factors and violence, the issue with static variables is that these are not sensitive to fluctuations in patients' mental state and changes in their environment. Yet, these dynamic changes can rapidly increase or decrease the risk of imminent aggression (Daffern, 2007). In this context, research has repeatedly pointed to the strong association between psychopathology and inpatient aggression, even when sociodemographic variables linked to violence are statistically controlled (Coid, Yang, Roberts et al, 2006; Monahan, Steadman, Silver et al, 2001). Although the debate whether, and if so then why, specific symptoms are causally connected to aggression is ongoing (Wallace, Mullen, & Burgess, 2004), the fact that this association exists is well established (e.g. Hankin, Bronstone & Koran, 2011).

In principle, Needham, Abderhalden, Meer, Dassen et al (2004) confer that the use of a structured tool can be effective and efficient in guiding management of potential inpatient aggression. The problem however is that though a number of risk assessment tools have been investigated with regards to their applicability to inpatient settings as discussed in chapter two of this thesis, the majority of these instruments require extensive information about the patient and are time consuming to complete. This means these tools are not suited to be used to assess and target imminent violence, and indeed most tools are not

designed to do so. This noted, the Broset Violence Checklist (BVC, Woods & Almvik, 2002) and the Dynamic Appraisal of Situational Violence – Inpatient Version (DASA-IV, Ogloff & Daffern, 2006) are two short term risk assessment tools specifically designed to assess and inform the management of inpatient aggression. The BVC consists of six dynamic risk factors (i.e. confusion, irritability, boisterousness, verbal threats, physical threats and attacks on objects) while the DASA-IV is based on seven dynamic risk factors; both aim to identify potential aggressors over a 24 hour period. While the BVC has been validated, has good psychometric and predictive properties and is easy to use, several of the scale's items, though dynamic, are not open to staff intervention and therefore perhaps limited in guiding risk management (Ogloff & Daffern, 2006). In contrast, the DASA-IV comprises risk items open to intervention thereby allowing a context-specific clinical assessment of patient's current and fluctuating state.

Development of the DASA-IV

The DASA-IV was developed and validated on a sample of 100 mentally disordered offenders and patients admitted to three acute units (admission and continuing care wards) in a secure hospital in Australia. The majority of participants were male (78%) and the primary diagnosis was a psychotic disorder, in particular schizophrenia (77%). Initially, psychiatric nurses were asked to rate patients on a 16 item structured risk assessment scale consisting of items from existing risk assessment tools, i.e. the clinical scale of the HCR-20, all items on the BVC and four items measuring suicidal intent, observed unwillingness to follow directions, being easily angered when demands were not met and observed sensitivity to provocation. Psychiatric nurses were asked to rate patients' behaviour three times within a 24 hour period, i.e. at the end of every shift over a six month period. Simultaneously, staff were required to record any aggressive incidents ranging from verbal aggression to physical aggression towards others and property. Findings suggested that using a structured risk assessment tool significantly improved nurses' identification of violent individuals. Further analysis revealed the top seven risk items most strongly associated with physical aggression. Of these, two items are derived from the HCR-20 (negative attitudes and impulsivity), two items from the BVC (irritability and verbal threats), and the three items identified through previous in-house research (sensitive to perceived provocation, easily angered when requests are denied and unwillingness to follow directions). Based on these items, the likelihood that a patient would be physically aggressive increased as the DASA-IV score increased. Validation studies of the DASA-

IV have shown the tool to be of excellent predictive power in forensic inpatient settings (Ogloff & Daffern, 2006; Canter & Zukausekiene, 2008). The tool has also been validated on a sample of civil and forensic patients in New Zealand (Barry-Walsh, Daffern, Duncan et al, 2009), personality disordered patients in a high risk unit in the UK (Daffern & Howells, 2007), and adolescent male and female offenders in a high secure correctional setting in Singapore (Chu, Hoo, Daffern et al, 2012). With this in mind, this chapter will describe the predictive validity and clinical utility of the DASA-IV when used in a prospective pilot study within high secure psychiatric care.

9.2 Methods

Design and Setting

The study was prospective and took place in the State Hospital, the high secure psychiatric hospital for Scotland and Northern Ireland as part of a wider study on the predictive validity of violence risk assessment tools. This research was approved by the Multi Centre Research Ethics Committee (MREC) Lothian and the State Hospital Research Board. The data collection took place between May and November 2007.

Measure

The DASA-IV is a seven item structured risk assessment tool assessing imminent inpatient aggression. Each item is scored dichotomously with 0 indicating no change in a patient's behaviour, and a rating of 1 suggesting a negative change in the patient's presentation. The total score, ranging from 0 to 7, is calculated to assess an individual's likelihood for imminent aggression. Completion of the scale takes less than five minutes. Ogloff and Daffern (2006) state that scores of 0 reflect very low risk for aggression, scores ranging from 1 to 3 indicate a moderate likelihood for risk while a score of 4 or more implies high risk for aggression. It is recommended that at a score of 6 or 7, risk for aggression may be imminent and preventive measures should be taken.

Outcome measure

The main outcome measure was incident rates recorded on the Staff Observation Aggression Scale – Revised (SOAS-R, Nijman et al, 1999). This is an incident reporting system widely used in Europe, in particular in the Netherlands (Almvik, Woods & Rasmussen, 2000). The SOAS-R consists of five items covering consecutive aspects of

aggression: observed provocation, means used by patient, aim of aggression, consequences and immediate measures taken by nurses. The total severity score of the SOAS-R is calculated by summing the severity scores of the five SOAS-R columns, and can range from 0 (mildest form of aggression) to 22 (most severe form of aggression). The authors recommend that scores of 9 or more indicate severe aggression (Nijman et al, 1999) as these incidents either inflict physical pain to the victim, cause the victim to feel threatened or reflect the use of weapons (Bjoerkdahl, Olsson & Palmstierna, 2006). The scale has been associated with good psychometric properties. In clinical practice, interrater reliability was reported to range between fair to good (Cohen's K = 0.61 and 0.74, and Person's r = 0.87). Concurrent validity was good; the SOAS-R correlated significantly with other methods of assessing the severity of aggressive behaviour (ranging from r = 0.38 to 0.81). The tool has been successfully cross-validated with clinical estimates of the severity of incident noted by nursing staff (Nijman, Merckelbach, Evers et al, 2002; Nijman, Palmstierna, Almvik et al, 2005; Nijman et al, 1999).

The SOAS-R was used in this study as research on officially recorded incidents in psychiatric hospitals is often limited by underreporting (Department of Health, 2002; Healthcare Commission, 2007; Crowner, Peric, Stepcic & Van Oss, 1994). However, some researchers suggest that the SOAS-R is also associated with underreporting due to reporting fatigue and shifting attention (De Niet, Hutschemaekers & Lendemeijer, 2005; Tenneij, Goedhard, Stolker et al, 2009). Therefore, data were triangulated by cross-checking all completed SOAS-R forms with incidents recorded on the hospital's online recording system (Datix) and a random cross-section of nursing notes on the study ward.

Procedure

Recruitment of study ward

The study ward was identified by investigating the total number of aggressive incidents recorded across all wards on Datix. In line with Ogloff and Daffern (2006), the inclusion criteria were that the ward was either a continuing care or admission ward, and that the total number of incidents on the ward were committed by more than three patients. This resulted in the exclusion of the female, the admission, the learning disability and one continuing care ward from the study as on all four wards only one or two patients were the main perpetrators of aggressive incidents. Following the application of these inclusion

criteria, the ward with the highest annual number of incidents recorded in the year prior to the research study was approached.

The study ward selected was a continuing care ward with a total of 58 incidents reported in 2006. Of these incidents, 19 were classified as verbal aggression, 21 were reported to be assaults and 18 were described as aggressive behaviour, e.g. standing in an aggressive or intimidating stance. These figures appear to reflect a consistent pattern as a similarly high number of incidents was recorded on this ward in 2005. The median number of incidents per ward across the hospital was 17 ranging from 2 to 99 incidents in 2006.

Training

All qualified nurses on the study ward were trained on the study measures, i.e. the scoring procedure of the DASA-IV and the SOAS-R was explained by the researcher prior to data collection. The study was run on a trial basis for one week to allow nurses to familiarise themselves with the measures and ask questions on practical issues. An instruction sheet explaining the measures and how to complete these was left on the ward, and sent to nursing staff through internal mail. Posters (A4 format) were displayed in the ward office, and reminders were left in the clinical nursing notes folder regarding the completion of the questionnaires. During the initial three months, the researcher attended the ward on a daily basis to uplift completed forms, review the recording process and leave blank questionnaires for the following day. This allowed the researcher to maintain nursing staff's interest in the study, and be available to respond to any questions or difficulties staff may experience with the research project. During the final three months, the researcher attended the ward at least three times a week. On only four occasions (accumulating to 2.45% of all DASA-IV ratings) did the ward staff fail to complete the DASA-IV due to high clinical activity on the ward. At these times, the researcher completed the DASA-IV retrospectively by reviewing the nursing notes, and applying the scoring instructions where appropriate. When clinical symptoms were noted, the researcher assigned a preliminary score; this was later discussed with the nurse in charge in order to verify the rating and minimise any potential biases.

Study procedure

To ensure that the research study fitted in with the daily clinical routine on the ward, the ward manager was consulted on all matters regarding the procedure of the study. This

resulted in the identification of the back shift (2.45 – 10pm) as the best time for staff to complete the DASA-IV. In this shift, nursing staff were asked to complete one DASA-IV form each day for each patient as part of their daily routine. Typically, the form was completed at the same time as nursing notes were written up, i.e. at the end of the shift. In addition, all nursing staff on the study ward were asked to complete a SOAS-R form when any incident occurred. In discussion with the ward manager, an incident was defined as any event that required the intervention of a qualified staff nurse.

Study Sample

There was a maximum of 26 patients on the ward during the study period. Two of these patients were admitted during the study period while four were discharged, meaning approximately 20 patients were consistently resident at the study ward throughout the research period. All patients were male. The mean age was 36 years (sd = 9.35, range: 21 – 57 years) and the primary diagnosis was a psychotic illness (n = 20, 76.9%). The sample appears to be representative of both, the wider State Hospital population according to age and diagnosis when compared to Thomson et al (1997) as well as the HCR-20 sample described in chapter 6 of this thesis.

Analysis

Receiver Operating Characteristic (ROC) analysis is the preferred method for assessing the predictive accuracy of risk assessments as the analysis does not depend on the base rate of violence (Mossmann, 1994). ROC analyses plot the sensitivity (true positive rate) of the predictor against the false positive rate (1 – specificity). This results in the production of the area under curve (AUC) as an index of the overall accuracy of the risk assessment. In practice, values of .50 indicate a chance prediction while AUCs in the range of .70 - .80 are seen as indicating moderate/large effect sizes (Rice & Harris, 2005).

Data entry

Data entry for ROC analysis assumes that every single score is an individual, independent unit, i.e. scores are not entered according to a within-subject design but a between-subject design. Ogloff and Daffern (2006) explain that this procedure is applicable to the analysis of DASA-IV scores due to the large number of scores generated. It is imperative to pair incident data to the DASA-IV rating made during the 24 hour period prior to the incident.

9.3 Results

Prevalence of incidents

Staff recorded 181 incidents over the study period. Of these, seventy-nine (43.6%) were rated as verbal aggression, 91 (50.3%) were categorised as physical aggression and 11 (6.1%) were described as aggressive behaviour, e.g. patients posing in a threatening stance. The majority of incidents were targeted at staff (n = 156, 86.2%). Fellow patients were the target on 22 recorded occasions (12.2%) and three times aggression was not targeted at anyone nor property specifically (1.6%).

Staff rated the severity of 130 (71.8%) incidents on the SOAS-R. The mean severity of these incidents was 8.28 (sd = 5.15, range: 1 – 20), the median was 9.0. For physical aggression only, the mean severity score was 12.42 (sd = 4.32, range: 2 – 20) while the median severity score was 10.0 indicating that incidents were in general severe.

Estimated number of incidents

An error rate was calculated using triangulation of data. The completed SOAS-R forms were cross-checked with the hospital's online incident recording system and five randomly chosen patient case notes were reviewed. In this way, 112 incidents were identified, which had not been recorded on the SOAS-R forms. These additional incidents were added to the SOAS-R incidents; the calculated error rate of 32.2% was then applied to the number of incidents for the remaining patients. This resulted in an estimate of 326 incidents during the study period. One hundred and twenty-five (38.4%) of these incidents were verbal aggression while 182 (55.8%) were incidents of physical aggression and 19 (5.8%) incidents were aggressive behaviour.

Perpetrators of incidents

There were 16 perpetrators of aggressive incidents recorded, half of these (n = 8) were involved in incidents of physical aggression. However, one patient (referred to as patient X) who was admitted to the ward three months into the study was the main perpetrator of 160 (87.9%) incidents of physical aggression. Given the high percentage of incidents perpetrated by this patient, the nature and frequency of recorded incidents was recalculated for the sample when patient X was removed from the dataset.

Nature and frequency of incidents without patient X

One hundred and two incidents were recorded. Of these incidents, only n = 14 (13.7%) were classified as physical aggression. The majority of incidents reported were for verbal aggression (n = 77, 75.5%) while 11 (10.8%) incidents were categorised as aggressive behaviour. The average SOAS-R score was 5.89 (sd = 4.03) ranging from 1 – 20 with a median of 4. For physical aggression, the average SOAS-R score was 9.0 (sd = 5.89) ranging from 2 to 20 with a median of 10.

Predictive validity of the DASA-IV

Table 51 describes the AUC for the DASA-IV for the whole sample, and for two subsets of the sample, i.e. when patient X who was involved in the majority of physical aggression was removed from the analysis, and when only incidents recorded on the SOAS-R forms were used.

The results indicate that the predictive power of the DASA-IV was consistent for incidents of verbal aggression, and varied slightly for all aggressive incidents (AUC = .70 - .76). The most notable difference in predictive validity across the different samples was found in relation to physical aggression (ranging between AUC = .65 - .82). When all physical violence was the outcome variable and at a cut-off point of 1, the specificity was .66 and the sensitivity was .88 for all patients. The DASA-IV was no better than chance in predicting physical aggression in the subsample without patient X. Across all subsamples, the DASA-IV was not a significant predictor when data were split according to target of physical aggression.

Table 51 AUC (standard error) and 95% confidence intervals for the DASA-IV

	Sample with all patients		Sample without patient X		SOAS-R forms only	
	AUC (SE)	**(95% CI)**	**AUC (SE)**	**(95% CI)**	**AUC (SE)**	**(95% CI)**
All aggressive incidents	.74 (.02)**	.70 - .79	70 (.03)**	.64 - .76	.76 (.03)**	.70 - .81
Verbal aggression	.71 (.03)**	.65 - .77	.71 (.03)**	.65 - .77	.71 (.04)**	.64 - .78
Physical aggression	.78 (.03)**	.72 - .84	.65 (.12)	.42 - .87	.82 (.04)**	.75 - .89
Against staff	.53 (.05)	.44 - .62	.48 (.15)	.19 - .76	.55 (.06)	.44 - .66
Against patients	.61 (.17)	.28 - .94	.55 (.20)	.15 - .94	.65 (.19)	.26 – 1.0

** significant at p < .01
*significant at p < .05

9.4 Discussion

This study validated the DASA-IV on a Scottish sample of mentally disordered offenders in a high secure hospital. In line with previous research, findings indicate that the DASA-IV had moderate to good predictive power for aggressive incidents recorded. Statistically, the DASA-IV was highly significant in predicting verbal and physical aggression. Practically, this means that patients with a higher DASA-IV score were more likely to be involved in verbal and/or physical aggression 24 hours post-rating than patients with a lower DASA-IV score. Yet, the optimal cut-off point calculated for sensitivity and specificity was low across all outcomes, which suggests that the instrument may be best utilised as an aide memoire, i.e. to inform risk management rather than stipulate interventions according to scores. It is difficult to draw further conclusions as patient X accounted for a large variance of documented physical aggression. That is, the DASA-IV showed poor predictive power for physical aggression (AUC = .65) when analysis was conducted on a subset of the sample, i.e. in the absence of patient X. The DASA-IV was also of limited predictive use when analysis was conducted on victim categories of aggression (staff vs. fellow patients). In particular, though the DASA-IV reliably predicted physical aggression per se, the likely target of this aggression could not be identified with any degree of confidence. However, it is important to note that Daffern and Howells (2007) argue that the function of inpatient aggression varies according to target. For example, violence between patients is thought to arise when status and patient-related hierarchies are defended, maintained or formed. In contrast, aggressive actions against staff seem to be reactively driven, e.g. in response to restrictions or to add emphasis to verbal communication (Haggard-Grann & Gumpert, 2005). In addition, the remit of the DASA-IV is to identify likely high risk aggressors rather than to identify the likely recipient of aggressive incidents.

Patient X

From a social psychology perspective, the findings of this study may also be explained by previous research on the association between environmental risk factors and the likelihood of aggression (Gadon, Johnstone & Cooke, 2006). Environmental risk factors such as changes on the ward, and fluctuating group dynamics between staff and patients may have contributed to some incidents, actual and near misses, not being recorded. This is to say that the inclusion of a single highly aggressive individual (as may be reasonably expected to be found in this context) referred to as patient X needs to be taken into account when

interpreting the findings. The poor predictive power of the DASA-IV for physical aggression may be linked to the low number of physical incidents in the sample once patient X was discarded from the analysis. It is assumed that the low number of recorded incidents are associated with the increased clinical activity caused by patient X. An appropriate analogy is perhaps the popcorn model of workplace violence (Folger & Skarlicki, 1995), which Cooke, Wozniak and Johnstone (2008) aptly applied to institutional violence. This model compares a high risk individual, such as patient X, to the first piece of corn to pop in an active, i.e. hot, environment. This high risk individual may not pop if the environment is controlled and calm, i.e. cold. If staff invest into keeping the setting calm, or 'turning down the heat' (Cooke, Wozniak & Johnstone, 2008, p. 1067), risk management strategies at both, the individual and the situational level, may be more effective. In other words, staff successfully turned down the heat across the study ward in order to manage patient X, which resulted in fewer incidents among other patients on the ward. Alternatively, however, staff may have had to focus their clinical attention onto patient X to such an extent that incidents perpetrated by others were not recorded for this study. This means that if staff failed to record incidents committed by other patients, yet patients were rated on the DASA-IV according to overt clinical presentation, the statistical calculation would find the DASA-IV to be poor at predicting incidents. Considering the estimated high number of incidents missed, it appears likely that this will have impacted on the statistical calculations. Nonetheless, these findings reflect the reality of conducting research in a clinical setting and as such have considerable ecological validity.

SOAS-R

The predictive validity of the DASA-IV was particularly good for incidents of physical aggression recorded on the SOAS-R forms. This was also reflected in the sensitivity (.76) and specificity (.88) associated with this outcome. This may indicate that nursing staff were more likely to record incidents when these were seen as serious, i.e. when there was a perceived risk of physical harm. The average SOAS-R score for physical aggression was in line with previous research in a review across various settings (Nijman et al, 2005) even when patient X, who was involved in a large proportion of aggressive incidents was removed from analysis.

Of concern is the observed reporting fatigue evidenced in the current study. Approximately one third of incidents occurring during the study period were not

documented on SOAS-R forms despite the researcher's regular presence on the study ward. Indeed, Noda, Nijman, Sugiyama et al (2011) recently found that gender and age of the aggressor, as well as gender of the rater impacted on the reporting of an incident, and the perceived severity of this incident using the SOAS-R. It seems, however, more likely that the high clinical activity related to patient X affected staff's resources and motivation to document incidents on the SOAS-R forms. This said, a report published by the Healthcare Commission (2007) noted that there seemed to be a general lack of awareness amongst nursing staff regarding the need to reliably record incidents affecting patient and staff safety. This was linked to the finding that staff had little confidence in how the employer would react, if at all, to the records of incidents. Indeed, Skellern and Lovell (2008) questioned nursing staff in a learning disability service in England who viewed reporting incidents of violence in the workplace as a 'waste of time' (p. 202). This begs the question as to whether incidents should have been collected in a different format in the study reported here. Research on the prevalence of aggressive events typically employs either period- or incident-based recording tools. The former are completed in fixed intervals such as weekly or monthly, regardless of whether an incident had occurred or not. Though period-based tools such as the Modified Overt Aggression Scale (Kay, Wolkenfield, & Murrill, 1988) have been noted to be completed more regularly by nursing staff (Drieschner, 2009), the outcome data provide little information about triggers or causes of discrete incidents. In contrast, incident-based reporting tools such as the SOAS-R allow the identification of several incident-specific characteristics including the nature and severity of the incident.

Comparison to previous research on the DASA-IV

The DASA-IV significantly predicts inpatient violence within forensic settings with predictive accuracy ranging from 61 to 82 per cent (Ogloff & Daffern, 2006; Daffern & Howells, 2007; Barry-Walsh, Daffern, Duncan & Ogloff, 2009). The results of the pilot study reported in this chapter reflect these findings, in particular in reference to physical aggression (AUC = .82). This is perhaps not surprising given that the current research matched the validation study of the DASA-IV (Ogloff & Daffern, 2006) in that the length of follow-up was identical (six months) and the participating population consisted of forensic mentally ill inpatients. The difference in the total number of documented incidents (181 vs 285) may be because Ogloff and Daffern (2006) reported on a larger

sample size (n = 100 patients), with a larger proportion of aggressors (16 vs 50) and covered three acute wards including the admission ward.

Though other research on the DASA-IV identifies the tool as a significant predictor, the magnitude of the predictive validity reported may imply that perhaps the tool is not that well suited to other populations. For example, Daffern and Howells (2007) report modest predictive power of the DASA-IV (AUC = .65) when used with a sample of personality disordered offenders in England. The authors suggest that inpatient aggression amongst personality disordered individuals may be conceptually different from that displayed by mentally ill people (Heilbrun, 1997). Likewise, there may be different risk factors pertinent to the prediction of imminent aggression depending on the cultural context, age and psychiatric diagnosis. Chu, Hoo, Daffern et al (2012) note that the DASA-IV performed with poor to modest predictive accuracy when used on a sample of incarcerated, non-mentally ill, adolescents (female and male) in a secure unit in Singapore. The study implied that when females were omitted from analysis, the DASA-IV was a significant predictor, though only when analysed using logistic regression. Similarly to the study reported in this chapter, Barry-Walsh, Daffern, Duncan and Ogloff (2009) noted that the predictive accuracy of the DASA-IV varied greatly across different types and targets of aggression. The authors explain their results in reference to the function of aggression. The extent to which the study's patient population (civil and forensic), cultural norms (New Zealand) and diverse psychiatric diagnoses may have impacted on the results was not explored. This is an unfortunate shortcoming given the evidence that nurses' attitudes towards inpatient aggression varies across countries (Jansen, Middel, Dassen et al, 2006) which may have impacted on nursing response and practice.

9.5 Limitations

Though the results reported here mirror previous research on the DASA-IV, and the tool appears to be clinically useful, there are various shortcomings to this study. For example, the lack of a generally accepted definition of aggression and violence makes it difficult to approach this topic in a consistent and reliable manner. This then affects the monitoring, auditing and research, which in turn impacts on the ability to identify reliable predictors and thus the ability to take preventive measures. However, research in a clinical setting, by necessity, takes a secondary role when compared to clinical activity. In this study, aggressive incidents were underreported on the research tool used. There were a number

of confounding variables such as nursing staff's perception of incidents too minor to complete a SOAS-R form, as well as nursing staff's allocated time to complete SOAS-R forms in general. Though the definition of incidents was tailored to the experience of working staff on the study ward, this is likely to have affected the sensitivity with which the DASA-IV correctly identified aggressors. This noted, the DASA-IV was regularly completed with the exception of four occasions. Final feedback from the ward manager of the study ward implied that nurses viewed the completion of the DASA-IV as part of their daily work routine. However, this begs the question of how short term risk assessment tools should be completed, and how the manner of completion might affect the tool's efficacy.

9.6 Summary

Considering the different risk needs and scenarios present across risk settings, it is imperative to assess the clinical utility of the DASA-IV when implemented into clinical practice. Yet, changes at an organisational level are notoriously difficult to achieve (Michie, Pilling, Garety et al, 2007). Previous work examining this (Daffern, Howells, Hamilton et al, 2009) shows no statistical reduction in aggressive incidents despite the implementation of the DASA-IV. This was linked to the nature of the study population, i.e. personality disordered offenders, and to the fact that a survey of nursing staff elicited largely negative attitudes towards the DASA-IV. In the words of Daffern et al (2009), we 'should examine consequences to the introduction of risk assessments more broadly' (p. 675). In an inpatient setting, nursing staff are at the forefront and thus any implementation strategy needs to take account of nursing staff's perceptions and attitudes. Given the apparent clinical usefulness of the DASA-IV, future research may want to focus on the potential barriers, individually, socially and culturally, to implementation efforts.

CHAPTER 10

GENERAL DISCUSSION AND CONCLUSIONS

The process of violence risk assessment and management planning informs the effective care, treatment and management of forensic patients and is a core task for forensic mental health services. The process is embedded within the Care Programme Approach and this approach has been identified in guidance from the Scottish Government as the appropriate mechanism for reviewing all forensic patients. There is, however, a gap between predictive and clinically applicable risk assessment tools. While the history of risk assessment is one of debate and inconsistency, one may argue that the important point is that limitations in risk methodologies are considered when using specific tools to guide clinical decision making in practice. Although the terminology associated with violence risk may vary (RMA, 2011), the Risk Management Authority recommends a Structured Professional Judgment (SPJ) approach to conducting violence risk assessments (RMA, 2005). These instruments are thought to be well suited to clinical practice as clinical judgement is guided and informed by a host of empirically and clinically based risk factors. Yet, there is limited knowledge on how SPJ tools perform when completed in practice. The systematic literature review undertaken within this thesis also indicated that few studies into the utility of SPJ tools (specifically the HCR-20, SVR-20 and RSVP) had been conducted within high secure care, and perhaps most notably only one study (Pedersen, Rasmussen & Elsass, 2012) clearly outlined and interpreted its results within an implementation context. This said, this particular study lacked a systematic and standardised implementation process. The limited empirical research regarding implementation therefore provided the rationale for the present thesis, which was to assess the predictive validity of the HCR-20, the SVR-20 and the RSVP when completed by clinicians for the purpose of care and treatment, i.e. risk management, within a high secure psychiatric hospital in Scotland. Additionally, this thesis explored the predictive validity of dynamic measures in the prediction of violence, and a pilot validation study of a short term risk assessment tool specifically designed for imminent inpatient aggression was conducted.

10.1 Main findings

The sample

The thesis sample was representative of the wider State Hospital population in respect to demographic background, e.g. primary diagnosis, forensic and psychiatric history, nature of index offence, physical and psychiatric comorbidity as well as extent of self harm and suicidal behaviour. The analysis of research participants' background in terms of personal, psychiatric, forensic, legal and health history underlined that the cohort was disadvantaged, with several adverse life events often experienced from early childhood onwards, and with limited access to health services. In other words, admission to high secure psychiatric care is associated with a host of complex needs when compared to psychiatric patients residing in less secure settings or the community.

Predictive validity of the HCR-20 and the RSVP

The findings indicate that the HCR-20 lacks in predictive validity when the tool is applied by clinicians into practice, when the predictive validity is calculated to cover months or years, and when addressing non-serious violence across different risk settings. This included the community. Likewise, the RSVP failed to predict incidents within similar parameters to those used with the HCR-20; a follow-up period that varied considerably between months and years, and an outcome variable of non-serious violence including minor sexual incidents. In contrast to the HCR-20, however, no member of the RSVP cohort reached the community during the study period. These results did not change when alternative analyses were conducted to explore confounding factors or control for length of follow-up time. For example, the HCR-20 maintained its poor predictive power when the dataset was split according to source of referral, restriction status, and absence or presence of personality disorder. Likewise, the RSVP did not improve in efficacy when analyses were controlled for the presence of sexual or physical abuse, type of sex offender and presence of prior sex offences.

While the low predictive power of the HCR-20 was associated with a reduction of violent incidents, the absence of any comparison data and the small sample size of the RSVP cohort (n = 21) make interpretation of the findings difficult. At face value, while the RSVP did not predict any incidents, the HCR-20 clinical scale of RSVP assessees was a significant predictor of sexual incidents (AUC = .89). This noted, these incidents were

committed by a small group of three patients, two of whom were involved in all but one sexual event. Similar results were found in relation to the HCR-20 study in chapter 6 in that while the total scale was predictive of serious violent incidents (AUC = .86), these were rare events (n = 3).

The contribution of clinical symptoms

Clinical variables appeared to be important contributing factors to violent incidents in this thesis. This conclusion is based on a variety of analyses. The HCR-20 clinical scale was significantly related to non-serious sexual incidents, in terms of presence and frequency, when using appropriate small sample statistics. This is further endorsed by the researcher-led study described in chapter eight. When psychometric scales were administered by the researcher, psychiatric symptoms were predictive of incidents in the sample with a large effect size (AUC = .79). Several researchers (e.g. Gray, Fitzgerald, Taylor et al, 2003) have pointed out that clinical factors are likely to be predictive upon admission due to acute symptomatology. This noted, further exploration of the data confirmed that chronicity of symptoms, i.e. the persistence of these symptoms measured across the follow-up period, was significantly related to violence. This was also the case when partial correlations were conducted which isolated the unique contribution of psychiatric symptoms to the variance in incidents. Additional support for the role of clinical factors is presented in the pilot validation study on the short term risk assessment tool for inpatient aggression (DASA-IV). This instrument consists of dynamic, clinical items only. Over a period of six months, and when completed by frontline nursing staff on a daily basis, the DASA-IV predicted inpatient incidents within 24 hours of the ratings made. In summary, these results suggest that psychiatric and clinical variables play an important part in inpatient violence across several different risk settings. In contrast to the research on the HCR-20 and the RSVP, however, the findings on psychiatric symptoms and the DASA-IV were not applied to clinical practice, i.e. the information was not systematically used to inform care and treatment.

10.2 Comparison with the wider literature

The HCR-20

In the context of the wider literature, including the output of meta analyses and systematic reviews (e.g. Fazel, Singh, Doll et al, 2012), the findings of this thesis may appear

atypical, in particular with regards to the HCR-20 lacking predictive validity when the tool is applied by clinicians into practice. Previous research clearly demonstrates that the HCR-20 relates to violence to some degree, as was reflected in the literature review conducted for this thesis in which studies included indicate the HCR-20 to be a valid predictor of future violence in male mentally disordered offenders. The majority of studies typically reported that the efficacy of the HCR-20 ranged between moderate to large effect sizes (AUC = .65 to .75). The clinical HCR-20 scale was generally a better predictor of short term violence (Gray, Taylor & Snowden, 2011) while the historical risk scale was predictive of long term violence, typically recidivism (Dolan & Khawaja, 2004). These findings, however, are based on non-implementation studies, i.e. ratings were typically provided by researchers for the purpose of research rather than clinical practice. The few studies that utilised clinicians as raters, or remarked that risk measures were completed as part of routine clinical practice, generally suggested that perhaps the risk assessment may have informed risk management. Yet, this seemed to be primarily based on speculation as none of these studies described the management processes or procedures involved, and therefore lack a solid basis to explore this argument further.

Given the complexities involved in the study of risk assessment and implementation, it is difficult to account for the disparity between reports of previous research and the outcomes of this thesis with any certainty. However, it is likely that three main factors may be considered relevant to these findings. Firstly, the thesis sample was significantly different from other research cohorts, and secondly, the quality of the completed HCR-20s was poor given the complexities of the implementation process. Thirdly, it could be argued that lack of predictive validity of the HCR-20 was reflective of the tool being used effectively to inform care and treatment such that incidents were prevented from occurring. In response to these possibilities, the thesis sample was representative of the wider State Hospital population. Comparison with similar cohorts confirmed that HCR-20 risk scores were congruous. If at all, then the risk ratings in the thesis sample were higher implying that detention in high secure settings was warranted. While there may be an argument that the implementation context of this study affected the quality of HCR-20s, analysis revealed that when the sample was categorised as ‘early vs late’ HCR-20s according to when patients were recruited during the implementation, predictive power did not increase. Of concern though is that this study identified discrepancies in personality disorder diagnoses when comparing ratings on the relevant HCR-20 item (H9) with diagnoses documented in patients’ case notes. Despite this, the findings of low

predictive validity on the HCR-20 are thought to suggest that the instrument was effectively used to inform risk management, thereby preventing violent incidents. The main support for this hypothesis stems from a comparison of the present results with those of a retrospective researcher-led study in the State Hospital (Thomson, Davidson, Brett et al, 2008). Of note is that the mean number of incidents and the proportion of violent inpatients were significantly lower in the thesis research. Arguably, it is unlikely that both studies used exactly the same patients, yet the characteristics of the thesis sample resembled those of Thomson et al's cohort as described in chapter four.

There is further evidence in the literature outlining the possible impact of implementation efforts on the predictive validity of the HCR-20. For example, Pedersen, Rasmussen and Elsass (2012) implemented the HCR-20 across a Danish secure hospital. The authors report that the tool was associated with lower predictive accuracy when compared to other research. Similar to the present thesis, Pedersen and colleagues compared the rate of inpatient incidents and recidivism with a previous, retrospective study in the same setting. A substantial reduction in all outcome variables was noted, which led the authors to conclude that the implementation must have been successful. That is, the HCR-20 effectively prevented violent incidents.

The RSVP

While the sex offenders in the thesis sample were representative of the wider State Hospital population in terms of demographics and HCR-20 risk scores, comparison to similar mentally disordered sex offenders is difficult. The literature review in chapter 2 identified that there were no studies on the predictive properties of the RSVP published to date. Though the RSVP is akin to the SVR-20, the only studies conducted on mentally disordered samples concern recidivism rather than inpatient incidents and are set outwith the UK. The lack of research on specific groups of sex offenders has been underlined by several researchers in that study cohorts are generally drawn from a variety of different sources such as prison, community programmes and forensic hospitals (Stinson & Becker, 2012). While the extent to which mental disorder, in particular psychosis, contributes to violence in sex offenders is under debate (Fazel, Sjoestedt, Langstroem et al, 2007), those in prison differ from those in psychiatric facilities in terms of needs and access to appropriate interventions (Moulden, Chaimowitz, Mamak et al, 2013). Therefore, comparison with other non-mentally disordered study samples does not appear

meaningful. While the quality with which the RSVPs were completed may be an issue, inspection of the descriptive data confirms that ratings were clinically grounded.

Theoretically, the RSVP ought to be low in predictive power given the incorporated case management process, yet the instrument did not relate to the discharge of patients. Arguably, it is an assumption that RSVP risk information was successfully translated into the case planning section. Whereas the RSVP was not related to the frequency or the presence of incidents, the HCR-20 clinical scale correlated with sexual incidents. The HCR-20 clinical scale also predicted sexual incidents, though caution is required given the small sample size and the limited number of sexual aggressors. Despite the methodological problems attached to the present study, it seems that the RSVP may not be a suitable additional risk assessment instrument for sexual violence within psychiatric inpatient settings.

Clinical variables

The results on the importance of clinical factors reflect those of other research projects (Thomson et al, 2008). Notably, Gray and colleagues (2003, 2004, 2008) established in a series of research papers that the clinical HCR-20 scale was related to inpatient aggression. Of note, however, is that some such as McDermott and colleagues (2008a) demonstrated the incremental value of psychiatric symptoms over and above the HCR-20 in inpatient settings. This is not to devalue the utility of the HCR-20 across residential secure environments; conversely some of the clinical and historical HCR-20 risk factors lend themselves to being addressed within inpatient settings. For example, risk items on substance abuse, employment problems or relationship instability can be addressed through work placements, psychological programmes on communication skills, or drug and alcohol interventions including relapse prevention. This noted, risk factors in psychosis are contextual. This has been further explored by Witt, van Dorn and Fazel (2013) in a systematic review and meta regression of 110 studies. While the results suggest that the risk of violence is mostly related to forensic histories among psychotic individuals, the authors observe that certain dynamic risk factors including psychopathology warrant more attention in risk assessment and management. This is because the odds of violence occurring increased with every incremental step in positive symptoms and other clinical variables within inpatient settings, while the contribution of static risk factors such as previous violence decreased. The lack of predictive power of such historical factors, however, may also be related to the high degree of shared variance

in historical risk in forensic settings (Belfrage, Fransson & Strand, 2000). This means that at a group level, historical risk factors may lose significance; this may not apply to clinical practice where the individual is considered rather than a group of individuals.

This noted, the literature review in chapter 2 of this thesis elucidated opposing reports on the predictive validity of the clinical scale across diagnostic groups, most notably when schizophrenia and personality disordered groups were juxtaposed. This is perhaps where research struggles to reflect clinical practice because clinicians typically attend to the individual, rather than the individual within a comparison group.

10.3 Clinical implications

The results of this thesis may suggest that HCR-20s when completed by clinicians for the purpose of clinical decision-making, can effectively inform care and treatment. By comparing the sample recruited for this thesis with a cohort described in a previous study in the State Hospital, a significant difference in the number of inpatient aggressors and mean number of violent incidents was found. With this in mind, the thesis has contributed to the wider clinical context and suggests the ongoing use of the HCR-20 as a valuable assessment tool in practice. Furthermore, the findings of this study support the role of dynamic risk factors in inpatient violence; these seem of value to risk management. This particularly refers to the identification of psychiatric symptoms in terms of severity and chronicity as good predictors of inpatient violence. Future service developments may consider allocating resources to enable staff to identify those high at risk due to psychiatric symptoms and design appropriate and feasible intervention strategies. Not only does this require a set of skills such as empathic listening and the ability to reflect but staff ought to be given sufficient time to establish a therapeutic relationship safe enough for inpatients to share information. These are key components of clinical practice, and have been linked to the occurrence of inpatient violence. For example, research has suggested that patients are more likely to be violent if staff are perceived as lacking in empathy (Meehan, McIntosh & Bergen, 2006). A lack of empathy, in turn, has been linked to lacking the skill to reflect.

The predictive validity of clinical variables is further corroborated in the study on the clinical structured risk assessment tool (DASA-IV). The tool was predictive of imminent aggression, which provides possible avenues for structured interventions by nursing staff. While more research is required to establish the instrument's validity across larger

samples and different patient groups, it seems most important that nursing staff are consulted in this respect. The experience of the implementation process of SPJ tools across the State Hospital has underlined that while such efforts are possible, the ability to create relationships is a crucial characteristic in the change team and leader as described in chapter five. While the described implementation process may not be applicable to less secure settings, this study has highlighted that the adaptation of care and treatment documentation in line with the SPJ risk approach seems to have an impact on staff awareness of patients' needs. This is endorsed in the finding that the number of unmet needs as perceived by patients decreased significantly while the number of met needs rated by staff increased. Moreover, staff rated those with an implemented HCR-20 which was updated at 12 months follow-up with significantly more met needs than those whose HCR-20 had not been updated. This makes sense when considering that the newly introduced risk management documentation stipulated the nature of tasks to be met within a specific timeframe by named staff members.

Nonetheless, there were general problems with locating and retrieving baseline and updated risk assessments across the entire study period. Of further note is that most SPJ tools included a psychopathy rating despite the appropriate assessment not being found. This is not to say that that these were not necessarily completed. It seems more likely that either psychopathy assessments were not filed, were not filed in the designated sections or not stored for future reference. While the latter seems unlikely given the criminal justice context, the findings of this thesis reflect overall issues of ineffective record keeping across various forensic sites. This is because of those participants who were discharged, the SPJ tools of very few were updated or shared for the purpose of this research. Considering best practice guidelines stipulating that the best possible care is provided, this very much highlights a major clinical issue across the wider Forensic Network. Equally concerning was the finding that the introduction of the RSVP seemed to encourage clinicians to discontinue using the SVR-20 in the assessment and management of sex offenders in the State Hospital. While clinically this may have seemed sensible given that the tool comes with a specific case management section, several researchers have drawn attention to the fact that the RSVP lacks an established evidence base (Rettenberger & Hucker, 2011).

10.4 Ethical implications

Clinicians are professionally and ethically bound to provide care and treatment based on effective assessments. On one side, the clinician is the risk assessor attempting to protect the public, on the other side the clinician is the therapist who works for the patient's best interest and human rights. This act of balance is safeguarded by careful documentation of clinical decisions. In relation to risk assessment and management, this then means that those who assess need to be appropriately trained, that risk assessments are kept uptodate, that a client's behavior is considered in a variety of different situations and that decisions are transparently documented. This is so that care and treatment can be followed and, where necessary, questioned. Therefore the findings discussed in chapter 5 of this thesis, i.e. the lack of filed assessments, are an issue of great ethical and clinical concern.

In relation to the RSVP study, the criminal justice context of risk assessments requires the evaluation of future risk. Chapter 2 of this thesis highlighted that there is a dearth of validation studies on SPJ tools when applied to mentally disordered sex offenders across the UK. While clinicians may be ethically obliged to do 'something' rather than nothing in response to potentially harmful behaviour, they are equally ethically bound to utilise scientifically tested methods of risk assessment that promote transparency in decision making in order to improve legal accountability. Yet, this thesis found that clinicians readily accepted the RSVP into clinical practice despite its lack of validation. Given the clinical led nature of this thesis, the prospective validation study of the RSVP presented here is, arguably, flawed due to methodological shortcomings. Nonetheless, the findings advise against using the RSVP in psychiatric inpatient care until further validation studies have been conducted. Ethically, researchers and clinicians are bound to work together in order to produce scientifically sound and clinically useful knowledge.

10.5 Limitations

Conceptual limitation

Violence is a complex concept and one that is not well defined among practitioners or researchers. Statistically, violence is often viewed in dichotomous terms, i.e. the presence or absence of physical violent acts. Some researchers include threats and verbal aggression as a violent outcome whereas others focus on the function of violence, e.g. instrumental vs. reactive. The variation of definitions of violence impacts greatly on the

reported base rates, and ultimately the accuracy and confidence with which statistical models using this information can be interpreted. This also links in with the importance of considering the length of follow-up time employed in research studies. Not only does this affect the percentage of recidivists and the base rate of offending but also the methodology that can be applied to the assessment of risk.

Much of the research published and disseminated considers the predictive validity of SPJ tools on North American and Canadian samples. Typically, a retrospective design is employed, which may confuse the concept of prediction with that of postdiction. Not only is it likely that postdicting violence may statistically inflate results, but more importantly, findings may not be able to be replicated within clinical practice considering that clinicians utilise client interviews, general presentation, collateral information in addition to file information. The latter is the primary, if not sole, source of information in retrospective studies. This is not to say that these studies are not valuable, nor is the quality of these studies under debate. On the contrary, retrospective research is important to establish a statistical link between risk factors and violence across different settings and populations.

Theoretical limitations

The majority of validated risk assessment tools contain factors which are associated with an increased risk of violent recidivism; factors which may operate to decrease risk have been largely neglected. The consideration of protective factors in violence risk assessment is important to ensure that the assessments are balanced, comprehensive and accurate. Protective factors may facilitate daily risk management by identifying areas for intervention and facilitating client's engagement by adopting a more positive approach (de Vries, de Vogel & de Spa, 2011). The Structured Assessment of Protective Factors for violence risk (SAPROF) is a recently developed SPJ tool, which has been shown to add incremental validity to the HCR-20 (de Vogel & de Ruiter, 2006). The composite final risk judgement of the HCR-20 and the SAPROF was noted to be particularly predictive. Though the tool has been introduced in the UK, there are no validation studies in Scotland to date. Based on the research available, it is unclear what factors should be considered protective. Furthermore, environmental risk factors are rarely considered (Gadon, Johnstone & Cooke, 2006); this refers to overcrowding, ward atmosphere as well as staffing levels. While the inclusion of such factors into risk assessment is perhaps not clinically useful given the relatively limited range of interventions to such problems, it

seems important that these are considered when interpreting the underlying factors of violence.

Methodological limitations

Though the sample size of the thesis cohort was sufficient in terms of power, the base rate was unexpectedly low which is likely to have affected the AUC results. The accuracy with which the clinical scale of the HCR-20 predicted sexual incidents in the RSVP study was high, however, this is based on a limited pool of data (n = 21 participants). The full study sample is further affected by response bias. Only those able to give informed consent and only those agreeable to the research study participated. In this way, perhaps those most likely to be violent were excluded from the study. This may have contributed to the low base rate of violence. In addition, it is possible that the clinical scale of the HCR-20 may have been significant of incidents regardless of the implementation process. In other words, the findings of this study are perhaps not easy to generalise to chronically unwell forensic patients.

Considering that dynamic risk as represented in the clinical and the risk management scale is likely to fluctuate, it seems unlikely that any risk assessment conducted at baseline should be able to predict incidents months or years later. Unfortunately, in this thesis it was not possible to assess the extent to which the HCR-20 or either of the other tools reflected changes in risk across time and settings. This was because reviews or updates of relevant patients' instruments could not be located in the files. This was despite the implementation policy of updating risk on at least an annual basis, and as such the lack of HCR-20 updates highlighted a major clinical issue across the State Hospital. This also applied to the wider Forensic Network as most settings were unable to provide updated risk assessments when study participants had been discharged from the State Hospital. It is important to note that this does not necessarily mean that clinical teams did not review risk per se. Rather, such reviews were either not documented or were not filed. This also applied to the final risk judgement. This is the underlying rationale of the SPJ methodology; the point at which the collated risk information is interpreted within a clinical judgement context. It is unclear why clinical teams in the State Hospital did not document the final risk judgement except that the implementation procedure did not stipulate documenting the final risk judgement or perhaps clinicians did not utilise the final risk judgement in practice.

The impact of setting

It is likely that the management features of the research site prevented incidents from occurring in the first place. The nature and frequency of violence in the community is arguably very different from that within secure hospitals. The minor inpatient violence documented in this thesis does not compare to the potentially life threatening violence in the community. This may also be applicable to different levels of risk management. Dernevik, Falkheim, Holmqvist et al (2001) noted that the HCR-20 was not predictive in high secure wards, yet the tool was a good predictor across less secure management levels within the same research site. When considering the setting, it is a shortcoming that this thesis did not include verbal violence, i.e. behaviour ranging from intimidating statements to clear direct threats of violence and harm to others (Yudoskfy, Silver, Jackson et al, 1986), as an outcome variable. While previous research suggests that there is no consistent pattern of risk indicators for inpatient incidents (Bowers, Stewart, Papadopulos 2011), in most secure settings verbally aggressive individuals would be monitored and de-escalation techniques would be applied. However, verbal abuse is rarely consistently documented and therefore proves to be an unreliable criterion variable. This is an unfortunate limitation, in particular in respect to the study on the RSVP. Sexual incidents within a high secure setting differ from those possible in the community, and therefore it may not be sensible to expect the RSVP to relate to inpatient sexual incidents. This said, it is typically an inpatient setting where risk is foremost assessed and interventions are tailored in order to address these risks.

Research vs Clinical practice

As already stated, it is of some concern that the introduction of the RSVP led to the discontinuation of the SVR-20 across the State Hospital given that the former has not yet been validated to establish an evidence base. Perhaps this is because the RSVP is thought to be closely linked to the SVR-20, yet validation studies of this tool are typically out with the UK and focus on recidivism rather than inpatient settings. The disparity between clinical practice and research in sex offending has been addressed by Harris and Hanson (2010) who offer an explanation for this. Citing Monahan (2007), the authors acknowledge that a risk assessment tool needs to consist of evidence based risk factors. Therefore, the authors argue, risk assessment procedures and assessments need to change in line with new evidence including recidivism rates and the nature of sex offences. While this is true, this poses problems when trying to bridge the gap between research and

practice in sex offending, i.e. when implementing tools into practice. Above all, this is typically a remarkably time consuming and resource intensive process; organisations rarely adapt and sustain changes rapidly as described in chapter 5 of this thesis. In other words, while updating the evidence base is an important and useful endeavour, research is often not able to keep up with changes and developments in sex offending services and therefore research findings may become outdated.

Statistical limitations

Though a prominent and much cited statistical approach in the field of risk prediction, ROC analysis is not without shortcomings. For example, ROC analysis can only be applied to binary outcomes, meaning that continuous information such as the frequency or subtle differences in severity with which offending occurs cannot be reliably assessed. In addition, ROC analysis cannot account for the reliability of data sets, i.e. differences in follow-up periods or variations in offender or setting characteristics. Cooke and Michie (2014) report that ROC statistics produce misleading results when used to evaluate the effectiveness of risk scales. The authors re-assessed existing data by using logistic regression analysis and natural frequency diagrams, and found that the uncertainity associated with predictions were extremely large, i.e. the produced AUCs were thought to be meaningless. Szmukler, Everitt and Leese (2012) argue along the same lines in that AUC values lack any meaning in the absence of sensitivity and specificity calculations. Yet, neither sensitivity nor specificity are useful aids to the clinical decision making process of whether a person should be detained or not (Cooke & Michie, 2014). This is further marred by the fact that though authors frequently label levels of sensitivity and specificity as '(in)sufficient' this seems arbitrary as typically no definition is provided on what constitutes sufficient specificity or sensitivity. This essentially means that research focusses on AUCs that may fall within a common, shared range. Applied to a clinical context, however, the trade-off between false positive and false negative errors may render the tool clinically unsuitable.

The AUCs reported in the present thesis were further affected by the variable lengths of follow-up time. Though survival analyses were conducted to control for time dependent variables including follow-up, this statistic is not recommended when the base rate is low. In addition, the various lengths of follow-up time meant that confounding factors such as changes in policy and procedures across the research site might have impacted on the overall results.

Statistically, there do not appear to be any alternativs to ROC nor survival analysis when assessing the efficacy of a risk tool. While risk ratios can be informative, they are limited as results are contextual; the risk ratio expresses an increase or decrease of risk in comparison to other criterion variables. In this way, the magnitude of the ratio may be of little clinical value if the other variables are not applicable to the individual. Essentially, even if the risk of a rare event is doubled, the likelihood of the event occurring is nonetheless rare. Cooke & Michie (2014) therefore propose that instead of relative risks, absolute risk and numbers needed to treat ought to be reported.

10.6 Impact on clinical practice

Despite the described limitations, this thesis resulted in clinically relevant and practical recommendations in relation to documentation and file keeping and training modules on violence risk assessment and management. The lack of filed SPJ and psychopathy assessments led to the establishment of an audit committee with distinct responsibilities of monitoring this clinical issue. Furthermore, the results of the DASA-IV study led to the formal decision to implement the tool into clinical practice.

The output of this thesis also attracted further funding for research relevant to the effective management of risk. In particular, the perspective of patients regarding individual and generic risk of violence and risk management were explored in a qualitative study. This was based on the argument that while the HCR-20 may result in effective risk management, the overall aim is that of encouraging service users to internalise strategies in order to prevent future offending. While these principles are prominent in best practice guidelines (e.g. Department of Health), there is relatively little knowledge of what it is like to be at the receiving end of risk management. Preliminary findings have been presented across the Forensic Network and international conferences (Vojt, Marshall, Thomson et al, 2012). Additionally, Vojt, Marshall and Thomson (2012 – 2013) scrutinised the quality of completed HCR-20s following clinical implementation at the State Hospital. By using a mixed methodology design, the PhD student established that on paper, the link between HCR-20 risk assessment and management had improved steadily when comparing early- mid- and current HCR-20s and their respective risk management plans. It was, however, the qualitative interviews that were perhaps most illuminating. The aim of interviews was to examine clinicians' views on the clinical utility of the HCR-20 in practice. A convenience sample was recruited which included opponents to the HCR-20 as described in the implementation challenges in chapter 5 of

this thesis. Findings revealed that even those who opposed the HCR-20 were intimately familiar with its items, its purpose and its applicability (or lack thereof) to clinical care and treatment documentation. While the exent to which this knowledge may have impacted on risk practice is not known, it is hypothesised that clinicians' conceptualisation of risk changed significantly following the implementation and in line with the SPJ approach. The researchers intend to publish these results in a peer reviewed journal.

10.7 Conclusions

The predictive validity of the HCR-20 and the RSVP are poor when the tools are completed by clinicians, the outcome variable is minor violence and where the prediction covers months and years. By comparing the base rate of violence with a previous retrospective study at the State Hospital, the poor efficacy of the HCR-20 suggests that the tool was used as intended; it effectively informed risk management and thereby prevented incidents from occurring. The research base on the RSVP is limited, and the present findings are based on a small sample, therefore conclusions are only tentative. It appears that the RSVP may not be a suitable additional risk measure within secure psychiatric inpatient settings, and when the outcome variable is sexual violence. Dynamic risk factors, in particular psychotic symptoms, were good predictors of inpatient violence. This was further reflected in the efficacy of a clinical structured risk assessment tool for imminent inpatient aggression. These findings place great significance onto clinical variables within the risk assessment and management process in inpatient settings. Service development may benefit from allocating more resources to the identification of and intervention aimed at severe and chronic psychiatric variables.

In conclusion, from a clinical practice perspective, a risk tool may be of greater utility if it has the potential to inform risk formulation, scenario planning and identification of risk management strategies. Such tools nonetheless need to be statistically reliable and valid. This then puts emphasis on the need for researchers and clinicians to work together in order to create an evidence base that is informative but also anchored within the practicalities and priorities of clinical settings.

RECOMMENDATIONS FOR FUTURE RESEARCH

Further research on violence and sexual violence risk assessment tools within inpatient settings ought to incorporate verbal violence in the outcome variable. This should include unwanted sexual communication and threats of violence. It is recommended to conduct further research, in particular on the quality of implemented SPJ tools, and the connection between risk items on risk assessments and in risk management plans. Assessing the quality of risk formulation, as the link between assessment and management, and its impact on care and treatment is also a task for future research.

While the HCR-20 has been applied to a variety of settings, research is required to assess its implementation potential in settings with limited resources. A tiered risk assessment approach has been suggested (RMA, 2011); the feasibility and clinical value of this has not been evaluated to date. Furthermore, the proclaimed advantage of the SPJ methodology is that of being able to guide and inform risk management, yet there is a remarkable paucity of research exploring the underlying processes. For example, the quality and the associated outcomes of the risk formulation as informed by SPJ tools could be contrasted with a control group without an SPJ informed risk formulation.

Future research is also suggested in relation to the RSVP. Perhaps the most concerning finding in relation to the RSVP was that despite its lack of validation, the instrument was readily accepted into clinical practice. While it is important to recognise that clinicians need to utilise whatever tool they feel appropriate and relevant to the task at hand, it is equally important to establish that clinicians are aware of the potential shortcomings associated with tools. This then means that, rightly or wrongly, validation studies are required, especially when tools are used for clinical decision making within the criminal justice and forensic mental health system. It is therefore recommended that a retrospective study is conducted to validate the tool's risk factors in relation to sexual recidivism in the community. This would add to the currently ongoing prospective research study by the Sex Offender Liaison Service in Edinburgh on the validity of the RSVP with non-mentally disordered sex offenders in Scotland. It is equally important to assess how the tool relates to mentally disordered offenders residing in inpatient settings. While the RSVP may not be suitable in the prevention of sexual incidents considering these rarely occur in secure facilities, clinicians may use the tool primarily to engage sex offenders to establish a therapeutic alliance. Of further interest is the question whether the RSVP does actually result in effective case management. The mere existence and

instructions for RSVP information to be applied to case management does not mean that this is occurs in clinical practice.

Further research is recommended on the DASA-IV following implementation. While the present thesis found that the tool is predictive, the question is whether it is of clinical utility in managing inpatient violence. It is also of interest whether the manner in which the DASA-IV is completed affect its utility and validity

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APPENDIX 1 Summary of studies included in literature review

Study	**Location**	**Design**	**Study sample**	**Risk assessment**	**Outcome**	**ROC (AUC)**
Abidin et al (2013)	Ireland High to low secure	Prospective 6.5m follow-up	100 (94% male)	HCR-20	Inpatient violence	HCR-20=.87 H=.84 C=.79 R=.81 HC=.80 (any violence)
Daffern & Howells (2007)	UK high secure	Prospective 4m follow-up	38 – 40 PD (all male)	HCR-20 C scale only	Inpatient violence	C=.63 for imminent aggression
De Borba-Telles, Folino & Taborda (2012)	Brazil	Prospective 12m follow-up	68 (all male)	HCR-20	Inpatient violence	HCR-20=.82 H=.83 C=.76 R=.64 (any violence) HCR-20=.73 H=.65 C=.75 R=.69 (physical violence)
De Vogel & de Ruiter (2005)	Denmark	Retro and prospective (use of data from two other studies) 81.1m vs 18.7m follow-up	42 (all male)	HCR-20	Inpatient violence and recidivism (violent only)	HCR-20=.88 H=.83 C=.75 R=.88 Final risk judgement=.91
de Vogel, de Ruiter, Hildebrand, Bos & de Ven (2004)	Denmark	Retrospective 72.5m follow-up	120 (89% male)	HCR-20	Recidivism (violent only)	HCR-20=.82 H=.80 C=.77 R=.79
De Vogel, de Ruiter, van Beek & Mead (2004)	Netherlands	Retrospective 140m follow-up	122 sex offenders with MD (all male)	SVR-20	Recidivism	SVR-20=.80 SVR-20 psychosocial=.68 SVR-20 sexual offence=.79 SVR-20 future=.76 SVR-20 final risk judgement=.83

<table>
<tr><th>Study</th><th>Location</th><th>Design</th><th>Study sample</th><th>Risk assessment</th><th>Outcome</th><th colspan="2">ROC (AUC)</th></tr>
<tr><td>De Vogel & de Ruiter, (2006)</td><td>Denmark</td><td>Prospective
21.5m follow-up</td><td>127 (all male)</td><td>HCR-20</td><td>Inpatient violence</td><td colspan="2">HCR-20=.85
H=.77
C=.80
R=.79
HCR-20 final risk judgement=.86 (consensus scores for physical violence)</td></tr>
<tr><td>De Vries, de Vogel & Douglas (2013)</td><td>Denmark</td><td>Retrospective
1y, 3y and L/T (mean = 11y) follow-up</td><td>188 (all male)</td><td>HCR-20</td><td>Recidivism (violent only)</td><td colspan="2">HCR-20=.64-.84
H=.55-.74
CR=.67-.84</td></tr>
<tr><td>De Vries, de Vogel & de Spa (2011)</td><td>Denmark</td><td>Retrospective follow-up of 1y, 2y and 3y</td><td>126 (all male)</td><td>HCR-20</td><td>recidivism (violent only)</td><td colspan="2">HCR-20=.68-.81 at 3y follow-up</td></tr>
<tr><td>Dernevik, Grann & Johansson (2002)</td><td>Denmark
High, medium and low secure</td><td>Prospective
52 – 60 week follow-up</td><td>54 (no description of gender)</td><td>HCR-20</td><td>Inpatient violence and recidivism (violent only)</td><td>H=.62
C=.59
R=.60
HCR-20=.64 (in high security)
H=.83
C=.74
R=.64
HCR-20=.82 (in medium security)</td><td>H=.75
C=.49
R=.62
HCR-20=.71 (in low security)

HCR-20=.84 (violent recidivism)</td></tr>
<tr><td>Desmarais et al (2012)</td><td>Canada</td><td>Retrospective
12m follow-up</td><td>120 (all male)</td><td>HCR-20</td><td>Inpatient violence</td><td colspan="2">HCR-20=.66 - .80</td></tr>
<tr><td>Dietiker, Dittman & Graf (2007)</td><td>Germany</td><td>Retrospective
5y follow-up</td><td>64 sex offenders with MD (all male)</td><td>SVR-20
HCR-20 + 3</td><td>Recidivism</td><td colspan="2">HCR-20 = .92
SVR-20 = .89</td></tr>
</table>

<table>
<tr><th>Study</th><th>Location</th><th>Design</th><th>Study sample</th><th>Risk assessment</th><th>Outcome</th><th colspan="2">ROC (AUC)</th></tr>
<tr><td>Dolan & Blattner (2010)</td><td>UK
medium secure</td><td>Prospective
6y follow-up</td><td>72 (87% male)</td><td>HCR-20</td><td>Inpatient violence and recidivism</td><td colspan="2">HCR-20=.86
H=.60
C=.91
R.85</td></tr>
<tr><td>Dolan & Fullam (2007)</td><td>UK
medium secure</td><td>Retrospective
12m follow-up</td><td>136 (all male)</td><td>HCR-20</td><td>Inpatient violence</td><td colspan="2">HCR-20=.72
H=.66
C=.73
R=.67</td></tr>
<tr><td>Dolan & Khawaja (2004)</td><td>UK
medium secure</td><td>Retrospective
Min 2y follow-up</td><td>70 (all male)</td><td>HCR-20</td><td>Recidivism and community violence</td><td colspan="2">HCR-20=.76
H=.78
C=.65
(self reported violence)
HCR-20=.71
(any recidivism)
HCR-20=.67(serious recidivism)</td></tr>
<tr><td>Douglas, Ogloff & Hart (2003)*</td><td>Canada
high secure</td><td>Pseudo-prospective
42.9m follow-up</td><td>100 (91% male)</td><td>HCR-20</td><td>Recidivism and community violence</td><td>HCR-20=.67
H=.63
C=.68
R=.53
Final risk judgement=.69
(any violence)</td><td>HCR-20=.70
H=.65
C=.70
R=.55
Final risk judgement=.74
(physical violence)</td></tr>
<tr><td>Douglas & Ogloff (2003)*</td><td>Canada
high secure</td><td>Pseudo-prospective
42.9m follow-up</td><td>100 (91% male)</td><td>HCR-20</td><td>Recidivism and community violence</td><td colspan="2">HCR-20 C scale predictive of severe violence – cox regression.</td></tr>
<tr><td>Douglas & Ogloff (2003)*</td><td>Canada
high secure</td><td>Pseudo-prospective
42.9m follow-up</td><td>100 (91% male)</td><td>HCR-20</td><td>Recidivism and community violence</td><td colspan="2">Cox regression including confidence rating – only C scale significantly predictive of violence.</td></tr>
</table>

Study	Location	Design	Study sample	Risk assessment	Outcome	ROC (AUC)
Doyle, Dolan & McGovern (2002)	UK medium secure	Retrospective 3m follow-up	87 (97% male)	HCR-20 H scale only	Inpatient violence	H =.70 any violence H=.66 serious violence.
Fagan et al (2009)	Ireland high to low secure	Prospective 6m follow-up	81 (all male)	HCR-20	Inpatient violence	HCR-20=.80 H=.77 CR=.77
Fitzgerald et al (2013)	UK mediumsecure	Prospective 6m follow-up	45 (all male)	HCR-20	Inpatient violence	HCR-20=.73 H=.62 C=.72 R=.66 Final risk judgement=.70 (physical violence)
Fujii et al (2005)	US	Retrospective 7m follow-up	108 (81.5% male): Asian-American (N=51), Euro-American (N=46), Native-Hawaiian (N=38)	HCR-20	Inpatient violence	HCR-20=.47-.58 Asian-Americans HCR-20=.58-.64 Euro-Asians HCR-20=.59-.74 Native Hawaiians
Grann, Belfrage & Tengstrom, (2000)	Sweden	Retrospective, follow-up 2 y post discharge	schizophrenia (n = 202) vs PD (n = 293) (proportion of males unknown)	HCR-20 H scale only	Recidivism (violent only)	H=.71 (PD cohort) H=.66 (schizophrenia). H=.71 (whole cohort)
Gray, Taylor & Snowden (2008)	UK medium secure	Pseudo-prospective 6m,1y,2y and 5y follow-up	887 (all male)	HCR-20	Recidivism (violent only)	HCR-20=.70-.76 H=.68-.77 C=.54-.61 R=.63-.69
Gray et al (2007)	UK medium secure	Pseudo-prospective Min 2y follow-up	996 (86% male)	HCR-20	Recidivism	HCR-20=.68 H=.71 C=.51 R=.63 (general recidivism) HCR-20=.68 H=.69 C=.55 R=.63 (violent recidivism)

Study	Location	Design	Study sample	Risk assessment	Outcome	ROC (AUC)	
Gray et al (2004)	UK medium secure	Prospective 6y follow-up	315 (87.6% male)	HCR-20	Recidivism	HCR-20=.61 H=.62 C=.48 R =.62 (all recidivism) HCR-20=.56 H=.57 C=.47 R = .56 (serious recidivism)	HCR-20=.63 H=.63 C=.49 R=.62 (minor recidivism)
Gray et al (2003)	UK medium secure	Prospective follow-up over 3m	34 (all male)	HCR-20	Inpatient violence	HCR-20=.81 H=.77 C=.79 BPRS=.84 (physical violence)	
Gray, Taylor & Snowden (2011)	UK medium secure	Pseudo-prospective 2y follow-up	890 (all male)	HCR-20	Recidivism	HCR-20=.73 H=.73 C=.55 R=.70 (violent recidivism)	HCR=.69 H=.69 C=.51 R=.68 (general recidivism)
Grevatt, Thomas-Peter & Hughes (2004)	UK Medium secure	Retrospective; follow-up 6m	44 (all male)	H scale C scale HC composite	Inpatient violence	C =.72 (for any incident) C = .81 (for verbal assaults), C=.65 for property damage, C=.60 for physical assaults. C =.68(for repeated incidents of all types), C=.76 (for repeated physical assaults) HC composite=.61 (for repeated physical assaults) H-10 was not judged as significant for any outcomes	

Study	Location	Design	Study sample	Risk assessment	Outcome	ROC (AUC)	
Hilterman et al (2011)	Netherlands	Retrospective (follow-up length not specified)	195 (proportion of males unknown)	HCR-20	Recidivism	HCR-20=.69 C=.66 R=.62 Final risk judgement=.69 (serious recidivism)	HCR-20=.70 H=.70 C=.64 R=.62 Final risk judgement=.65 (general recidivism)
Ho, Thomson & Darjee (2009)	UK Medium secure	Retrospective 2y follow-up	96 (92% male)	HCR-20 H scale only	Community violence	H=.60 any violence H=.62 minor violence H=.74 serious violence H=.60 minor recidivism H=.54 serious recidivism	
Langton et al (2009)	UK high secure	Prospective; follow-up 1.5y	44 PD (all male)	HCR-20	Inpatient violence	HCR-20=.68 C=.68 R=.73 for full follow-up period	
Macpherson & Kevan (2004)	UK High secure	Retrospective 3.5m follow-up	86 (all male)	HCR-20	Inpatient violence	HCR-20=.64 H=.59 C=.72 R=.57 (any violence) HCR-20=.70 H=.65 C=.73 R=.60 (threatening behaviour)	HCR-20=.55 H=.50, C=.65 R=.50 (physical violence)

Study	Location	Design	Study sample	Risk assessment	Outcome	ROC (AUC)
McDermott et al (2008)	USA	Prospective 2.5y follow-up	154 (84% male)	HCR-20	Inpatient violence	HCR-20=.65 H=.61 C=.61 R=.66 (any violence)
McDermott et al (2008)	USA	Prospective 2.5y follow-up	238 (86% male)	HCR-20	Inpatient violence	HCR-20=.57-.68 H=.46-.64 C=.66-.69 R=.58-.69
McKenzie & Curr (2005)	UK Medium secure	Retrospective 2weeks follow-up	94 (79% male)	H scale C scale	Inpatient violence	HC= .65 H=.55 C= .68 (any violent incident)
Michel et al (2013)	Canada, Finland, Germany, Sweden	Prospective Follow-up over24m (6, 12, 18 and 24m)	150 (all male)	HCR-20	Recidivism	HCR-20=.67-.74 across all follow-up
Pedersen, Rasmussen & Elsass (2012)	Denmark (high, medium and low secure)	Prospective; follow-up over 5.6y	81 (all male)	HCR-20	Inpatient violence and recidivism	HCR-20=.66 H=.68 C=.62 R=.58 Final risk judgement=.56 (violent recidivism) HCR-20=.70 H=.68 C=.66 R=.66 Final risk judgement=.64 (inpatient violence)
Sjoestedt & Langstrom (2002)	Sweden	Retrospective 92m follow-up	51 PD (all male)	SVR-20	recidivism (sexual, non-sexual violent, any violent)	SVR-20=.49 SVR-20 psychosocial=.47 SVR-20 sexual offence=.50 Final risk judgement=.56 (sexual recidivism) SVR-20 psychosocial=.71 (violent non-sexual recidivism)

Study	Location	Design	Study sample	Risk assessment	Outcome	ROC (AUC)
Snowden, Gray & Taylor (2010)	UK Medium secure	Retrospective 2y follow-up	1,006 (84.5% male)	HCR-20	Recidivism	HCR-20=..71 H=.70 C=.54 R=.69
Stadtland & Nedopil (2005)	Germany	Retrospective 5.1y follow up	139 (85% male)	HCR-20	Recidivism	HCR-20 = .65 H = .67 C=.56 R = .63
Strand et al (1999)	Sweden	Retrospective 3- 12y follow-up	40 (proportion of males unknown)	HCR-20	Recidivism (violent only)	HCR-20=.80 Subscales not reported
Tengstrom (2001)	Sweden	Prospective 86m follow-up	106 (all male)	HCR-20 H scale only	Recidivism (violent only)	H-10=.76
Tengstroem et al (2006)	Germany	Prospective 1y follow-up	216 (94.1% male)	HCR-20	Inpatient violence	HCR-20=.65 schizophrenia HCR-20=.32 PD (for physical violence) HCR-20=.65 schizophrenia HCR-20= .66 PD (for any incident)
Thomson et al (2008)	UK High secure	Retrospective, 8-10y follow-up	169 (90% male)	HCR-20 H scale only	Inpatient violence and recidivism	H=.76 general recidivism H=.77 violent recidivism
Wilson et al (2013)	Canada High to low secure	Pseudo-prospective 1y follow-up	30 (all male)	HCR-20	Inpatient violence	HCR-20=.88 H=.79 C=.89 R=.85 CR=.89 Final risk judgement=.91

APPENDIX 2 Clinician information letter

ASSESSMENT OF RISK OF HARM TO OTHERS IN PEOPLE WITH A MENTAL DISORDER

What is the study about?

The State Hospital has decided that it is very important to evaluate the assessments and treatments that are carried out. In order to do this we would like to obtain permission from each patient to use information in casenotes for this.

All patients in the hospital are assessed using different measures. This is part of routine clinical practice and this will happen even if a patient does not take part in the research. All patients will also be invited to participate in the research. It is up to a patient to decide whether or not to take part. Taking part involves a patient consenting to their clinical information being used for research. We also ask that we can follow up a patient's progress through file records during their time in the hospital and that we may approach a patient after they leave the hospital if we plan to do any further research. Lastly we would like permission from a patient to look at their offending history as recorded by the Scottish Criminal Records Office, the Home Office Offenders Index or the Royal Ulster Constabulary, depending on where the patient is living, for up to 10 years after their admission. It may be that the patient will not benefit directly from this research but we hope that the information we get from this study may help us to manage future patients at the State Hospital better.

What will participants be asked to do?

Participants will only be asked to take part in routine clinical practice. This consent form **does not** include any measures that are not part of routine clinical practice. Any additional measures would require a separate consent form.

How can you help?

As Responsible Medical Officer, or a member of the nursing team, I would be grateful if you would agree to a member of your clinical team approaching each of your patients (a list of names will be given to you) to inform them of the study. Any patient that you identify as being unable to give informed consent should be excluded from this study. A letter of information and a patient information sheet will be given to each patient. Informed consent will subsequently be taken by a member of the clinical team for those who agree to participate.

Inclusion criteria

Able to give informed consent
Patient in the State Hospital

Exclusion criteria

Unable to give informed consent

Where will the study take place?

The study will take place within The State Hospital as part of standard clinical practice.

What will happen to the information?

Any information used for research purposes will be collated and anonymised. The findings of any studies will be written up and submitted to peer reviewed journals. The findings will be used to develop services in the hospital and to help meet the needs of patients.

Thank you for taking the time to read this information leaflet.

APPENDIX 3 Patient information letter

6th March 2006

Research Study

Assessment of Risk of Harm to Others in People with a Mental Disorder

You are being invited to take part in research. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

The State Hospital has decided that it is very important to evaluate the assessments and treatments that are carried out. In order to do this we would like your permission to use the information in your casenotes for this.

All patients in the hospital are assessed using different measures. This is part of routine clinical practice and this will happen even if you do not take part in the research. All patients will also be invited to participate in the research. It is up to you to decide whether or not to take part. Taking part involves consenting to a patient's clinical information being used for research. We also ask that we can follow up your progress through file records during your time in the hospital and that we may approach you after you leave the hospital if we plan to do any further research. Lastly we would like your permission to look at your offending history as recorded by the Scottish Criminal Records Office, the Home Office Offenders Index or the Royal Ulster Constabulary, depending on where you are living, for up to 10 years after your admission. It may be that you yourself will not benefit directly from this research but we hope that the information we get from this study may help us to manage future patients at the State Hospital better.

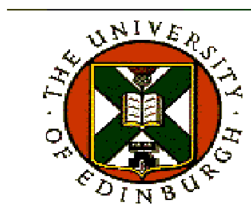
All information which is collected about you during the course of any research will be kept **strictly confidential**. Any information about you which leaves the hospital will have your name removed so that you cannot be recognised. We hope to publish the results of this research in various psychiatric and psychological journals and present the results at relevant conferences. It will not be possible to identify you as only group results will be presented. Any specific research proposal will have to obtain approval from the local Research Ethics Committee. You can use the State Hospital's complaints' procedure if you have any problems with the research.

If you have any questions about the use of your data for research purposes please ask to speak to a member of the Research Committee.

Thank you for taking the time to read about research within the State Hospital and for considering taking part. If you decide to take part you will be given this information sheet to keep and **be asked to sign a consent form**. If you decide to take part **you are still free to withdraw at any time and without giving a reason**. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive.

APPENDIX 4 Patient consent form

CONSENT FORM



Title of project: Assessment of Risk of Harm to Others in People with a Mental Disorder

Please tick box

1. I confirm that I have read and understand the information sheet dated 6 March 2006 for the above study and I have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my care or rights being affected. ☐

3. I understand that any information disclosed regarding abuse or the intent to harm others or myself will be communicated to the nursing and clinical team. ☐

4. I consent that sections of my medical notes may be looked at by the researchers authorised to do so by the State Hospitals Research Committee. ☐

5. I agree to the Scottish Criminal Records Office, the Home Office Offenders Index or the Royal Ulster Constabulary, as relevant, to give information on my offending history until 10 years after the date of this form. ☐

______________________	____________	____________________
Name of Patient	Date	Signature
Name of Person taking consent (if different from researcher)	Date	Signature
Researcher	Date	Signature