Violence risk assessment: combining actuarial and clinical information to structure clinical judgements for the formulation and management of risk

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Throughout history most societies have assumed a link between mental disorder and violence to others. In recent times there has been increasing concern in the United Kingdom over law and order, specifically the risk of violence, and these issues are now high on the political and mental health agenda. Nurses and staff working in National Health Service Mental Health Service Trusts are the groups most at risk of violence. Many clinical decisions are based on risk. Mental health nurses play a pivotal role in the assessment and management of risk and it is argued that they need to adopt a clear structured approach to violence risk assessment and management, which is evidence-based. The advantages of clinical and actuarial approaches to risk assessment are briefly reviewed and a structured clinical judgement approach is proposed that combines these approaches. A method of linking the assessment process with the management plan via a risk formulation is discussed.

Keywords: assessment, mental health, nursing, risk, violence

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Introduction

Throughout history most societies have assumed a link between mental disorder and violence to others. Although the majority of users of mental health services are not violent, it is clear that a small yet significant minority are violent in inpatient settings and the community (Swanson *et al*. 1990, Monahan 1992, Hiday 1997). In recent times there has been increasing concern in the United Kingdom over law and order, specifically the risk of violence, and these issues are now high on the political agenda. A small number of incidents have received considerable media attention and left a strong impression of the potential dangerousness to the public of individuals with various forms of mental disorder. There is increasing suspicion that the professionals and various institutions that are expected to manage risk in day-to-day life have not performed adequately, reinforced by subsequent official inquiries, some of which reveal serious shortcomings both in the clinical management and supervision of these individuals, and failures in liaison and co-operation between agencies (Reed 1997). These perceived failures can be linked in the minds of the public with the perception of inadequate service provision, and with the growing concern that the public are not ade-

quately protected from dangerous individuals by current legislation. Irrespective of whether people with mental disorder are more likely to be violent than the non-mentally disordered, it is evident that there are a significant minority of mental health service users who pose a risk to others and it has been suggested that violence is endemic in healthcare (United Kingdom Central Council for Nursing, Midwifery and Health Visiting 2001). This is reinforced by the finding that nurses are the occupational group most at risk of violence (Gallagher 1999) and staff working in National Health Service Mental Health Service Trusts are up to eight times more likely to be assaulted than staff working in non-mental health Trusts (NHS Executive 1999).

As clinical decisions on risk are made at all stages of the clinical care process and prioritizing treatment need and predicting subsequent outcome of any therapeutic approach will rely heavily upon the level of risk (Department of Health 2000), it is important that mental health nurses (MHNs) have a clear structured approach to violence risk assessment.

Role of mental health nurses in violence risk assessment and management

Risk assessment is an inexact science. Ultimately the decision on the level of risk is based on clinical judgement. Ideally, in practice, decisions on risk should be made by a multidisciplinary team involving all the clinicians involved in the care, treatment and management of the individual being assessed. MHNs play a pivotal role in the assessment and management of risk.

In inpatient settings MHNs are a major source of clinical information that needs to be considered by the nurse and the team as a whole when assessing risks. Mental health nurses in inpatient settings have access to 24-h observation of behaviour and have greater opportunities than other professionals to develop relationships with service users and their families/carers (Allen 1997). MHNs are constantly making decisions based on the level risk to and/or from service users in these environments, for example managing crises as they arise, controlling freedom of movement within and outside the mental health facility and maintaining safe levels of supervision and observation. This unique position makes the role of the MHN crucial to the process of assessing and managing violence risk. In the community, MHNs may have a more autonomous role in assessing and managing violence risk, especially true if they are identified as the keyworker or care co-ordinator in accordance with the requirements of the care programme approach (Department of Health 1990, 2000). Mental health nurses have been found to be the discipline most often identified as keyworker (Boyd *et al*. 1996).

Mental health nurses in the community are often at the forefront of mental health screening of service users in areas such as accident and emergency and mentally disordered offender court diversion schemes, where their expertise gives them a key position in the process of screening (Royal College of Nursing 1997). These relatively new roles have significant implications for MHNs as they identify, assess and manage risk, not least because their individual legal responsibility may increase (Gupta 1995) and also because their professional judgement will inevitably be subjected to closer scrutiny, especially when things go wrong. Mental health nurses are often highly skilled practitioners. They may have advanced competencies in psycho-social interventions employing behavioural and cognitive therapies, counselling, psychodynamic therapies and family therapy. Clearly, the knowledge, skills and experience MHNs possess are crucial to clinical interventions involved in the process of assessing and managing risk. In summary, it is clear that the role of the MHN is pivotal in the assessment and management of violence, not least because nurses are often the target of such violence. However, it is far from clear how MHNs assess and manage risks.

Historical background to violence risk assessment in mental health services

In the recent past there has been serious doubt about the ability of mental health professionals when predicting violence. In the 1970s, several studies arrived at discouraging conclusions (e.g. Steadman & Cocozza 1974, Thornberry & Jacoby 1979) that spread pessimism to the field. It was argued that mental health professionals' predictions of dangerous behaviour were 'wrong about 95% of the time' (Ennis & Emery 1978) and Faust & Ziskin (1988) argued that the accuracy of the judgements of psychologists and psychiatrists did not necessarily surpass that of lay-persons. The possible reasons as to why predictions of violence have been so poor will now be considered by reviewing approaches to violence risk assessment in mental health services.

Clinical approach: 'first generation'

Historically, the most common approach used is unstructured clinical or professional judgement. This approach involves professional 'opinion' or judgements where there is complete discretion over which information should be considered and there are no constraints on the information the assessor can use to reach a decision (Grove & Meehl 1996). This has the advantage of being flexible, allowing a focus on case-specific influences and violence prevention

(Hart 1998). However, the clinical approach has been criticized for being unstructured, informal, subjective and impressionistic (Grove & Meehl 1996) and is plagued by various sources of bias and error as information is highly dependent upon interviewing, observation and self-report (Kemshall 1996). Hart (1998) also highlighted several weaknesses of unstructured clinical judgement. First, there tends to be a lack of consistency or agreement across assessors with low inter-rater reliability. Secondly, assessors may fail to specify why or how they reach a decision, making it difficult for others to question that decision. Thirdly, there is little evidence that decisions made using this approach are accurate and many observers have attributed the inaccuracy of clinicians' judgements on risk to the unstructured nature of the clinical approach (e.g. Monahan 1981).

Research studies have examined the accuracy of predictions made by clinicians using a predominately clinical approach. Otto (1992) called these 'clinical prediction studies'. Some well-known examples are 1970s studies, such as Steadman & Cocozza (1974) and Thornberry & Jacoby (1979). Later studies include Holland *et al.* (1983), Sepejak *et al.* (1983), Lidz *et al.* (1993), Menzies *et al.* (1994) and Belfrage (1998). The body of knowledge generated by these studies suggests that while clinicians' assessments of risk are not as exceedingly poor as the most pessimistic debaters argued, there seems to be general agreement that clinical risk predictions are only slightly above chance and the competence varies greatly between clinicians (Lidz *et al.* 1993). Monahan (1981) published an influential review of 'first generation research' involving clinical, unstructured approaches to violence prediction in which he strongly criticized the accuracy of this approach and later he concluded that the upper bound level of accuracy that the best risk assessment technology could achieve was of the order of 0.33, indicating that clinicians were accurate in no more than one out of three predictions of violence (Monahan 1984). Monahan (1981) cited a number of errors clinicians make when assessing violence risk that lead to inaccurate predictions. These included lack of specificity about the criterion being assessed (i.e. unclear definition of what is to be assessed), relying on illusory correlations, failure to incorporate situational or environmental information and probably the most common error, ignoring statistical base rate information (Monahan 1981). The inference was that prediction could be improved by incorporating research evidence into the assessment process by integrating statistical information on valid predictive relationships into clinical practice (Monahan 1981). Monahan (1984) drew the lines of a 'second generation' of theory and policy aimed at identifying a valid array of actuarial risk markers for violence risk assessment. Integrating statistical evidence into violence prediction has been termed the actuarial approach and is now briefly described.

Actuarial approach: 'second generation'

The actuarial approach to violence risk assessment is typified by assessors reaching judgements based on statistical information according to fixed and explicit rules. 'Second generation' research on actuarial violence risk assessment among the mentally disordered evolved in an attempt to overcome methodological and conceptual problems. In recent times the notion of 'dangerousness' has been replaced by the continuum of 'risk', thereby recognizing that the subject matter is continuous and dynamic in nature rather than discrete and static. The focus of research and to some degree practice has moved from assessing the inherent 'quality' of dangerousness to a focus on individual 'actions'; namely violent behaviour (Monahan 1981, Steadman *et al.* 1993, Gunn 1996). The focus on the concept of risk has led to a third line of inquiry referred to as 'experimental predictions studies' (Otto 1992). These studies do not describe or represent current clinical practice, but rather identify potential predictor variables and possible predictive methods, formulas or techniques. The most common approach is to compile a checklist of a number of predictors or factors, each of which is allotted a score. The sum of the risk factors is an 'actuarial' graduated probability measure, representing the amount of risk attributed to the individual.

Actuarial judgements are based on specific assessment data selected because they have been demonstrated empirically to be associated with violence and coded in a predetermined manner (Kraemer *et al.* 1997, Hart 1998). There seems to be little doubt from research that the actuarial approach is statistically superior to unstructured clinical judgement as it improves the predictive accuracy (Monahan 1981, Dawes *et al.* 1989). In a meta-analysis of 136 studies that compared clinical vs. actuarial prediction, eight resulted in greater predictive accuracy for the clinical method, 64 showed more accurate prediction for the actuarial method and 64 showed no difference (Grove & Meehl 1996). However, there are limitations to the approach that have been summarized by Hart (1998). First, actuarial approaches tend to focus the assessment on a limited number of factors, thus ignoring potentially crucial case-specific, idiosyncratic factors. Secondly, there is a tendency to focus on relatively static factors that are immutable, therefore leading to passive predictions. Thirdly, actuarial approaches may exclude crucial risk factors on the basis they have not been proven empirically, even though they may be entirely logical (e.g. homicidal threats) (Hart 1998). Fourthly, actuarial approaches tend to be optimized to pre-

dict a specific outcome, over a specific time period in a specific population, leading to non-optimal, even bizarre, decisions when applied in different settings (Gottfredson & Gottfredson 1986).

There is also the conflict between the concept of 'prediction' and that of risk management. The function of actuarial prediction methods is simply that, prediction. Risk assessment in mental health services is broader and has to link closely with management and prevention. This is illustrated by Moore (1996), who highlights the paradox between the poor performance of clinicians in predicting violent behaviour, which may be largely accounted for by under-reporting of violence, and the paradox that successful prediction leads to prevention and thus the prediction proves itself wrong. Put another way, if a clinician predicts that someone is going to be violent then they usually have a duty to intervene in some way to prevent the violence. In this sense referring to violence prediction is misleading as clinicians are ethically and legally bound to prove themselves wrong when they predict violence (Hart 1998). In a recent review, Hart (1998) considered the aim of violence risk assessment in mental health services. He emphasized that the purpose of risk assessment is to 'prevent' rather than 'predict' violence. This illustrates an important distinction between the research and clinical perspectives. In research the aim is to identify variables that are predictive of violence, whereas in clinical practice similar variables are used to estimate the risk to others in order to develop plans to prevent the violent act. If clinicians reach a judgement that an individual is at a high risk of violence and subsequently the individual does not become violent, from a research perspective the clinician has made a false-positive error. However, in reality they may have been instrumental in ensuring effective preventative measures to minimize the risk of violence, paradoxically rendering their original judgement ('prediction') inaccurate. Finally, actuarial risk assessment tends to disengage clinicians from the clinical process, therefore minimizing the role of professional judgement (Hart 1998).

Structured clinical judgement: 'third generation'

Clinicians, including MHNs, are concerned with the clinical reality of assessing and managing risk rather than the research task of prediction. Both clinical and actuarial approaches have definite advantages and disadvantages. The debate as to which approach is most relevant to clinical practice is complex. However, it would appear that a combination of the clinical and actuarial approach is warranted. Such an alternative 'third generation' approach, referred to as empirically validated, structured decision-making (Douglas *et al*. 1999) or structured clinical judgement (Hart 1998), attempts to bridge the gap between the scientific (actuarial) approach and the clinical practice of risk assessment. Here the emphasis is on developing evidence-based guidelines or frameworks that promote systemization and consistency yet are flexible enough to account for case-specific influences and the contexts in which assessments are conducted. Such instruments can promote transparency and accountability yet encourage use of professional discretion and are based on sound scientific knowledge, yet practically relevant (Hart 1998, Douglas *et al*. 1999). This approach also moves the emphasis from one of prediction to risk management, where prevention and treatment issues are considered and the conditions under which the risk will increase and decrease are highlighted. This approach also recognizes the reality that the process of clinical risk assessment is a dynamic and continuous process that is mediated by changing conditions (see Doyle 2000).

In support of the structured clinical judgement approach, Webster *et al*. (1997) argue that clinical violence risk prediction can be improved significantly if: assessments are conducted using well-defined published schema (structure); agreement between assessors is good, through their training, knowledge and expertise; prediction is for a defined type of violent behaviour over a set period; violent acts are detectable and recorded; all relevant information is available and substantiated; and finally actuarial estimates are adjusted only if there is sufficient justification.

In summary, structured clinical judgement involves a broad assessment approach that is rooted in evidence that for the most part has been validated by research (Douglas *et al*. 1999). To facilitate this approach instruments need to be developed that are grounded in well-substantiated research that may improve the clinical practice of risk assessment (Borum 1996).

Violence risk assessment instruments

Various schemes, guides and instruments have shown promise in improving predictive accuracy in mental health services. Many are bespoke untested systems (see Kettles *et al*. 2000), although there have been some attempts to develop evidence-based assessment instruments to improve violence risk assessment for mental health nursing (e.g. Woods *et al*. 1999, Holdsworth *et al*. 1999) and in mental health and forensic services generally (see Table 1). Recent reviews of recently developed violence risk assessment instruments concluded that the use of a structured approach to violence risk assessment has shown sustained and even enhanced levels of predictive accuracy (Borum 1996, Dolan & Doyle 2000). However, there still appears to be a gulf between research evidence and clinical practice

Table 1
Examples of violence risk assessment instruments

Instrument	Reference
Behavioural Status Index (BSI)	Woods P., Reed V., Robinson D. (1999) The Behavioural Status Index: the rapeutic assessment of risk, insight, communication and social skills.*Journal of Psychiatric and Mental Health Nursing* 6(2), 79–90
Broset Violence Checklist	Almvik R., Woods P. & Rasmussen K. (1999) The Broset ViolenceChecklist: sensitivity, specificity and interrater reliability. *Journal ofInterpersonal Violence* 15 (12), 1284–1296
Historical Clinical Risk 20 Version 2 (HCR-20)	Webster C., Douglas K., Eaves D. & Hart S. (1997) *HCR-20: Assessing Risk for Violence, Version 2.* Simon Fraser University, British Columbia, Canada
Novaco Anger Scale	Novaco R. (1994) Anger as a risk factor for violence among the mentally disordered. In J. Monahan & H. Steadman (Eds) *Violence and MentalDisorder: Development in Risk Assessment.* University of Chicago Press,Chicago, pp 21–59
Overt Aggression Scale	Yudofsky S., Silver J., Jackson W., Endicott J. & Williams D. (1986) The overt aggression scale for the objective rating of verbal and physicalaggression. *American Journal of Psychiatry* 143(1), 35–39
Psychopathy Checklist: Screening version (PCL:SV)	Hart S., Cox D. & Hare R. (1995) *The Hare PCL: SV: PsychopathyChecklist: Screening Version.* Multi-Health Systems Incorporated, New York
Risk Assessment Management and Audit System (RAMAS)	O'Rourke M., Hammond S. & Davies E. (1997) Risk assessment andrisk management: the way forward. *Psychiatric Care* 4(3):104–106
Violence Risk Appraisal Guide (VRAG)	Webster C., Harris G., Rice M., Cormier C. & Quinsey V. (1994) *Violence Prediction Scheme: Assessing Dangerousness in High Risk Men.* Centre ofCriminology, University of Toronto.
Violence Risk Scale (VRS)	Wong S. & Gordon A. (1999) *Violence Risk Scale – Version 2.* Regional Psychiatric Centre (Prairies), Canada

(Borum 1996, Douglas *et al*. 1999) and a recent review of risk assessments across 67 secure mental health services in the United Kingdom revealed a wide variability in the instruments used, with little evidence of attention to issues of validity and reliability (Kettles *et al*. 2000).

There may be a number of reasons why evidence-based assessment instruments are not used routinely in contemporary mental health services. Mental health nurses and other clinicians may find structured instruments impractical and too costly (Gardener *et al*. 1996) and they may require extensive training before use, which may prove prohibitive in routine practice (Monahan *et al*. 2000). There may also be concern about the ethics of managing violent patients in a purely technical, business-like fashion (Gendreau *et al*. 1996) and questions have been asked about the value of applying actuarial predictive models, derived from aggregate data, to individual cases (Grubin 1997). Also, as most of the valid instruments developed to date have emerged from North America it is possible that they do not account for cross-cultural diversity (Cooke & Michie 1999) and therefore may not generalize well to other populations. Actuarial instruments, especially the early ones, comprised simple sociodemographical variables, such as age and previous criminality. The absence of clinical theoretical constructs for the assessment of violence seems to reduce the face validity of actuarial tools among many experienced clinicians, possibly because they feel that their specific competence can be replaced by 'automated' statistical procedures. Another reason for why standardized assessment instruments are not used routinely in some mental health services may stem from the fact that developments in this area are still in their infancy and it seems somewhat premature to assume that they have as yet demonstrated adequate practical utility for current clinical practice, especially in a European context. Therefore attempting to develop a practical risk assessment framework for multidisciplinary use in clinical practice would appear warranted (Doyle *et al*. 2002). In summary, combing actuarial and clinical risk factors should enhance MHNs' approach to risk assessment. This involves considering a number of factors relating to past history, and the use of an objective measure(s) integrated with the assessment of current presentation, protective and contextual factors (Table 2). However, making sense of assessment information and summarizing this is important ahead of planning management interventions.

Formulation of risk

Evidence-based practice requires that the assessment of risk informs the management plan in a systematic fashion. Formulation of assessment information can make sense out of the complex interactions between different factors, and evidence from scales or tests, while identifying possible causal mechanisms. Formulation is seen as crucial in clinical practice, especially psychological therapies, for understanding individuals' problems and behaviours, explaining factors that maintain problems, linking thoughts, feelings and

Table 2
Risk and protective factors

Historical	Current presentation		Contextual	Protective
A history of violence (recency, frequency, severity, pattern)	Alcohol or other substance misuse	Fear, especially perceived threat from others and fear of imminent attack	Safety of environment	Responsive/compliant with treatment
Recent verbal threats	Involuntary status	Delusions focused on a particular identified person	Extent of social support	Good insight
Violent lifestyle and background	Poor collaboration with suggested treatment and management	Command hallucinations to harm others; particularly if perceived as omnipotent	Immediate availability of a weapon	Amotivational
Victim of childhood physical and sexual abuse	Antisocial, explosive or impulsive personality traits	Specific preoccupation with violence	Relationship and proximity to potential victim	Physical disability
		Agitation, anger excitement, over thostility or suspiciousness		Good rapport with staff Good social networks No interest in or knowledge of weapons or the means of violence Fear of own potential forviolence

behaviours, providing a framework for interventions, helping service users to understand their problems and helping them to develop ways of helping themselves (Kirk 1989, Blackburn & Davidson 1995, Persons & Tompkins 1997). Psychological case formulations involve functional analysis of possible causal relationships (Haynes & O'Brien 1990), often using simple ABC analysis (i.e. antecedent–behaviour–consequence) or revisions to encompass the influence of cognitions on behaviour where ABCs represent antecedents, beliefs and consequences (Chadwick *et al*. 1997). Whereas research on the value of risk analysis and formulation remains limited, there is evidence to suggest that formulations can improve understanding of individual problems and risk behaviour (Linehan 1993, Persons & Tompkins 1997). For risk assessment and management purposes it would be helpful to base formulations on simple connections between what is known (fact) in order to hypothesize how this may impact on an individual's risk (judgement).

A number of researchers have developed specific formulations to gain a better understanding of risk behaviour to assist in research and clinical practice. Novaco (1994) developed a conceptual framework that represents the determinants and consequences of anger, including the link between cognitive, arousal and behavioural domains of anger. More recently Huessman (1998) developed a unified social information-processing model that similarly linked events, schemas and emotional states to provide an information-processing framework that explained the role of cognitions in aggression. Linehan (1993) includes an individualized behavioural analysis in the treatment of parasuicidal behaviour, where client and therapist work together in specifying the chain of behaviours and circumstances leading up to and following parasuicidal behaviour. Risk formulations of this type are scarce but they share the attempt to systematize evidence that can be derived from assessment information. Using a risk formulation of the evidence could provide the crucial link between assessment and management (Table 3) by informing the planning and implementation of interventions while concisely summarizing and communicating an individual's risk status. Risk formulations can be useful in summarizing what is known, although initially it is important to consider the gaps in information and accuracy of the assessment. Where possible simple ABCs of past and present behaviour should be considered, as well as current risk and protective factors, specific person or persons at risk and the circumstances under which the risk will increase or decrease. Handled carefully risk formulations can also lead to collaborative working on risk between the nurse and service user.

Conclusion

There is a need for systematic methods to assess violence risk that incorporate the identification of risk and protective factors, formulation of risk and planning and imple-

Table 3
Assessment, formulation and management of risk

ASSESSMENT → Accrue evidence	FORMULATION → Based on evidence from assessment	MANAGEMENT PLAN Formulation based
History	How co-operative is the service user?	Identified risk factor(s)
Objective measure(s)	How accurate is the assessment?	Desired outcome
Current presentation	Are there any gaps in information?	Interventions
Protective factors	What are the antecedents, beliefs consequences	Responsible person
Context and situation	(physical, emotional) related to past/present risk behaviour?	Time-scale
Liaison with others	What do the scale/test results suggest?	
	What risk factors are present?	
	What protective factors are present?	
	Are there specific person/persons at risk?	
	Is there a relationship between risk and mental disorder?	
	What factors are likely to increase/decrease risk?	
	What are the views of the service user, carers and others?	

mentation of interventions to prevent violence. Both clinical and actuarial approaches have definite advantages and disadvantages. It would appear that a combination of the clinical and actuarial approach is warranted. A number of instruments for aiding violence risk assessment have been developed and tested. They may be useful in clinical practice as part of an approach that considers historical, current, protective and contextual factors. Risk formulations may provide a crucial link between assessment and management. Although future research aimed at evaluating structured clinical judgement and risk formulation is required, evidence from other areas of clinical practice would suggest that it can assist MHNs in defensible decision-making and the effective management of risk.

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