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## **Risk Formulation in Forensic Practice: A Review of the Evidence**

**Purpose:** The purpose of this paper is to review the evidence base for the use of risk formulation in forensic practice settings.

**Design / Methodology / Approach:** Systematic literature review principles were adopted to identify literature exploring risk formulation in forensic practice settings in relation to offending behaviour.

**Findings:** Data were analysed utilising a narrative synthesis approach, and commonalities were observed across some of the studies in terms of definitions, outcomes, and implementation, of risk formulation, however the findings of the review did not provide a definitive account of risk formulation practice in forensic settings. This is due to the narrow scope of the included studies, the small yet diverse samples, the heterogeneity in research aims, and the methodological weaknesses apparent within the included studies.

**Practical Implications:** Further research is needed to understand the application and outcomes of risk formulation in forensic practice settings. Practitioners should be clear about how they are defining, implementing and assessing the outcomes of risk formulation, alongside being mindful of the evidence base when utilising forensic risk formulation in practice.

**Originality / Value:** This is the first paper to focus solely on the evidence base for forensic risk formulation in practice.

**Keywords:** risk formulation, forensic practice, narrative synthesis, systematic literature review

### **Introduction**

Formulation provides an evidence-based understanding of a person's difficulties (Johnstone and Dallos, 2006), facilitating the organisation of information to generate an understanding of the underlying mechanism of the problem to inform intervention (Logan and Johnstone, 2010), and enable communication (Hart and Logan, 2011). Jones (2020) described formulation as an individualised causal model developed collaboratively with the individual. The idiographic nature of formulation facilitates individualised treatment design

and decision-making (Hart *et al.*, 2011). This is achieved through engaging in collaborative empiricism with the client, over time, with a focus on identifying strengths (Kuyken *et al.*, 2008). Formulation complements the strengths-based recovery approaches that are increasingly popular within mental health settings, providing a more holistic understanding of the individual as compared with behaviourist, functional analytical approaches (Gresswell and Hollin, 1992), such as the ABC model (antecedents, behaviour, consequences), common to forensic practice.

Psychological formulation, first cited in the clinical psychology regulations in 1969, is defined within the British Psychological Society Good Practice Guidelines as “a hypothesis about a person’s difficulties, which links theory with practice and guides the intervention” (BPS, 2011, p. 2). The guidance recognises formulation as a core competence for clinical psychologists, however, acknowledges that there is no agreed consensus on the definition of formulation. Formulation is specified within the Health and Care Professions Council (HCPC) Standards of Proficiency for Practitioner Psychologists in the UK (HCPC, 2018), in relation to planning interventions, assisting multi-professional communication, facilitating service user understanding of their experiences / situation, and as part of the cycle of assessment, formulation, intervention and evaluation. Similarly, the British Psychological Society Practice Guidelines identify “formulation of client needs and problems” (BPS, 2017, p. 9) as one of the core skills of registered, chartered and in-training psychologists.

The application of formulation to risk assessment and management in clinical settings appeared within the literature in the 1990’s (Lewis and Doyle, 2009). Within the UK, the Royal College of Psychiatrists issued guidance on the assessment and management of risk of harm to others (RCP, 1996) (as cited in Lewis and Doyle, 2009), and recommended the use of formulation to identify factors that are likely to increase and decrease risk related behaviours to understand the nature of the risks and to inform intervention. Systematic

methods for organising information in order to understand the causes of the presenting problem (Lewis and Doyle, 2009), and propose hypotheses to facilitate change (Hart and Logan, 2011), was identified as the “crucial link” (Doyle and Dolan, 2002, p. 654) previously missing from risk assessment and risk management. This integration of formulation into the risk assessment field led to a definition of risk formulation as “an organizational framework for producing a narrative description that explains the underlying mechanism involved in the generation of harmful behaviour and for proposing hypotheses regarding action to facilitate change” (Doyle and Logan, 2012, p. 413).

The UK Department of Health (2009) highlighted risk formulation as a point of best practice for mental health practitioners when managing service users’ risk of harm. Risk formulation has been incorporated into the HCR-20 V3 (Historical Clinical Risk Management-20, Version 3) (Douglas *et al.*, 2013), which is one of the most commonly used violence risk assessments internationally (Viljoen *et al.*, 2018). The Offender Personality Disorder (OPD) strategy, jointly delivered by NHS England and HM Prison and Probation Service (HMPPS), aimed at those whose offending is linked to complex personality presentations and who present a high risk of harm (Joseph and Benefield, 2012), uses formulation to guide sentence planning and risk management in custody and the community. A good formulation enhances the ability of the Offender Manager to manage risk (Skett *et al.*, 2017), leading to more successful outcomes in terms of risk and psychological wellbeing (Minoudis *et al.*, 2013). Shingler and Needs (2018) identified that Parole Board members and psychologists valued formulation as it facilitated their understanding of prisoners and the risk assessment process and was helpful in generating recommendations, concluding that Parole Board members view formulation as key to understanding the individual.

Hart and colleagues (Hart *et al.*, 2011; Hart and Logan, 2011) have identified key features of forensic formulation. These include: being consistent with theory; based on

information about the case; having internal coherence; accounting for the critical evidence, and generating hypotheses, which also serve as criteria by which forensic case formulations can be evaluated.

Risk formulation is increasingly being utilised within a range of forensic settings, and criterion have been generated to facilitate consistency and structure in the use of risk formulation in practice. Yet the evidence base supporting the use of risk formulation is scant, and, as advocated by Hart *et al.* (2011), it is imperative that the knowledge, practise, and outcomes, of risk formulation, and the evidence pertaining to this are explored. Therefore, the aim of this systematic literature review was to explore risk formulation in forensic practise settings; to understand how risk formulation is defined and implemented within forensic practise settings, and to understand the outcomes of risk formulation.

## **Method**

### *Search Strategy*

Systematic literature review principles were adopted to identify literature exploring risk formulation in forensic practice settings to uncover evidence of risk formulation in relation to offending behaviour. The risk behaviour was not specified within the search terms as it was considered that using specific inclusion and exclusion terms in the initial search strategy would reduce sensitivity and potentially lead to relevant papers being excluded. The search did not include terms related to who completes risk formulations as there are no agreed guidelines for who can/cannot complete a formulation. Risk formulation discussed solely as a theoretical concept unrelated to practice was not within scope of this review. The key concepts of the review were therefore identified as: risk, formulation, and population / setting. Ten databases were searched: Criminal Justice Database, Psychology Database, Social Science Database, ProQuest Dissertations and Theses Global, National Criminal

Justice Reference Service (NCJRS), Applied Social Sciences Index and Abstract (ASSIA), PsycINFO, MEDLINE, Embase and Web of Science (see figure 1 for the search terms).

[insert figure 1]

### *Search Results*

The Selection and Screening tool (SST) was based on the SPIDER search tool (Cooke *et al.*, 2012). It included five search categories: **S**ample (forensic practice setting that work with adult service users who are at risk of offending / reoffending / harming others); **P**henomenon of **I**nterest (formulation in relation to service user risk to others / risk of reoffending); **D**esign (a range of research designs); **E**valuation (themes, experiences, attitudes, perceptions, descriptions or outcome of assessment measures); and **R**esearch Type (quantitative, qualitative or mixed). Studies with no empirical data collection or analysis, no application to real life settings, and discussion/opinion papers were excluded. Four notable experts within the field were contacted however, this did not yield any additional references.

The initial search yielded 1330 references, this was reduced to 62 following review of the titles/abstracts. The Screening and Selection tool (SST) was then applied by reviewing the abstract and/or full text of the 62 remaining references, and for inclusion within the review each paper had to fulfil all five categories of the SST. Once the SST had been applied to the 62 remaining references, 10 articles met the criteria for this review. A diagram of the selection and screening sequence can be seen in Figure 2.

[Insert figure 2]

### *Quality Appraisal*

The quality of the quantitative studies was assessed using an adapted form of the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative

Studies (EPHPP, 2009). For the qualitative studies, identified as those with non-numerical descriptive outcomes, the Critical Appraisal Skills Programme checklist for qualitative research (CASP, 2017) was utilised. To further refine the quality assessment process and capture more nuanced information about the included studies, three additional questions were added to the checklist (Has the researcher explained how the participants were selected? Is it clear how the data were collected? Is there an in-depth description of the data-analysis process?).

The quality scores of the two quantitative studies ranged from 46% (Shaw *et al.*, 2017) to 65% (Hopton *et al.*, 2018); the former used randomisation to allocate participants to the formulation and control groups, gathering data from Offender Managers and those who have committed offences. The researchers provided training to the Offender Managers in the formulation group and were engaged in creating the formulations, therefore blinding procedures were not implemented in this study. The study by Hopton *et al.* (2018) compared the quality of risk formulations completed as part of the HCR-20 Version 2 and Version 3. This study demonstrated strengths in the sample selection strategies, however the assessors may have been able to identify which version of the HCR-20 had been completed.

The quality scores of the eight qualitative studies ranged from 15% (Belfrage, 2015) to 73% (Judge *et al.*, 2014). Seven of the qualitative studies were classified as illustrative case examples, whereby the authors had described formulation in relation to a specific case within a forensic practice setting (Connell, 2015; Duff and Willis, 2006; Kirkland and Baron, 2015; Maltman and Turner, 2017; Mannix and Bergin, 2016; Whitehead *et al.*, 2007) or a service level implementation of risk formulation (Belfrage, 2015). Data were not elicited from the subjects of the risk formulation and the account provided was presented from the perspective of the research author/s. These were not considered to be case study designs as such, therefore rating the quality of these studies did not require case study design quality

criteria (e.g. Reichow *et al.*, 2018). Generally, the quality of the qualitative studies was low, due to the limited information provided within the illustrative case examples regarding selection and representativeness of the case; the role of the researcher within the intervention; and the approach to data collection and analysis. One qualitative study (Judge *et al.*, 2014) gathered data from criminal justice practitioners utilising postal questionnaires and face-to-face semi-structured interviews, this was analysed using a framework analysis. Although the strongest of the qualitative studies, limitations in terms of data collection impartiality were identified.

## **Results**

The key characteristics of each of the studies, such as location, participants, aims of the study and outcomes, were extracted and collated into a table (see table 1).

[Insert table 1]

### *Narrative Synthesis*

The study review questions were used as a framework for extracting the data (see figure 3 for concept map), then a narrative synthesis approach was applied, allowing for a discussion of the commonalities, relationships, and exceptions within the data set leading to a summary of knowledge on the topic (Lisy and Porritt, 2016).

[Insert figure 3]

### *Definitions of Risk Formulation in Practice*

Explicit definitions of risk formulation were not evident within the included studies therefore the defining characteristics of risk formulation were identified from the narrative within the papers. The individualised nature of risk formulation explicitly featured in three



illustrative case example studies (Belfrage, 2015; Duff and Willis, 2006; Kirkland and Baron, 2015). Risk formulation as a hypothesis or theory to assist understanding was evident in four illustrative case example studies (Belfrage, 2015; Duff and Willis, 2006; Kirkland and Baron, 2015; Maltman and Turner, 2017), and one quantitative study (Hopton *et al.*, 2018). The future focus of risk formulation, in terms future treatment, risk management or pathway planning was present in four illustrative case example studies (Duff and Willis, 2006; Maltman and Turner, 2017; Mannix and Bergin, 2016; Belfrage, 2015). Less common factors related to risk formulation as: assisting communication (Hopton *et al.*, 2018), supporting the development of healthy relationships (Mannix and Bergin, 2016), and providing a space for reflection (Mannix and Bergin, 2016). There was no clear definition stated in three of the studies (Connell, 2015; Judge *et al.*, 2014; Whitehead *et al.*, 2006). One study (Belfrage, 2015) described the elements that should be included within a risk formulation: offence history, risk factors, scenario planning, risk management recommendations, and risk relevant changes.

#### *Implementation of Risk Formulation in Practice*

*Occupation.* The job role of those completing the risk formulation included nurses and psychologists (Belfrage, 2015); psychologists and trainee psychologists (Hopton *et al.*, 2018). Two studies describe formulation being developed jointly between the Offender Manager and a psychologist (Maltman and Turner, 2017; Mannix and Bergin, 2016). Both studies were within the OPD framework and would likely be working towards the common outcomes as set out in the OPD Pathway Strategy (NOMS and NHS, 2015).

*Data sources.* Data used to inform the risk formulation process were gathered from a range of sources across the studies: file review (Connell, 2015; Judge *et al.*, 2014; Kirkland and Baron, 2015; Mannix and Bergin, 2016); clinical interview (Connell, 2015; Judge *et al.*,

2014; Whitehead *et al.*, 2007); and assessment measures (Connell, 2015; Kirkland and Baron, 2015; Whitehead *et al.*, 2007). Two studies documented collaboration with the service user when constructing the risk formulation (Kirkland and Baron, 2015; Shaw *et al.*, 2017). Two studies documented a whole team approach to completing risk formulations (Belfrage, 2015; Mannix and Bergin, 2016) and two studies described a consultancy approach, whereby guidance was provided to others completing the formulation (Judge *et al.*, 2014; Maltman and Turner, 2017). Three studies specified that the risk formulation was completed as part of structured professional judgement guidelines, specifically the HCR-20 (Belfrage, 2015; Hopton, *et al.*, 2018<sup>1</sup>) and the RSVP<sup>2</sup> (Judge *et al.*, 2015).

*Formulation frameworks.* A range of models and frameworks were discussed within the illustrative case example papers, encompassing a diversity of theoretical approaches and variety in terminology. Maltman and Turner (2017) described their approach as transtheoretical, incorporating a range of models (schema, attachment, cognitive behavioural, five p's<sup>3</sup>). Belfrage (2015) specified the identification of motivators, destabilisers, and disinhibitors. Mannix and Bergin (2016) discussed adhering to the Ramsden framework (problem, predisposing, protective, triggers, maintainers). Connell (2015) utilised multi sequential functional analysis (identifying antecedents, behaviour and consequences). Duff and Willis (2006) utilised the Finkelhor<sup>4</sup> model, to identify factors that increase and decrease risk of sexual offending. Kirkland and Baron (2015) used a cognitive analytic approach (sequential diagrammatic reformulation). Whitehead *et al.* (2007) used the good lives model and risk needs framework.

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<sup>1</sup> Both papers explored the transition from HCR-20 V2 to HCR-20 V3

<sup>2</sup> RSVP: Risk for Sexual Violence Protocol (Hart *et al.*, 2003)

<sup>3</sup> Weerasekera (1996)

<sup>4</sup> Finkelhor (1984)

*Sharing the formulation.* Three illustrative case example studies stated that the risk formulation was shared with the service user (Belfrage, 2015; Kirkland and Baron, 2015; Mannix and Bergin, 2016). Five studies (illustrative case example and qualitative) discussed sharing the risk formulation with other professionals (Belfrage, 2015; Judge *et al.*, 2014; Kirkland and Baron, 2015; Maltman and Turner, 2017; Mannix and Bergin, 2016), usually a multi-disciplinary team; to establish a shared understanding (Maltman and Turner, 2017); to transfer knowledge and share learning (Mannix and Bergin, 2016) or to explain the risk formulation (Belfrage, 2015). One study (Kirkland and Baron, 2015) emphasised the benefits of using the method of formulation, the CAT (cognitive analytic therapy) map, to facilitate communication between professionals from different disciplines.

*Quality measures.* There was no evidence of quality measures for risk formulations for nine of the studies (Belfrage, 2015; Connell, 2015; Duff and Willis, 2006; Judge *et al.*, 2014; Kirkland and Baron, 2015; Maltman and Turner, 2016; Mannix and Bergin, 2016; Shaw *et al.*, 2017; Whitehead *et al.*, 2007). Hopton *et al.* (2018) utilised CFQC-R (Case Formulation Quality Checklist- Revised<sup>5</sup>) to assess the quality of the risk formulations, comparing those that had been completed within Version 2 of the HCR-20, with those that had been completed as part of Version 3.

### *Outcomes of Risk Formulation*

*Risk management and risk reduction.* None of the studies discussed whether risk formulation had any measurable impact on risk of harm to others, however evidence of risk formulation informing risk management practises was detailed within three studies. Two of the five themes identified from the qualitative data gathered from the criminal justice professionals (Judge *et al.*, 2014) were ‘informing risk management’ and ‘treatment’. Participants

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<sup>5</sup> McMurrin and Bruford (2016)

highlighted how the risk assessment process facilitated knowledge of, and access to, a wider range of treatment options, which influenced risk management. Risk formulation was also cited as informing risk management within two other studies; in a risk management case conference and MAPPA<sup>6</sup> (Kirkland and Baron, 2015), and to manage inpatient and discharge environments to reduce risk (Connell, 2015).

*Relationships.* With regard to professional relationships, two illustrative case example studies stated that risk formulation had a positive impact within professional groups; Kirkland and Baron (2015) reported that feedback gathered from professionals at the risk management meetings indicated that they felt valued as a result of engaging in the risk formulation process; and Belfrage (2015) stated that risk formulations improved relations across professional groups, based on observations of the implementation of the HCR-20 V3 in two hospitals.

Three studies (illustrative case example and quantitative) (Maltman and Turner, 2017; Mannix and Bergin, 2016; Shaw *et al.*, 2017) reported improved relationships between the service-users and Offender Managers. Shaw *et al.* (2017) compared a formulation and a control group, both consisting of Offender Managers and those who had committed offences, by measuring the quality of relationships. The Offender Managers in the formulation group were found to have significantly higher scores indicating more positive relationships, as compared with the Offender Managers in the control group. Whilst the those who had committed offences in the formulation group reported significantly higher scores on the Trust subscale of the DRI-R<sup>7</sup>, than the those who had committed offences in the control group. The Offender Manager sample had an overall 25.6% attrition rate at follow-up, with a higher rate

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<sup>6</sup> Multi-Agency Public Protection Arrangements – a multi-agency approach to manage the risk posed by violent and sexual offenders in the community

<sup>7</sup> DRI-R = Dual Role Relationships Inventory Revised – assess the qualities of probation officer and offender relationships

of attrition within the formulation group (9.7% higher than that for the control group). The study authors note that the attrition rate was within acceptable limits for randomised designs, however they highlighted this could be a source of bias if due to non-random processes, such as the Offender Manager/Offender relationship, or Offender Manager competence in managing high risk individuals with a personality disorder diagnosis.

One of the themes within the data gathered from the criminal justice professionals (Judge *et al.*, 2014), ‘confirming what was known and giving weight’, highlighted how SOLS (Serious Offender Liaison Service) risk assessments were respected by the senior personnel responsible and that recommendations were ‘taken more seriously’ when supported by risk assessment. Another theme ‘understanding personality’ described how formulations helped practitioners understand relationship processes and their responses to those who had committed offences. These two themes highlight the positive impact of risk formulation on multi-disciplinary, and offender-practitioner, relationships.

*Progression.* Three illustrative case examples reported successful outcomes for the individual: being discharged from MAPPA management and variation in recall arrangements (Maltman and Turner, 2017); achieving enhanced status and progressive move to lower category establishment (Mannix and Bergin, 2016); and reduction in severity of offending behaviour and reduction in substance use (Whitehead *et al.*, 2007), however possible outcomes would likely be dependent on the nature of the case studied rather than on the risk formulation activity specifically

## **Discussion**

The aim of this review was to understand risk formulation in forensic settings; looking at the definitions of risk formulation, how risk formulation is implemented and the outcomes of risk formulation. Ten studies met the inclusion criteria, two quantitative and

eight qualitative, with a total of 108 criminal justice practitioners, and 166 service users.

Quality of the studies was below 50% for eight of the ten included studies. Recruitment, data collection and data analysis processes influenced quality ratings, with the authors often being the practitioners involved in creating the risk formulations and then analysing and reporting on the findings. The number of participants involved in the studies was low, which may reflect the individualised nature of risk formulation, and risk formulation activities not translating easily to larger scale research studies. There may also be publication bias in that unsuccessful risk formulation practices / outcomes have not been reported, or papers are not being accepted for publication based on quality (as evidenced in the quality assessment scores of the illustrative case examples). The decision to publish the illustrative case examples may have been made after the successful intervention had been completed, therefore it may be beneficial for future single participant research to follow single case design methods guidance, completing a research protocol prior to the commencement of the study (Yin, 2018), enabling a clearer articulation of participant recruitment, data collection and data analysis.

There were variations in the models / frameworks used to structure the formulations, yet they had common elements, albeit utilising different terminology. A common feature within the definitions was the individualised nature and, interestingly, the majority of studies included within this review were single participant illustrative case examples. Other common features were that risk formulation involves generating a hypothesis / explanation of why an individual presents as a risk, and that the purpose of completing the formulation is future focused, to guide treatment or management, corresponding with the definition by Doyle and Logan (2012).

It has been suggested by the studies in this review, that perhaps risk formulation is beneficial particularly when working with individuals with a personality disorder diagnosis,

and those who have been convicted of more serious (violent/sexual) crimes. However, there is a lack of comparison groups included within the research.

Relationships appeared to be a theme emerging from this review, discussed as an outcome in five of the studies. In the randomised controlled post-test study (Shaw *et al.*, 2017) favourable outcomes, in perceptions of relationship quality and trust, from the perspective of the Offender Managers and those who had committed offences, were identified. However, the authors of this study conducted the risk formulation training with the participants and worked collaboratively with the Offender Managers and those who had committed offences to construct the formulations. Judge *et al.* (2014) reported the positive impact of risk formulation on multi-disciplinary and offender-practitioner relationships; however, the primary researcher conducting the interviews was a representative of the organisation providing the consultancy service to the participants. Similarly, the other studies reporting positive outcomes for relationships were single participant illustrative case examples, the findings were anecdotal and reported from the perspective of the report authors who, in some, if not all the cases, were the professionals working with the case discussed.

### ***Limitations of Current Review***

Utilising a description of risk formulation (Doyle and Logan, 2012) upon which to base the inclusion / exclusion criteria may have framed the review to correspond with a particular theoretical standpoint; this is therefore a potential limitation of the review.

Inclusion of low quality studies is a further limitation of this review; however, the quality of the studies has been taken into consideration when interpreting the study findings.

The review findings were identified by the primary author, however it would also have been useful to establish the inter-rater reliability for the themes across the authors, and whilst discussions took place between the study authors regarding the inclusion/exclusion

criteria, it would have been beneficial for an independent reviewer to rate a sample of the retrieved references against the SST.

### ***Implications for Practice and Future Research***

Further research to understand the efficacy and utility of risk formulation is needed. Specifying a profession-wide guiding framework for risk formulation in forensic practice, would facilitate the identification of methods and techniques through which risk formulation can be researched, validated, and advanced. Further research should be well-designed, and planned with quality criterion in mind, taking into account factors such as role of researcher, case selection, data gathering and analysis. The research should examine what happens in practice, so exploring who is completing risk formulations, when are they being completed, what is included, what biases may occur within the process, how the formulation is generated and how is it being used. The experience of engaging in risk formulations, and the experience of the outcomes of risk formulation, from the perspective of the service users and the practitioners should be explored. Understanding and investigating the range of outcomes of risk formulation, such as but not limited to, the impact on risk management practices and risk of harm to others, to ascertain whether it is a worthwhile activity in the longer term, is vital.

In terms of implications for practice, practitioners should be explicit about how they are defining and implementing risk formulation in practice, and they should also clearly articulate the aims and outcomes of the process. They should be mindful of the limited evidence base as whilst there are research papers citing positive views from forensic practitioners and decision makers about risk formulation (for example, Shingler and Needs, 2018), the evidence base supporting the use of risk formulation in forensic practice has not been firmly established. Practitioners using risk formulation in forensic practice should be transparent about the current knowledge and evidence pertaining to risk formulation, to



ensure that they practice within the parameters of this, and that others are aware of the limits of risk formulation, particularly when used to inform legal decisions.

## **Conclusion**

This review identified that there are few good quality empirical studies focussing specifically on risk formulation practises within forensic settings. Research is needed to establish a solid evidence base regarding the value and outcomes of risk formulation, to enable practitioners, decision makers and service users to make an informed, evidence-based decision regarding the benefits, or otherwise, of engaging in risk formulation.

## **Implications for Practice**

- Good quality research is needed to understand the efficacy and utility of risk formulation.
- It would be beneficial to develop a profession-wide guiding framework for risk formulation in forensic practice, to facilitate the identification of methods and techniques through which risk formulation can be researched, validated, and advanced.
- Practitioners should report on how they are defining and implementing risk formulation in practice, with clearly articulated aims and outcomes.
- Practitioners using risk formulation should be mindful of, and transparent about, the current knowledge and evidence pertaining to risk formulation, and that others are aware of the limits of risk formulation, particularly when used to inform legal decisions.

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