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The effectiveness of probation supervision towards reducing reoffending: a Rapid Evidence Assessment

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Abstract

In response to the lack of universal agreement about what works in probation supervision (Trotter, 2013) we undertook a Rapid Evidence Assessment of the empirical literature. Our analysis of research into the effect of probation supervision reducing reoffending included 13 studies, all of which employed robust research designs, originating in the USA, UK, Canada and Australia, published between 2006 and 2016. We describe the papers included in our review, and the meta-analyses of their findings. Overall we found that the likelihood of reoffending was shown to be lower for offenders who had been exposed to some type of supervision. This finding should be interpreted cautiously however, given the heterogeneity of the studies. We suggest future research and methodological considerations to develop the evidence base concerning the effectiveness of probation supervision.

Keywords

Probation, supervision, recidivism, Rapid Evidence Assessment, meta-analysis

Introduction

Rapid Evidence Assessments (REAs) are a form of academic systematic review, usually undertaken intensively in a shorter period than a full systematic review (e.g. approximately 3 months as opposed to 12 months). REAs are often used to understand the impact of a particular issue or intervention, in order to produce evidence that may inform policy and practice (Government Social Research Unit 2007). Prompted by our understanding of probation supervision and lack of universal agreement about what works (Trotter, 2013) we undertook an REA to address the question 'what is the effect of probation supervision on recidivism?'.

We firstly provide an overview of the current state of evidence on probation supervision including its' definition, features and the state of the art from an empirical perspective. We then describe our review methodology and findings, including a meta-analysis, before offering a short discussion and signposting steps to developing the evidence base concerning the effectiveness of probation supervision towards reducing reoffending.

Background to the review

Supervision in probation has often been understood in terms of its commonality with supervision and professional helping relationships in other sectors. Consequently it has not always been understood only in relation to working with involuntary clients (Gursansky, Harvey and Kennedy, 2003). Definitions of supervision in criminal justice vary according to jurisdiction as well as government policy and wider societal factors (Bottoms, Gelsthorpe and Rex, 2001). The Council of Europe (2017) makes clear that 'supervision' is integral to community sanctions and measures. Community sanctions and measures should be meaningful to suspects and offenders and seek to contribute to their personal and social development. Supervision should serve these aims (ibid.).

In the UK supervision varies across jurisdictions. In Scotland the devolved administration has maintained a stronger focus on the social work dimension of community measures and sanctions with policy initiatives focused on reparation and rehabilitation and, to a lesser extent, reintegration (McNeil 2016). In Northern Ireland community measures and sanctions have been shaped by the political context although in recent years a period of 'normalization' of the criminal justice system has seen the role of supervision changing (Carr 2016). England and Wales has seen radical reform of the criminal justice system. *Transforming Rehabilitation: A Strategy for Reform* (Ministry of Justice 2013) reiterated the Ministry of Justice's intention to introduce a widespread programme of competition for probation services including regional Community Rehabilitation Companies (CRCs) taking responsibility for low and medium-risk offenders in the community and post-sentence. Supervision of high-risk offenders was moved to a new National Probation Service (NPS). Most of the CRCs are managed by private, for-profit, organisations, some working in partnership with not-for-profit organisations. The Offender Rehabilitation Act (2014) extended the use of post-custody supervision to prison sentences under 12 months (often referred to as 'short sentences'). In her most recent Annual Report the Chief Inspector of Her Majesty's Probation Inspectorate described a two-tier and fragmented probation service, with individuals being supervised by the NPS more effectively than by CRCs, ineffective 'through-the-gate' services and a lack of continuity in supervisory relationships within CRC settings (HMIP 2017).

Despite variation across jurisdictions supervision typically incorporates the oversight and monitoring of an individual's activities in the community (Robinson, McNeill and Maruna, 2013). The concept of supervision is complex as it can include functions and goals such as monitoring offenders, enforcing court sentencing, ensuring public protection and reducing reoffending. Supervision is associated with "a measure of sanction before imprisonment, instead of imprisonment, as an interlude during imprisonment (temporary release) and after imprisonment" (Durnescu, Enengl and Grafl, 2013, p.21).

Within the United States, approximately 6.5 million offenders are under supervision (Bureau of Justice Statistics, 2015). Offender management in the UK has a history of over a century. A shift towards a more community orientated approach to working with offenders has resulted in supervision becoming a vital component of the justice system in the UK and in Europe, which has developed rapidly in scale, distribution and intensity (Beyens and McNeill, 2013). There were 265,047 offenders on probation as at 30 September 2017, a high proportion of which will have been under supervision (Ministry of Justice, 2018a). Reoffending rates for those serving community

sentences in England and Wales fluctuate between 28% to 31% over the past decade (Ministry of Justice, 2018b). The probation service's total annual offender caseload increased by 32 per cent between 2001 and 2006, placing a considerable amount of pressure on the probation service (National Audit Office, 2008).

Different approaches to supervision

Supervision in the UK and further afield incorporates models that seek to establish roles and responsibilities, encouraging compliance and the use of authority to deter future criminality. However, there is not a single unified model of supervision.

Supervision practice typically requires the risk assessment of offenders to identify factors that may influence their likelihood of partaking in criminality (Healey, 1999). While assessment processes and tools vary over time and by jurisdiction, their primary aim is to understand an offender's needs, concerns and attitudes that may negatively influence their behaviour. Following assessment, practitioners are able to apply techniques and/or interventions during supervision to address needs, discourage criminal behaviour and promote positive change (Andrews and Bonta, 2006). The nature of interventions and techniques used in supervision and the degree of professional discretion available to practitioners has been influenced by 'What Works' narratives, a body of empirical research that determines what is effective when aiming to reduce recidivism (McGuire, 1995, Lipsey and Cullen 2007). Additionally, practitioners may refer offenders to services in the community, with the aim of mitigating risk and to provide practical support. Supervision sessions often take place in a private setting to allow the facilitation of sensitive issues relating to an offender's life (Durrance, Hosking and Thorburn, 2010). In the initial stages, sessions often support the development of interpersonal relationships which helps to provide a bedrock for desistance. Regular interaction between offender and offender manager is regarded as fundamental in the early stages of an order, as evidence suggests reoffending is significantly higher during this period (Shapland et al., 2012).

Modern practice has received significant influence from the principles outlined in risk-need-responsivity (RNR) model (Andrews and Bonta 2006, Taxman and Marlowe, 2006). RNR aligns the level of service to the *risk* posed by an individual by targeting criminogenic *needs* and identifying appropriate treatment as a *response*. Supervision has also been influenced by the Good Lives Model (GLM) approach to offender rehabilitation, which interprets an individual's life holistically, rather than directing attention to risk factors (Ward and Maruna 2007). GLM understands offenders as those who are lacking in areas that define a good life and that criminality reflects failed attempts to pursue primary needs. Both proponents of the RNR and the GLM models argue that there are similarities or overlaps between the two models (e.g. Ward and Maruna 2007 and Andrews et al. 2011a). However, the extent and nature of the overlap is contested (e.g. Ward et al. 2012).

Deering (2010) notes that supervision practice has changed considerably both in the UK and abroad. In the UK, the probation service has focused increasingly on punishment, risk management and public protection (Hudson, 2003). Practitioners have adopted approaches that accentuate monitoring and enforcement, as opposed to more humanistic and social care orientated methods (Turner, 2010). Despite findings suggesting that practitioners prefer to work using the latter methods (Mawby and Worrel, 2014), increasing workloads and time constraints have prioritised risk as opposed to rehabilitation (Ward and Maruna 2007). For example, in the UK, the Offender

Management Model (OMM) sets out expectations of those responsible for managing offenders, including a specification of the standards and performance measures that form the basis for development (NOMS, 2005). Ward (2008) suggests that developments have been less influenced by empirical literature that discusses desistance (e.g. Maruna, 2001; McNeill, 2006; Sampson and Laub, 1995) and instead the rehabilitation of offenders has been viewed persistently through the lenses of retribution and control, due to external political pressures and the dichotomous relationship between policy and practice. Furthermore, Ward (2008) argues that overemphasis on 'What Works' principles, to which the OMM are central, may have directed attention away from literature that seeks to understand the mechanisms within which supervision is expected to deliver outcomes. Although the 'What Works' paradigm is widely regarded legitimate and substantial, it is suggested that the OMM may require a "variation of its existing theme, a paradigm modification rather than a paradigm change" (Ward 2008, p.403). Some commentators argue that underpinning the shift in practice towards 'what works' is a new managerialism, which has led to a growth in 'surveillance work', an approach that "places an emphasis on monitoring and enforcing compliance with the rules or supervision and the detection of violations leading to revocation and return to custody" (Seiter and West 2003, p.5). Reforms in this vein have often been met with opposition within the field and have been described as the managerialisation of practice (Beyens and McNeill, 2013; Poporino, 2010).

The empirical evidence underpinning supervision

In recent years several studies have examined the empirical evidence-based underpinning supervision. Dowden and Andrews (2004) focused on the 'responsivity' element of the RNR model and undertook a meta-analysis of the importance of staff practice in delivering effective correctional treatment. Reviewing studies up until 1998 they found that the following elements of core correctional practice were associated with statistically significant reductions in rates of re-offending: relationship factors; skill factors; effective reinforcement; effective disapproval; problem solving; structured learning; and effective modelling. Trotter (2013) questions whether all studies in the meta-analysis actually focused on routine community-based supervision. Trotter's (2013) systematic review asks 'What is the impact on offender recidivism of different worker skills and practices used by supervisors in the one-to-one supervision of offenders on probation or other community based orders?'. He identified 8 studies, all of which found that when probation officers use evidence-based practice skills their clients have lower recidivism rates. In addition, all but one of the studies showed a significant difference between the recidivism rates of those supervised by more and less skilled officers. Relevant skills included pro-social modelling and reinforcement, problem solving and cognitive techniques.

Trotter was uncertain about the impact of worker-client relationships, drawing a tentative conclusion that trusting and non-blaming relationships with good communication seemed more effective than those characterised by reflective listening practices. Shapland et al. (2012) conducted an extensive search of current literature to identify key contributions to the development of knowledge in this area. Shapland et al. (2012) explain how the purpose of probation is often malleable and reliant on a number of complex socio-economical, cultural and political influences, meaning that the application of a static frameworks is problematic. This complex process is thought to be enhanced by the adaptation of techniques that encourage engagement, the formation of relationships and promotion of offender agency (Maruna, 2001). Many argue that the quality of the

relationship between offender and practitioner is regarded as pivotal in reducing recidivism (e.g. McNeill, 2006) with a need for relationships based on mutual understanding, especially when interpreting an offender's life circumstances (Maruna, 2007). Such relationships help to establish roles and responsibilities, and to develop trust. Practitioner characteristics including warmth, empathy, likability and respect are fundamental in the formation of relationships, as are those common to social work practice which encourage a more in-depth connection (Trotter, 1990). Relationships built on these foundations consist of stronger bonds, which enrich the delivery of practice and promote greater levels of compliance (Raynor et al., 2012; Ugwu-dike, 2010). Other studies that explore quality of supervision have shown that practitioners are less inclined to employ cognitive behavioural approaches such as prosocial modelling (considered a key contributor to behaviour change), despite it being a valuable component of social learning theories (Bonta et al., 2008).

The largest quantitative study in the UK in recent years was the Offender Management Community Cohort Study (OMCCS), a UK based longitudinal study measuring the reoffending rate among offenders aged 18 or over (n=2,919). Wood et al. (2015) inferred that frequent meetings between offenders and offender managers were less significant in reducing offending compared with other aspects of case management such as effective absence monitoring. As well as closely monitoring missed appointments, particularly in the early stages of an order when the propensity to offend is increased, the authors suggest that "fewer, longer meetings between offenders and Offender Managers, monitored for quality" could improve practice outcomes (Wood et al., 2015, p.42).

So called 'intensive community supervision' programmes were developed as alternatives to custody and typically focus on offender monitoring and surveillance. In a meta-analysis, Aos et al. (2006) identified 24 experimental and quasi-experimental evaluations and concluded that this approach to offender management has not produced statistically significant reductions in recidivism rates, except where the focus was on treatment provision, suggesting that the treatment, not the surveillance, was the effective element.

What areas need further exploration?

Despite the prevalence of offender supervision there is a relatively underdeveloped evidence base for the efficacy of the practice, particularly with regard to the aspects of practice that are effective in reducing recidivism (Turner, 2010). The most recent systematic review (Trotter 2013) focused specifically on worker skills and practices and does not include a meta-analysis. There is therefore a need to better understand the effectiveness of supervision at a programmatic and practice level. This includes the exploration of structures within which effective practice occurs (Trotter, 1996). While narrative reviews are able to incorporate smaller scale and qualitative studies, there is also a need for reviews that prioritise causality and that quantify the effect of supervision.

The review

Approach and research question

This section outlines our REA methodology, which was guided by our research question: '*what is the effect of probation supervision on recidivism?*' We were interested to understand the empirical evidence associated with probation supervision and reoffending outcomes, and to explore different

aspects of supervision including the role of probation staff and specific supervision skills. We therefore used a deliberately broad research question to guide our review.

The criteria for studies was as follows:

Participants. Only studies involving participants who are offenders or in the care of the Criminal Justice System were included. Since offenders in England and Wales under the age of 18 are in the care of youth offending services rather than the probation service, studies reporting data about these individuals were excluded.

Interventions. Only studies that tested the effect of probation supervision on levels of reoffending were eligible for review. We excluded studies focusing on intensive supervision (e.g. Integrated Offender Management; UK Government, 2018), and group and specialist interventions. Only studies with at least one control or comparison condition were included (see *study design* below). The comparison condition could be treatment as usual (i.e. no intervention), a different level of the usual treatment (e.g. supervision meetings once per month instead of weekly), or a combination of these.

Outcome measures. The primary outcome measure was a measure of reoffending such as arrests, convictions, or breaches of condition.

Settings and timeframe. Studies published in English after 2006 in the UK and other OECD countries were eligible for inclusion in the review.

Study design. The selection of studies was limited to empirical impact evaluations that adopted experimental and quasi-experimental designs. We included studies using unmatched comparison groups as we had anticipated a shortage of evaluations with experimental and quasi-experimental designs. The included studies therefore correspond to levels 3 to 5 on the Maryland Scientific Methods Scale (Sherman et al., 1997) adapted for reconviction studies (Friendship et al., 2005, p.7). Robust research designs such as these are able to support strong inferences about causality; that the treatment or intervention was partly or wholly responsible for the observed effect.

Table 1. Maryland Scientific Methods Scale adapted for reconviction studies

Standard	Comparison	Description	Methods
Level 1	No comparison	Reconviction rate reported for intervention group only	Before and after study of intervention group
Level 2	Comparison with predicted rate	Actual and expected reconviction rates of intervention group compared	Expected reconviction rates generated by Offender Group Reconviction Scale (OGRS)
Level 3	Unmatched comparison group	Reconviction rate of intervention group compared with reconviction rate of an unmatched comparison group	Between groups comparison
Level 4	Well-matched comparison group	Reconviction rate of intervention group compared with reconviction rate of a comparison group matched	Propensity score matching; regression discontinuity

		on static (and dynamic) risk factors e.g. criminal history, gender	
Level 5	Randomised control trial (RCT)	Reconviction rates are compared between intervention and control groups that have been created through random assignment	Randomisation

Search strategy

We adopted a four step search strategy.

1. The following electronic databases were searched: ASSIA (Applied Social Sciences Index and Abstracts); Criminal Justice Database; ERIC (Education Resources Information Center); PsycINFO; PsycARTICLES; Scopus; Sociological Abstracts; Web of Science.
2. Several governmental agencies and organisations associated with criminal justice research were searched for reports and other grey literature: UK Ministry of Justice; College of Policing; The Scottish Government; Correctional Services Canada; Australian Institute of Criminology; US National Institute of Corrections; Vera Institute for Justice; Washington State Institute for Public Policy.
3. The Probation Journal was hand searched for relevant articles between 2007 and 2016.
4. We identified no systematic reviews or meta-analyses of the effects of probation supervision on recidivism, but Trotter (2013) provides a systematic literature review. Studies referenced in this review were included in our initial identification of records.

The following search string was used, reflecting search terms adopted in previous reviews of probation supervision (Gill et al., 2010):

((offender* OR probationer* OR licensee* OR "service user*" OR client*) AND (probation* OR supervision* OR parole) AND (re-offen* OR reoffen* OR recidiv* OR re-arrest* OR rearrest* OR re-onvict* OR reconvict* OR re-incarceration OR incarceration OR "return to custody") AND (evaluation OR experiment OR trial OR impact OR effect*))

Screening and risk of bias assessment

All studies retrieved through the search process were imported into Covidence (www.covidence.org), a specialist online tool for screening records for inclusion in reviews. This enabled the identification and removal of duplicates at the point of importation. Two reviewers independently screened the titles and abstracts of retrieved studies to identify those that met the exclusion criteria. The full texts of studies that had not been excluded were then further screened.

Eligible randomised studies were assessed for risk of bias using the Cochrane Risk of Bias tool (Savović et al., 2014). Non-randomised studies were assessed using the ROBINS-I tool (Sterne et al., 2016). These tools apply stringent criteria to information provided in articles which are eligible for inclusion in an REA or systematic review, and elicit a judgement with regard to 'a systematic error, or deviation from the truth, in results or inferences' (Higgins and Altman, 2008, p.188). Risk of bias assessment does not directly assess the quality of research, but confidence in the reported results. Each study was

assessed by two reviewers and rating differences discussed until a consensus judgement was reached. Studies assessed as being of high risk of bias were subsequently excluded from the REA. Those whose risk of bias was unclear but not deemed to be in areas of concern for the REA were included.

Data extraction and synthesis

Data were extracted from each of the eligible full texts, including:

- Study details (first author; year of publication)
- Intervention
- Research design (study design; sample size for treatment and control groups)
- Measures
- Results (rates of recidivism; effect type; effect size, including 95% confidence intervals)

Meta-analyses were conducted on the results from all studies included in our review. We identified two primary types of dependent variable (binary and continuous measures of recidivism) used in the studies, and implemented two meta analyses, one for each type of dependent variable, using the metan package in Stata¹.

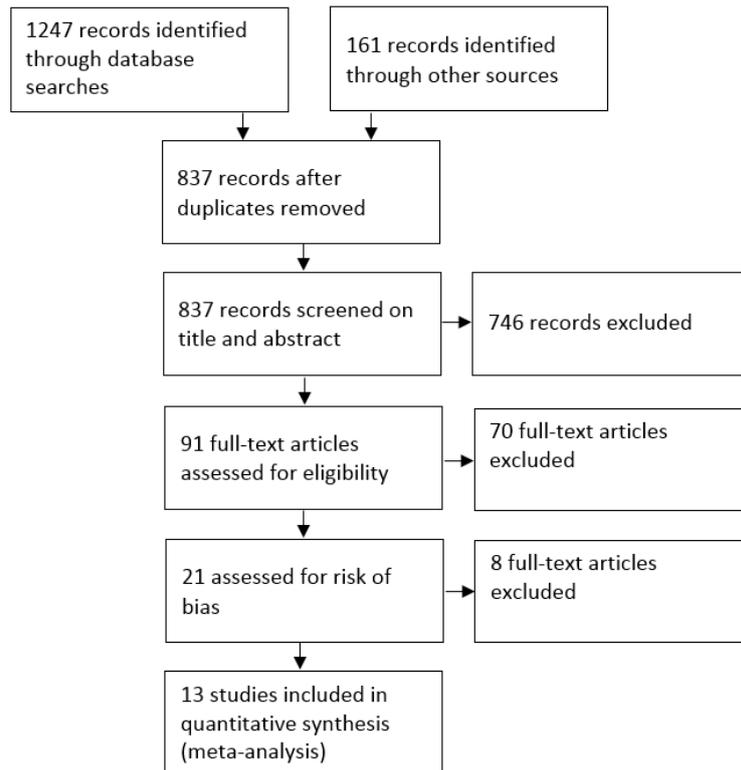
Findings

Searching and screening

Our search strategy identified 837 studies from the initial search, and after screening on exclusion criteria, we found 21 studies. The included studies addressed probation supervision both as a community sentence and as part of a license (parole).

Figure 1. PRISMA flow diagram (Moher et al. 2009) of search and included studies

¹ Full details of the meta-analysis methodology can be found at: <https://reducing-reoffending.uk/assets/uploads/files/metaanalysis-method.pdf>



Based on the information available we judged six studies to represent a high risk of bias, and therefore excluded them from further analysis. We found one study that used the same data as another study (but with a different first author), and this was also excluded, along with one study whose statistics were not useable due to an error in the data.

Narrative synthesis

Before describing the results of our meta-analyses, we outline here the included articles and some of their findings.

Only a minority (2/13) of the articles described studies based in the UK, whilst the majority (9/13) described studies which were conducted in the USA. Other studies were undertaken in Canada (1) and Australia (1). Our search strategy was designed to identify and include studies representing levels 3 to 5 on the Maryland Scientific Methods Scale (studies with an unmatched or matched comparison group, and randomised designs). The included articles did not feature any studies at level 3 (with an unmatched comparison group) on the scale. 5 studies were quasi-experimental designs employing various analytical methods (e.g. Difference in Differences; Propensity Score Matching), thus representing level 4 on the scale. Seven of the articles described randomized controlled trials.

Considering both the geographical source of the articles and the research designs, we suggest that the fact that the majority of the studies included were conducted in the USA may be an artefact of our search strategy. There is evidence (Roberts et al. 2012) that randomised controlled trials have a greater prevalence in the USA than in the UK. However, we had deliberately widened our search criteria to identify level 3 (unmatched comparison group) studies, which potentially may have identified more UK based studies. The origin of the studies included in our review does not

necessarily lead us to conclude that there is relatively little evidence for the effect of probation supervision within the UK, but that the impact may be predominantly researched using designs not captured by this REA.

Consistent with the differences in research design, we also found considerable variability in the sample sizes employed in the studies. The majority of studies included sample sizes of less than 1000 (these were typically randomised controlled trials), with two studies using quasi-experimental designs sampling between 5000 and 10000 offenders. This is understandable, as randomised designs are typically costly and complex, with both factors likely to mean that smaller sample sizes are more practical. In addition, calculations of statistical power used in experimental design may lead to the utilisation of relatively smaller samples as an adequate means of establishing an effect size.

Across the studies, offenders were between 77 percent and 97 percent male, with an average age of 26-39 years. The majority of studies reported metrics describing offender risk of recidivism, and across most of the studies this ranged from low to high. Two studies (Robinson et al, 2012; Taxman, 2008) included medium and high risk offenders only. Bouffard and Bergeron's (2006) study included serious and violent offenders, as they were uniquely eligible for the Serious and Violent Offender Reentry Initiative under examination in his paper. Some studies reported findings which were associated with specific levels of risk. For example, Lowenkamp et al. (2014) found that Staff Training Aimed at Reducing Rearrest (STARR) was associated with a reduction in recidivism for moderate risk offenders, but that there was no effect for high risk offenders unless STARR related skills were employed alongside Motivational Interviewing techniques. Pearson et al. (2016) found a non-significant effect of the Citizenship programme across all the offenders sampled, but a statistically significant reduction in reoffending amongst high risk offenders. These differential findings associated with risk level in some studies therefore suggest a more nuanced understanding of effect sizes (the effectiveness of the intervention for different groups) than overall effect sizes suggest.

We found that how supervision was deployed varied considerably across the studies, and three studies specifically investigated skills training for probation officers, and consequent effects upon offender recidivism. In the former category were studies which investigated the effect of enhanced reentry programmes on recidivism following a custodial sentence, specific programmes for offenders supervised in the community as part of a community sentence, and studies which looked at variations in the intensity of supervision, and to officer caseloads.

Four of the studies (Bouffard and Bergeron, 2006; Duwe, 2012; Duwe 2014; Ostermann and Hyatt, 2016) considered the effects of enhanced reentry programmes on recidivism. These were compared with regular parole arrangements, and included features such as helping released offenders to develop social support networks and to find employment, and additional counselling. Findings included reduced arrest rates for those in the intervention group (Bouffard and Bergeron, 2006; Ostermann and Hyatt, 2016), although in the first example these were not observed to persist beyond 6 months. For example, Duwe (2012) concluded that Minnesota Comprehensive Offender Reentry Plan was effective in reducing recidivism due to the additional support which offenders had access to, such as employment and social support upon leaving prison. One article (Wan, Poynton and Weatherburn, 2016) compared the use of post-release supervision with unconditional release, using propensity score matching to analyse a large sample (n=7494) of offenders in Australia. This

study found a significant difference between supervised and unsupervised groups in the number of days to the first new proven offence, and a significantly higher proportion of the unsupervised group (51.3%) recidivating compared with the supervised group (46.1%).

Other studies investigated similar probation programmes but not specifically in the context of reentry. For example, A US-based programme (Proactive Community Supervision; Taxman, 2008) found a statistically significant effect; that offenders who undertook the programme were less likely to be rearrested (32%) than those who did not (42%). In a UK context, Pearson et al. (2011) and Pearson et al. (2016) investigated 'Citizenship', a structured probation programme based on 'What Works' principles. Findings from both studies suggest that the programme was associated with reductions in recidivism for the participating offenders, although in the 2016 study the overall effect for all risk levels was not significant (this finding possibly being a consequence of the more rigorous randomised research design used).

Three studies randomised treatment to probation officers, with those in the intervention group receiving training in a specific approach to supervision (with associated skills). For example, Bourgon and Gutierrez (2012) described Canadian probation officers as receiving a three-day STICS (Strategic Training Initiative in Community Supervision) training, which included a cognitive-behavioural model of change. Robinson et al. (2012) and Lowenkamp et al. (2014) describe the US-based Staff Training Aimed at Reducing Re-arrest (STARR) model training, which also includes a cognitive model component, in addition to other motivational and supervisory interpersonal skills. All three studies report reductions in reoffending for offenders supervised by officers who had been trained and transferred the associated skills to the supervisory relationship. There were however, variations in how this effect was observed. Bourgon and Gutierrez (2012) found observation to be related specifically to discussion in supervision of pro-criminal attitudes, and Lowenkamp et al. (2014) found different effects according to the risk level of the offender. Overall, these findings suggest a complex interaction of supervisor skills and offender characteristics in terms of determining offender outcomes.

A further two studies investigated variables associated with intensity of supervision and officer workload. Barnes et al. (2012) compared low intensity supervision (in which offenders have a face-to-face meeting with their supervisor once every six months, and a telephone supervision meeting mid-way between each in-person meeting) with regular supervision. This study did not find a statistically significant difference between recidivism rates for offenders receiving the different types of supervision, leading the authors to conclude that low intensity supervision may be an appropriate means of supervision for some offenders (e.g. low risk of harm). Jalbert and Rhodes (2012) investigated reducing officer caseloads to an average of 54 cases per officer, compared with a regular caseload of 106. This study estimated that reduced caseloads were associated with a 30% reduction in recidivism. It should be noted however that this study did not employ a randomised design, and that therefore there is less certainty about the observed effect and whether it is wholly attributable to reduced caseloads. The authors also concluded that the study provides 'no insight into how reduced caseloads would affect recidivism in an agency that did not employ EBP' (Jalbert and Rhodes, 2012, p.233).

As the studies varied in terms of geographical origin, study design, and intervention, we also found differences with regard to how recidivism was measured. Across the studies, the following measures were apparent, with a number of studies employing multiple measures in order to compare the effects according to different criteria.

Table 2. Measures of recidivism found in the included studies

Measure	Studies
Rearrest, excluding technical violations	7
New arrest, technical violation or parole revocation	4
Reconviction, excluding technical violations	3
Reconviction or including technical violation	5
Reincarceration for a new offence	1
Technical violations only	3
Any recidivism	2

The individual studies offered clear rationales as to the choice of recidivism measures, but this variation added to the complexity of undertaking a quantitative synthesis of the studies. Similarly, there was variation in terms of the length of time to recidivism, which ranged from 12-36 months across the studies. A number of studies measured recidivism at different time points, and found that effects varied accordingly.

In summary, the included studies varied along a number of dimensions, particularly with regard to the specific aspect of probation supervision under investigation.

Meta-analysis

Figures 2 and 3 below show meta-analysis results for the included studies.

Figure 2 shows binary recidivism measures expressed as odds ratios, which compare the odds of two events happening (i.e. whether an individual reoffended or not during or following the supervision intervention). An odds ratio below 1 indicates a positive impact of the supervision intervention, while an odds ratio above 1 indicates a negative impact. The combined odds ratio of binary measures used in the included studies is 0.6, indicating that the odds of reoffending in the treatment group are 0.6 times the odds of reoffending in the control group).

Figure 3 shows continuous recidivism measures expressed as hazard ratios. Hazard ratios are related to relative risk and are not cumulative over the course of the study (in contrast to odds ratios which test reoffending in the two groups at the end of the treatment and include only those subjects that completed the study). Hazard ratios relate the experimental and control groups in terms of their reoffending rates at any point during the study: the statistical model used to generate hazard ratios (Cox regression) measures survival rates over time. The combined hazard ratio of measures used in the included studies is 0.7, indicating that reoffending in the treatment group will occurred 0.7 times as frequently as in the control group at the 24 month mark.

Figure 2. Forest plot (meta-analysis of binary recidivism measures)

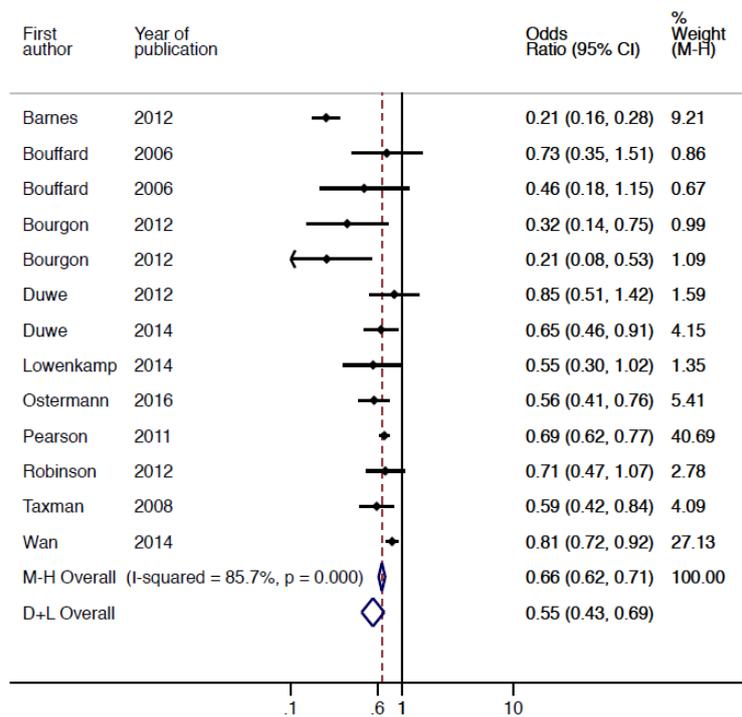
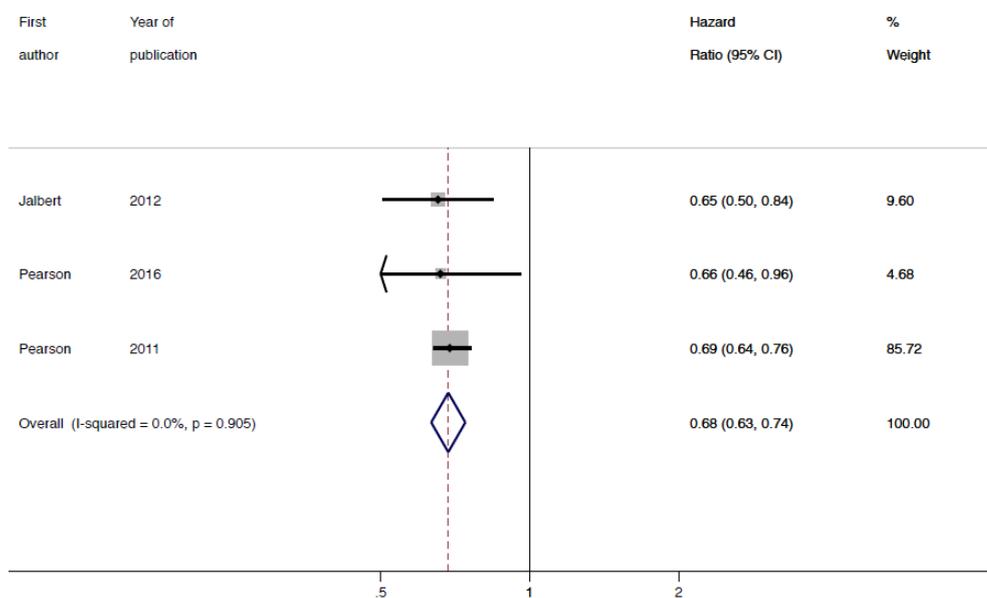


Figure 3. Forest plot (meta-analysis of continuous recidivism measures, reoffending at 2 years)



Whilst the forest plots allow for some comparison between studies, we caution against drawing firm conclusions from these comparisons, given our finding concerning the heterogeneity of studies, and in particular the different aspects of supervision explored. Similarly, we also exercise caution in interpreting the combined odds ratio and hazard ratio results displayed on each forest plot, for the same reason. However, both meta-analyses indicate that probation supervision, overall, has a positive effect on levels of reoffending, and that the likelihood of reoffending (expressed as odds

ratios or hazard ratios) is shown to be lower for those offenders who have been exposed to some type of supervision. For the purposes of this analyses, these two ratio measures are comparable and are consistent in size.

Discussion and conclusion

This review was broader than that of Trotter (2013) which focused specifically on worker skills and practices. Consequently, a number of the included studies were evaluations at the program level, rather than of specific probation staff skills, and thus they did not explicitly discuss the quality of the supervisory relationship. Conversely our review was also narrower than Trotter's (2013) in terms of the research designs included, and our findings support his summary that there 'no universal agreement about what works in offender programs or offender supervision' (Trotter, 2013, p.43). Our broad research question created the possibility that we would find considerable variation in terms of the included studies, particularly the design of probation supervision or specific features under evaluation. However, our finding of 13 robustly designed studies represents a paucity of research given the long history and prevalence of probation supervision worldwide. We noted that a small minority of the included papers focused on probation supervision in the UK.

The overall positive effect of probation supervision identified in our review occludes a number of factors (both the type and frequency of supervision, supervisor skills and workload, and offender characteristics) which are likely to have an impact on rates of recidivism. Individual studies provided some empirical support for the effectiveness cognitive and behavioural skills in supervision, and also that the effectiveness of supervision strategies may vary by the offender's risk level, a point also discussed by Trotter (2013), and alluding to RNR principles more generally. There were also indications of support for the Good Lives Model (Ward and Maruna 2007), with the satisfaction of offenders' primary needs being facilitated by supervision (e.g. helping the offender to find employment and to develop social support; Duwe, 2012). Intermediate outcomes such as these were not evaluated by our review, but including them in future research would make a clear contribution to the empirical evidence about the mechanisms through which probation supervision reduces recidivism. There was some evidence to indicate that the frequency of supervisory meetings may be a variable of interest, thus concurring with (Wood et al., 2015, p. 42). This finding could have considerable implications for resource allocation and management in probation agencies operating in difficult economic circumstances, but further research is needed to validate it and to generalise conclusions from this one study.

Despite the range of interventions described in the included studies, none of the interventions made significant use of technology to aid delivery of supervision. One study (Barnes et al., 2012) considers how some use of telephone contact between supervisors and offenders represent an element of low intensity supervision, and this did not significantly affect rates of recidivism. However the Transforming Rehabilitation agenda in the UK has sought to increase innovation to the sector (Fox and Marsh 2016), and the use of technology is growing, so this would be a worthwhile avenue for future research.

When undertaking quantitative impact evaluations such as those included in this review, there is the opportunity to consider economic effects of the intervention. Given the challenging economic conditions in which probation agencies operate, with resources to support community supervision

'either static or dwindling' (Barnes et al., 2012), it would be useful to understand the potential costs and benefits of specific approaches to probation supervision. This is particularly the case where new approaches have been trialled, in order to make the case for further investment of public funds. Pearson (2011) estimated that the gross savings from the Citizenship programme were over £200,000, but this is the only one of the reviewed studies which included a detailed economic analysis. This is perhaps indicative of the literature more widely; Duwe (2014) notes that the prisoner reentry literature specifically is in need of more economic evaluations.

Limitations of this review

Our review is subject to a number of limitations. Firstly, this was an REA rather than a more in-depth systematic review and our search is likely not to have been as exhaustive as a more extensive review. We also based our review around a broad research question, which resulted in a high degree of heterogeneity amongst the included studies, and did not specifically identify literature evaluating the use of specific skills in the supervision relationship. This means that the results of our meta-analysis in particular cannot be understood as a summative indication of the effect of one universal mode of probation supervision. Furthermore we have prioritised research designs which tend towards randomised designs to infer causality. Whilst there are considerable strengths to this approach, simple randomised designs often lack causal explanation whilst highlighting causal description (Shadish, Cook and Campbell, 2002).

We therefore suggest that considerable future research is required to accumulate empirical evidence with regard to the impact of probation supervision on reoffending, particularly within a UK context. This would involve clearly defining aspects of supervision which are being evaluated, and replicating studies to build the evidence base, investigating the degree to which findings generalise. Causal explanation (specifying and testing mediating and moderating variables, and outcomes other than recidivism) should feature in future research, in order to understand the ways in which supervision is effective. Whilst we suggest that robust quantitative research designs (e.g. Maryland Scale levels 4 and 5) are instrumental in this endeavour, and could leverage the availability of significant amounts of reoffending data, we advocate a mixed-methods approach to enhance causal explanation with regard to RCTs in particular (Hesse-Biber, 2012). In addition, subgroup analysis would seek to understand differential effects by offender characteristics (e.g. age gender, risk). A final methodological consideration which would aid replication is the adoption where possible of a common measure of recidivism. Such a measure already exists, in terms of definitions for the measurement of proven reoffending (Ministry of Justice, 2016).

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