

Family and parenting interventions for conduct disorder and delinquency: a meta-analysis of randomised controlled trials

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Aims: To determine whether family and parenting interventions benefit children and adolescents with conduct disorder and delinquency.

Methods: Meta-analysis of eight randomised controlled trials involving 749 children and adolescents (aged 10-17 years) with conduct disorder and/or delinquency. Criminality, academic performance, future employment, problem behaviour, family functioning, parental mental health, and peer relations were evaluated.

Results: Family and parenting interventions significantly reduced the time spent by juvenile delinquents in institutions (weighted mean difference 51.34 days). There was also a significant reduction in the risk of a juvenile delinquent being rearrested (relative risk 0.66) and in their rate of subsequent arrests at 1-3 years (standardised mean difference -0.56).

Conclusions: The evidence suggests that family and parenting interventions for juvenile delinquents and their families have beneficial effects on reducing time spent in institutions and their criminal activity. In addition to the obvious benefit to the participant and their family, this may result in a cost saving for society.

Conduct disorder is a psychiatric disorder characterised by a repetitive and persistent pattern of antisocial behaviour in children and adolescents with an estimated prevalence of between 1.5% and 3.4% in this age group.¹ Delinquency is a sociolegal category that refers to children and adolescents who break the law. A history of conduct problems in childhood is a predictor of future juvenile delinquency.² Each year 2% of children and adolescents come in contact with the juvenile justice system. Of these a minority persist in offending (recurrent juvenile delinquents) and account for a disproportionately large percentage of court appearances.³

Conduct disorder and delinquency have multiple risk factors that can be classified as genetic, biological, and/or environmental. Environmental causes include parental discipline, family dysfunction, and parental mental illness. These familial factors are affected by social ecological factors such as poverty, school failure, unemployment, and poor peer relationships.^{1,2}

Family and parenting interventions have been recommended for children and adolescents with conduct disorder and delinquency.^{2,4,5} These range from parent training to multisystemic therapy (MST)⁴ and multidimensional intervention foster care (MTFC).⁵ MST is a family based, individualised therapy that targets the multiple risk factors of conduct problems in children and adolescents.^{4,6} This may occur in the context of out of home placement, for example, MTFC.⁵

Children and adolescents with conduct disorder and delinquency have significant adverse outcomes, which include criminality, school failure, and unemployment.^{1,6} In adulthood, costs for individuals with conduct disorder have been found to be 10 times higher than for those with no problems.⁷ Current literature has an increasing focus on the role of interventions in early childhood to prevent conduct disorder and delinquency. Recently a systematic review was conducted to examine the effectiveness of "group based" parent training programmes in improving behaviour problems in 3-10 year old children; this review was therefore limited to individuals

over the age of 10.⁸ However, there will always be children, who, for various reasons do not access these interventions or who have conduct problems despite them.² It is important that the effectiveness of family and parenting interventions in minimising these adverse outcomes is investigated.

METHODS

Search strategies

Randomised controlled trials of family and parenting interventions used in conduct disorder and delinquency in children and adolescents aged 10-17 were identified by searching the Cochrane Controlled Trial Register (Cochrane Library, Issue 2, 1999), Medline (1966 to July 1999), EMBASE (1988 to July 1999), CINAHL (1982 to March 1999), Psych Info (1984 to Jan 1999), Sociofile (1974 to June 1999), ERIC (1966 to June 1999), and Healthstar (1975 to July 1999). The databases were searched using strategies for the identification of randomised controlled trials developed for the Cochrane Collaboration. Search terms were modified to meet the requirements of individual databases with regard to differences in fields. All terms necessary to the intervention (for example, family therapy, multisystemic therapy, parent training), and the participant groups (for example, child, adolescence, conduct disorder, aggressive behaviour, juvenile delinquency, child behaviour disorder, social behaviour disorder) were used. Other sources of information were the bibliographies of systematic and non-systematic reviews and reference list of articles identified through the search strategy. In order to identify unpublished trials, experts in the field were contacted by letter. There were no language restrictions.

Abbreviations: MST, multisystemic therapy; MTFC, multidimensional intervention foster care; RR, relative risk; SMD, standardised mean difference; WMD, weighted mean difference

Inclusion criteria

The titles and abstracts from the search were screened by one reviewer (SW). Articles that clearly did not fulfil inclusion criteria as judged by titles and abstracts were rejected. Included articles were retrieved and reviewed independently for trial eligibility by two reviewers (SW, KW).

Trials were included if they were randomised controlled trials of family and/or parenting interventions for children and adolescents aged 10–17 with conduct disorder and/or delinquency. Conduct disorder was defined by a standardised psychological assessment (for example, using a child behaviour checklist), or a psychiatric diagnosis. Delinquency was defined by a referral from a juvenile justice or another legal system for a child/adolescent who has committed a serious crime (for example, assault) and/or offended on at least two occasions. Trials with participants who had committed only sex or drug offences were excluded as it was felt by the reviewers that these offenders may be less likely to have underlying conduct disorder.¹ Only trials that used at least one objective outcome measure (for example, arrest rates) or used an outcome measure that had been published in peer review publications and validated for the relevant purpose, were included. Trials were required to have a control group. Where more than one publication of one trial existed, only the publication with the most complete data was included.

Quality assessment

Trials under consideration were evaluated for methodological quality and appropriateness as per the Cochrane Handbook⁹ by two reviewers (SW, KW). Any differences were negotiated with a third reviewer (JP). Assessments were based on allocation concealment, blinding of outcome assessment, reporting of clinically important outcomes, and completeness of follow up.

Data extraction

Data extraction was carried out independently by two reviewers (SW, KW). The information extracted included trial location, methods, participant details, type of intervention, duration of intervention, and outcome. Based on known risk factors and adverse outcomes for children and adolescents with conduct disorder and delinquency, the following outcomes were considered: criminality, academic performance, problem behaviour, peer relations, future employment, family functioning, parental mental health, and sibling delinquency.^{1 2 6}

Statistical methods

Data synthesis was performed using RevMan 4.1, the latest Cochrane analysis software. For continuous outcome data, such as family functioning, the mean score difference between the two groups at follow up was calculated for each outcome. A standardised mean difference (SMD) was used when outcome measures differed between trials, and a weighted mean difference (WMD) was used when trials used the same measure. For dichotomous outcome data, such as number of rearrests, a risk ratio and its 95% confidence interval (95%CI) was calculated to compare the groups at follow up.

Heterogeneity was assessed using the χ^2 test of heterogeneity along with visual inspection of the data. A random effects model was used in meta-analysis and a significance level less than 0.1 was interpreted as evidence of important heterogeneity.⁹

Sensitivity analysis was performed to explore the effects of the inclusion and exclusion of studies of lower quality. Trials where concealment allocation was “unclear”, “inadequate”, or “not used” were excluded in this sensitivity analysis.

RESULTS

Study characteristics

Of the 970 titles identified through the search strategy, 13 were randomised controlled trials. On critical appraisal, three

trials had data that were not reported in a useable form or useable data could not be obtained from the trial authors,^{10–12} one had an unclear case definition and data also not in useable form,¹³ and one had no randomised control group.¹⁴ Thus, eight trials involving a total of 749 children and adolescents were evaluated.

Table 1 shows the characteristics of the eight trials.^{4 5 15–20} In seven of the trials, the participants and their families were referred to the intervention programmes by juvenile justice systems from six different states in the USA.^{4 5 15–19} These participants were all juvenile delinquents who were chronic and/or serious offenders. The other trial was conducted in Australia.²⁰ This was the only trial where the participants had been assessed as having conduct disorder but had not had contact with the juvenile justice system.

The studies used a number of different family and parenting interventions: short term family intervention,¹⁵ parent training,^{16 20} MST,^{4 17 19} MTFC,⁵ and an adolescent diversion project with a family condition and a multifocus condition.¹⁸ In addition, different types of control groups were used, including “usual intervention controls”, “wait list controls”, and “no intervention controls”.

Study quality

All trials were randomised controlled trials (see table 2). While all eight stated that random allocation was used to determine the intervention and control group, only four trials had adequate concealment allocation.^{4 5 17 19} In seven studies, blinding of the assessors to the intervention was deemed adequate as follow up outcome data were archival, for example, juvenile justice records for rearrest data.^{4 5 15–19} In five of these seven trials, there were also psychosocial data (for example, behaviour checklist data), collected in an unblinded fashion, introducing a source of bias.^{4 5 17–19} Intention to treat analysis was used in three studies.^{5 15 18} However, in a further three studies its use was unclear,^{17 19 20} and in two studies subjects were excluded from the analysis if they refused the intervention or withdrew from the study.^{4 16} For the included trials, attrition rates were known for seven studies for archival data and ranged from 0% to 14%.^{4 5 15–17 19 20}

Long term outcomes

Mean length of time in institutions and risk of incarceration

Four studies had comparable data on time in days spent in institutions (for example, prison, detention, community treatment centres) for juvenile delinquents receiving family and parenting interventions.^{4 5 16 19} Family and parenting interventions significantly decreased the amount of time spent by juvenile delinquents in institutions at follow up compared to those who received usual interventions (WMD –51.34 days, 95% CI –72.52 to –30.16, $p < 0.00001$; fig 1). When the Bank study¹⁶ was excluded from the sensitivity analysis (based on study quality), there was an even greater reduction in institution time (WMD –56.52, 95% CI –83.83 to –29.20, $p = 0.00005$; fig 2).

Only two studies reported dichotomous outcome data on the number of juvenile delinquents who had been incarcerated during follow up.^{4 19} Both these trials used MST with chronic serious juvenile delinquents. The pooled relative risk of incarceration for MST compared to usual treatment was 0.50 (95% CI 0.20 to 1.21, $p = 0.12$).

Risk and rate of rearrests

Five studies gave dichotomous outcome data about the number of juvenile delinquents who had been rearrested at follow up.^{4 5 15–17} Family and parenting interventions significantly reduced the risk of a juvenile delinquent being subsequently rearrested compared to those having usual interventions (RR 0.66, 95% CI 0.44 to 0.98, $p = 0.04$; fig 3).

Table 1 Description of intervention, sample, and outcomes of included studies

First author	Experimental intervention and duration	Usual intervention and duration	Sample and setting	Age and sex	Outcome measures	Follow up
Henggeler ⁴ (USA) 1992	Multisystemic therapy 13.4 weeks, 33 hours direct contact (SD 29), 24 hr a day case coverage	Usual intervention – probation or institution	84 serious juvenile offenders Referred by Juvenile Justice	Mean age 15.2 years 77% male, 23% female	Arrests, incarceration SRD, FACES, MPRI, RBPC, SCL-90-R, SCS-CBC	59 weeks
Chamberlain ⁵ (USA) 1998	Multidimensional treatment Foster care 6 month duration	Usual treatment (group care) 6 month duration	85 chronic juvenile offenders out of home placement. Referred by Juvenile Justice System	12–17 years 100% male	Running away Reunited with family Rate of criminal referrals, EBC	1 year
Alexander ¹⁵ (USA) 1973 Follow up study Klein ²¹ (USA) 1977	Short term family intervention 5–6 weeks	No treatment, Usual treatment (client centred family groups programme, psychodynamic family programme) 5–6 weeks	86 juvenile delinquents and their families – recurrent “soft offences” e.g. shoplifting Referred by Juvenile Court	13–16 years 44% male, 56% female	Official offence reports Sibling court involvement	6–18 months 2.5 to 3.5 years
Bank ¹⁶ (USA) 1991	Parent training Mean duration – 44.8 hours professional contact (23.3 hrs phone) and booster sessions	Usual intervention – community control (includes family therapy), >50 hours	60 chronically offending delinquents, Referred by Juvenile Court	Mean age 14 years 100% male	Official offence reports Institution time	3 years
Borduin ¹⁷ (USA) 1995	Multisystemic therapy, Mean duration – 23.9 hours of treatment (SD 8.2)	Usual intervention – individual therapy Mean duration – 28.6 hours of treatment (SD 9.8)	176 serious juvenile offenders Referred by Juvenile Court	12–17 years 68% male, 32% female	Arrests – number and type of crime, FACES, MPRI, RBPC, SCL-90-R, UDQ	4 years
Emshoff ⁸ (USA) 1983	Adolescent diversion project – family condition Adolescent diversion project – multifocus condition 18 weeks	Usual intervention (court control) 18 weeks	73 juvenile delinquents – serious misdemeanours or non-serious felonies Referred by Juvenile Court	Mean age 14.5 years 66% male, 34% female	Police and court contacts Incarceration School data SRD	6 months
Henggeler ¹⁹ (USA) 1997	Multisystemic therapy 122.6 days (SD 32.6 days)	Usual intervention – probation, out of home placement 6 months	155 violent and chronic juvenile offenders Referred by Juvenile Justice	11–17 years 82% male, 18% female	Arrests rates, incarceration rate, GSI & BSI, FACES & FAM, MPRI & PPCI, RBPC, SRD, Monitoring Index	1.7 years
Raue ²⁰ (Aust) 1985	Group parent reciprocity training programme 4 weeks Individual – family based reciprocity training programme 4 weeks	Wait list control 4 weeks	30 families of children rated by parents >1.5 SD above norm on Aggressiveness factor of the CBCL. Referred by schools, GP, agencies, parents	10–16 years 73% males, 27% female	PAS CBPC CPPBQ	2 months

Revised Behaviour Problem Checklist (RBPC), Global Severity Index (GSI) of the Brief Symptom Inventory (BSI), Social Competence Scale of the Child Behaviour Checklist (SCS-CBC) used to measure individualised emotional adjustment, adolescent behavioural problems, and adolescent social competence.
Symptom Checklist-90-revised (SCL-90-R) used to measure parental psychiatric symptomatology.
Family Adaptability and Cohesion Evaluation Scales (FACES-III), Family Assessment Measure (FAM-III), and/or Unrevealed Differences Questionnaire – Revised (UDQ-R) used to measure perceived and observed family functioning.
Monitoring Index used to measure parental monitoring.
Missouri Peer Relations Inventory (MPRI), Parent Peer Conformity Inventory (PPCI) used to measure peer relations.
Self Report Delinquency Scale; EBC – Elliot Behavioural Checklist used to measure delinquency.
PAS, Parent Attitude Survey; CBPC, parent completed Child Behaviour Problem Checklist; FES, Family Environment Scale; CPPBQ, Child Perception of Parent Behaviour Questionnaire.

Table 2 Quality of included studies

First author	Allocation concealment	Blinding	Follow up	Clinically important outcomes
Henggeler ⁴ (USA) 1992	Adequate (sealed envelope)	Yes*	100% for archival data 66% for psychosocial measures	Reported
Chamberlain ⁵ (USA) 1998	Adequate (coin toss)	Yes*	87% for archival data	Reported
Borduin ¹⁷ (USA) 1995	Adequate (coin toss)	Yes*	94.5% for archival data 71.5% for psychosocial measures	Reported
Henggeler ¹⁹ (USA) 1997	Adequate (sealed envelope)	Yes*	90% for archival and psychosocial measures	Reported
Alexander ¹⁵ (USA) 1973	Inadequate (some subjects not randomised)	Yes*	86% for archival data	Reported
Bank ¹⁶ (USA) 1990	Unclear	Yes*	88% for archival data	Reported
Emshoff ¹⁸ (USA) 1983	Unclear	Yes*	Attrition data not given	Reported
Raue ²⁰ (Aust) 1985	Unclear	No	86% for psychosocial measures	Not reported

*Archival data used for objective outcome assessments.

Comparison: 01 Family and Parenting Intervention v usual treatment
Outcome: 11 Mean Length of Time in Institutions(days)

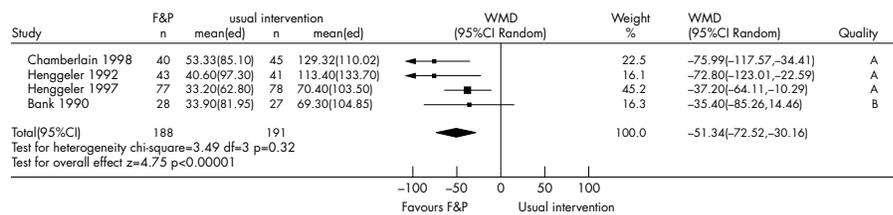


Figure 1 Mean length of time in institutions.

Comparison: 02 Sensitivity Analysis
Outcome: 03 Mean Length of Time in Institutions(days) - Sensitivity Analysis (quality)

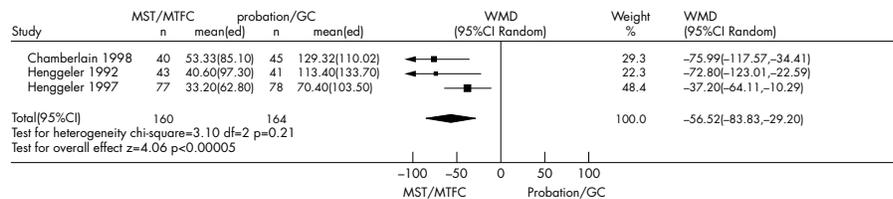


Figure 2 Mean length of time in institutions (sensitivity analysis).

Comparison: 01 Family and Parenting Intervention v usual treatment
Outcome: 10 Risk of Re-arrest

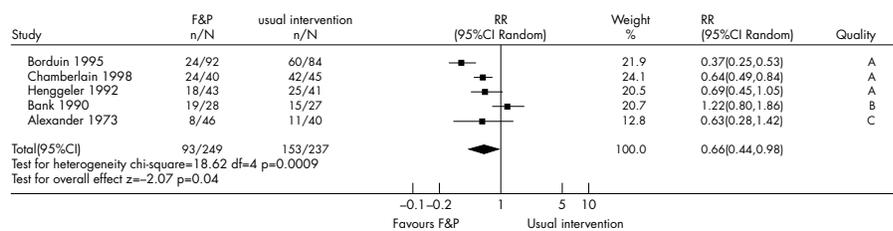


Figure 3 Risk of re-arrest.

When the Bank¹⁶ and Alexander¹⁵ studies were excluded in the sensitivity analysis based on study quality, this reduction in risk increased (RR 0.55, 95% CI 0.37 to 0.81, p = 0.003; fig 4).

Five studies^{4 5 16 17 19} gave continuous outcome data in terms of the rate of subsequent arrests for juvenile delinquents over one to three years. Family and parenting interventions reduced the rate of subsequent arrests for a juvenile delinquent at one to three years (SMD -0.56, 95% CI -1.100 to -0.03, p = 0.04; fig 5). When Bank¹⁶ was excluded in the sensitivity analysis based on study quality, this reduction persisted (SMD -0.68, 95% CI -1.29 to -0.07, p = 0.03; fig 6).

Three studies used self report delinquency scales (the Self-Report Delinquency Scale and Elliot Behavioural Checklist) to

measure criminal activity.^{4 5 19} Pooled data revealed a significant difference between the intervention group (MST and MTFC) and the usual intervention group (group care or probation): SMD -0.41 (95% CI -0.65 to -0.17, p = 0.0008; fig 7).

Sibling delinquency

One trial, reported in two articles,^{15 21} found a statistically significant reduction in sibling delinquency at 2.5 to 3.5 years follow up after a short term behavioural family intervention. In this trial, the percentage of siblings of delinquents whose families had this intervention who offended was 20% compared to 59% in the client centred group (usual intervention control), 63% in the psychodynamic family programme

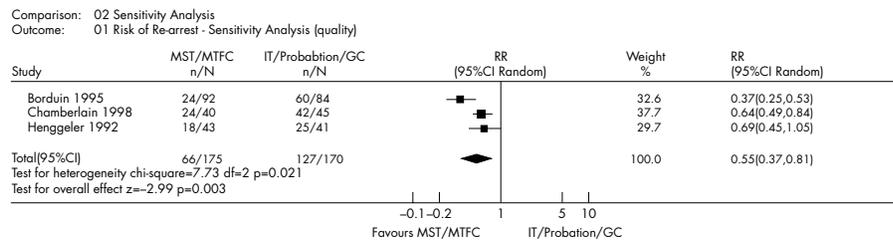


Figure 4 Risk of rearrest (sensitivity analysis).

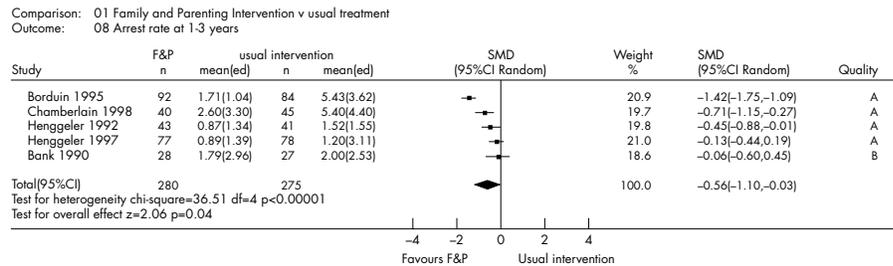


Figure 5 Rate of rearrest.

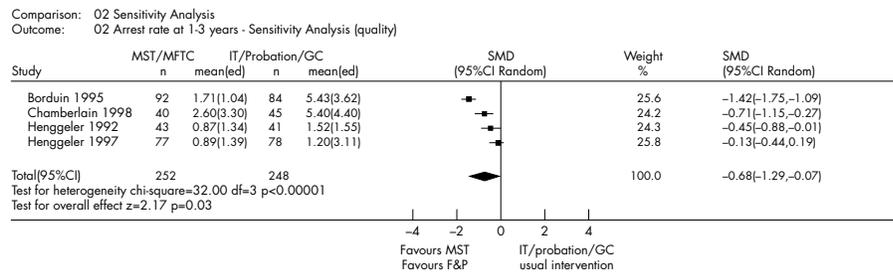


Figure 6 Rate of rearrest (sensitivity analysis).

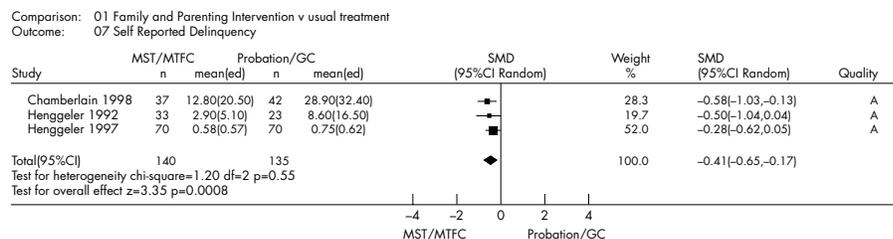


Figure 7 Self reported delinquency.

(usual intervention control), and 40% in the no intervention control group.

Running away and reunification with family

Chamberlain³ compared chronic juvenile offenders in “out of home” placement who received MTFC, which had a major family and parenting intervention component, to those who received the usual intervention of “group care”. The trial found that offenders in the intervention group ran away less than those in usual intervention group (30.5% v 57.8%, p = 0.02). In addition, offenders in the intervention group spent twice as much time living with parents and relatives during the 12 month follow up (p = 0.056).

Academic performance and future employment

In only one study¹⁸ was school outcome data reported comparing juvenile delinquents who received the “adolescent diversion project multifocus condition”, the “adolescent diversion project family condition”, and the usual intervention (court control). The study found a trend towards decreasing school attendance over the six month follow up for all groups. Attendance was measured as “percentage of participants not enrolled”. A smaller percentage of the multifocus condition group were “not enrolled” compared to the other

two groups (multifocus condition 9%, family condition 23%, usual intervention 23%). There were no objective data on future employment in any of the studies.

Peer relations, family functioning, problem behaviour, and parental mental health

Pooling of the data using SMD, found no significant difference for peer aggression (SMD -0.15, 95% CI -0.37 to 0.07, p = 0.17); bonding (SMD -0.02, 95% CI -0.24 to 0.20, p = 0.9); peer maturity (SMD 0.03, 95% CI -0.19 to 0.25, p = 0.8); family cohesion (SMD 0.35, 95% CI -0.08 to 0.77, p = 0.11); family adaptability (SMD 0.10, 95% CI -0.29 to 0.50, p = 0.6); problem behaviour (SMD -0.65, 95% CI -1.44 to 0.14, p = 0.11); and parental mental health (SMD -0.05, 95% CI -0.63 to 0.52, p = 0.9). Of note, these data were assessed in an unblinded fashion in the studies and therefore the usefulness of these findings in informing practice is limited.

DISCUSSION

This review has shown that the use of family and parenting interventions can result in a significant reduction in time spent in institutions such as prison and detention centres by juvenile delinquents. Of interest this finding was not

accompanied by a significant reduction in the risk of incarceration. This may be because incarceration was investigated in only two of the studies compared to four studies in which time spent in institutions was investigated. An alternative explanation is that the judges were not blind to the intervention allocation when sentencing a juvenile delinquent who had re-offended. Therefore a judge may have been more lenient and given shorter sentences if they were aware that the offender was allocated to a family and parenting intervention.

This review has also shown that the use of family and parenting interventions can result in a significant reduction in the risk of a juvenile delinquent being rearrested and in their rate of subsequent arrests at one to three years. Of note, for this rearrest data there was significant heterogeneity in the pooled data even after exclusion of the poorer quality trials. This may reflect the wide range of usual interventions, including probation, group care, and individual therapy used in different juvenile justice systems and to a lesser extent variability between the family and parenting interventions. As a result this heterogeneity limits the interpretation and usefulness of these findings.

The significant reduction in self reported delinquency supports the above findings and is important because it reflects the young person's own report of their criminal activity, rather than relying on them being caught. However, it is also possible that a family and parenting intervention may affect the amount that children and adolescents report on their true level of criminal activity. There is also preliminary evidence which may suggest that these interventions have a "spill over" effect of reducing future sibling delinquency.^{15 21}

The findings of this review persisted and were strengthened with sensitivity analysis that took quality of the studies into account. This sensitivity analysis was in effect a post hoc subgroup analysis because it excluded non MST/MTFC trials. In future, the authors of this review will consider performing subgroup analysis of studies by intervention type, as these trials become available to the Cochrane collaboration.

At present there is insufficient evidence that family and parenting interventions have a beneficial effect on problem behaviour, parental mental health, family functioning, and peer relations. In addition, data on long term outcomes such as employment, and criminality as an adult were not collected in any of the identified studies.

In all but one of the studies included in this review the participants were juvenile delinquents and their families residing in the USA. It can therefore be argued that the applicability of such studies is limited. There is the potential for publication bias in this review; however, no unpublished trials were identified after contact with experts in the field.

In none of the trials was the potential for harm discussed. Although there was no evidence that family and parenting interventions such as multisystemic therapy caused harm, such therapies are labour intensive. This has practical implications for making decisions about the implementation of these programmes when prioritising resource allocation.

Of concern, only one randomised controlled trial was able to be included in this review where the participants had been assessed as having conduct disorder but had not yet had contact with the juvenile justice system. Well designed, randomised controlled trials of family and parenting interventions for this group of children and adolescents are required. Trials should also focus on the effect of these interventions on outcomes, which include family functioning, peer relations, academic performance, employment, mental health, and criminality as an adult.

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