Interventions for prevention of drug use by young people delivered in non-school settings (Review)

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TABLE OF CONTENTS

[Intervention Review]

Interventions for prevention of drug use by young people delivered in non-school settings

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ABSTRACT

Background

Interventions intended to prevent or reduce use of drugs by young people may be delivered in schools or in other settings. This review aims to summarise the current literature about the effectiveness of interventions delivered in non schools settings.

Objectives

(1) - To summarise the current evidence about the effectiveness of interventions delivered in non-school settings intended to prevent or reduce drug use by young people under 25;

(2) - To investigate whether interventions' effects are modified by the type and setting of the intervention, and the age of young people targeted;

(3) - To identify areas where more research is needed.

Search methods

We searched Cochrane Central Register of Controlled Trials (CENTRAL - The Cochrane Library Issue 4, 2004), MEDLINE (1966-2004), EMBASE (1980-2004), PsycInfo (1972-2004), SIGLE (1980-2004), CINAHL (1982-2004) and ASSIA (1987-2004). We searched also reference lists of review articles and retrieved studies.

Selection criteria

Randomised trials that evaluated an intervention targeting drug use by young people under 25 years of age, delivered in a non-school setting, compared with no intervention or another intervention, that reported substantive outcomes relevant to the review.

Data collection and analysis

Two authors independently assessed trial quality and extracted data. Results were tabulated, as studies were considered too dissimilar to combine using meta-analysis.

Main results

Seventeen studies, 9 cluster randomised studies, with 253 clusters, 8 individually randomised studies with 1230 participants, evaluating four types of intervention: motivational interviewing or brief intervention, education or skills training, family interventions and multi-component community interventions. Many studies had methodological drawbacks, especially high levels of loss to follow-up. There were too few studies for firm conclusions. One study of motivational interviewing suggested that this intervention was beneficial on cannabis use. Three family interventions (Focus on Families, Iowa Strengthening Families Program and Preparing for the Drug-Free Years), each evaluated in only one study, suggested that they may be beneficial in preventing cannabis use. The studies of multi component community interventions did not find any strong effects on drug use outcomes, and the two studies of education and skills training did not find any differences between the intervention and control groups.

Authors' conclusions

There is a lack of evidence of effectiveness of the included interventions. Motivational interviewing and some family interventions may have some benefit. Cost-effectiveness has not yet been addressed in any studies, and further research is needed to determine whether any of these interventions can be recommended.

PLAIN LANGUAGE SUMMARY

Interventions delivered to young people in non-school settings for the prevention of drug use

Drug use is widespread among young people including those still at school.Taking drugs is not a medical problem in itself but can affect physical andmental health and social functioning. People may become dependent on drugs, and use of low risk illicit drugs can escalate into use of higher risk

drugs. In schools, programs have been introduced to prevent or reduce drug use among young people. Non-school settings for interventions include youth

clubs, primary care centres, colleges, with families and in the community. Srategies can target entire populations or be directed at specific groups,

often those at high risk.

The review authors identified 17 controlled studies, 9 cluster randomised studies with 253 clusters and 8 individually randomised studies with 1230

participants. All but two of the studies were conducted in the USA. The other studies were in the UK and China. Follow-up periods varied from at

completion of the intervention to six years. The studies were too few and each intervention too different to draw any firm conclusions on whether

non-school based interventions prevent or reduce drug use by young people.The interventions with suggested benefits need further evaluation before it

can be firmly established that they are effective. One of two studies of motivational interviewing suggested that this intervention was beneficial on

self-reported cannabis use. Three family interventions (Focus on Families, Iowa Strengthening Families Program and Preparing for the Drug-Free Years)

were evaluated, in two separate studies, and may have been beneficial in preventing self-reported cannabis use. The latter two programs were

compared to the school-based Life Skills Training program. All of the eight studies of family interventions included contact with parents, in family

groups or in separate sessions for parents and their children. Multicomponent community interventions did not have any strong effects on

drug use. There were five studies, four of which added the community component to a school drug education program. Education and skills training

was not effective in two studies.

Many of the studies lacked blinding and had high numbers of participants lost to follow up. No study reported cost outcomes.

BACKGROUND

Drug use is not in itself a medical problem, but it is a risk factor for a range of adverse consequences or harms, including deleterious effects on physical and mental health and social functioning. Dependence and other problems may result from a wide range of types of drug use, and the probability of their occurrence will depend on factors associated with the drug used, the characteristics of the user, and the environment in which the use takes place (Zinberg 1984).

Among young people, there is additional concern that some types of illicit drug use which themselves may be considered to be relatively low risk, may escalate into types of drug use which are relatively high risk (Kandel 1986). For example, oral or nasal use of cocaine or other stimulants may precede a transition to injecting or smoking of these drugs.

Drug prevalence studies have provided data on the high level of drug use, both among those of compulsory schooling age and among young people more broadly (ESPAD 2004; Johnston 2003; Boreham 2001; Ramsey 2001). Internationally, there is a growing awareness of the need to develop effective interventions with young people in light of rising drug prevalence and to systematically review possible responses. Whilst drug prevention interventions are common (for example, drug education is mandatory in British schools), study of their effectiveness has been limited outside the United States. Studies in the USA accounted for 90% of those examined in an earlier systematic review (White 1998).

Many interventions for preventing drug use among young people are carried out in primary or secondary schools, and a Cochrane review of school-based interventions is being conducted (Faggiano 2005). However, interventions are also delivered in other settings, especially if they target young people beyond the ages of school attendance. In a related Cochrane review of the prevention of alcohol misuse (Foxcroft 2002), 42 of the 56 studies included examined interventions delivered entirely within the school setting, with a further four studies involving school and community or family components. Non-school settings for interventions identified by Foxcroft 2002 included youth clubs, emergency rooms, colleges, young offender institutions, the family, and the community. Interventions may seek to target either non-users, in order to prevent the initiation of use of any drugs (primary prevention), existing users with a view to the minimisation of harms (secondary prevention), or both. Interventions may also be universal in orientation, targeting entire populations, or be directed at specific groups defined by prior drug use or other risk characteristics.

This review aims to summarise the evidence about effectiveness of interventions delivered in non-school settings that are intended to prevent drug use among young people. It will therefore include randomised controlled trials that have compared any eligible intervention with a control group. The control group may have received no intervention, another specific drug prevention intervention (for example, in a trial comparing a non school-based versus a school-based drug use prevention programme), or a standard treatment.

OBJECTIVES

(1) - To summarise the current evidence about the effects of interventions delivered in non-school settings intended to prevent or reduce drug use by young people under 25, compared with no intervention or a different intervention, on drug use and other substantive outcome measures;

(2) - To investigate whether interventions' effects are modified by the type and setting of the intervention, and the age of young people targeted;

(3) - To identify areas where more research is needed.

METHODS

Criteria for considering studies for this review

Types of studies

Eligible study designs were randomised controlled trials
Studies were eligible for inclusion if:

(1) - the intervention(s) evaluated was intended to prevent or reduce drug use
(2) - the target population was people under the age of 25, and outcomes were reported for this group
(3) - the intervention was delivered in a non-school setting (i.e. not in a primary or secondary school as part of the curriculum).

Types of participants

Young people less than 25 years of age, either illicit drug users or non-users. Studies that included older participants were included if the number of older participants was small and the intervention was targeted at young people, or if data were published or could be provided for young participants separately. We did not include studies that do not report the age of participants, or where the intervention is not clearly targeted at young people and are likely to have included a substantial proportion of older people.

Types of interventions

Any non school-based intervention designed for prevention of drug use, targeted at young people, compared with another intervention or no intervention. We included studies that used schools as the site of recruitment but the intervention was not delivered in a school. Studies in which the experimental and control groups received the same school-based intervention, and the experimental group received an additional non-school based intervention were included, as they tested the effects of adding a non-school based component to a school-based programme. Studies evaluating a school-based programme plus a non-school based prevention intervention versus no treatment were excluded, as it was not possible to separate the effects of the school-based and non school-based interventions. However, studies evaluating interventions that included some school based elements in a predominantly non school-based intervention were included. A consensus decision was reached about inclusion of such studies. For example, a study of a classroom curriculum based intervention such as Life Skills Training (LST) plus a community intervention would be excluded, but a community intervention that involved teachers in one of a number of activities would be eligible.
Studies that evaluated treatment interventions i.e. those offered within formal services in response to either voluntary or coerced help-seeking for problems associated with illicit drug use, were excluded. Interventions that targeted either licit and illicit drug use, or illicit drug use along with other behaviours were included. Studies of the prevention of the use of solvents and other substances whose legal status may be variable were included, providing the substances themselves are generally understood to be 'drugs'. Both primary prevention and secondary prevention interventions were included, as were interventions specifically targeting drug users or other groups of young people. The prevention of steroid use or other forms of drug use not designed to be mood altering (such as performance enhancing drugs in sport), and for which drug dependence is understood not to be possible, were excluded.
Subgroup analyses classifying studies by their type of intervention and setting were planned but not performed due to lack of data (see "Methods of review" below).

Types of outcome measures

(1) - Drug use or initiation of drug use (for primary prevention studies) or reduction or cessation of drug use (for secondary prevention studies)
measured as(a) - self reported and (b) - biologically validated or otherwise corroborated
(2) - substance dependence (Diagnostic and Statistical Manual of Mental Disorders, (DSM IV)criteria)
(3) - death (all cause and drug related)
(4) - hospitalisation
(5) - treatment for drug-related health problems
(6) - criminal activity
Other relevant outcomes (for example, scales measuring substance use) were reported by some studies and are reported in the review, identified as non-pre-specified outcomes.
Studies that reported eligible interventions but did not mention that any relevant outcomes were recorded were excluded. Where relevant outcomes were apparently recorded but not reported, authors were contacted for clarification.

Search methods for identification of studies

We located relevant studies through a multiple search strategy including electronic searching and hand searching.
As eligible studies may be described in a variety of ways, we found it very difficult to produce a list of search terms that will identify all eligible studies. This is especially true for terms describing the intervention and the outcomes. Many different words could be used to describe prevention or reduction of drug use, and attempting to specify all of these would risk missing eligible studies.
We located relevant studies by electronic searches of the Cochrane Central Register of Controlled Trials which includes the Cochrane Drugs and Alcohol Group Trials Register (CENTRAL - The Cochrane Library Issue 4, 2004), MEDLINE (OVID 1966 - July 2004), EMBASE (OVID 1980 - July 2004) and PsycInfo (July 2004), CINAHL (1982 - July 2004), ASSIA (CSA Illumina 1987 - July 2004), and SIGLE (WEBSPIRS 1980 - July 2004). For search strategies for each database *see* Appendix 1; Appendix 2; Appendix 3; Appendix 4; Appendix 5; Appendix 6
We checked the reference lists of all potentially eligible studies obtained as full reports to identify any further studies not retrieved by the electronic search. Full reports of review articles retrieved by the search were obtained and checked for other relevant citations.
All searches included non-English language literature and studies with English abstracts were assessed for inclusion using the same

criteria. No potentially eligible studies in languages other than English were identified.

Data collection and analysis

Study selection

One author (SG) screened the titles of all papers identified by the electronic searches to reject studies that clearly did not meet the review's inclusion criteria. Abstracts of the remaining studies were then checked by two authors, and those that were potentially eligible were obtained as full reports. Two authors then independently evaluated whether studies should be included or excluded. Disagreements were resolved by discussion.

Two authors independently extracted data from eligible studies, including the study design and methodological information to allow assessment of protection against bias, subgroup information and the pre-specified outcomes. Authors of all included studies were contacted for clarification of the study methodology or outcome information where this was unclear or missing. Quality assessment was not used for any sensitivity or subgroup analyses, because no meta-analyses were performed.

Assessment of the methodological quality

The quality assessment included the following aspects of studies:

Randomisation and allocation concealment

The method of generating a random allocation sequence and the mechanism for allocating participants to groups were recorded. Allocation concealment was graded as adequate, unclear or inadequate.

Adequate allocation concealment: central randomizations (e.g. allocation by a central office unaware of subject characteristics), opaque sealed envelopes, on-site computer system combined with allocations kept in a locked unreadable computer file that can be accessed only after the characteristics of an enrolled participant have been entered or another description that guaranteed concealment.

Unclear allocation concealment: when the authors either did not report an allocation concealment approach or reported an approach that did not fall in the category A or C.

Inadequate allocation concealment: alternation or reference to case numbers, dates of birth, day of the week. Any procedure that is entirely transparent before allocation or could be changed after allocation, such as an open list of random numbers or other description that contained elements not guaranteeing concealment.

Blinding

Blinding of participants or practitioners was considered unlikely given the nature of the interventions. Blinding of outcome assessment was graded yes, no or unclear.

Completeness of follow-up

This was evaluated by recording the number and percentage of randomised participants lost in each group.

Analysis in randomised groups (yes/no)

If participants had not all been analysed in their randomised groups, they were restored to the correct group for the review if sufficient information to allow this was included in the study report or could be obtained from the authors.

Data were extracted from the published reports on the review's specified outcomes. In many cases, results were presented as statistics resulting from complex analyses rather than as numbers of participants with the outcome. In these cases, we extracted the results of the published analysis, and, where possible, the numbers of participants with each outcome at each data collection point. Where these data could not be extracted, authors were contacted to ask whether they could be provided.

The results from each study, either a published analysis or a risk ratio and 95% confidence interval calculated from data in the report or supplied by the author, were tabulated (Tables 1, 2 and 3). No meta-analyses were performed because the studies' interventions were too different to allow meaningful combination.

For inclusion of cluster randomised trials in meta-analyses, we planned to adjust the sample sizes of the intervention and control groups to take account of non-independence between individuals in the same cluster. Where published estimates of the intra cluster correlation coefficient were not available, authors were contacted to ask whether an estimate of the ICC was available from the study. For some cluster randomised trials, we calculated risk ratios and confidence intervals using data extracted from publications or provided by authors. In these cases, we adjusted the analysis to take account of clustering using a value of 0.02 for the ICC. This value was chosen because most reported ICCs from three studies were less than this (see Methodological Quality). We used the ICC to adjust the analysis using the methods described in Deeks 2005. These adjusted analyses were calculated for cases where the unadjusted analysis suggested that there may be a difference between the groups. For most analyses, the number of events was too small to show any difference in an unadjusted analysis; adjusting the analysis will always increase the width of the confidence intervals, and therefore in these cases the adjusted analysis would not reach a different conclusion. Adjustment by dividing by the design effect involves some approximation, as the adjusted number of events and denominator must be rounded to the nearest whole number; when the number of events is small this means that the adjusted analysis may be a poor approximation. For these reasons, adjusted analyses were performed only for analyses where there 10 or more events in one of the groups, or the unadjusted analysis suggested a difference. Adjusted and unadjusted analyses are indicated in the tales of results.

The following subgroup analyses were pre-specified but not performed due to lack of data:

(1). Age of participants: 12 years and under; 13 to -15, 16 to -19, 20 years and over, mixed or not specified;

(2). Type of intervention (e.g. psychosocial or educational)

(3). Setting of intervention.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

Forty-nine RCTs that potentially fulfilled the eligibility criteria were identified from their titles and abstracts, and full papers were retrieved.

Excluded studies

After examination of the full reports, thirty two were excluded, for the following reasons;

- trial evaluated a school based intervention (7 studies; Bryson 1999; Corbin 1993; Furr-Holden 2004; Hecht 1993; Pedro-Carroll 1985; Stolberg 1985; Weiss 1998);
- compared an intervention consisting of a school-based programme plus a non-school based intervention versus a control group, and it was therefore not possible to estimate the effect of the non-school elements (5 studies; Dishion 2002; Prinz 2000; Hostetler 1997; Morris 2002; Pentz 1989);
- treatment intervention (1 study; Santisteban 2003);
- trial evaluated an eligible intervention but did not record any outcomes relevant to this review (16 studies; Bernstein 1987; Brody 2004; Cheadle 2001; Corby 1997; CPPRG 2002; Dishion 1995; Fishbein 2002; Kipke 1993; Kumpfer 2002; Miller-Heyl 1998; Pantin 2003; Polansky 1999; Kosterman 1997; Schinke 2004; Szapocznik 1989; Wolchik 1993)
- concerned with performance-enhancing drugs among athletes (1 study; Marcello 1989);
- intervention was not intended to prevent drug use (1 study; Morris 2003);
- intervention used in the trial varied between participating communities and not all were concerned with drug use prevention. In addition it was not possible to separate randomised from non-randomised elements of this study (1 study; Wagner 2000);

Included studies

Seventeen studies were included in the review. These evaluated four types of intervention, which are considered separately below.

- *Education and skills training see*Table 1

Two studies with 352 participants evaluated programmes of education and skills training for young people (Lindenberg 2002; Palinkas 1996). Both of these recruited young women and used interventions that consisted of a programme of group sessions. One study recruited high risk young women (Palinkas 1996), the other young Mexican-American women (Lindenberg 2002). The comparison groups received no intervention (Palinkas 1996) or printed health education materials (Lindenberg 2002).

- *Family interventions see*Table 2

Eight studies (3 cluster randomised studies with 104 clusters, and 5 individually randomised studies with 845 participants) evaluated an intervention designed to improve family functioning or parenting skills, delivered to parents, children or families, either alone or in groups. One study evaluated the addition of a family-based intervention to the school-based Life Skills Training programme (Spoth 2002), and one compared a programme delivered to parents and children with a child-only programme (Wu 2003). Six studies compared a non-school based programme of education or skills training to a control group. The comparison groups for these studies varied, and included delayed intervention (McGillicuddy 2001), self study (Wolchik 2002), minimal contact (Dembo 2000) or no intervention (Lochman 2002b; Catalano 1997; Spoth 1999).

The content, duration, target group and mode of delivery of the training interventions varied. The duration of the intervention varied from 5 weeks (Spoth 1999) to 16 months (Lochman 2002b) and included between 5 (Spoth 1999) and 34 (Lochman 2002b) sessions. One study (Dembo 2000) did not state the duration of the intervention or the number of sessions. The majority of programmes were delivered to groups of parents, young people, or families in locations other than their home; only two trials included interventions to individual families in their home (Dembo 2000; Wu 2003). All interventions included contact with parents; in some this was in family groups, whereas other included sessions for parents separately from their children.

- *Brief intervention or motivational interviewing*

Two studies, one cluster randomised and one individually randomised, involving 32 clusters and 33 participants respectively (McCambridge 2004; Oliansky 1997) evaluated a brief intervention or single session motivational interviewing. One study (Oliansky 1997) was based in primary care clinics, and the other in further educational colleges.

- *Multi-component community interventions see*Table 3

Five cluster randomised studies involving 117 clusters evaluated multi-component community interventions. Four of these (Schinke 2000; Perry 2003; Flay 2004; Biglan 2000) compared addition of this type of intervention to a school-based drug education programme with the school-based programme alone. The fifth (Wu 2002) compared a community intervention with no intervention. The intervention evaluated in Biglan 2000 was primarily focussed on prevention of adolescent tobacco use, and much of its content was tobacco-related, but use of cannabis was also assessed in this trial.

Type of interventions

The interventions in these studies included the following elements: Wu 2002

- one-day training workshops for community leaders, women leaders, youth leaders and drug users
- trained leaders subsequently organised one day workshops for villagers
- community mobilisation by forming groups of village leaders, parents, youth, militia women and former drug users to mobilise community members to participate in drug prevention activities
- videos on drug and HIV prevention
- two 2-3 hour knowledge training sessions for villagers
- Workshops and videos on technical farming skills, to involve villagers without adolescent children
- Evening classes for school dropouts
- Entertainment games for villagers
- drop-in centres to provide entertainment for young people
- drug/HIV prevention in schools.

Schinke 2000

- media releases about benefits of substance abuse prevention efforts
- flyers and posters distributed to businesses, health and social services agencies, schools and churches
- information meetings held at schools for parents, neighbours and teachers

Perry 2003

- Community organisers created and facilitated youth action teams to conduct extracurricular activities.
- Neighbourhood action teams led by same community organisers addressed issues of drug use and violence.

Flay 2004

- Parent support programme to reinforce parenting skills and promote parent-child communication
- School staff and school--wide youth support programmes
- Community programme to forge links between school, parents and community
- School task force to implement programme components, propose changes in school policy, develop school-community liaisons, solicit community organisations to support drug prevention programme.

Biglan 2000

- Activities were implemented by a paid community coordinator, full time for 1 year and 0.75 for 2 years
- Media advocacy module; a set of strategies for publicising the tobacco problem, including newspaper articles, presentations to local civic groups, fact sheets mailed to community leaders, messages on sports programmes, radio advertisements or public service announcements, billboards at sports fields, messages on local cable access reader boards.
- Youth anti tobacco module; designed to assist community coordinators and youth in developing anti-tobacco activities for young people.
- Family communications module, designed to encourage parents to communicate to their children that they did not want them to use tobacco. Included pamphlets distributed to parents and a tobacco quiz for parents.
- ACCESS module: five component programme to reduce the number of stores selling tobacco to minors. Included mobilisation of community support, merchant education, rewards to staff for not selling and reminders to those who sold, positive publicity about refusal to sell, feedback to store owners about the extent of their selling to adolescents.

The interventions evaluated in four of these studies involved schools to some extent. In Wu 2002 school education is mentioned as one element of the intervention. The School/Community Intervention used in Flay 2004 included school staff and school-wide youth support programmes. The community intervention in Schinke 2000 involved teachers and school guidance counsellors, and the DARE Plus intervention in Perry 2003 included a 4 session classroom peer-led programme, in addition to the community elements.

All of these five studies used a cluster randomised design, with schools (Schinke 2000; Perry 2003; Flay 2004), villages (Wu 2002) or communities (Biglan 2000) as the unit of randomisation.

Countries in which the studies were conducted

All of the studies were conducted in the USA except for McCambridge 2004 (London, UK) and Wu 2002 (Yunnan, China).

Follow-up periods

The follow-up periods of included studies varied from the immediate post-intervention period (Lochman 2002b) to six years (Wolchik 2002). Eight studies followed up participants for more than a year.

Risk of bias in included studies

- **Randomisation and allocation concealment**

All studies were stated to have been randomised. Only one of the individually randomised trials (Wolchik 2002) provided information on the generation of the random sequence (by computer random number generation), and none provided enough information on allocation concealment to judge whether it was effective.

Two cluster randomised studies gave information on the method of randomisation of clusters (McCambridge 2004; Biglan 2000). In one (McCambridge 2004) the method was adequately concealed (performed by a researcher not involved in the study), but in the other (Biglan 2000) concealment of allocations was unclear. Randomisation was in this case by tossing a coin, which is random but could be open to subversion.

A potential problem in randomisation was noted in one study (McGillicuddy 2001). This was initially assumed to be individually randomised, but information supplied by the author suggested

that in fact groups of participants were randomised. This may have introduced bias into the comparison of the groups.
The text of one cluster randomised study (Wu 2002), which randomised villages to a multi-component community intervention or control, suggested that the intervention and control villages may have been in geographically separated areas. If so, this may have been a source of bias, as there are likely to have been differences between the control and intervention groups. For example, the report states that the ethnic mix of the intervention villages and control villages was different; the intervention villages contained about twice as many people belonging to the Jingpo ethnic minority (55% versus 25%) and half the proportion belonging to the Dai minority (28% versus 57%). The author was contacted for clarification but no reply was received.

- **Blinding**

The nature of the interventions evaluated in these trials makes blinding of participants virtually impossible. In many cases interventions were delivered by the researchers, who were therefore not blind to study group. No studies mentioned any attempts at blinding of practitioners, and only one had partially blinded outcome assessment (McCambridge 2004). In this study, an investigator blind to study group performed outcome interviews on a sample of participants.

- **Analysis in randomised groups**

There were no reported cases of participants being analysed in the incorrect group in the included studies.

- **Losses to follow-up**

Losses to follow-up were generally high. Five studies did not report outcome information for more than 20% of the participants at the longest follow-up. Follow-up of a high proportion of participants several years after recruitment is difficult, although one study achieved a rate of 91% at six years (Wolchik 1993). However, some studies reported high rates of loss to follow-up even short times after randomisation. No major differences were noted in follow-up rates between the arms of any trial.

Statistical analyses

Most studies used methods such as analysis of covariance for their statistical analysis, modelling the outcome variables as a function of baseline characteristics, time and group allocation. Results were almost always presented as statistics and p-values, or a statement about statistical significance, rather than a measure of the difference between the groups and a confidence interval.
Two studies (Flay 2004; Perry 2003) reported outcomes for boys and girls separately, based on a finding of a statistically significant difference between the sexes. It was unclear whether these were planned or unplanned subgroup analyses. We have combined data for boys and girls in this review.
Nine cluster-randomised trials were included in the review. Five were analysed in the primary publication using a method that took account of non-independence between members of each cluster, but none reported values for the intra cluster correlation coefficient (ICC) in the primary publication. After contacting authors, three studies provided estimates of ICCs; in one, they varied, depending on the outcome, from 0 to 0.02, in one they were all less than 0.01, and in the third they ranged from 0 to 0.12.

Effects of interventions

(1) Education and skills training See Table 01
Lindenberg 2002 did not present any numerical data or statistics, but stated that there was no detectable difference between the groups. Palinkas 1996 did not find any differences in use of cannabis or other illicit drugs between the groups who received PALS (Positive Adolescent Life Skills) and no intervention.
(2) Family interventions See Table 02
The published results generally showed no clear differences between the groups. Three interventions (evaluated in two RCTs) appeared to be superior to no intervention in preventing self-reported cannabis use; Focus on Families ($p<0.10$) (Catalano 1997), Iowa Strengthening Families Program (ISFP) ($p<0.01$), and Preparing for the Drug-Free Years (PDFY) ($p<0.01$) (Spoth 1999). Calculated results for this study, using the numbers of drug users at follow-up, showed an advantageous effect of the ISFP on self-reported lifetime cannabis use at 6 year follow-up (adjusted RR 0.55, 95% CI 0.32 to 0.95) and self-reported cannabis use in the past year at six year follow-up (adjusted RR 0.44 95% CI 0.20 to 0.96), but no clear effect of PDFY on any of the outcomes and any follow-up period. However, less than 70% of the participants were followed up at 4 and 6 years, so there may be a possibility of bias in these results.
(3) Brief intervention/motivational interviewing
The primary care-based study (Oliansky 1997) used scores on the Substance Use Screening Instrument (SUSI) to measure drug use. The control group scores were higher than those of the intervention group at both 1 month and 3 month follow-up (1 month means, intervention 1.15, control 4.31, $p=0.05$; 3 month means intervention 1.58, control 7.46, $p=0.04$; no standard deviations given).
The other trial (McCambridge 2004) included baseline covariate in its analysis to control for imbalances between the groups. There was a large decrease in the frequency of self-reported cannabis use in the intervention group (15.7 times per week to 5.4) but not in the control group (13.3 to 16.9); this remained statistically significant after adjustment for confounders. There were also reductions in the quantity of cannabis used and the number of days it was smoked in the intervention compared to the control group. There was no difference in the use of stimulant drugs, but the intervention group were less likely to report use of non-stimulant illicit drugs other than cannabis (adjusted OR 0.32, 95% CI 0.12 to 0.82 $p=0.04$).
(4) Multi component community intervention See Table 03
Wu 2002 found a large reduction in new drug users in intervention villages compared to control villages (published result). However,

the methodology of this study may be suspect, and the calculated result from the data extracted from the publication does not appear to support this conclusion.

Two studies that evaluated addition of a community component to a school-based programme (Perry 2003; Flay 2004) published results for boys and girls separately. No differences in substance use were identified. However, the calculated result from Flay 2004, combining data for boys and girls, suggested that the school plus community intervention may possibly reduce self-reported substance use. This result was marginally statistically significant when analysed without adjustment for clustering, but not so when adjusted using a value of the ICC of 0.02 (RR 0.89, 95% CI 0.75 to 1.05). This adjustment may be conservative. The third similar study, Biglan 2000, found a marginally statistically significant reduction in self-reported cannabis use in the group randomised to the community programme in addition to the school-based programme (p=0.043), but the difference in the number of users at four years was small (6.7% versus 8.5%).

The community study of native American youth, Schinke 2000, found no clear effects of the community intervention on self-reported cannabis use.

DISCUSSION

There is a lack of evidence showing that non-school based interventions are effective in preventing or reducing drug use by young people. This is mainly because existing evidence is insufficient to draw any firm conclusions. A large number of potentially eligible trials were excluded from this review because they did not collect data on substantive measures of drug use. We did not include studies that recorded only participants' attitudes to drugs and their behavioural intentions, rather than their actual use of drugs. The relationship of these surrogate outcome measures to drug use and drug-related health problems is unknown, but it cannot safely be assumed that there is a strong relationship.

We did not perform any meta-analyses in this review, as we judged that the interventions were too heterogeneous to be combined meaningfully. The included trials evaluated a wide variety of interventions, and so far there has been no replication of trials by different research groups. There needs to be independent evaluation of the interventions that suggest benefit, before it can be established firmly whether or not they are effective.

Many of the RCTs in this review were affected by methodological problems. Some of these may have been simply poor reporting: for example, few studies gave any information about concealment of allocations before randomisation, but it is likely that this was adequate in some studies but not mentioned in the published report. Losses to follow-up were high in many studies, with a consequent risk of bias. Some of the populations studied may be difficult to follow-up, and it may be that trials in these populations will always tend to have a high rate of exclusions. Many of the included studies used cluster randomised designs, which are appropriate for many of the interventions evaluated. For example, for multi-component community interventions cluster randomisation is probably the only design possible. However, some studies did not account for clustering in the analysis, but instead analysed as if the trial had been individually randomised. This will overestimate the precision of any difference between the groups, and make it more likely that spurious differences will be found. Typically, these studies included relatively few clusters with a large number of participants per cluster. In these circumstances an analysis as if individually randomised could be very misleading, as the precision of the effect estimate may be substantially overestimated.

Most of the RCTs evaluating family or educational interventions did not demonstrate clear effects on drug use or other substantive outcome measures. The quantity of evidence for each intervention is therefore limited. The Spoth 1999 study demonstrated a reduction in self-reported cannabis use in the groups assigned to the PDFY and ISFP, and hence suggests that these interventions may be helpful in preventing drug use. However, there was high loss to follow-up in this study, and the sample size available was not large. Further evaluation of these interventions in larger studies and different contexts would provide stronger evidence about their effectiveness.

There is little information from this review about the effectiveness of multi-component community interventions, as only five such studies were included. Several studies of community interventions were excluded from the review for various reasons. In four of the included studies the community component was an "add-on" to a school-based programme, and the remaining study (Wu 2002) had significant methodological problems. Two of the studies suggested that the community intervention may have an effect on self-reported substance use or cannabis use (Biglan 2000; Flay 2004), but these results were of marginal statistical significance. The interventions evaluated in the five included trials were all different, and it is not possible to draw any general conclusions about the effectiveness of this type of intervention.

None of the included studies included an economic evaluation or any cost outcomes. Use of non-school educational, family training or multi-component community interventions is likely to involve significant costs, so it would be beneficial for studies to estimate the cost-effectiveness of interventions. Decisions about whether to use any of them on a large scale will be based largely on economic considerations, and so high-quality economic evidence would help to provide a sound basis for service provision decisions.

AUTHORS' CONCLUSIONS

Implications for practice

None of these interventions has been shown unequivocally to be effective, and cost-effectiveness is unknown. It is therefore difficult to recommend their use until more research has been conducted.

Implications for research

There is insufficient evidence to establish whether any of the interventions considered in this review is effective in preventing or reducing drug use by young people. Further trials are therefore justified. Some interventions appear to have potential benefit, and these should be prioritised for future trials. Future RCTs should measure substantive drug use, economic and health outcomes, use a sufficiently large sample size to show clinically important differences in these outcomes, and be reported according to CONSORT guidelines (www.consort-statement.org). If a cluster randomised design is used, trials should be designed and analysed taking clustering into account.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Biglan 2000

Methods	RCT, cluster randomised by community. Clusters pair matched on socioeconomic status and population. Randomisation: toss of coin Blinding: not stated, assumed none. Analysis in randomised groups: yes Follow-up period: 4 years Exclusions and losses: intervention group 2 years 14%, 4 years 23%. control group 2 years 14%, 4 years 21%
Participants	Communities population 1700-13500 in Oregon USA. 7th and 9th Grade students. 16 communities recruited, 4438 students.
Interventions	Experimental group: Community Program (CP) plus school-based PATH curriculum. Funded community coordinator (full time for 1 year, 0.75 for 2 years). Implemented Media advocacy module, Youth anti-tobacco module, Family communication module and ACCESS module (designed to stop stores selling tobacco to minors). See Description of Studies for more details. Comparison group: School based PATH curriculum only. Numbers randomised to each group not given.
Outcomes	Cannabis use.
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Catalano 1997

Methods	RCT; individually randomised. Randomisation: not stated Blinding: not stated, assumed none Analysis in randomised groups: yes Follow-up period: 2 years 98/144 (68%) followed up at 2 years.
Participants	Setting: methadone clinic in Seattle, USA. 144 parents in methadone clinic, treated for >90 days, children aged 3-14, residing within 25 miles of clinic

Catalano 1997 (*Continued*)

Interventions	Experimental group: Focus on families. 53 hours of training in groups of 6-10 families. 1x5 hour "retreat", 32x90 minute meetings twice weekly. Delivered to families (12 sessions) or parents (20 sessions); 6-10 families per group. Content: parental skills training. Home based case management for 9 months; 1xhome visit and 2xphone calls per week. 82 parents/97 children. Comparison group: no intervention. 62 parents/81 children.
Outcomes	Marijuana use in last month (self report); criminal activity (stealing)
Notes	Results differ slightly between the publications. Analyses stated to include all participants randomised.

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Dembo 2000

Methods	RCT; individually randomised. Randomisation: methods not stated. Blinding: not stated, assumed none. Analysis in randomised groups: yes Follow-up period: 1 year Exclusions and losses: 31/194 (16%)
Participants	Setting: juvenile assessment centre, Florida, USA. Arrested youths processed at Hillsborough County Juvenile Assesement Center. Number recruited: 194
Interventions	Experimental group: Family Empowerment Intervention. Home visits to youth and family from study field consultants (not trained therapists). Duration of intervention and number of visits not stated. Content: parenting and family functioning education. Comparison group: Extended Services Intervention. monthly telephone contact from study research assistant
Outcomes	Drug use, self report and biochemically validated; criminal activity
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Flay 2004

Methods	RCT; cluster randomised. Randomisation: no information. Blinding: not mentioned, assumed none. Analysis in randomised groups: yes Follow-up period: 3.5 years (approx) Exclusions and losses: not stated
Participants	Setting: schools in Chicago, USA Schools with enrolment > 500, >80% black and <10% Hispanic students, not on probation or reorganising, not special school. 12 schools recruited. Number of students recruited not stated
Interventions	Experimental group: School/ Community intervention (SCI): Social Development Curriculum (SDC, see below) plus parental support, school climate and community components, conducted by a school task force. Control group: SDC only. 16-21 lessons in grades 5-8, skills training. Control (no intervention) arm also randomised; not included in review
Outcomes	Drug use (self report, scale)
Notes	

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Lindenberg 2002

Methods	RCT; individually randomised. Randomisation: "by lottery", no further information Blinding: not stated, assumed none. Analysis in randomised groups: yes Follow-up period: 3 months. 6/56 (11%) lost to follow-up
Participants	Setting: local Red Cross classrooms in Georgia, USA. 56 low income Mexican-American women aged 15-24 years.
Interventions	Experimental group: Risk and resiliency workshops, 5 sessions over 2.5 weeks, with facilitator. Content: Risks involved in alcohol, tobacco, drug use and risky sexual behaviour; promotion of seven habits of effective people. 29 participants. Comparison group: health education. Printed leaflets in Spanish on substance use, pregnancy and HI/ AIDS sent once a week for 5 weeks
Outcomes	Substance use (self report)
Notes	

Lindenberg 2002 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Lochman 2002

Methods	RCT; individually randomised. Randomisation: not stated Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: post-intervention Outcomes recorded for 203/245 (83%).
Participants	Setting; 17 schools in Alabama, USA. 245 fifth grade students rated by their teachers as high risk
Interventions	Experimental group: Coping Power. Child programme: 34 group sessions (40-50 mins) over 16 months, 5-8 children and 2 facilitators. Also individual 30 minute session every 2 months. Parent component: 16 sessions over 16 months, 12+ parents per group plus 2 co-leaders (40-50 minutes). Content: Child component: social skills, coping skills and refusal skills. Parent component: parenting skills. 120 children randomised. Comparison group: No intervention. 125 children randomised.
Outcomes	Marijuana use in last month (self-report)
Notes	Children in this study were also randomised by classroom to a universal school based prevention programme (Coping with the Middle School Transitions), or control. Results for this RCT were also included in the published paper

Risk of bias		
Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

McCambridge 2004

Methods	RCT; cluster randomised by recruiter. Randomisation: allocations randomly drawn by researcher not involved in study. Concealed until point of intervention delivery. Blinding: none except partially blinded outcome assessment. Analysis in randomised groups: yes. Follow-up period: 3 months. 172/200 (90%) followed up at 3 months.
Participants	Setting: further education colleges in London, UK. 200 participants in 32 clusters
Interventions	Experimental group: single session motivational interview, duration 60 minutes, delivered by researcher. 105 participants/ 16 clusters. Comparison group: no intervention. 95 participants/ 16 clusters
Outcomes	Drug use self-report (cannabis, stimulants, non-stimulant drugs); selling drugs; frequency of cannabis use
Notes	

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Yes	A - Adequate

McGillicuddy 2001

Methods	RCT; probably cluster randomised. Randomisation: participants elected to join groups scheduled to meet at two different times of the week. When roster for a time period was full, it was randomly allocated by flipping a coin. Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 8 weeks. Losses to follow-up: none.
Participants	Setting: Homes. 22 parents/guardians of child 12-21 who is substance user not receiving treatment
Interventions	Experimental group: parental skills training. 8 weekly 2-hour group sessions. Content: coping skills. 14 families. Comparison group: delayed intervention (wait list). Intervention given after 8 weeks. 8 families
Outcomes	Children's marijuana use (parent's report)
Notes	Information from authors suggests that randomisation was by group

Risk of bias

McGillicuddy 2001 (*Continued*)

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Oliansky 1997

Methods	RCT; individually randomised Randomisation: not stated. Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 3 months Exclusions and losses: 8/33 (24%) lost at 3 months.
Participants	Setting: primary care clinics. 33 adolescents at risk of substance use. Screened using Substance Use Screening Instrument (SUSI). Scores of 6-25, or 1-5 plus regular substance use by someone in their house, were eligible. Scores <6 considered not at risk, >25 considered to have problem
Interventions	Experimental group: brief intervention delivered by nurse, primarily educational about harmful effects of substance use. Comparison group: no intervention.
Outcomes	SUSI change score
Notes	Report includes data from 3 clinics; only clinic B included in review. Clinics A and C recruited adults (aged 18-55)

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Palinkas 1996

Methods	RCT; individually randomised. Randomisation: not stated. Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 3 months. Outcomes reported for 229/296 (77%) participants.
Participants	Setting: San Diego, USA. 296 females aged 14-19, English speaking living near San Diego, at risk of drug use

Palinkas 1996 (*Continued*)

Interventions	Experimental group: Positive Adolescent Life Skills (PALS). 16 weekly sessions of 90 minutes. Groups of 8-12. Content: Cognitive and behavioural training to improve social skills, modelling by skilled adults and peers, practising of skills. 144 randomised. Comparison group: no skills training. 152 randomised.
Outcomes	Drug use (self-report); marijuana, other illicit drugs, all drugs
Notes	All participants also received Facts of Life curriculum.

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Perry 2003

Methods	RCT; cluster randomised by school. Randomisation: not stated. Blinding: not stated, assumed no blinding. Analysis in randomised groups: yes Follow-up period: 18 months.
Participants	Setting: schools in Minnesota, USA. Schools with >200 7th grade students. 24 schools and 6237 students included.
Interventions	Experimental group: DARE plus. DARE (see below) plus 4 session classroom per-led program, plus extracurricular activities and neighbourhood action teams, organised by community organisers hired by research study. 8 schools, 2221 participants. Comparison group: DARE. 10 sessions in school delivered by police officers. 8 schools, 2226 participants
Outcomes	Marijuana use, self-report; multiple drug use, self-report.
Notes	Also randomisation to no-treatment control group (not included in review); 1790 randomised. Loss to follow-up was 16% of those included at baseline. Other students included in analyses; 7261 students contributed to the published analysis

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Schinke 2000

Methods	RCT; cluster randomised by school. Randomisation: not stated. Blinding: not stated, assumed no blinding. Analysis in randomised groups: yes. Follow-up period: 42 months. Overall attrition up to 42 months including all 3 randomised arms was 14.1% (197/1396)
Participants	27 schools in Native American reservations in USA (N. Dakota, S. Dakota, Idaho, Montana, Oklahoma) . 1396 3rd to 5th grade native American students
Interventions	Experimental group: school plus community intervention. School intervention (see below) plus media, posters information meetings for parents, neighbours and teachers. Number of schools not stated; 456 participants. Comparison group: school intervention only. 15x50 minute weekly sessions delivered by group leaders and older peers. Number of schools not stated; 465 participants. Control (no intervention) arm also randomised; not included in review
Outcomes	Marijuana use self-report (4 or more instances in past week). Biochemically validated marijuana use collected from a sample of participants only
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Spoth 1999

Methods	RCT; cluster randomised by school. Randomisation: "randomly allocated"; no further information. Blinding: not stated, assumed no blinding. ITT analysis: yes. Follow-up period: 6 years. Follow-up rates: 4 years 67% (447/667), 6 years 68%(451/667)
Participants	33 schools in Iowa, USA. 667 families with 6th or 7th grade student. School eligibility: community of 8,500 people or fewer, proportion of children eligible for free or subsidised school lunches exceeded statewide average
Interventions	Experimental group 1; Preparing for the Drug-Free Years (PDFY). 1x2-hour session per week for 5 weeks. 1 session child plus parents, 4 sessions parents only. Group size approx 10 families (16 people) plus 2 leaders. Content: Substance abuse education, parenting skills, peer resistance skills (for children)11 schools, 221 participants. Experimental group 2; Iowa Strengthening Families Program (ISFP). 1x2-hour session per week for 7 weeks. 1st hour parents and children separately, 2nd hour together. Group

Spoth 1999 (*Continued*)

	size 3-15 families, average 20 people plus 3 leaders. Parenting skills and (for children) peer resistance and per relationship training. 11 schools, 238 participants. Comparison Group: no intervention. 11 schools, 208 participants
Outcomes	Marijuana use (self report).
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Spoth 2002

Methods	RCT; cluster randomised by school. Randomisation: "randomly assigned"; no further information. Blinding: not stated, assumed no blinding. Analysis in randomised groups: yes. Follow-up period: not stated. Attrition from included groups was 18.3% (214/1170).
Participants	36 rural schools in a mid western state (USA), 1664 7th grade students. 20% or more of households in the school district within 185% of federal poverty level, school district enrollment < 1200, grades 6-8 taught at one location
Interventions	Experimental group: Strengthening Families Program 10-14 (SFP), plus LST (see below). SFP: 1x2-hour session per week for 7 weeks. 1st hour parents and children separately, 2nd hour families together. Average 6 families per group, with facilitators. Four booster sessions in 8th grade year. Parenting skills and (for children) peer resistance and peer relationship training. 12 schools, 549 participants. Comparison group: Life Skills Training (LST). 15 lesson classroom programme. 12 schools, 621 participants. Control (no intervention) arm also randomised; not included in review
Outcomes	Cannabis use; cannabis initiation.
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Wolchik 2002

Methods	RCT; individually randomised. Randomisation: computer random number function. Randomised in blocks of 3, one to each intervention, so allocation always known in advance of randomisation for third family in block. Blinding: Not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 6 years. Outcomes reported at 6 years for 218/240 participants (91%).
Participants	240 children aged 9-12 with resident female parent; divorce decree within previous 2 years; mother had no partner; no psychological problems
Interventions	Experimental group 1: Mother Plus Child Program. 11 group sessions of 1.75 hours. Groups led by clinicians. Size of groups not stated. Content: Effective coping, reducing negative thoughts about divorce stressors, improving mother-child relationship quality. Experimental group 2: Mother Program. 11 group sessions of 1.75 hours plus 2 individual 1-hour sessions. Groups led by clinicians. Size of groups not stated. Content: Improving mother-child relationship quality and effective discipline, increasing father's access to child and reducing inter parental conflict. Comparison group: Self-study. Mothers and children received 3 books, at 3-week intervals
Outcomes	Drug dependence; cannabis use (self report); other drug use (self report); polydrug use (self report)
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Wu 2002

Methods	RCT; cluster randomised by village. Randomisation: not stated. Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 17 months. Exclusions and losses: unclear
Participants	38 villages in Yunnan, China.
Interventions	Experimental group: multidimensional community intervention, including community, clinic, family and school education elements. 19 villages. Comparison group: no intervention. 19 villages.
Outcomes	Initiation of drug use.
Notes	Text of paper suggests that intervention and control villages may have been in geographically different locations. Outcomes reported for males aged 15 to 29.

Wu 2002 (*Continued*)

Risk of bias		
Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Wu 2003

Methods	RCT; cluster randomised by recruitment site. Randomisation: random number table, no further information. Blinding: not stated, assumed none. Analysis in randomised groups: yes. Follow-up period: 12 months. Exclusions and losses: 237/817 (29%)
Participants	Setting: community, Baltimore, USA. 35 clusters, 817 youths randomised.
Interventions	Experimenetal group: Focus on Kids (FoK) plus Informed Parents and Children Together (ImPACT): FoK, see below. ImPACT: 20 minute video plus two instructor-led vignettes, delivered in homes. 496 participants, number of clusters not stated. Comparison group: FoK only. 8 sessions of education/games/videos, groups of 5-10 with older leader and assistant. Content: Decision making, goal setting, communication, negotiating skills and information about safe sex, alcohol and drugs. 321 participants, number of clusters not stated
Outcomes	Cannabis use self-report; crack/cocaine use self report; drug selling
Notes	Outcomes reported for 580/817 participants at 12 months (71%)

Risk of bias		
Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

PATH = Programs To Advance Teen Health

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Bernstein 1987	RCT, individually randomised. Reason for exclusion: no drug use outcomes reported.
Brody 2004	RCT, cluster randomised by county. Reason for exclusion: no drug use or other relevant outcomes
Bryson 1999	RCT, individually randomised. Computer-based skills training versus no intervention. Reason for exclusion: school-based intervention delivered by teacher
Cheadle 2001	RCT, cluster randomised by neighbourhood. Reason for exclusion: no relevant outcome data reported. Investigator reports that drug use outcomes were recorded but have not been published
Corbin 1993	RCT. Reason for exclusion: school-based intervention.
Corby 1997	RCT, individually randomised. Reason for exclusion: no drug use or other substantive outcome measures
CPPRG 2002	RCT, cluster randomised by school. Reason for exclusion: no drug use or other relevant outcomes
Dishion 1995	RCT, families randomised. Reason for exclusion: no drug use or other relevant outcome data
Dishion 2002	RCT Reason for exclusion: Not eligible comparison (school+non-school versus control)
Fishbein 2002	RCT, cluster randomised by class. Reason for exclusion: no drug use or other substantive outcomes
Furr-Holden 2004	RCT Reason for exclusion: two school-based interventions
Hecht 1993	RCT Reason for exclusion: school-based intervention
Hostetler 1997	RCT Reason for exclusion: not eligible comparison (school+non-school versus control)
Kipke 1993	RCT: Intervention aimed at HIV risk reduction, included elements targeting drug use. Reason for exclusion: no drug use or other substantive outcomes reported
Kosterman 1997	RCT: Families randomised (individual randomisation of adolescents) Reason for exclusion: no drug use or other relevant outcomes

(*Continued*)

Kumpfer 2002	RCT; randomisation by classroom. Reason for exclusion: no drug use or other relevant outcomes
Marcello 1989	RCT Reason for exclusion: not eligible intervention (concerned with preventing performance-enhancing drug use by athletes)
Miller-Heyl 1998	RCT, families randomised. Reason for exclusion: no drug use or other relevant outcomes
Morris 2002	RCT Reason for exclusion: not eligible comparison (school+non-school versus control)
Morris 2003	RCT Reason for exclusion: not eligible intervention (not intended to prevent drug use; intended to get parents off welfare and into employment)
Pantin 2003	RCT, families randomised. Reason for exclusion: no drug use or other relevant outcomes
Pedro-Carroll 1985	RCT, individually randomised. Children of Divorce Intervention Program versus wait-list control. Reason for exclusion: school-based intervention.
Pentz 1989	RCT Reason for exclusion: not eligible comparison (school+non-school versus control)
Polansky 1999	RCT, individually randomised. Reason for exclusion: no drug use or other relevant outcomes
Prinz 2000	RCT Reason for exclusion: not eligible comparison (school+non-school versus control)
Santisteban 2003	RCT: brief strategic family therapy verus control. Participants were adolescents with behavioural problems, self-referred or referred by school counsellor. Reason for exclusion: treatment intervention.
Schinke 2004	RCT, cluster randomised by recruitment site. Reason for exclusion: no drug use or other relevant outcomes
Stolberg 1985	RCT, individually randomised. Reason for exclusion: school-based intervention.
Szapocznik 1989	RCT, families randomised (Solomon four group design) Reason for exclusion: no drug use of other relevant outcomes
Wagner 2000	RCT, cluster randomised by community. Reason for exclusion: not eligible intervention, methodology

(*Continued*)

Weiss 1998	Report includes data from only one site, where intervention was delivered in school. Further report of this study including data from other sites (Smith & Kennedy) awaiting assessment
Wolchik 1993	RCT, individually randomised. Reason for exclusion: no drug use or other relevant outcome measures

DATA AND ANALYSES

This review has no analyses.

ADDITIONAL TABLES

Table 1. Results of studies of education and skills training interventions

Study	Design	Comparison	Outcome	Source	Method of analysis	Published results
Palinkas 1996	Individually randomised	PALS vs no intervention	Cannabis use	Published analysis	Logistic regression:adjusted odds ratios reported	OR 0.7 (95% CI 0.4 to 1.4) . N.B. OR reported in paper with groups reversed
			Other illicit drug use	Published analysis	Logistic regression:adjusted odds ratios reported	OR 1.3 (95% 0.6 to 2.5). N.B. OR reported in paper with groups reversed
			Cannabis use at 3 months (self-report)	Published data	Calculated RR	PALS 34/107. No intervention 39/122. RR 0.99 (95% CI 0.68 to 1.45)
			Other illicit drugs use at 3 months (self-report)	Published data	Published data	PALS 17/107. No intervention 22/122. RR 0.88 (95% 0.49 to 1. 57)

Table 2. Results of studies of family iterventions

Study	Design	Comparison	Outcome	Source	Method of analysis	Published result
Dembo 2002	Individually randomised	Family Empowerment Intervention vs minimal contact	Cannabis use	Published analysis	Unclear	P (one-tailed)>0. 10
			Cocaine use (hair test)	Published analysis	Unclear	P (one-tailed)>0. 10

Table 2. Results of studies of family iterventions (*Continued*)

			Frequency of cannabis use	Published analysis	Multiple regression	P (one-tailed)<0.5,>0.01
			General theft offences	Published analysis	Multiple regression	P (one-tailed)>0.10
			Crimes against persons	Published analysis	Multiple regression	P (one-tailed)>0.10
			Index crimes	Published analysis	Multiple regression	P (one-tailed)>0.10
			Drug sales	Published analysis	Multiple regression	P (one-tailed)<0.5,>0.01
Catalano 1997	Individually randomised	Focus on Families vs no intervention	Cannabis use in last month (self-report at 24 months)	Published analysis	Analysis of covariance/ logisti regression	7% vs 16%, p<0.10
			Stole in last 6 months (self-report at 24 months)	Published analysis	Analysis of covariance/ logisti regression	23% vs 30%, p<0.10
Lochman 2002	Individually randomised	Coping Power vs no Intervention	Substance use (alcohol, tobacco, cannabis)	Published analysis	Repeated measures ANOVA	No result presented for indicated intervention vs control
McGillicuddy 2001	Cluster randomised	Parental skills training v delayed intervention	Cannabis use (days used during 50 day period)	Published analysis	Analysis of covariance	Effect size (eta-squared) = 0.08
			Cannabis use in previous 50 days at 8 weeks (parent report)	Author	Calculated RR	Parental skills training 10/14Delayed intervention 7/8RR 0.82 (0.54, 1.25)
Spoth 1999	Cluster randomised	ISFP v no intervention	Cannabis use	Published analysis	Growth curve analysis (SAS PROC MIXED)	Significant time x treatment group interaction (p < 0.01) : favours ISFP
			Cannabis use in past year	Published analysis	Z test	No significant difference

Table 2. Results of studies of family iterventions (*Continued*)

			Cannabis lifetime use at 1. 5 years	Author	Calculated RR	ISFP 4/ 160No intervention 3/156 RR 1. 30 (95% CI 0.30 to 5.71)
			Cannabis lifetime use at 2. 5 years	Author	Calculated RR	ISFP 4/ 152No intervention 8/141 RR 0. 46 (95% CI 0.14 to 1.51)
			Cannabis lifetime use at 4 years	Author	Calculated RR	ISFP 13/151No intervention 25/ 151 Adjusted RR 0. 50 (95% CI 0.24 to1.05)
			Cannabis lifetime use at 6 years	Author	Calculated RR	ISFP 22/148No intervention 43/ 156 Adjusted RR 0. 55 (95% Ci 0.32 to 0.95)
			Inhalants and other drugs lifetime use at 4 years	Author	Calculated RR	ISFP 8/ 151No intervention 11/151 RR 0.73 (95% CI 0. 30 to 1.76)
			Inhalants and other drugs lifetime use at 6 years	Author	Calculated RR	ISFP: 7/ 148No intervention: 16/156 RR 0.46 (95% CI 0. 20 to 1.09)
			Cannabis use in past year at 1.5 years	Author	Calculated RR	ISFP 1/ 160No intervention 2/156 RR 0. 49 (95% CI 0.04 to 5.32)
			Cannabis use in past year at 2.5 years	Author	Calculated RR	ISFP 1/ 152No intervention 5/141RR 0. 19 (95% CI 0.02 to 1.57)

Table 2. Results of studies of family iterventions (*Continued*)

			Cannabis use in past year at 4 years	Author	Calculated RR	ISFP 8/151No intervention 18/151Adjusted RR 0.48 (95% CI 0.19 to 1.22)
			Cannabis use in past year at 4 years	Author	Calculated RR	ISFP 8/151No intervention 18/151Adjusted RR 0.48 (95% CI 0.19 to 1.22)
			Cannabis use in past year at 6 years	Author	Calculated RR	ISFP 11/148No intervention 27/156Adjusted RR 0.44 (95% CI 0.20 to 0.96)
			Other illegal drugs use in past year at 4 years	Author	Calculated RR	ISFP: 3/151No intervention: 3/151 RR 1.00 (95% CI 0.21 to 4.88)
			Other illegal drugs in past year at 6 years	Author	Calculated RR	ISFP: 1/148No intervention: 9/156 Adjusted RR 0.16 (95% CI 0.02 to 1.26)
		PDFY v no intervention	Cannabis use	Published analysis	Growth curve analysis (SAS PROC MIXED)	Significant time x treatment group interaction ($p < 0.01$) : favours PDFY
			Cannabis use in past year	Published analysis	Z test	No significant difference
			Cannabis lifetime use at 1.5 years	Author	Calculated RR	PDFY: 3/155No intervention: 3/156 RR 1.01 (95% CI 0.21 to 4.91)
			Cannabis lifetime use at 2.5 years	Author	Calculated RR	PDFY 6/145No interven-

Table 2. Results of studies of family iterventions (*Continued*)

						tion: 8/141RR 0. 73 (95% CI 0.26 to 2.05)
			Cannabis lifetime use at 4 years	Author	Calculated RR	PDFY 15/ 143No intervention 25/151 Adjusted RR 0.62 (95% CI 0.31 to 1.25)
			Cannabis lifetime use at 6 years	Author	Calculated RR	PDFY 30/ 147No intervention 43/156 Adjusted RR 0.75 (95% CI 0.47 to 1.21)
			Inhalants and other drugs lifetime use at 1. 5 years	Author	Calculated RR	PDFY 16/ 153No intervention 6/155 Adjusted RR 3.11 (95% CI 1.03 to 9.35)
			Inhalants and other drugs lifetime use at 2. 5 years	Author	Calculated RR	PDFY 17/ 145No intervention 10/140 Adjusted RR 1.70 (95% CI 0.70 to 4.14)
			Inhalants and other drugs lifetime use at 4 years	Author	Calculated RR	PDFY 19/ 143No intervention 11/151 Adjusted RR 1.88 (95% CI 0.82 to 4.31)
			Inhalants and other drugs lifetime use at 6 years	Author	Calculated RR	PDFY 17/ 145No intervention 16/156 Adjusted RR 1.10 (95% CI 0.52 to 2.35)
			Cannabis use in past year at 1.5 years	Author	Calculated RR	PDFY: 3/155No intervention: 2/156 RR

Table 2. Results of studies of family iterventions (*Continued*)

						1.51 (95% CI 0. 26 to 8.91)
			Cannabis use in past year at 2.5 years	Author	Calculated RR	PDFY 5/ 145No intervention: 5/141 RR 0.97 (95% CI 0. 29 to 3.29)
			Cannabis use in past year at 4 years	Author	Calculated RR	PDFY 13/ 143No intervention 18/151 Adjusted RR 0.75 (95% CI 0.33 to 1.67)
			Cannabis use in past year at 6 years	Author	Calculated RR	PDFY 21/ 147No intervention 27/156 Adjusted RR 0.75 (95% CI 0.40 to 1.39)
			Other illegal drugs use in past year at 4 years	Author	Calculated RR	PDFY 3/ 143No intervention 3/151RR 1. 06 (95% CI 0.22 to 5.15)
			Other illegal drugs in past year at 6 years	Author	Calculated RR	PDFY 4/ 145No intervention 9/156 RR 0. 48 (95% CI 0.15 to 1.52)
Spoth 2002	Cluster randomised	SFP10-14 + LST v LST only	Cannabis initiation	Published analysis	Multilevel analysis of covariance	F(1,21) = 0.01, no significant difference
			Cannabis initiation at follow-up (time not specified)	Published data	Calculated RR	SFP10-14 + LST: 19/ 453LST only: 22/503 Adjusted RR 0.95 (95% CI 0.41 to 2.20)
Wolchik 2002	Individually randomised	Mother and Child Program v control	Drug dependence or abuse symptom count	Published analysis	Analysis of covariance	P = 0.39

Table 2. Results of studies of family iterventions (*Continued*)

			Polydrug use (no of drugs used in past year)	Published analysis	Analysis of covariance	P = 0.44
		Mother program v control	Drug dependence or abuse symptom count	Published analysis	Analysis of covariance	P = 0.85
			Polydrug use (no of drugs used in past year)	Published analysis	Analysis of covariance	P = 0.90
		Mother and Child Program v control	Diagnosis of drug dependence or abuse at 6 years	Published data	Calculated RR	MPCP: 3/73Control: 2/68 RR 1.40 (95% CI 0.24 to 8.11)
			Cannabis use (any use, self report) at 6 years	Author	Calculated RR	MCPC: 22/68Control: 23/65 RR: 0.91 (95% CI 0.57 to 1.47)
		Mother program v control	Diagnosis of drug dependence or abuse at 6 years	Published data	Calculated RR	MP: 4/77Control 2/68 RR 1.77 (95% CI 0.33 to 9.34)
			Cannabis use (any use, self report) at 6 years	Author	Calculated RR	MP: 30/75Control: 23/65 RR: 1.13 (95% CI 0.74 to 1.74)
Wu 2003	Cluster randomised	FOK + ImpACT v FoK	Used cannabis at 12 months	Published analysis	Analysis of covariance	FOK significantly lower (p = 0.04)
			Used crack/cocaine at 12 months	Published analysis	Analysis of covariance	No significant difference (p value not given)
			Sold drug at 12 months	Published analysis	Analysis of covariance	No significant difference (p value not given)
			Used cannabis at 6 months	Author	Calculated RR	FOK+ImPACT: 64/344FOK: 56/239 RR 0.79

Table 2. Results of studies of family iterventions (*Continued*)

						(95% CI 0.58 to 1.09)
			Used crack/cocaine at 6 months	Author	Calculated RR	FOK+ImPACT: 6/344FOK: 4/239 RR 1.04 (95% CI 0.30 to 3.65)
			Sold drug at 6 months	Author	Calculated RR	FOK+ImPACT: 14/344FOK: 10/239 RR 0.97 (95% CI 0.44 to 2.15)
			Used crack/cocaine at 12 months	Author	Calculated RR	FOK+ImPACT: 9/362FOK: 6/241 RR 1.00 (95% CI 0.36 to 2.77)
			Sold drug at 12 months	Author	Calculated RR	FOK+ImPACT: 20/362FOK: 14/241 RR 0.95 (95% CI 0.49 to 1.85)

Table 3. Results of studies of multi-component community interventions

Study	Design	Comparison	Outcome	Method of analysis	Source	Result
Bilgan 2000	Cluster	Community program v school-based programme	Cannabis use (self-report)	Random coefficients analysis for nested cross sectional design	Published analysis	p = 0.043 (community programme better)

Table 3. Results of studies of multi-component community interventions (*Continued*)

Flay 2004	Cluster	SCI v SDC	Substance use (proportion saying yes to any of four items)	Hierarchical models (generalised estimating equations); relative reduction and p-value presented	Published analysis	Boys: relative reduction 4%, p = 0.89 Girls relative reduction not given, p = 0.37
			Substance use at 3.5 years approx (proportion saying yes to any of four items)	Calculated RR	Published data	Boys and girls combined: SCI 237/366SDC 303/417 Adjusted RR = 0.89 (95% CI 0.75 to 1.05)
Perry 2003	Cluster	DARE plus v DARE	Cannabis use at 18 months (approx); 6 item scale range 6-26.	Hierarchical linear model (growth curve analysis)	Published analysis	Boys, p=0.20 Girls p=0.16.
			Multiple drug behaviour at 18 months (approx) : 21 item scale range 21-102	Hierarchical linear model (growth curve analysis)	Published analysis	Boys p=0.16 Girls p=0.20.
Schinke 2000	Cluster	Skills + community v skills	Cannabis use (4 or more instances in previous week) ; 42 month follow-up	ANOVA with Scheffe post hoc comparisons	Published analysis	No significant difference (p>0.01)
			Cannabis use at 18 months (4 or more instances in previous week, self-report)	Calculated RR	Author/ published data	Skills + community 24/432Skills only24/443 Adjusted RR 1.01 (95% CI 0.47 to 2.21)
			Cannabis use at 30 months (4 or more instances in previous week, self-report)	Calculated RR	Author/ published data	Skills + community 25/411Skills only 21/423 Adjusted RR 1.33 (95% CI 0.59 to 2.95)

Table 3. Results of studies of multi-component community interventions (*Continued*)

			Cannabis use at 42 months (4 or more instances in previous week, self-report)	Calculated RR	Author/ published data	Skills + community 40/390Skills only 28/399 Adjusted RR 1.44 (95% CI 0.75 to 2.77)
Wu 2002	Cluster randomised	Community intervention v no intervention	New male drug users at 17 months	Ratio of change in incidence between baseline and follow-up periods in intervention and control groups (95% CI)	Published analysis	Age 15-19: ratio 152, 95% CI (58, 429) Age 20-29 ratio 0.9 95% CI (0.7, 1.2)
			New male drug users aged 15-29 at 17 months	Calculated RR	Published data	Intervention: 7/292Control 5/261 RR 1. 25 (95% CI 0.40 to 3.88)

APPENDICES

Appendix 1. CENTRAL search strategy

1. SUBSTANCE-RELATED-DISORDERS*:ME
2 . (drug near abuse):ti
3. (substance near abuse):ab
4. #1 or #2 or #3
5. ADOLESCENT:ME
6. Adolescent
7. young people
8.teen*
9. youth
10. child*
11. early adult*
12. STUDENTS:ME
13. #6 or #7 or #8 or #9 or #10 or #11 or #12
14. #4 and #13

Appendix 2. MEDLINE search strategy

1. exp substance-related disorders/
2. (drug or substance) adj (abuse$ or use$ or misuse or depend$ or addict$).tw
3. 1 or 2
4. adolescen$.tw
5. teen$.tw
6. youth$.tw
7. early adult.tw
8. child$.tw
9. student$.tw
10. young people.tw
11. 4 or 5 or 6 or 7 or 8 or 9 or 10
12. 3 and 11

combined with the phases 1 & 2 of the Cochrane Highly Sensitive Search Strategy for the identification of RCTs as published in Appendix 5b2, Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2005):

13. randomized controlled trial.pt.
14. randomized controlled trials/
15. controlled clinical trial.pt.
16. random allocation/
17. double blind method/
18. single blind method/
19. 13 or 14 or 15 or 16 or 17 or 18
20. clinical trial.pt.
21. exp clinical trials/
22. (clin$ adj trial$).ab,ti.
23. ((singl$ or doubl$ or trebl$ or tripl$) adj (blind$ or mask$)).ab,ti
24. exp PLACEBOS/
25. placebo$.ab,ti
26. random$.ab,ti
27. exp Research Design/
28. 20 or 21 or 22 or 23 or 24 or 24 or 26 or 27
29. 19 or 28
30. 12 and 29
31. limit 30 to human

Appendix 3. EMBASE and PsycInfo search strategy

1. exp drug abuse/
2. exp Substance abuse/
3. (drug or substance) adj (abuse$ or use$ or misuse or depend$ or addict$).tw
4. 1 or 2 or 3
5. adolescent/ or adolescen$.tw
6. teen$.tw
7. exp juvenile/
8. early adult.tw
9. child/ or child$.tw
10. exp student/ or student$.tw
11. young people.tw
12. 5 or 6 or 7 or 8 or 9 or 10 or 11
13. random$.ab,ti
14. placebo.ab,ti
15. (singl$ or doubl$ or trebl$ or tripl$) and (blind$ or mask$)).mp

16. (cross-over$ or crossover$).tw
17. randomized controlled trial/
18. phase-2-clinical-trial/
19. phase-3-clinical-trial/
20. double blind procedure/
21. single blind procedure/
22. crossover procedure/
23. Latin square design/
24. exp PLACEBOS/
25. multicenter study/
26. 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25
27. 4 and 12
28. 27 and 26
29. limit 28 to human

Appendix 4. CINAHL search strategy

1. exp substance-related disorders/
2. (drug or substance) adj (abuse$ or use$ or misuse or depend$ or addict$).tw
3. 1 or 2
4. adolescen$.tw
5. teen$.tw
6. exp juvenile/
7. early adult.tw
8. young adult.tw
9. child/ or child$.tw
10. student/
11. student$.tw
12. young people.tw
13. 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12
14. 3 and 13
15. randomi$.tw.
16. clini$.tw.
17. trial$.tw.
18. (clin$ adj2 trial$).tw.
19. (singl$ or doubl$ or tripl$ or trebl$).mp. and (mask$ or blind$).mp
20. crossover.tw.
21. random$.tw.
22. allocate$.tw.
23. assign$.tw.
24. (random$ adj2 (allocate$ or assign$)).tw.
25. exp Random Assignment/
26. 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25
27. 14 and 26

Appendix 5. ASSIA search strategy

1. exp drug abuse
2. exp substance abuse
3. exp drug addiction
4. (drug or substance) adj (abuse* or use* or misuse or depend* or addict*)
5. 1 or 2 or 3 or 4
6. adolescen*
7. teen*
8. youth*
9. early adult
10. young adult
11. child*
12. student*
13. young people
14. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
15. exp randomized controlled trials
16.5 and 14 and 15

Appendix 6. SIGLE search strategy

1. drug or substance
2. abuse or use or misuse or depend* or addict*
3. 1 and 2
4. adolescen*
5. teen*
6. youth*
7. early adult
8. young adult
9. child*
10. student*
11. young people
12. 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
13. random* or (random* and (allocat* or assign*)
14. RCT or controlled trial
15. cluster randomi* or (cluster and trial) or (community and trial) or community intervention trial
16. clinical trial or evaluat*
17. 13 or 14 or 15 or 16
18. 3 and 12 and 17

WHAT'S NEW

Last assessed as up-to-date: 1 November 2005.

Date	Event	Description
25 March 2008	Amended	Converted to new review format.

HISTORY

Protocol first published: Issue 4, 2004

Review first published: Issue 1, 2006

Date	Event	Description
2 November 2005	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

All authors contributed to writing the protocol. Simon Gates conducted searches, assessed studies for eligibility, extracted data and drafted the review. Jim McCambridge assessed studies for eligibility, extracted data and contributed to writing the review. Lesley Smith assessed studies for eligibility, resolved disagreements about inclusion, extracted data and contributed to writing the review. David Foxcroft resolved disagreements about inclusion, extracted data and contributed to writing the review.

DECLARATIONS OF INTEREST

Jim McCambridge is an author of one trial included in this review.

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- EDAP Project (Evidence for Drugs and Alcohol Policy) sponsored by the European Community- Directorate Public Health (Grant Agreement SPC.2002454), Not specified.

INDEX TERMS

Medical Subject Headings (MeSH)

*Counseling; Program Evaluation; Randomized Controlled Trials as Topic; Schools; Substance-Related Disorders [*prevention & control]

MeSH check words

Adolescent; Adult; Humans