

Parenting programmes for preventing tobacco, alcohol or drugs misuse in children <18: a systematic review

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Abstract

We conducted a systematic review of controlled studies of parenting programmes to prevent tobacco, alcohol or drug abuse in children <18. We searched Cochrane Central Register of Controlled Trials, specialized Register of Cochrane Drugs and Alcohol Group, Pub Med, psych INFO, CINALH and SIGLE. Two reviewers independently screened studies, extracted data and assessed study quality. Data were collected on actual or intended use of tobacco, alcohol or drugs by child, and associated risk or antecedent behaviours. Due to heterogeneity we did not pool studies in a meta-analysis and instead present a narrative summary of the findings. Twenty studies met our inclusion criteria. Statistically significant self-reported reductions of alcohol use were found in six of 14 studies, of drugs in five of nine studies and tobacco in nine out of 13 studies. Three interventions reported increases of tobacco, drug and alcohol use. We concluded that parenting programmes can be effective in reducing or preventing substance use. The most effective appeared to be those that shared an emphasis on active parental involvement and

on developing skills in social competence, self-regulation and parenting. However, more work is needed to investigate further the change processes involved in such interventions and their long-term effectiveness.

Introduction

Tobacco, alcohol and drug use is a widespread and increasing problem among young people. Recent trends show a growth in heavy drinking with an associated increase of smoking and illegal drug use [1]. One in four deaths of European men aged 15–29 years is related to alcohol [2] and an UK survey found that 13% of 11- to 15-year olds smoke regularly [3] and 20% had used illegal drugs in the past year [4].

A number of systematic reviews and meta-analyses have shown parenting programmes to be effective in changing children's behaviour [5–7], reducing time in institutions for juvenile delinquents [8] and improving psychosocial health of mothers [9]. However, behavioural problems are not the only aspect of a child's health that is influenced by their family and home environment. Low parental supervision and monitoring has been found to be a strong predictor of smoking in girls and increased drinking and problem behaviour in boys [10, 11]. Expressions of parental disapproval have been demonstrated to be effective deterrents to children smoking [12].

Although we found several systematic reviews of substance use prevention among young people [13–15], none focused on interventions involving parents. A non-systematic overview of drug prevention programmes did, however, find promising

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effects from family-based interventions [16]. In order to clarify the situation, we conducted a systematic review to assess whether programmes designed to increase parenting skills can prevent tobacco, alcohol and drug misuse in children and teenagers.

Objectives

- (i) To assess the effectiveness of parenting programmes in preventing or reducing use, misuse or abuse of drug, alcohol or tobacco by children under the age of 18 years compared with no intervention or other interventions.

Methods

Inclusion criteria: types of studies

Randomized controlled trials (RCTs), controlled trials and controlled before/after (CBA) studies.

Inclusion criteria: participants

Parents with children <18 years of age. Studies were excluded if they were designed to manage children with established drug, alcohol or smoking habits or focused on parents who were receiving treatment for their own addictions to alcohol or drugs.

Inclusion criteria: intervention

There is ongoing debate as to whether education should be directed towards abstinence or harm reduction [17]. The terms ‘abuse’, ‘use’ and ‘misuse’ often have cultural and social differences in definition and therefore the scope of the review was not limited by imposing an arbitrary distinction between these terms. We relied upon the definitions provided in each identified study and included any parenting programme that aimed to prevent or reduce substance use among young people.

For the purpose of the review, we defined ‘parenting programmes’ as any intervention involving parents which was designed to develop

parenting skills, improve parent/child communication or enhance the effects of other interventions, e.g. classroom-based programmes. We included all types of learning medium, e.g. group discussion, distance learning by internet or post, video programme, individual coaching, etc. and any source of delivery, e.g. programmes provided by health visitors or school nurses, programmes run by charities or voluntary organizations, etc. Interventions where there was minimal contact with parents (e.g. leaflets only) were not considered to constitute a ‘programme’ and were therefore excluded.

The comparisons of interest were

- (i) parenting programme versus no programme and
- (ii) parenting programme versus other type of intervention such as school- or community-based programme.

Inclusion criteria: outcomes

Studies had to include an objective or self-reported measure of at least one of the following:

- (i) smoking, drinking or drug use by child;
- (ii) intention of child to participate in smoking, drinking or using drugs;
- (iii) alcohol and drug-related risk behaviours in child such as criminal offending, antisocial behaviour, risky sexual behaviour and
- (iv) antecedent behaviours such as truancy, conduct disorders or poor academic performance.

Identification of studies

We searched for published and unpublished studies using the following databases: Cochrane Central Register of Controlled Trials, Cochrane Library, issue 4, 2003, Specialized Register of Cochrane Drugs and Alcohol Group, Pub Med, 1960–October 2003, psych INFO, 1978–October 2003, CINALH, 1982–October 2003, SIGLE, 1980–October 2003, UK Department of Health National Research Register, 2000–October 2003. For search terms used see Box 1. We checked reference lists and contacted experts in the field. There were no date or language restrictions.

1. Parents OR parenting OR parent–child relations
 2. Education, or voluntary programmes OR programmed instruction OR communication OR programme*
 3. Substance-related disorders (MeSH exploded) OR substance abuse, OR smoking OR tobacco OR marijuana OR smoking cessation (MeSH exploded) OR alcohol-related disorders OR alcohol OR drinking
 4. Clinical trial OR CCT OR intervention studies OR control groups OR random allocation OR comparative study OR evaluation study OR programme evaluation
 5. Attention deficit disorder with hyperactivity OR attention deficit and disruptive behaviour disorders OR autistic disorder OR schizophrenia OR epilepsy

Example: Cochrane Library Search: (1) AND (2) AND (3) AND (4) NOT (5)

*Truncated.

Box 1. Search terms used.

Data extraction and analysis

Two reviewers independently examined the title and abstract of citations identified by the electronic search, applied the selection criteria to the study reports, extracted data and assessed study quality. Data were extracted on methodological quality of studies, type of participants, outcomes, intervention and length of follow-up. Data extracted on the intervention included type and duration of programme, setting and training of staff delivering the programme.

Methodological criteria for randomized and controlled trials were allocation concealment (A = adequate, B = unclear, C = inadequate), baseline measurement of outcome, blinded assessment of primary outcomes, follow-up (were ≥80% of participants followed-up?), protection against contamination (is there a description of allocation methods and is it likely the control group received the intervention?), intention to treat analysis and unit of allocation and analysis. For non-randomized studies, we assessed whether there was an appropriate choice of control site, baseline measurement of primary outcome, blinded assessment of primary outcome, adequate follow-up and protection against contamination. Quality assessment details for RCTs are reported in Table II and for non-randomized studies in Table III. While summary scores for quality need to be used with some caution [18], they can be useful when interpreting results. Therefore, quality scores are reported alongside effectiveness in Table IV.

Due to heterogeneity in study design, interventions and outcome, we did not pool studies in a meta-analysis. Instead a narrative and tabular

summary of findings is presented and an assessment made on the quality, size of the effect observed and statistical significance of the studies. In many of the trials, the unit of allocation and analysis was different. Participants were allocated at group level (school, class or family) and analysed at individual level. While it is beyond the scope of this systematic review to reassess each set of results in the light of unit of analysis errors, we have documented them and highlight associated problems.

Results

Initial searches generated 1617 articles. Of these, 122 were identified as potentially relevant and full texts were obtained. Forty-six reports on 20 studies met our inclusion criteria. Sixteen were RCTs [19–34], three CBAs [35–37] and one a controlled trial [38].

Studies took place almost exclusively in the United States, apart from one Russian study [34], one Australian [37] and one Norwegian [23]. However, the Russian study was an offshoot of the US study, Project Northland [27]. The format of the parenting intervention varied widely between studies. They included parenting skills training in groups [20, 22, 24, 26, 28, 30, 31, 36, 38], homework tasks requiring parental participation [27, 34, 35], mailed booklets [19, 21, 29], home visiting [25] and a mixture of these approaches [21, 23, 32, 33, 37]. Most subscribed to social or behavioural learning models, teaching communication skills, reinforcing

refusal skills and developing boundary setting and problem-solving approaches.

Five studies focused on alcohol [25–27, 33, 34], five on tobacco [21, 23, 29, 31, 37] and the remainder on a combination of substance misuse behaviours. Length of follow-up varied widely, ranging from 1 [34] to 12 years [38]. Five studies took place in rural areas [26, 27, 30, 31, 36], while the rest targeted urban or mixed urban and rural areas. Many were in places with high levels of economic deprivation [26, 27, 30, 31, 33, 38]. For more information on individual studies, see Table I. For information on study quality see Tables II and III.

The interventions could be grouped into three categories, studies that

- (i) identified and addressed pre-cursor behaviour in primary school pupils where parent and teacher relationships have maximum influence on children;
- (ii) focused on transition between primary and secondary school when expectations, boundaries and opportunities change dramatically for children and peer pressure begins to dominate and
- (iii) concentrated on adolescents, their emerging independence and ability to make choices among peer and community influences.

The results are therefore organized into these three categories and an overall summary of effect is presented in Table IV.

Primary school

Four studies involved primary school children aged 5–11 years [21, 25, 32, 38].

One study [38], the ‘Preparing For The Drug Free Years’ (PDFY) programme, looked at the effect of behaviour management training for teachers and parents and social skills training for children on tobacco, alcohol and drug use. The study included a longitudinal follow-up, reporting on student’s drug, alcohol and cigarette consumption at graduation. They found no significant difference in substance use between the intervention and control groups ($P = 0.93$) although the intervention

group had better academic achievement ($P = 0.01$), less school misbehaviour ($P = 0.02$) and reported fewer violent delinquent acts ($P = 0.04$).

Two studies [21, 32] focused on preventing tobacco use. In one, the ‘Family–School Partnership’ [32] a class-based intervention was compared with a parent and school-based intervention and a control group. After adjusting for sociodemographics and baseline covariates they found, at 6-year follow-up, a significant reduction in the risk of smoking in both intervention groups compared with the control group [class-centred programme RR 0.57 (95% CI 0.34, 0.96), family-centred programme RR 0.69 (95% CI 0.57, 0.97)] but no significant advantage for either intervention against the other. Non-adjusted results were not significant. The other [21] ‘Smoke-Free Kids’ programme also found a significant reduction in children’s intention to smoke (OR 0.60; 95% CI 0.37, 0.95).

One programme was designed to prevent children misusing alcohol [25]. The study, which included home-based facilitator led sessions, information and support, showed a significant reduction in alcohol use ($P < 0.001$) and misuse ($P < 0.05$) for those children who had no prior use of alcohol but a significant increase in the use and misuse of alcohol by children who had already commenced drinking at the time of the intervention (4% increase).

Transition from primary to secondary school

Eight studies targeted children at the change from primary (elementary) to secondary (middle and high school) education [22, 24, 26, 30, 33–35, 37].

Three [22, 30, 35] focused on tobacco, alcohol and drug use. One [22], ‘The Midwestern Prevention Programme’, was a 12-month programme involving homework designed to engage parents in reinforcing abstinence messages with their children. The study found a significant reduction in tobacco and marijuana use in the intervention group and a non-significant reduction in alcohol use (difference in absolute change from baseline, tobacco: 5.5%, marijuana 9%, alcohol: 3.1%). One [35] entitled ‘Project Star’ was a classroom intervention

Table 1. *Table of included studies*

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
Primary					
[38], Controlled clinical trial (CCT), Country: United States	643 children (Grade 1 = aged 6–7 years, Grade 5 = aged 10–11 years). Provider: not disclosed	Drugs, alcohol and tobacco	PDFY 1. Grade 1: five group sessions of 2 hours for parents on family management practices and preventing drug abuse ($n = 156$) 2. Grade 5: five group sessions of 2 hours for parents on family management practices and preventing drug abuse ($n = 267$) 3. Control: normal school curriculum and no parent training ($n = 220$)	Grades 1–5 (break in intervention during Grade 4)	Use of: cigarettes, alcohol, marijuana and other drugs
[21], RCT, Country: United States	887 families where one or more parent was a smoker. Children aged 8–9 years. Provider: project staff and trained support staff	Tobacco	Smoke-free kids 1. Five anti-smoking modules posted home + telephone call from a health educator, a helpline number and a parent and child newsletter ($n = 441$) 2. Control: fact-based leaflets mailed to home ($n = 446$)	3 months	Intention to smoke
[25], RCT, Country: United States	892 children (aged 9–10 years) and parents. Provider: community staff trained by project team	Alcohol	1. Three home-based facilitator led sessions, information folder, telephone support calls and newsletter ($n = 90$) 2. Control: standard school curriculum only ($n = 338$)	3 years	Use of: alcohol
[32], RCT, Country: United States	678 children aged 5–6 years. Provider: teacher, school psychologist and social worker.	Tobacco	Family–school partnership 1. Classroom centred ($n = 230$) 2. Family–school partnership including weekly school and home learning activities and workshops for parents ($n = 229$) 3. Control: standard school curriculum ($n = 219$)	1 year	Use of: tobacco
Transition					
[22], RCT, Country: United States	1607 students aged 11–13 years. Provider: volunteer parents trained by project staff	Drugs, alcohol and tobacco	Midwestern Prevention Programme 1. 10 session school programme with homework, parent programme, community programme and mass media coverage ($n = n/g$) ^a 2. Control: community programme and mass media coverage ($n = n/g$) ^a	3 months	Use of: cigarettes, alcohol and marijuana

Table I. *Continued*

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
[24], RCT, Country: United States	245 children aged 10–12 years. Provider: school guidance counsellors and specialist project staff	Drugs, alcohol and tobacco	Coping power programme 1. Universal: development of behaviour management skills via training groups for teachers and parents; enhanced communication between school and home ($n = 62$) 2. Indicated: group sessions for high-risk children plus individual guidance sessions and parenting skills training ($n = 59$) 3. Programmes 1 and 2 together ($n = 61$) 4. Control: normal school curriculum ($n = 63$)	16 months	Use of: alcohol, tobacco and marijuana. Delinquent behaviour
[26], RCT, Country: United States	424 families. Average age of children 11 years. Provider: local volunteers trained by project staff	Alcohol	PFDY 1. Five group sessions of 2 hours for parents on family management practices and preventing drug abuse ($n = 217$) 2. Control: Four booklets on adolescence sent to parents ($n = 151$)	5 weeks	Use of: alcohol
[35], CBA, Country: United States	5065 students aged 11–13 years. Provider: teachers and student leaders	Drugs, alcohol and tobacco	Project STAR 1. 10 class-based sessions and 10 homework sessions to do with parents. Mass media coverage re-project ($n = 3011$) 2. Control: wait list with mass media coverage ($n = 2054$)	10 weeks	Use of: alcohol, tobacco and marijuana
[30], RCT, Country: United States	446 families, children aged 11–12 years. Provider: trained volunteers	Alcohol, drugs and tobacco	PFDY/ISFP 1. PFTDFY: Five group sessions of 2 hours for parents on family management practices and preventing drug abuse ($n = 221$) 2. ISFP: Seven group sessions involving 1 hour of separate sessions for parents and children, followed by family hour. Both sessions focused on family management and communication. Children's sessions also included peer relationships skills management ($n = 238$) 3. Control: no intervention ($n = 208$)	5 weeks, 7 weeks	Use of: alcohol, marijuana and tobacco
[37], CBA, Country: Australia	3070 Children aged 11–12 years. Provider: info kit written by Quit campaign and Department of Education	Tobacco	Kickbutts 1. Five school-based lessons, information kit to parents, quit telephone line, parenting workshop and community programme to prevent under age sales of tobacco ($n = 2016$) 2. Control: standard school curriculum ($n = 1009$)	8 weeks	Use of: tobacco

Table 1. Continued

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
[33], RCT, Country: United States	650 children aged 11–12 years. Provider: school nurse	Alcohol	STARS for families 1. Grade 6: interview with school nurse + 10 advice postcards sent to parents and Grade 7: interview with school nurse + classroom activities and homework projects to do with parents ($n = 250$) 2. Control: booklet on alcohol use ($n = 157$)	2 years	Use of: alcohol
[34], RCT, Country: Russia	1212 children aged 10–12 years. Provider: class teachers trained by project team. Materials based on Project Northland	Alcohol	Russian–American partnership for prevention 1. Four homework sessions, handbook to parents and poster fair at school ($n = 510$ students, 544 parents) 2. Control: delayed intervention group ($n = 470$ students, 534 parents)	1 year	Use of: alcohol
Adolescence					
[19], RCT, Country: United States	1198 parent/child pairs. Children aged 12–14 years. Provider: health educators trained by project staff	Alcohol and tobacco	1. Family matters: booklet with parent–child activities + telephone advisor support ($n = 407$) 2. Control: no intervention ($n = n/g$) ^a	Not clear	Use of: cigarettes, chewing tobacco and alcohol
[20], RCT, Country: United States	327 children, average age 15 years. Provider: project staff	Drugs, alcohol and tobacco	Project SCCOPE—LST 1. Coping skills training for students (10 sessions students) ($n = 91$) 2. Coping skills training (10 sessions students, 5 sessions parents) ($n = 86$) 3. Control: self-awareness group for students—no parental participation ($n = 102$)	10 weeks plus two booster sessions at 1-year follow-up	Use of: cigarettes, alcohol and marijuana
[23], RCT, Country: Norway	4011 students, average age 13 years. Provider: not disclosed	Tobacco	BEsmokeFREE 1. Class-based curriculum with teacher training and parental involvement ($n = 1081$) 2. Class-based curriculum and parental involvement ($n = 1054$) 3. Class-based curriculum with teacher training ($n = 985$) 4. Control: no intervention ($n = 891$)	3 years	Use of: cigarettes

Table I. *Continued*

Study ID and methods	Participants and provider	Focus and duration of intervention	Intervention	Duration of intervention	Main outcomes
[27], RCT, Country: United States	3151 students aged 11–13, 16–18 years. Provider: project staff	Alcohol	Project Northland (from Grades 6–11) 1. Class curriculum, parent involvement, homework programme, peer leadership and community task force ($n = 1401$) 2. Control: usual curriculum + no parent/community involvement ($n = 1549$)	Phase 1 Grades 6–9, Phase 2 Grades 11–12	Use of: alcohol
[28], RCT, Country: United States	6728 students aged 12–13 years. Provider: police and community workers trained by project staff	Drugs, alcohol and tobacco	DARE Plus project 1. DARE: 10 school-based sessions delivered by police—drug resistance/citizenship ($n = 1269$) 2. Same as 1 plus homework to do with parents, drama project and behavioural advice postcards sent to parents 3. Control: delayed programme ($n = 1093$)	2 years	Use of: alcohol, tobacco, marijuana and other drugs
[29], RCT, Country: United States	2552 students aged 12–14 and 15–16 years. Provider: student peer leaders trained by project staff	Cigarettes and smokeless tobacco	1. Three mailed booklets to parents + seven class sessions with peer leaders ($n = 782$) 2. Control: standard curriculum ($n = 1091$)	3 weeks	Use of: cigarettes and smokeless tobacco
[31], RCT, Country: United States	1664 families, children aged 12–13 years. Provider: trained volunteers	Drugs, alcohol and tobacco	LST and ISFP 1. LST only: 15 classroom sessions and five booster sessions ($n = 621$) 2. Same as 1 + ISFP: seven group sessions involving 1 hour of separate sessions for parents and children, followed by family hour. Both sessions focused on family management and communication. Children's sessions also included peer relationships skills management ($n = 549$) 3. Control: standard school curriculum ($n = 494$)	2 years	Use of: alcohol, tobacco and marijuana
[36], CBA, Country: United States	1200 children aged 10–15 years. Provider: teachers and community volunteers trained by project staff	Drugs and smokeless tobacco	New Hampshire study—here's looking at you 2000 1. School-based curriculum (30 hours) ($n = 619$) 2. Same as 1 + community programme including 10 session parent communication course ($n = 305$) 3. Control: no intervention ($n = 276$)	1 year	Use of: marijuana and smokeless tobacco

^aNumbers not given.

Table II. *Quality assessment information, RCTs*

Study ID	Allocation concealment	Baseline data for primary outcome	Adequate follow-up at final assessment ($\geq 80\%$ followed up)	Blinded assessment of primary outcome	Unit of allocation and analysis of the same	Contamination risk	Intention to treat	Length of follow-up (post-intervention)
[19]	A	Yes	Yes (77%)	Yes	Yes	No	Yes	1 year
[20]	B	Yes	No (72%)	No	No	No	No	1 year
[21]	B	Yes	No (64%)	Yes	No	No	Yes	2 years
[22]	B	Yes	Yes (84%)	Unclear	Yes	No	Yes	3 years
[23]	A	Yes	Yes (93%)	Unclear	No	No	Yes	1 year
[24]	A	Yes	Yes (83%)	Yes	No	Yes	Yes	1 year
[25]	B	Yes	Yes (81%)	Unclear	Yes	No	Yes	1 year
[26]	B	Yes	No (70%)	Yes	No	No	Yes	3.5 years
[27]	B	Yes	No (67.8%)	Unclear	Yes	No	Unclear	6 years
[28]	B	Yes	Yes (84%)	Unclear	No	No	Yes	1.5 years
[29]	B	Yes	No (69%)	Unclear	No	No	Yes	1 year
[30]	B	Yes	No (67%)	Yes	No	No	Yes	2 years
[31]	B	Yes	Yes (82%)	Yes	No	No	Yes	2 years
[32]	B	No (not appropriate)	Yes (81%)	Yes	Yes	Yes	Yes	6 years
[33]	B	Yes	No (78%)	Unclear	Yes	Yes	Yes	1 year
[34]	B	Yes	Yes (81%)	Yes	No	No	Yes	1 year

A = adequate, B = unclear, C = inadequate.

Table III. *Quality assessment, non-RCTs*

Study ID	Baseline data for primary outcome	Blinded assessment of primary outcome	Adequate follow-up	Unit of allocation and analysis of the same	Appropriate control
[38]	No (N/A)	Unclear	Yes	No	Matched
[35]	Yes	Yes	Yes	No	Matched
[36]	Yes	Yes	Yes	Yes	Matched
[37]	Yes	Unclear	Unclear	No	Matched

that also included homework activities involving parents. The study found significant reductions for alcohol, cigarette and marijuana use among the intervention group compared with the control (change in proportion of use in last month between intervention and control; alcohol: difference 5.2%, tobacco: difference 9.7%, marijuana: difference 3.7%). The other the Iowa Strengthening Families Programme (ISFP) [30], which involved seven parent and child sessions, also found significant reductions in alcohol, drug and tobacco use, with a 21% difference between intervention and control in those who had ever used alcohol.

Another study [24] the ‘Coping Power Programme’ focused on children with aggressive behavioural problems who were considered to be at risk of later substance misuse and social exclusion. They found that group-based parenting skills training alone (indicated) or alongside the classroom programme (universal with indicated) had a significant effect on drug and alcohol scores compared with the control (indicated -0.01 , indicated with universal -0.01 , control $+0.10$). The classroom-only programme (universal) had no significant effect on reducing delinquency and substance misuse 1 year after the intervention (0.00).

Table IV. *Summary of results—effect of parenting intervention versus control*

Study	Alcohol	Drugs	Smoking	Other	Overall quality score
Primary school					
[38]	No difference	No difference	No difference	Better academic achievement, less school misbehaviour ^a	2/5
[21]	Not measured	Not measured	Reduced ^a		4/7
[25]	Reduced ^a if no prior use but increase ^a if already started drinking at time of intervention	Not measured	Not measured		5/7
[32]	Not measured	Not measured	Reduced ^a		4/7
Transition					
[24]	Reduced ^a	Reduced ^a	Reduced ^a	Delinquent behaviour reduced	5/7
[22]	Reduced	Reduced ^a	Reduced ^a		5/7
[26]	Reduced ^a	Not measured	Not measured		4/7
[35]	Reduced ^a	Reduced ^a	Reduced ^a		4/5
[30]	Reduced ^a	Reduced ^a	Reduced ^a		4/7
[37]	Not measured	Not measured	No difference		2/5
[33]	Reduced (but only significant in magnet schools)	Not measured	Not measured		3/7
[34]	Reduced	Not measured	Not measured		5/7
Adolescents					
[19]	No difference	Not measured	Reduced ^a		7/7
[20]	Increased	No difference	No difference		2/7
[23]	Not measured	Not measured	Reduced ^a		5/7
[27]	Reduced ^a	Not measured	Not measured		3/7
[28]	Reduced (only significant in boys)	Reduced (only significant in boys)	Reduced (only significant in boys)		3/7
[31]	Reduced ^a	Reduced ^a	Reduced ^a		5/7
[36]	Not measured	No difference	Not measured		5/5
[29]	Not measured	Not measured	Increased ^a	Reduction in children using smokeless tobacco ^a	3/7

^aResult statistically significant.

Three [26, 33, 34] focused on alcohol use only. PDFY programme [26] involved five group sessions for parents of children aged 11–13 years, and found a significant reduction in alcohol use. At 3.5-year follow-up initiation of use was 13% less and use in past month was 16% less in the intervention group than the control. The Russian–American

partnership for prevention study [34], including homework sessions and parent handbook, showed a non-significant effect in reducing initiation or experimentation with alcohol (use in past year 17.9 versus 20%, $P = 0.67$).

The other was a study of an alcohol prevention programme involving booklet-based parenting

education ['Start Taking Alcohol Risks Seriously (STARS) For Families'] [33]. The authors reported results for two types of schools separately. A reduction in mean alcohol use was found in both types of schools but it was only statistically significant in one (magnet school, $P < 0.05$).

One study [37] entitled 'Kickbutts' aimed to prevent tobacco use. They compared a school and parenting intervention with the standard school curriculum. The parenting intervention included information and workshops. They found no difference between the intervention and control group (change from baseline 9 versus 8.7%).

Adolescent programmes

Eight studies looked at interventions with teenage children and their parents [19, 20, 23, 27–29, 31, 36].

Three studies [20, 27, 28] focussed on drugs, tobacco and alcohol use. Project [South Carolina Coping Skills Project (SCCOPE)] [20] evaluated coping skills training. They compared three groups, a classroom-based programme, a classroom-based programme with additional parenting programme and a control. At the 2-year follow-up, the classroom-only programme showed effective results, but those with both parenting and classroom intervention showed an increase in use of drugs and alcohol. One study [28] compared the established classroom programme of school-based sessions [Drug Abuse Resistance Education (DARE)] with an additional parenting programme involving homework tasks (DARE Plus). Outcome data for girls and boys were reported separately. The study found no significant differences in the girls' substance use scores. For the boys, scores were lower in the DARE and DARE Plus groups when compared with control (but this was only statistically significant in the DARE Plus group). The other [31] compared a parenting programme [Life Skills Training (LST) with Strengthening Families Programme (SFP)], involving evening sessions for children and their parents, with a classroom-only intervention (LST) and a standard school curriculum control group. There was a relative reduction in numbers of new users of tobacco, alcohol and marijuana in both

intervention groups compared with the control. However, reductions were higher in the parenting programme (LST with SFP) than the classroom-only intervention (LST) (relative reduction rate in number of new users—alcohol, LST with SFP 30%, LST 4%; tobacco, LST with SFP 28%, LST 14%; marijuana, LST with SFP 48%, LST 46%).

The New Hampshire study [36] looked at use of drugs and chewing tobacco in adolescents. They compared three groups: a classroom-based intervention, a classroom intervention with additional 10-session parent communication course and a control. There was a reduction in initiation and regular use of marijuana in both intervention groups, which was greater in the parenting group, but this was not statistically significant in either [classroom intervention: initiation RR 0.95 (95% CI 0.67, 1.35), regular use RR 0.84 (95% CI 0.51, 1.36); parenting programme: initiation RR 0.74 (95% CI 0.48, 1.14), regular use RR 0.56 (95% CI 0.29, 1.08)].

The 'Family Matters' study [19] evaluated the effect on alcohol and tobacco use of a series of booklets for parents of children aged 12–14 years. At 1-year follow-up they found a significant reduction in smoking onset (16.4%, OR 1.30, $P = 0.037$) and a non-significant reduction in alcohol use (5%, OR 1.26, $P = 0.1$).

Two studies [23, 29] looked at tobacco use only. One 'BESmokeFREE' [23] was a 3-year intervention in 99 Norwegian secondary schools with pupils 12–14 years of age. The full programme included teacher training, classroom curriculum, information leaflets for parents about communication with adolescents, a parent–teacher interview and a non-smoking contract with the child. At 1-year follow-up, they found a significant reduction in the average number of cigarettes smoked per week by children experiencing the full intervention programme (full intervention 10, control 17). The programme was found to be less effective when teacher training or parent involvement was omitted (teacher training only 13, parent programme only 14). The other study [29] targeted the use of smokeless tobacco and cigarettes by children in early- to mid-adolescence. They compared a classroom-only intervention with classroom and parent component (mailed booklets)

and a control. Both interventions showed a significant reduction in the number of children using smokeless tobacco but an increase in the number of children smoking cigarettes (increase in mean number of cigarettes per month from baseline to post-test at Year 10: control 16.7, intervention 34). The study found no significant link between parental involvement and outcome.

The Project Northland study [27] targeted alcohol use only. They compared an alcohol prevention programme, classroom activities supported by parental involvement and standard classroom curriculum. The intervention ran from Grade 6 to Grade 12 (graduation). The study found growth rates for alcohol use in the intervention group were nearly half that of the control group (1.44 versus 2.11). However, in Grade 10, an interim year in which no intervention occurred, rates of alcohol use increased rapidly among the intervention group.

Discussion

This systematic review has examined the effectiveness of parenting programmes in reducing tobacco, alcohol and drug misuse in children <18 years. The quality of the studies and nature of the interventions varied considerably, making assessment of the empirical literature difficult. In general, methodological quality of included studies was fair. However, only three reported adequate allocation concealment [19, 23, 24], in the rest it was unclear. Although poorly concealed trials may introduce selection bias and inflate treatment effect, all three trials with good allocation concealment showed significant positive effects. Other methodological problems included, inappropriate analysis for the unit of allocation which may overestimate significance of differences, high losses to follow-up, poor reporting of results and contamination. The scope of the review was also broad, including alcohol, tobacco and drug use in a wide age range of young people and involving a diverse range of study types, settings and interventions. This heterogeneity meant meta-analysis was inappropriate and makes meaningful comparisons between studies

difficult. In addition, although a number of studies demonstrated statistically significant results, this does not always correlate with clinical meaningfulness. Nevertheless, the evidence suggests that parenting programmes can be effective in reducing substance misuse in children.

The strongest evidence found in the review was based on work that had been undertaken with pre-teen and early adolescent children. Seven of the studies [19, 22–24, 26, 30, 31] that were of good or fair quality (see Table IV), being well-designed and conducted RCTs, had focussed on this group. Each of these studies reports that the parenting programme evaluated led to a significant reduction in one or more of the outcome variables measured, in particular the use of alcohol [24, 26, 30, 31], drugs [22, 24, 31] or tobacco [19, 22–24, 31], compared with controls.

Three of these studies [26, 30, 31] examined two specific interventions; the ISFP and the PDFY programme. Both these interventions were found to be effective in reducing substance misuse in pre-teen and early adolescent children, although in one study [31] LST was found to be as effective as an intervention that included LST in conjunction with the ISFP. A key feature of the three interventions found to be effective was that they focussed on developing strategies to involve adolescents in family activities, maintain good familial bonds and manage conflict, rather than just focusing on the issue of substance misuse. A second shared feature was an emphasis on parental engagement in an activity-based programme. Although brief, 5–7 weeks duration, the three interventions required parents to be active participants in group exercises. In addition, in these studies parents demonstrated considerable commitment to the programme, with at least 61% attending all sessions in studies [26] and [30] and >89% attending >50% of sessions in study [31].

Although these three studies were all school-based, the parenting programmes could have taken place in a number of settings, such as health or community centres. Two other well-conducted RCTs [22, 24] found collaborative school–parent programmes were also effective in reducing substance

misuse for pre-teen and early adolescent children. Although different parenting programmes were evaluated, like the ISFP and the PDFY programme, the effective interventions shared an emphasis on active parental involvement and on developing skills in social competence, self-regulation and parenting, rather than focussing exclusively on substances and substance use. A further study [28] also found that interactive sessions which focussed on social skills, with active parental involvement, were effective in reducing substance misuse for boys. Although the latter study had some methodological limitations, the sample size was much larger than any of the other studies, providing additional support for the value of interventions involving active parental involvement and focussing on social skills.

Interventions with 11- to 14-year olds that were more specifically school-based were found to be effective in two high quality RCTs [19, 23]. These studies each found the intervention groups which showed a significant reduction in substance use, compared with controls. Once again, a characteristic of the successful interventions was a focus on developing social skills and sense of personal responsibility among the young people. Although the interventions were primarily school-based, the homework tasks in two studies [19, 35] also involved active parental participation and there was direct communication with parents, either face to face [19, 23] or by telephone [35]. Active parental involvement, therefore, appears to be an important feature of successful interventions. The interventions that were found to be least effective did not include this. Thus, studies evaluating a school-based intervention supplemented only with mailed information to parents found no significant differences between intervention and control groups [34] or an increase in the targeted behaviour [29], although it must be acknowledged these studies were also weak in terms of methodological quality (see Table IV).

Implications for practice and research

Many of the studies reviewed had complex interventions of which a parenting programme was

only one component. It was difficult, therefore, to evaluate the effectiveness of one particular aspect of the intervention. The most effective interventions in reducing substance misuse among children <18 appeared to be those that

- (i) emphasized development of social skills and sense of personal responsibility among young people, as well as addressing issues related to substance use and
- (ii) included active parental involvement.

The broad-based nature of such interventions, targeting social and behavioural factors, and active participation of children and parents appears more important than whether the intervention was targeted specifically at parents, was school-based, or involved collaboration between school and home. However, more work is needed to investigate further the change processes involved in such interventions and their relationships to outcome variables. Levels of participation in the parenting programmes was problematic in several studies. Programmes need to be sensitive to the needs of parents in order to ensure their motivation. The long-term effect of parenting programmes must also be considered.

An important issue in designing programmes is to identify the best time to deliver the intervention. The transition from primary to secondary school appeared to be an effective time to intervene. Six of the seven studies focusing on this age group reported improvements in outcomes, with differences reaching statistical significance in five [22, 24, 26, 30, 35].

Few studies distinguished between children who were regular or occasional users. More work is needed to assess the effectiveness of interventions to prevent the development of regular use in experimental or occasional users. In addition, a large number of studies relied on self-reported measures of substance use and it is highly possible that children under- or over-reported their intake. Use of more rigorous, independent, measures would allow more accurate appraisal of the effectiveness of interventions. Finally, most of the studies were conducted in the United States and

included two parent families. Further research is needed to assess the applicability of these findings to other social groups.

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Conflict of interest statement

None declared.

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