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Characteristics of Effective & Ineffective Adolescent Health Interventions with a Parental Component

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CHARACTERISTICS OF EFFECTIVE AND INEFFECTIVE ADOLESCENT HEALTH INTERVENTIONS WITH A PARENTAL COMPONENT

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INTRODUCTION

Parenting can be broadly defined as “purposive activities aimed at ensuring the survival and development of children” (Hoghughi and Long, 2004: p5). Parents are responsible for promoting the intellectual, emotional, social and physical development of their children, and preparing them for life as productive adults.

Parenting influences adolescent health behaviours, and increases uptake of health services and susceptibility to illness in later life (Collins et al, 2000; Stewart-Brown, 2012; Fergusson et al, 2005; Temcheff et al, 2011; Stewart-Brown et al, 2005; Beveridge and Berg, 2007). Parenting styles are configurations

of parenting behaviours, often categorised according to two dimensions: parental warmth or connectedness and control or regulation (Hoeve et al, 2009).

Parental warmth refers to behaviours that make the child feel comfortable and approved, whilst control refers to behaviours that involve placing demands and exercising control. The World Health Organisation (WHO) recognises the importance of these two dimensions, in addition to three further dimensions of parenting which affect adolescent health outcomes (WHO, 2007), shown in Table 1.

Table 1. Five dimensions of parenting for adolescent health (Adapted from WHO, 2007)

Dimension	Definition
Connection	Behaviours that convey to adolescents that they are loved and accepted
Behaviour control	Parents' actions aimed at shaping or restricting adolescents' behaviours
Respect for individuality	Allowing the adolescent to develop a healthy sense of self, apart from his or her parents
Modelling	Parents as role models – their behaviours and attitudes provide examples of how to behave
Provision	Provision of essentials for survival – food, shelter, clothing, etc. – and efforts to seek out relationships and opportunities within the community that can supplement what the family is able to provide

Parenting styles can also be categorised as authoritative (high warmth, high control), authoritarian (low warmth, high control), permissive (high warmth, low control) (Baumrind, 1966; 1968; 1971), and neglectful (low support, low control) (Maccoby and Martin, 1983).

In general, the authoritative parenting style is associated with better adolescent health outcomes, including lower levels of substance abuse and risky sexual behaviour (see Becona et al, 2011; Berge et al, 2009; Newman et al, 2009), and higher levels of academic achievement, healthy eating and physical activity (Berge et al, 2009; Edwardson and Gorely, 2010; Spera 2005).

This is in contrast to the authoritarian, permissive and neglectful parenting styles, which are

generally linked to poorer adolescent health outcomes (Becona et al, 2011, Newman et al, 2009 and Berge et al, 2009).

Additionally, specific parenting behaviours (e.g. parental modelling of healthy behaviours, nurturing behaviours, communicating openly, autonomy granting, and behaviours that promote connectedness) have been linked to better adolescent health outcomes, (Berge et al, 2009; Edwardson and Gorely, 2010; Ryan et al, 2010; Kawabata et al, 2011; Miller et al, 2001; Markham et al, 2010; Racz & McMahon, 2011).

This confirms that, as well as focusing upon the two dimensions of parental warmth and control, there is a need to focus on a broader range of dimensions such as those outlined by the WHO.

As part of a review to inform development of the National Parenting Strategy in Scotland (Scottish Government, 2012), we conducted a review of reviews to identify which adolescent health interventions with a parenting component (e.g. some part of the intervention was delivered to parents) have been effective and for which adolescent outcomes.

There was some evidence for the effectiveness of adolescent health interventions with a parenting component for alcohol, tobacco and substance use, and sexual risk behaviour with a handful of interventions demonstrating impact in the mid to long term (see Appendices 1 & 2 for more detail)¹. However, the majority of interventions and evaluations were conducted in the USA, and it is unclear to what extent findings would translate into the UK context.

Additionally, the paucity of evidence to support each effective intervention makes it difficult to make recommendations regarding which interventions work best. Despite this, it may be possible to tease out common characteristics across effective interventions, in order to draw some broad observations around what works. This report presents an analysis of the characteristics of the effective and ineffective alcohol, tobacco and substance use interventions included in each of the high quality reviews we identified.

AIM

To identify the characteristics of effective and ineffective interventions involving parents to influence adolescent alcohol, tobacco and substance use.

¹*Alcohol and substance use – Iowa Strengthening Families Programme (ISFP), Preparing for the Drug Free Years (PDFY) (Spath et al 1999 reported in Foxcroft and Tsertsvadze 2011 & Thomas et al 2008); Tobacco use – ISFP, PDFY, Focus on Kids (FOK) + Informed Parents and Children Together (ImPACT) (Spath et al, 1999; Wu et al 2003 reported in Thomas et al 2008); Sexual health – Mother Daughter HIV Risk Reduction (MDRR), Real Men, Keepin' It REAL (Dancy et al, 2006; Dilorio et al, 2007; Dilorio et al, 2006 reported in Wight and Fullerton (2013).*

METHODS

We searched for systematic reviews, with low risk of bias, published up until 2013.

Reviews were eligible for inclusion if they:

- reported on randomised controlled trials of interventions involving parents with a current adolescent child, in the general population;
- reported on child health outcomes.

In total, we identified eight reviews, including high quality reviews for alcohol use (Foxcroft & Tsertsvadze 2011), smoking (Thomas et al, 2008), substance use (Gates et al, 2009), and sexual health (Wight and Fullerton, 2013). Methods and a summary table of the review level literature are provided in Appendices 1 & 2. In order to identify characteristics of effective interventions, we obtained the full reports of randomised controlled trials reported in the highest quality reviews, related to alcohol, tobacco and substance use.

We considered the nature of sexual risk behaviour to be qualitatively different from alcohol, tobacco and substance use, with the latter three relating specifically to use of substances. We therefore did not include any individual studies reported in the sexual health review.

Inclusion criteria

- Measured child health outcomes in the mid to long term (defined as 1 year or greater after end of intervention)
- Delivered interventions in which the parenting component was at least one quarter of the full intervention.

The study team agreed that it would be unreasonable to attribute outcomes to the parenting component of an intervention if that component was less than one quarter of the full intervention.

This decision was arbitrary but had been used in a previous review, applied by calculating the ratio of the parent component to other intervention components based upon number of intervention contacts (Wight and Fullerton, 2012).

For example, the ratio of parent to other components for an intervention consisting of five

parent contacts and five adolescent contacts would be 1:1.

The inclusion criteria were applied and 20% of papers independently screened by two reviewers (JM & RJ) with good agreement.

Data extraction and coding

Data was extracted relating to country, participants, characteristics of the interventions, ratio of the parent component to other components, intermediate parental outcomes if reported, and primary outcome data for each intervention.

Interventions were considered to be effective if the authors reported a statistically significant change in the primary outcome favouring the intervention. In regards to intervention characteristics, we coded content according to the WHO dimension/s targeted (connection/behaviour control/ respect for individuality/modelling/ provision).

We also extracted data relating to the setting in which the intervention was delivered, who provided it, who received it, mode of delivery, intensity (number of contacts and duration of these), and whether authors reported a theoretical basis (Davidson et al, 2003).

Analysis

We undertook a descriptive statistical analysis to compare the effective and ineffective studies with respect to their characteristics. These included: the WHO definitions targeted by the interventions; the setting for the interventions (e.g. school, community, home); the recipients of the interventions (parents only or parent and children); the theory base for the interventions; the person(s) who delivered the intervention; the format of the intervention; the intensity of the parent component of the intervention; and the duration of the intervention.

We looked for similarities among characteristics of effective interventions and contrasted these with characteristics of ineffective interventions. Findings are narratively reported.

RESULTS

Fifty-two studies in total were obtained from three reviews. After applying the inclusion criteria to full paper reports of the studies, we included 19 studies reporting 21 interventions. Ten of the interventions were reported to be effective and 11 ineffective (See Appendix 3 for

table of study characteristics, and intermediate and primary outcome data for the effective interventions). Intervention characteristics for both effective and ineffective interventions are presented in Table 2, Figures 1-2 (see Appendix 4 for further detail).

Table 2. Intervention characteristics

Intervention characteristics	Effective (n=10)	Ineffective (n=11)
WHO dimensions targeted		
Connection	9/10 (90%)	7/11 (63%)
Behaviour control	8/10 (80%)	7/11 (63%)
Respect for individuality	1/10 (10%)	2/11 (18%)
Modelling	1/10 (10%)	1/11 (9%)
Provision	0	0
Setting		
Community	5/10 (50%)	0
Home	3/10 (30%)	3/11 (27%)
School/Home	2/10 (20%)	6/11 (54%)
School	0	1/11 (9%)
Primary care	0	1/11 (9%)
Recipients		
Parents & Adolescents	10/10 (100%)	10/11 (90%)
Parents only	0/10 (0%)	1/11 (9%)
Theory-base		
Stated	7/10 (70%)	4/11 (36%)
Not stated	3/10 (30%)	7/11 (63%)
Provider		
Trained deliverer	6/10 (60%)	3/11 (27%)
Self-delivered	1/10 (10%)	2/11 (18%)
Trained deliverer & Parents	1/10 (10%)	0
Trained deliverer & Police	1/10 (10%)	0
Trained deliverer & Teacher	1/10 (10%)	0
Teacher	0	3/11 (27%)
Clinician	0	2/11 (18%)
Trained deliverer & Self-delivered	0	1/11 (9%)
Format		
Group-parents / Group-adolescents / Group-families	3/10 (30%)	0
Individual-family / Group-adolescents	2/10 (20%)	1/11 (9%)
Individual-parent / Individual-family	2/10 (20%)	1/11 (9%)
Group-parents / Group-families	1/10 (10%)	0
Individual family	1/10 (10%)	2/11 (18%)
Group-parents / Individual-parents / Group-adolescents	1/10 (10%)	0
Individual-parent / Group-adolescents	0	2/11 (18%)
Individual-parent / Individual family / Group adolescents	0	1/11 (9%)
Group-parents / Group-adolescents	0	1/11 (9%)
Individual-family / Group-families	0	1/11 (9%)
Group parents	0	1/11 (9%)
Individual adolescent / Individual family	0	1/11 (9%)

Figure 1. Number of contacts with parents

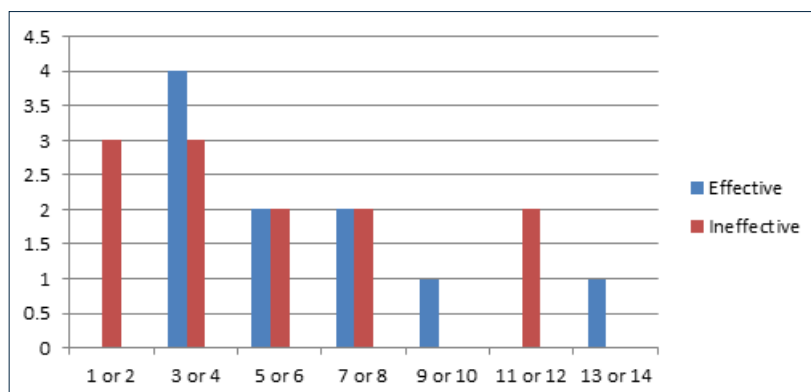
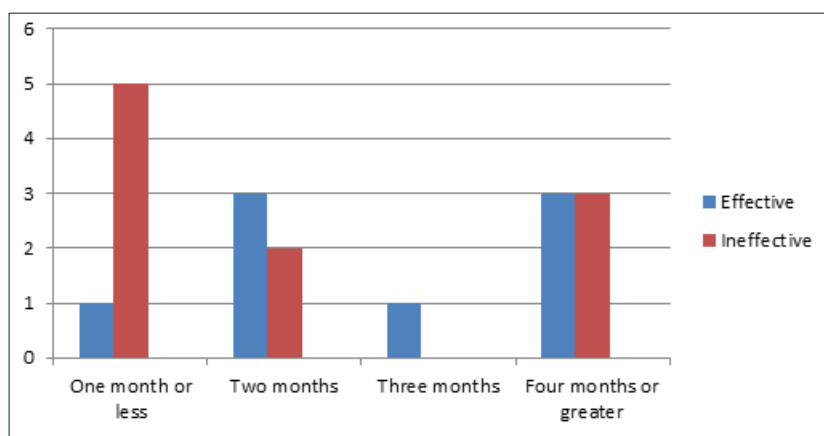


Figure 2. Duration of intervention in months*



*3 studies (two effective, one ineffective) did not report the duration of the intervention

A greater number of the effective interventions targeted the WHO dimensions of connection (9/10 [90%]) and behaviour control (8/10 [80%]) compared to the ineffective interventions (7/11 [63%] for both dimensions).

Half of the effective interventions were delivered in the community setting (5/10 [50%]), with the remainder in the home (3/10 [30%]), or school/home (2/10 [20%]). By contrast, more than half of the ineffective interventions were delivered in part or full in the school setting [7/11 [63%]], with none conducted in the community setting.

More than half of the effective interventions were delivered by an individual who had been trained to deliver the intervention (6/10 [60%]) compared to less than half of ineffective interventions

(3/11 [27%]). A greater number of the effective interventions stated an underpinning theoretical basis (7/10 [70%]) compared to ineffective interventions (4/11 [36%]).

All of the effective interventions reported duration of intervention (n=8) as one month or longer. The duration for around half of the ineffective interventions was less than one month (5/11 [45%]).

All interventions were delivered to both parents and adolescents bar one ineffective intervention that was delivered solely to parents. The format of interventions was similar across effective and ineffective interventions in that both used a mixture of individual and group sessions with adolescents, parents and/or families.

DISCUSSION

This review identified a number of differences between characteristics of effective and ineffective interventions. A greater number of effective interventions targeted the WHO dimensions of connection and behaviour control, were delivered in the community or home, by a trained deliverer, with a duration of at least one month, and were informed by theory. These characteristics are in contrast to the ineffective interventions, a greater number of which were delivered in the school setting, with a duration of less than one month, with no stated theoretical underpinning.

The finding that more of the effective interventions targeted the WHO dimensions of connection and behaviour control lends support to the idea that interventions with parents of adolescents may have a greater chance of effectiveness if they promote the authoritative parenting style. These findings are consistent with the observational literature relating to the positive effects of this parenting style, characterised by parental warmth or connectedness and parental control or regulation (e.g. Becona et al, 2011; Berge et al, 2009; Newman et al, 2009). It is worth noting that the majority of both effective and ineffective interventions targeted connection and behaviour control, with almost all of the effective interventions (9/10 [90%] and 8/10 [80%]) compared to just over half of the ineffective interventions (7/11 [63%] for both). As previously stated, the authoritative parenting style is generally considered to produce better outcomes. The finding that 9/10 of the effective interventions targeted these dimensions supports this, however, it is important not to lose sight of the finding that 7/11 interventions targeted those same dimensions yet did not produce the same effect.

Our findings suggest that interventions delivered in the community setting may be more likely to be effective. More than half of the ineffective interventions were delivered in the school setting, compared to none of the effective interventions, more than half of which were delivered in the community setting. Details relating to recruitment procedures were sparse, but it is possible that participants invited to take part in interventions delivered within the school setting, may have felt an element of compulsion to do so, since many of these interventions were delivered alongside curricular activities. It is

therefore possible that participants may not have been motivated to participate. This is consistent with findings relating to interventions involving parents to increase educational attainment (Gorard and Huat-See, 2013). Such parental involvement interventions, presuppose by their very definition that parents must want to be involved in order for them to be effective.

Less than half of the ineffective interventions were delivered by a trained deliverer, compared to more than half of those that were effective. Training in delivery of interventions has been identified as a factor influencing fidelity, as high levels of fidelity ensure that interventions are delivered as intended, thus increasing their likelihood of effectiveness (Carroll et al, 2007). It can be hypothesised therefore, that there may have been greater fidelity to the intervention protocol in those interventions that were effective, due to the presence of trained deliverers. However, it is difficult to be certain as to whether this was indeed the case, as very few of the included studies measured fidelity as an outcome.

A greater number of the effective interventions stated an underpinning theoretical basis (7/10 [70%]) compared to ineffective interventions (4/11 [36%]). Theories used to inform interventions varied, but included social inoculation theory, social learning theory, the prototype willingness model, social cognitive theory, family interaction theory, and family interaction theory. This is consistent with arguments that a theoretical understanding of factors influencing target outcomes and associated processes of change can guide selection of appropriate intervention techniques, thereby increasing the likelihood of an intervention having its intended effect (Michie and Abraham, 2004). It is unclear to what extent these theories informed the interventions and/or how they were applied, since this was not reported. It is possible that those interventions stating theoretical underpinnings may vary in terms of the extent to which they are theory-based (Michie and Prestwich, 2010). It is therefore difficult to draw any firm conclusions regarding whether the use of theory in the case of these interventions, may have contributed to intervention outcomes.

The duration of all effective interventions reporting this was one month or longer, compared to the ineffective interventions, around half of which had a contact time of less than one month. Parenting itself is influenced by a number of factors, including the parental upbringing parents themselves received (Ghate et al, 2003), attitudes and beliefs about parenting (Pinderhughes et al, 2000), and environmental circumstances, including social deprivation (Waylen and Stewart-Brown, 2010). Parenting also refers to a set of complex behaviours, which repeated over time, may become entrenched and more difficult to change. It is unsurprising that brief interventions are unlikely to be effective.

This analysis has a number of strengths and weaknesses. It is the first time (to our knowledge) that an analysis has been undertaken to assess and describe the characteristic of effective interventions within the parenting literature. Other reviews focus primarily on outcomes and not how those outcomes may have been achieved. Our analysis, therefore, allows for a much greater understanding of what the effective characteristics are, and we have hypothesised as to why these may be effective. Additionally, we have synthesised the review level literature to provide a broad, but digestible overview of the evidence in this area. However, there are a number of limitations that need to be acknowledged.

First, it is possible that our coding may not fully capture exactly what was occurring within these interventions. For example, 'connection', and 'behaviour control' could be targeted in a number of different ways, e.g. in the case of 'connection', this might involve providing advice on how to communicate as a family, to role-playing situations in which communication might be challenging, etc.

Second, some techniques used (e.g. to increase connection) may be more effective than others, and it is possible that the ineffective interventions were using ineffective techniques to target these dimensions. Third, although intervention components are important themselves, this is not the only place we should look to when seeking to explain intervention outcomes. How the intervention components interact with the contexts in which they are implemented can determine whether or not they have their intended effect. For example, an identical

intervention delivered in a socially deprived area versus one that is not may produce different outcomes due to factors inherent to those circumstances (Pawson and Tilley, 1997). It is therefore possible that the finding that almost half of all interventions targeting connection and behavior control were ineffective, may be explained by differences in the way that interventions interacted with the contexts in which they were implemented. Fourth, our coding was limited to what was reported within the papers, and descriptions of interventions, and the contexts in which interventions were implemented generally lacked in-depth descriptions. This has been reported elsewhere in the wider literature related to social and behavioural interventions to improve health (e.g. Bhopal et al, 2009; Mayo-Wilson et al, 2013).

As outlined in Appendices 1 & 2, there are a number of promising interventions. However, it is important to note that the majority of studies included in this review report interventions that were developed, implemented and evaluated in the United States. It is unclear to what extent these findings would translate to Scotland and the wider UK. Prior to committing to implementation of any given intervention, we recommend that such interventions be evaluated within the UK.

Additionally, all included studies were randomised controlled trials in which the focus is upon summations of effectiveness. Whilst RCTs are necessary, there is a need to apply additional methods of evaluation that can broaden our understanding of how such interventions interact with context to produce their intended or unintended outcomes (Cartwright and Munro, 2010). Realist evaluation is a theory-driven type of evaluation that attempts to explain intervention outcomes by contrasting how an intervention intends to work with how it actually works in the context in which it is implemented (Pawson and Tilley, 1997). Currently, there are no realist evaluations within the published parenting intervention literature. Such evaluations may provide insight into the broad variety of factors that can influence effectiveness, and therefore provide valuable information relating to how best to implement such interventions.

CONCLUSIONS

This review has identified characteristics of effective and ineffective interventions involving parents to influence adolescent alcohol, tobacco and substance use. Whilst the evidence itself has limitations (see Appendices 1&2), it is possible to make some broad observations that can be applied by those considering developing and/or implementing interventions involving parents to influence the health of their adolescent children.

Such interventions may be more effective if they target the dimensions of connection and behaviour control, are delivered in the community and/or home, by a trained deliverer, with duration of at least one month, and are informed by theory. Our findings are consistent with the observational parenting literature, and we have hypothesised as to why these characteristics may play a role in influencing outcomes.

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Studies included in the analysis of intervention characteristics:

Studies reporting effectiveness

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Appendix 1

National Parenting Strategy review *Methods*

We sought English language systematic reviews, including meta-analyses and narrative reviews, with low risk of bias, published up until 2013. We included reviews reporting interventions involving parents with a current adolescent child, in the general population, targeting that child's health outcomes. Reviews reporting parental involvement as a component of a wider intervention package were also eligible for inclusion. Reviews were excluded if they reported therapeutic approaches and/or the target group was a clinical population (e.g. physician delivered cognitive behaviour therapy for a diagnosed psychological disorder), parenting techniques in the absence of a parenting intervention, and interventions targeting conduct disorder or conduct problems.

Inclusion criteria

We sought English language systematic reviews, including meta-analyses and narrative reviews, with low risk of bias, published up until 2013. We included reviews reporting interventions involving parents with a current adolescent child, in the general population, targeting that child's health outcomes.

Reviews reporting parental involvement as a component of a wider intervention package were also eligible for inclusion.

Reviews were excluded if they reported therapeutic approaches and/or the target group was a clinical population (e.g. physician delivered cognitive behaviour therapy for a diagnosed psychological disorder), parenting techniques in the absence of a parenting intervention, and interventions targeting conduct disorder or conduct problems.

Search strategy and databases searched

The following databases were searched: Medline, Cochrane Library and DARE (Database of Abstracts of Reviews of Effects –DARE conducts weekly extensive searches and assesses thousands of citations to identify potential systematic reviews). The search strategy was

developed using MeSH terms and free text terms. The following string was applied to the Medline Database: (parent* or father* or mother* or step-parent* or stepparent*) and (program* or interven*) and (teen* or you* or adolescen*) in TI.

The Medline search was then limited to Reviews only. The term 'parent*' was used to search the Cochrane Library and the term 'parenting' used to search DARE (the term 'parent*' resulted in too many hits when applied to DARE). The Cochrane database search resulted in 145 reviews, and 100 reviews were identified in the search of DARE.

Applying the inclusion criteria

The inclusion criteria were applied with 20% of papers independently screened by two reviewers (JM & RJ). Exclusions comprised reviews focusing upon observational studies, commentaries, single studies, reviews of therapies with young people or parents, reviews of parenting interventions with specific groups and not the general population, and reviews that were unrelated to parenting.

In total, 872 potentially relevant papers were identified, of which around 30% were duplicates, leaving 611 papers, as shown in Figure 3. In total, eight reviews were included, reporting a total of 129 relevant studies.

Quality assessment

The quality of reviews was assessed using a method adapted from the NICE 'Methods for the development of NICE public health guidance' (Jepson et al, 2010). This method prioritises reviews with a transparent and replicable methodology and analysis.

Reviews were scored as good quality “++” if 10 or more quality criteria were met, moderate quality “+” if 7-10 quality criteria were met, and poor quality “-” if fewer than seven quality criteria were met. The quality criteria are outlined in Table 3. In addition, reviews were allocated a score for type of evidence, as outlined in Table 4.

The classification of bias was then combined with the classification of evidence. Thus, good quality reviews containing evidence from RCTs were scored as ++1, etc.

Figure 3. Selection procedure

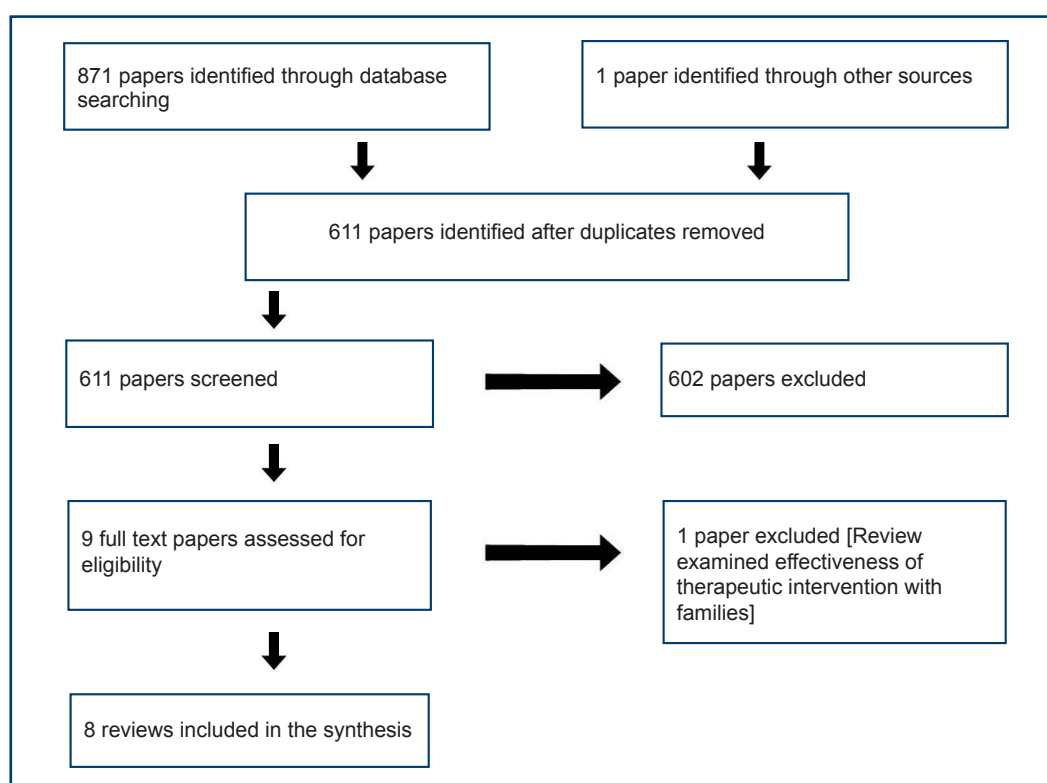


Table 3. Criteria for assessing quality of reviews (adapted from Jepson et al, 2010)

No	Criteria
1	Was there a focused aim or research question?
2	Explicit inclusion/exclusion criteria
3	More than 1 assessor/selector
4	Provides details of databases searched
5	Lists years searched
6	Followed up references in bibliographies
7	Experts consulted for further sources
8	Grey literature included/searched
9	Specified search terms/strategy
10	Not restricted to English language papers only
11	Quality assessed
12	Data supports conclusions

Table 4. Scoring by type of evidence included in the reviews (adapted from Jepson et al, 2010)

Classification	Type of evidence
1	Randomised controlled trials
2	Non-RCTs, case-control studies, cohort studies, controlled before and after, interrupted time series, correlation studies
1 & 2	Evidence contains both types of evidence listed in classification 1 & 2

Data extraction

Data on the following were extracted: review descriptives (author, year, etc), number of included studies, types of studies, methods of the review, and outcomes and key findings relating to effectiveness.

Analysis

Findings from the highest quality reviews with the highest level of evidence are reported narratively. Where there is more than one high quality review, findings from the most recent are presented. Study overviews are annotated from details provided in the reviews hence more detailed information is available for some than others.

Appendix 2. National Parenting Strategy review- Table of findings reported in the highest quality reviews

Author	Description	Findings
Gates et al (2006). Interventions for prevention of drug use by young people delivered in non-school settings.	<p>Systematic review of the effectiveness of interventions to prevent or reduce use of drugs by young people in non-school settings.</p> <p>No. included studies: 12 RCTs</p> <p>Interventions: interventions involving parents to influence substance use in young people under 25. Interventions were designed to improve family functioning and to increase parenting skills.</p> <p>Countries: Majority of studies conducted in US.</p>	<p>Two interventions evaluated in one study (Spoth et al, 1999) are highlighted as “superior” to no intervention in preventing self-reported cannabis use: Iowa Strengthening Families Programme ($p < 0.01$) and Preparing for the Drug Free Years ($p < 0.01$). ISFP had an effect 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 6 year follow up (adjusted RR 0.44 95% CI 0.20 to 0.96). Effects for PDFY were less clear. Less than 70% of participants were followed up at 4 to 6 years, increasing the likelihood of bias.</p> <p>Both ISFP and PDFY involved both parents and their children (11-12 year olds), and focus upon activities to promote authoritative parenting – responsive communication, parental rule setting / boundaries / expectations. Additionally, ISFP also provides opportunities for skill rehearsal.</p> <p>The authors conclude that the evidence is insufficient to draw any firm conclusions, but that there are some promising interventions.</p>
Thomas et al (2008). Family-based programmes for preventing smoking by children and adolescents	<p>Systematic review of family based programmes to help family members to strengthen non-smoking attitudes and promote non-smoking children or adolescents or their family members.</p> <p>No. of included studies: 22 RCTs</p> <p>The components of interventions varied from providing information, skill building, development of social skills, and feedback to parents on their child’s behaviour.</p> <p>The majority of trials were conducted in the USA with one in the UK.</p>	<p>Of the four RCTs rated by the authors as minimal risk of bias, two found positive effects of family interventions. Of the 10 RCTs rated as one or more risks of bias, three found positive effects and one found some negative effects. Six trials were rated as having multiple risks of bias.</p> <p>Of those rated as minimal or one or more risks of bias, five studies reported post intervention impact ranging from 2-6 years. Spoth et al (1999) reported that after six years, self-reported lifetime cigarette use was significantly lower in those who received the ISFP (previously described) compared to the control group ($p < 0.01$). Schinke et al (2004) reported post intervention impact at 3 years, and reported lower cigarette use at 1, 2, and 3 years in the intervention group when compared to control. Jackson et al (2006) reported that after three years, the control group were more likely to initiate smoking than the intervention group (OR=2.16, 95% CI=1.39 to 3.37; $p < .001$). Josendal et al (1998) reported that after 3 years there were 68.3% of non-smokers in the group which received the classroom plus parents intervention compared to 58.3% in the control. Wu et al (2003) reported that at two years there was less smoking in the group that received the intervention (Focus on Kids [FOK] + Informed Parents and Children Together [ImPACT]) intervention versus the comparison group.</p>

Author	Description	Findings
Foxcroft, D.R., & Tsertsvadze, A. (2011). Universal family-based prevention programs for alcohol misuse in young people	<p>Systematic review to determine if family based psychosocial and educational prevention programs prevent alcohol misuse compared to other types of intervention or no intervention</p> <p>No. of included studies: 11 RCTs</p> <p>The components of intervention programs in the majority of trials included 'development of parental rules, monitoring and supervision, support, communication between parents and their children, time spent together, attachment and conflict reduction'.</p> <p>Of the 12 trials reported, 11 were conducted in the USA and one in the Netherlands.</p>	<p>Nine of the 12 trials demonstrated statistically significant greater reductions in alcohol use for the family based intervention compared to the control groups.</p> <p>One trial reported post-intervention impact at eight years (Spath et al 1999), reporting two interventions: ISFP and PDFY. The long term results indicated that both interventions significantly reduced the proportion of new alcohol users, past month mean frequency of drinking and scoring on a composite index of alcohol use.</p> <p>The authors report that less than 70% of participants were followed up at 4-6 years, with even less at eight years post-intervention, thus there is a risk of bias in these results.</p>
Wight, D., Fullerton D. (2013). A review of interventions with parents to promote the sexual health of their children.	<p>Systematic review to assess the effectiveness of interventions involving parents or carers to improve the sexual health of their children.</p> <p>No. of included studies: 22 relevant trials.</p> <p>The components of the interventions were described by the authors as focusing on improving parent-child communication about sex in order to change adolescent sexual behaviour. The authors state that the parenting component varied considerably across trials.</p> <p>All relevant trials were conducted in the USA.</p>	<p>Of the 22 relevant trials reported, 13 reported effectiveness in relation to sexual behaviour, sexually transmitted infections or pregnancy. However, the majority of these reported interventions in which the parenting component was less than one fourth of the overall intervention content. The authors report three trials in which the parenting component was at least one fourth of the overall intervention content: Mother Daughter HIV Risk Reduction (MDRR) (Dancy et al, 2006) reported evidence of delayed sexual activity, Real Men (Dilorio et al, 2007) reported evidence of increased condom use, and Keepin' It REAL (Dilorio et al, 2006) reported increased condom use at last sexual intercourse.</p> <p>The authors stated that there was a lack of rigorous evaluations, specific problems including use of incomparable controls, short follow-ups and poor reporting of intervention outcomes – frequencies and effect sizes.</p> <p>Effective programs tended to be community based, contained at least 14 hours contact time and encouraged delayed sex.</p>

Appendix 3. Table of study characteristics, and intermediate and primary outcome data for 10 effective interventions

No	Study	Participants	Intermediate outcomes	Primary outcomes
1.	Bauman 2000 / US / Family Matters (Bauman 2002; Ennet 2001)	N: 1135 pairs [adolescent aged 12-14+parent] (intervention n=531, control n=604)	At 12 months, families receiving Family Matters were more likely to set rules about tobacco and alcohol use, provide encouragement not to smoke and talk about peer and media influences on alcohol use. However, these variables were not the variables that influenced adolescent alcohol and tobacco use therefore the authors conclude that effects upon adolescent health behaviour cannot be explained by the intervention.	At 12 months, % youths reporting lifetime cigarette use, OR = 1.36 (p=.014, lower bound confidence level 1.08) % youths reporting lifetime alcohol use, OR = 1.34 (p=.022, lower bound confidence level = 1.06)
2.	Brody 2006 / USA / The Strong African American Families Program (Brody 2010; Brody 2006a; Gerrard 2006)	N: 330 11 year old African Americans and their primary caregivers (intervention n=181, control n=149)	At 29 months, parents in the intervention group reported a greater increase in targeted parenting behaviours than did the control parents. These increases were associated with changes in adolescents' intentions to drink.	At 29 months % of children who initiated alcohol use was significantly lower in the intervention group compared to control (data not provided). The intervention group had a slower rate of increase in alcohol use than the control group ($\beta = -0.18$, $p < 0.05$); At 65 months, the intervention group had a slower rate of increase from the first to final FU ($\beta = -0.23$, $p < 0.05$). Intervention group drank half as often as the control group: average monthly drinking occasions 0.68 (sd1.76) vs 1.41 (sd7.99)
3.	Koning 2009 / Netherlands / (Koning 2010)	N: 2937 students and their parents (parent intervention n=801, student intervention n=942, combination n=812, control=935)	At 22 months, for the effective intervention (combined intervention), adolescent self-reported perceived rules and self-efficacy, and parental attitudes mediated the association between the intervention and onset of weekly drinking.	At 22 months, the intervention reduced weekly drinking and frequency of drinking.
4.	Loveland-Cherry 1989 / USA	N: 428 9-10 year olds and their parents (intervention n=90, control n=338)	None reported	Follow-up at 12, 24, 36, and 48 months: Alcohol use & alcohol misuse were lower amongst prior users only over time in the intervention group versus control group ($p < 0.01$, & $p < 0.05$ respectively).

No	Study	Participants	Intermediate outcomes	Primary outcomes
5.	Perry 2003 / DARE Plus / USA	N: 6237 (DARE Plus (parenting) n=2221, DARE only n=2226, control n=1790)	At 24 month follow-up, boys in the DARE plus program less likely to report decreases in parental rules about drugs compared to DARE only. Parent rules baseline score, DARE plus 25.64 (0.20), growth rate -0.14 (p=0.05). DARE plus vs Ctrl not significant.	<p>Follow-up at 24 months:</p> <p>DARE plus versus control: Boys in the DARE plus schools were less likely than those in the control schools to show increases in alcohol behaviour and intentions (Growth rate for Int 0.17 vs Ctrl 0.18, p=0.04), past year (Growth rate for Int 0.21 vs Ctrl 0.26, p=0.04) or past month alcohol use (Int 0.08 vs Ctrl 0.14, p=0.01), current smoking (Int 0.18 vs Ctrl 0.31, p=0.02), and drug behaviour & intentions (Int 0.37 vs Ctrl 0.38, p=0.05).</p> <p>DARE plus versus DARE only:</p> <p>Boys in the DARE plus schools were less likely than those in the DARE only schools to show increases in tobacco use behaviour and intentions (Growth rate for D+ 0.68 vs D 0.95).</p> <p>Girls in the DARE plus schools were less likely to report increases in ever having been drunk compared with DARE only (D+ 0.07 vs D 0.13).</p>
6.	Schinke 2004 / USA	N: 514 11.5 year olds & their mothers (CD only, CD+parenting & control n not provided)	AT 24 and 36 months, youths in the CD-ROM plus parent intervention group had higher family involvement scores than youths in the control group at 2 and 3 year follow-up: CD + Parent 2.4 (0.64), CD 2.3 (0.89) Ctrl 2.2 (0.91) and CD + Parent 2.6 (0.44) CD 2.4 (0.51) Ctrl 2.2 (0.73) respectively.	<p>Youths in either intervention group (CD only or CD +parent) reported less monthly alcohol use than control youths at 1 and 2 year follow-ups. Cigarette and marijuana use lower in either intervention group at 1, 2 and 3 year follow-ups.</p> <p>At 3 years, youths in CD + Parent reported less monthly alcohol use than CD only and Ctrl youths: CD + Parent 0.9 (0.17) CD only 1.0 (0.22) Control 1.6 (0.34) (both p's <0.05)</p>
7.	Schinke 2009c / USA	N: 591 12.7 year old girls & their mothers (intervention n=252, control n=339)	Girls who received the intervention reported greater communication with their mothers (Int 3.12 (1.06) vs Ctrl 2.59 (1.17) Wald chi-square 9.80 p<0.01), knowledge of family rules about substance use (Int 1.80 (0.45) vs Ctrl 1.51 (0.68) Wald 4.55 p<0.05), awareness that their parents were monitoring their discretionary time (Int 3.57 (0.76) vs Ctrl 3.29 (0.94) Wald 5.57 p<0.05). Mothers reported better communication with their daughters (Int 3.60 (1.73) vs Ctrl 3.16 (1.82) Wald 9.26 p<0.01), rules against their daughters' substance use (Int 3.85 (0.53) vs Ctrl 3.80 (0.55) Wald 5.41 p<0.05), and monitoring their daughters' out of home activities (Int 3.06 (1.08) vs Ctrl 2.46 (1.21) Wald 21.99 p<0.0001).	At 12 months follow-up, alcohol use occasions in the past 30 d, int vs ctrl: 0.17 (0.32) vs. 0.31 (0.61), Wald chi-square=6.11, p<0.05

No	Study	Participants	Intermediate outcomes	Primary outcomes
8. & 9.	Spoth 1999 (Guyll 2004; Mason 2009; Park 2000; Spoth 1999a; Spoth 2004; Spoth 2006; Spoth 2009; Spoth 2001) / USA / (8) Iowa Strengthening Families Program & (9) Preparing for the Drug Free Years / USA	N=667 11-12 year olds (ISFP n=238, PDFY n=221, control n=208)	9. PDFY: Parents in the PDFY condition showed significantly more improvement than the control group in norms against alcohol and other drug use	Alcohol: AT 120 mo: Drunkenness frequency 1.45 (1.34) vs 1.66 (1.50) vs 1.68 (1.43), alcohol problem frequency 0.27 (0.36) vs 0.23 (0.36) vs 0.31 (0.48). ISFP had slower rates of initiation of drunkenness, increase in drunkenness frequency, initiation of alcohol problems, increase in alcohol problem frequency. Both ISFP and PDFY had an indirect effect on drunkenness, ISFP vs Ctrl RR=19% (p<0.01), PDFY vs CTRL RR=9%, ISFP also had a direct effect on drunkenness and alcohol problems, and also an indirect effect on alcohol problems RR=23% (p<0.01). Smoking: After 6 years, time to initiation of smoking was 54.9 months in the ISFP compared to 31 in the Ctrl (p<0.05). Cannabis and other substance use: Cannabis use growth curve analysis: ISFP vs ctrl – significant time x treatment group interaction (p<0.01) favours ISFP; Cannabis lifetime use at 6 years ISFP 22/148 vs 43/156 RR0.55 (95%CI 0.32-0.95), Inhalants and other drugs lifetime use at 6 years ISFP 7/148 vs ctrl 16/156 (95%CI 0.20-1.09) Cannabis use in the past year at 6 years ISFP 11/148 vs 27/156 RR 0.44 (95% CI 0.20-0.96). Other illegal drugs in the past year at 6 years ISFP 1/148 vs ctrl 9/156 RR 0.16 (95% CI 0.02-1.26) Cannabis use growth curve analysis: PDFY vs ctrl – significant time x treatment interaction (p<0.01) favours PDFY; Cannabis lifetime use at 6 years PDFY 30/147 vs ctrl 43/156 RR0.75 (95% CI 0.47-1.21), Cannabis use in the past year at 6 years PDFY 21/147 vs ctrl 27/156 RR 0.75 (95%CI 0.40-1.39), Other illegal drugs use in the past year at 6 years PDFY 4/145 vs ctrl 9/156 (95%CI 0.15-1.52)
10.	Wu 2003 / USA / Focus on Kids [FOK] and IMPACT	N= 817 African American youths aged 12-16 years (FOK+impact n = 496, FOK only n = 321)	Perceptions of problem communication were significantly lower at 12 mo in those who received FOK plus IMPACT (2.97) vs FOK only (3.08)	At 12 months, less cannabis use (0.18 vs 0.24), smoking (0.14 vs 0.18) and alcohol use (0.22 vs 0.31) in the FOK and Impact group vs FOK only. 24 months: Less smoking (12.5% vs 22.7%) and cannabis use (18.3% vs 26.8%)

Appendix 4. Characteristics of interventions

No.	Study / Ratio of parent to adolescent component	Setting	Recipient	Provider	Theory	Format	Number of parent contacts	Duration
Effective interventions								
1.	Bauman 2000 / USA / Family Matters / 2:1	Home	Parents /Adolescents	Trained deliverer/ Parents	Social inoculation theory / Social learning theory	Individual-parent/ Individual-family	8	6 months
2.	Brody 2006 / USA / The Strong African American Families Program / 1:1	Community	Parents / Adolescents	Trained deliverer	Prototype willingness model	Group-parents / Group-adolescents / Group-families	14	7 weeks
3.	Koning 2009 / Netherlands / 1:1	School/Home	Parents/ Adolescents	Trained deliverer/ Teacher	None reported	Group-parents/ Individual-parent/ Group adolescents	3	2 months
4.	Loveland-Cherry 1989 / USA / 1:1	Home	Parents /Adolescents	Trained deliverer	Problem behaviour theory / Social cognitive theory	Individual-parent/ Individual-family	4	3 months
5.	Perry 2003 / DARE Plus / USA / 5:7	School/Home	Parents/ Adolescents	Trained deliverer / Police	None reported	Individual-family / Group adolescent	5	2 years
6.	Schinke 2004 / USA / 1:1	Community	Parents/ Adolescents	Trained deliverer	Social learning theory	Group-parents / Group-adolescents / Group families	4	Not reported
7.	Schinke 2009c / USA / 1:1	Home	Parents/ Adolescents	Self-delivered	Family interaction theory	Individual-family	9	9 weeks
8.	Spoth 1999 / USA / Iowa Strengthening Families Program 1:1	Community	Parents/ Adolescents	Trained deliverer	Social development model	Group-parents / Group-adolescents / Group families	7	7 weeks
9.	Spoth 1999 / USA / Preparing for the Drug Free Years / 1:1	Community	Parents/ Adolescents	Trained deliverer	Social development model	Group-parents/ Group families	5	5 weeks
10.	Wu 2003 / USA / Focus on Kids [FOK] and IMPACT / 1:2	Community	Parents/ Adolescents	Trained deliverer	None reported	Individual-family/ Group-adolescents	4	Not reported

No.	Study / Ratio of parent to adolescent component	Setting	Recipient	Provider	Theory	Format	Number of parent contacts	Duration
Ineffective interventions								
11.	Biglan 1987 / US / 4:5	School/Home	Parents/Adolescents	Teacher	None reported	Individual-parent/ Group-adolescents	4	3 weeks
12.	Curry 2003 / US / 5:1	Home	Parents/Adolescents	Self/ Trained deliverer	None reported	Individual-parent/ Individual-family	5	14 months
13.	Elder 1996 / FACTS for 5 & The Unpuffables / US / 1:2	School/Home	Parent/Adolescents	Teacher	None reported	Individual-family / Group-adolescents	4	Not reported
14.	Forman 1990 / US / 5:12	School	Parents/Adolescent	Trained deliverer	None reported	Group-parents / Group-adolescents	5	1 year
15.	Haggerty 2007 / Parents Who Care / US / 1:1	School/Home	Parents/Adolescents	Trained deliverer	Social development model	Individual-family/ Group-families	7	7-10 weeks
16.	Koning 2009 / Netherlands / 1:0	School/Home	Parents	Trained deliverer	None reported	Group-parents	2	1 day
17.	Li 2002 / US / ImPACT / 1:1	Home	Parents/Adolescent	Self	None reported	Individual-parent/ Individual-family/ Group-adolescents	1	60-90 minutes
18.	Schinke 2009b / US / 1:1	Home	Parents/Adolescent	Self	Family interaction theory	Individual-family	11	9 weeks
19.	Severson 1991 / US/ Project Path / 3:7	School/Home	Parents/Adolescent	Teachers	Social influence model	Individual-parent/ Group adolescents	3	2-3 weeks
20.	Stevens 2002 / US / 1:1	Primary care	Parents/Adolescent	Clinician	None reported	Individual-family	12	3 years
21.	Werch 2003 / US / 7:3	School/Home	Parents/Adolescent	Clinician	Stages of change/ Health belief model/ Social cognitive theory/ Behavioural self-control theory	Individual-adolescent/ Individual-family	7	3 weeks