

**Investigating the Effectiveness of Education in
Relation to Alcohol:
A Systematic Investigation of Critical Elements
for Optimum Effectiveness of
Promising Approaches and Delivery Methods in
School and Family Linked Alcohol Education**

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**June 2011
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Executive Summary

Background

This review examined evidence for school and family linked alcohol education programmes to reduce or prevent the misuse of alcohol by young people. The review aimed to identify critical programme or contextual elements positively associated with evidence of effectiveness. The review paid particular attention to, but was not confined to programmes that included social norms education and/or life skills training and/or the Good Behaviour Game and/or peer-to-peer delivery components.

The review was conducted by the Institute for Social Marketing, a joint initiative of the University of Stirling and the Open University. It was commissioned by the Alcohol Education and Research Council (AERC) on behalf of the Drinkaware Trust (DAT) who provided the funding. The original stated purpose of the study was 'to collate evidence that would help to inform how best DAT could approach and be involved in school-based alcohol education across the UK'.

Methods

Systematic literature search methods were used, along with a combined quality appraisal and evidence weighting assessment to identify 'promising' interventions. Promising interventions were defined as any intervention where study design was assessed as sound. Weight of evidence for aggregated evaluation results for each intervention was classified as equivocal or convincing. Any intervention reporting adverse effects on substance misuse was excluded.

After all relevance and quality screening was completed, the review identified 39 studies collectively reporting on 25 interventions.

The results were analysed thematically and with reference to pre-specified research questions.

Findings

- The most effective social norms interventions targeted peer alcohol use. Social norm change objectives in both school-based and family components were common and associated with effectiveness. Most of the evidence of effectiveness was derived from mass marketed (not personalised) social norms and did not appear to be informed by dedicated formative research.
- Life Skills Training (LST) was also a popular approach, often combined with approaches intended to strengthen protective family factors. Most of the evidence derived from the USA, so cultural transferability remains unclear and requires further piloting.
- There was evidence that peer-to-peer delivery is more effective when combined with peer driven planning and other techniques aimed at deeper engagement with target audiences and genuine participatory change.
- Reducing environmental availability of alcohol to young people as well as community tolerance of young people's consumption of alcohol appears to enhance the effectiveness of school and family linked alcohol education programmes.

- The evidence indicates that a range of education approaches and delivery methods can make a small positive contribution to harm reduction, but there are many examples of interventions which are ineffective or harmful.
- Neither knowledge and attitude change, nor acceptability of an intervention is predictive of positive behaviour change.
- Involving external specialists can enhance acceptability and effectiveness, but is not critical to effectiveness.
- Interventions perceived by target audiences as personally relevant achieve higher retention rates and are more effective than interventions that do not resonate with day to day concerns and circumstances of target audiences.
- There is evidence that programme effects, can be sustained up to six years after intervention completion. However, for most interventions positive effects decline fairly rapidly over time and therefore some type(s) of reinforcement intervention are required to maintain positive effects.
- Short duration, low-involvement interventions can achieve similar short-term effects to more intensive and longer term interventions.
- Most combined family and school-based interventions appear to lack a holistic perspective or any explanation for how the two components integrated and/or complemented one another within the overall programme design and its aims.

Strategic Implications and Recommendations

Combined school and family based alcohol education interventions will be most effective when integrated with broader based environmental interventions. Integration with community interventions can also help to build community ownership and improve intervention acceptability. Explicit linkage of educational interventions with environmental intervention is therefore recommended.

Clear conceptual rationale for both the individual content and the integration of school and family components may strengthen efficacy and cost effectiveness. Research in the future on which elements are best delivered via school and which via family programme components would be helpful to future programme design and planning.

An overarching strategy grounded in a theoretical model with clear goals and rationale will help guide consistency of messages, priorities and credibility of intervention agents and harm reduction/prevention objectives. This may be especially critical if multiple programmes and target audiences are supported by an intervention organisation.

Bottom up/participatory planning and delivery of current practice could be strengthened significantly and the use of specialists in participatory research, development and evaluation are recommended.

Consistent, systematic and pre-planned evaluation of future interventions would make a valuable contribution to the scientific evidence base and development of better practice and is therefore recommended. Restricting funding of all future intervention proposals to those which provide a detailed (including dedicated budget) evaluation plan would help to generate reliable and credible practice based evidence.

Research into the cost-effectiveness and efficacy of a planned series of short duration, age-appropriate interventions would be a useful contribution to the evidence base and development of better practice.

Behaviour change must be the definitive measure of effectiveness. It is recommended that scaling up investment should be restricted to approaches and methods that have previously demonstrated measurable (albeit probably small) reductions in alcohol use/misuse, and report comprehensive implementation details.

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1. Introduction

1.1 Outline

Comprehensive, credible and rigorous evaluation of intervention effectiveness in achieving stated aims is essential to building an evidence base that can contribute to the development of effective and cost-efficient policy and practice. Outcome and process evaluation are both useful in assessing the evidence base. Outcome evaluation is essential to assess effectiveness and protect against the proliferation of ineffective or harmful interventions. Process evaluation provides important supplementary information on why or why not an intervention is effective.

This report examines the evidence on the effects and positive contributing elements of alcohol education, delivered through schools and family linked intervention programmes.

Alcohol education is one of the most commonly used intervention approaches to tackle youth drinking (Anderson and Baumberg, 2006)¹. Previous reviews have concluded that alcohol education has at best small positive effects (Jones et al, 2007; Foxcroft et al, 2002)^{2 3}. Yet, there remain gaps in the evidence base, with most of the extant literature published in North America (Rehm et al, 2009)⁴. Most of the reported trials have focused on testing efficacy or descriptive process evaluation with limited linking of the two sources of evidence. There is therefore limited understanding of which methods and approaches work best, and how or why. Furthermore, the role of alcohol education as part of a multi-component alcohol intervention strategy has not been examined in detail (ISM, 2009)⁵.

1.2 The Social Context of Alcohol

Alcohol plays a significant social role in many countries including the UK. It is associated with celebrations; business, social and sport functions; and is consumed in religious and cultural ceremonies, as well as festive and transitional rituals (Wilson, 2005)⁶. Drinking alcohol serves as an expression of comradeship and solidarity, and it is extensively used to facilitate social interaction and bonding (Heath, 1995)⁷. For many young people drinking alcohol is perceived to be a major part of the socialisation process, and the rite of passage that represents the transition to adulthood (Foxcroft, 1996)⁸. Young people learn about alcohol early in life. In many European countries the majority of the adult population drink, therefore young people are exposed to consumption at home or in other environments (Eadie et al, 2010)⁹.

However, alcohol is also a toxic, addictive, teratogenic and carcinogenic drug, which has a considerable effect on society (House of Commons Health Committee, 2010)¹⁰. Alcohol use is associated with significant health harms, with an estimated 3.8 per cent of all global deaths, and 4.6 per cent of global disability adjusted life years attributable to alcohol (Rehm et al, 2009)⁴. Long-term excessive consumption and binge drinking is associated with a range of longer-term health harms including coronary heart disease, liver cirrhosis and stroke (Britton and McPherson, 2001; Gutjahr et al, 2001; Leon and McCambridge, 2006)^{11 12 13}.

1.3 Young People, Alcohol Harms and Harm Reduction

The drinking behaviours of young people in many countries have been shifting to more hazardous and harmful patterns including under-age drinking, earlier initiation into alcohol consumption, and high rates of heavy episodic (binge) drinking (Hibell et al, 2009)¹⁴. These changes in youth consumption trends are a matter for concern regarding young people's health and safety. Binge drinking in youth can have adverse neuro-developmental effects (Lisdahl Medina et al, 2008)¹⁵. More immediate health harms caused by youth drinking are also a cause for concern. In the UK there has been a 20 per cent rise in alcohol-related hospital admissions (Hospital Episode Statistics, 2007)¹⁶, and a 57 per cent increase in alcohol-related deaths among people aged 15-34 between 1991 and 2007 (Department for Children, Schools and Families, 2008)¹⁷. Furthermore regular recreational consumption and binge drinking in adolescence is a strong predictor of alcohol dependency in adulthood (Bonomo et al, 2004; Jefferis et al, 2005)^{18 19}.

Notwithstanding the considerable health harms caused by harmful drinking among youth, risky alcohol behaviours contribute to multiple social harms. These include poor educational performance, risky sexual behaviour and teenage pregnancy (Newbury-Birch et al, 2009; OECD, 2009)^{20 21}, crime and disorder (Home Office, 2004; Hibell et al, 2009)^{22 14}, and a range of physical and psychological harms (Hospital Episode Statistics, 2007; Scottish Government, 2010)^{16 23}.

The extent of alcohol-related harms has led to the World Health Organisation (2010)²⁴, the European Commission (2006)²⁵, national governments (HM Government, 2007)²⁶ and a range of stakeholders (BMA, 2008)²⁷, to identify youth consumption as a major public health, and policy issue. A range of policy interventions to mitigate youth alcohol-related harms are available including reducing availability and affordability, increasing the minimum legal purchasing age, regulating alcohol marketing, health information campaigns, brief intervention strategies, and alcohol education (Anderson et al, 2009a; Babor et al, 2010)^{28 29}.

A range of socio-cultural and environmental factors that influence youth drinking behaviour have been identified. These include: media exposure (Grube and Wallack, 1994)³⁰, gender (Lex, 1991)³¹, social context including parental, family member and peer influence (Petraitis et al, 1995; Szalay et al, 1996)^{32 33}, religion (Engs et al, 1990)³⁴, levels of deviance (Ellickson et al, 2001)³⁵, pro-drinking attitudes beliefs and behaviours (Ellickson et al, 2005)³⁶, socio-economic class (Bobo and Husten, 2000)³⁷, race and ethnicity (Jones-Webb et al, 1995)³⁸, and alcohol marketing (Anderson et al, 2009b)³⁹. Studies have shown that children who were warned about alcohol by their parents, and those who reported being closer to their parents were less likely to start drinking (Kandel et al, 1987; Andrews et al, 1993; Ary et al, 1993)^{40 41 42}. Membership of youth groups, high levels of self-esteem, and personal importance placed on religion have also been suggested as potential protective factors for youth drinking (Resnick et al, 1997)⁴³.

In the US a range of paradigms on alcohol education are apparent. Traditionally, there has been substantial support for abstinence models (simply don't do it). Social-economic models which use facts on the likely effects of irresponsible drinking have also been a significant driver and influencer of intervention approaches. Some

approaches treat alcohol consumption as a disease; and others have sought to offer alternatives to drinking. The harm reduction model is predicated on the assumption (some would argue recognition) that young people are likely to consume alcohol and seek to limit the harmful effects.

Loxley et al (2004)⁴⁴ note that children and young people who are exposed to few of the recognised protective factors and/or above average levels of exposure to known risk factors are of course most likely to be involved in risky alcohol behaviours and suffer alcohol-related harms. However, Loxley et al also note that those whose drinking is less frequently risky do occasionally engage in risky behaviours and therefore universal approaches are appropriate.

As well as a range of moral and value system perspectives on alcohol education, there are various theoretical and conceptual approaches to alcohol education.

1.4 Family-based Approaches to Alcohol Harm Reduction

One of the most recognised and extensively used approaches to alcohol education, which emerged in the 1980s, is the family-based approach. Family has been shown to be a strong influencing factor on young people's attitudes about drinking (Bjarnason et al, 2003)⁴⁵. Using this approach, parents are usually targeted as a key component of interventions. Many family-based interventions are delivered in conjunction with a school-based component. Parents and other family members can be involved in a number of ways. A classroom curriculum relating to alcohol issues may be supplemented with a parental curriculum. Interventions may feature training workshops, or meetings between parents, teachers and trained specialists, or information materials given to parents, other outreach activities such as mass media, or a combination of activities. Within the extant literature, the family-based approach to alcohol education has been found to be one of the most effective (Foxcroft et al, 2002; Jones et al, 2007)^{3 2}. Although family influence has been suggested as a protective factor for youth drinking, there is little research on whether this can cancel out the effect of peer influence. Evidence on susceptibility to peer influence is mixed, with some studies suggesting that this peaks at age fourteen, but others suggesting little evidence of increased susceptibility to peer drinking beyond age ten (Steinberg and Monahan, 2007)⁴⁶. Impulsivity, risk-taking and sensation-seeking are behaviours associated with teenagers in the twelve-sixteen age range. As cognitive control matures, social and emotional influences may be moderated but little is understood about when and how this developmental process can be matched appropriately and effectively to the range of approaches and delivery methods.

1.5 School-based Approaches to Harm Reduction

School-based alcohol education describes a diverse range of intervention approaches, paradigms and delivery methods. It may include a curriculum on alcohol-related issues to young people in a school setting, involve a range of stakeholders including head teachers, teachers, school governors, school nurses, counsellors, and social and health education coordinators, and the school may be a central agent in the process or a peripheral component perhaps used primarily as the access point to young people and their families.

A wide range of theoretical approaches have been used in devising and delivering school-based alcohol education. Key aims of school-based alcohol education may be to encourage young people not to drink, to delay the age at which they start to drink, reduce the age-related growth in alcohol consumption, discourage more risky behaviours, and/or reduce harms associated with drinking.

1.6 Alcohol Education and the Information Deficit Paradigm

Exclusively informational approaches to alcohol education in schools are now very rare as a result of unequivocal evidence that these are ineffective (Babor et al, 2010)²⁹. Information of alcohol effects and risks however is still a common component of broader-based education. From the age of seven, children begin to develop more advanced cognitive processing functions, and can be introduced information on the damaging effects of alcohol. In secondary school (age eleven onwards) young people may be given further information about the risks of alcohol, its damaging effect on family, friends, the community and wider society, and risk aversion and coping strategies (Jones et al, 2007)².

1.7 Social Norms Approaches to Alcohol Education

Social norms approaches to alcohol education, also known as social norms marketing are becoming increasingly popular. The approach was developed after researchers in the 1980s found that students at a small US college held exaggerated beliefs about the normal frequency and consumption habits of other students (Berkowitz, 2005)⁴⁷. Later studies found that these inflated perceptions were prevalent in universities of all types, in various locations. Social norms theory targets incorrect perceptions about the attitudes and/or behaviours of peers. A social norms intervention may assess the exaggerated descriptive norms of a population through formative (usually survey) research and then inform the population of the actual behavioural norm. Process evaluation may be used to guide the development of, and determine the effectiveness of communications used. Summative research can assess the impact of social norms interventions on knowledge, attitudes and behaviours.

1.8 Social Competencies Approaches to Alcohol Education

The provision of life skills training has been used quite extensively in family-based and school-based alcohol education programmes. The skills taught in such interventions include refusal assertiveness, general personal assertiveness, effective communication, coping with anxiety and stress, goal setting and problem-solving (Botvin et al, 1980)⁴⁸. Other social and life skills commonly included in such programmes include self-awareness and empathy, creative and critical reasoning, and decision-making. Typically, a curriculum featuring these elements is delivered in a school, family or combined setting, with life and social skills training supplemented with information sessions focusing specifically on alcohol. Although life skills training has been suggested as an effective approach to reducing illicit drug use, it seems to be less effective at reducing alcohol use (Foxcroft et al, 2002)³.

The social influences approach to alcohol education draws on the work of Kelman (1958)⁴⁹, who posited that social influence can be defined as changes in a person's thoughts, feelings, attitudes or behaviours as a result of interaction with others.

Social influences approaches to alcohol education often involve a curriculum which encourages critical thinking, decision making, problem-solving, creative thinking, effective communication, interpersonal relationship skills, self awareness, empathy, coping with emotions and stress, normative beliefs, and knowledge about the harmful effects of alcohol (Sussman et al, 2004)⁵⁰. There are obvious overlaps between the social influences approach and life skills training approaches. Interventions delivered using this approach are commonly delivered in schools, but can also include parental components.

Social learning theory, which is influenced by sociology and psychology, states that people's behaviours are learned, and influenced according to their environment and psychological factors (Bandura, 1977)⁵¹. Under this framework, people learn behaviours through overt reinforcement or punishment, or via observational learning of the social actors in their surroundings. Applying social learning theory, behavioural outcomes are facilitated by three requirements: retention, reproduction and motivation. Alcohol education interventions that use social learning theory typically involve a curriculum taught in schools, which provides students with education about the health risks of consuming alcohol and issues behavioural guidelines to lower risk. Other components include the encouragement of reflection and analysis of social situations to strengthen perceptions of risk, and the development of personal and social skills to resist peer and social pressures to drink alcohol. There are significant similarities between this approach, life skills training, and the social influences approach.

1.9 Early Childhood Education and Alcohol Harm Reduction

There is an emerging evidence base that links childhood disruptive behaviour problems and early onset of alcohol use and misuse (Ernst et al, 2006; Elkins et al, 2007)^{52 53}. Targeting childhood disruptive behaviour problems has therefore been identified as a prospective approach to alcohol education. Interventions using this approach are typically delivered in schools, and feature components that encourage students to manage their own, and their classmates' behaviour. One programme approach developed in the US in the 1960s is the Good Behaviour Game (GBG), which is a reinforcement-based group management strategy (Barish et al, 1969)⁵⁴. The class is divided into teams, and the students and teachers define disruptive behaviours, and decide how many infringements will be allowed. Each team's goal is to have the least amount of infringements of behaviour, with rewards awarded to the winners. Studies have found that prevention of onset of childhood disruptive problems seems to be effective in reducing alcohol misuse (Greenberg et al, 2001)⁵⁵, although evidence is mixed (van Lier et al, 2009)⁵⁶.

1.10 Peer-to-Peer Delivery of Alcohol Education

Peer alcohol education approaches involve the recruitment and training of peer educators to deliver programmes. Peer education has been defined as "an educational program that is delivered to students by other students of comparable age or slightly older" (Cuijpers, 2002, p107)⁵⁷. Over a series of training sessions often involving workshops and leisure activities, peer educators are encouraged to help devise an alcohol education programme, which they then deliver in a variety of settings including schools, youth clubs and organisations. Often peer education is

delivered in conjunction with teacher-led school-based alcohol education. A meta-analysis found that a range of factors can influence the effectiveness of peer alcohol education, but their effect on outcomes is rather mixed (Cuijpers, 2002)⁵⁷.

1.11 Community Systems Approaches to Alcohol Harm Reduction

Community systems involve framing alcohol issues within a wider context, rather than focusing solely on individuals or groups (Holder, 1998)⁵⁸. Addressing problems such as youth drinking using the community systems approach typically involves an understanding of an entire population and suggesting interventions that change the behavioural environment to promote desired outcomes. A key feature of community systems interventions is community ownership. In these types of interventions, it is important that the local community, and not specialist outsiders, drive the design, delivery, and implementation of the programme. As part of a wider remit of activities, community systems approaches often include a school and parental curriculum of alcohol education.

1.12 Background Research used to Inform the Scope and Purpose of this Project

The Alcohol Education and Research Council (AERC) invited proposals for a two-stage study to assess the effectiveness of education in relation to alcohol. Funding for the call was provided by the Drinkaware Trust (DAT). The purpose of the study was 'to collate evidence that would help to inform how best DAT could approach and be involved in school-based alcohol education across the UK'.

The first stage of the research was a scoping study which identified the breadth of the evidence base on the effects of education in relation to alcohol. A review of reviews research strategy was used. Fifty-eight high quality relevant reviews were assessed and used to answer eleven research questions on the type of published evidence available. The review of reviews found that:

- The evidence base on the various underpinning approaches and their impact, including educational approaches at primary secondary and tertiary levels, on alcohol-related behaviours and behaviour mediators was substantial.
- The evidence base on effectiveness for other substance misuse intervention was also substantial. Comparative analysis of alcohol only and alcohol and other substances preventive interventions was less comprehensive.
- The comparative evidence base for multi-faceted school-based initiatives, such as parental and family involvement, and a preventive school environment/ethos vs. curriculum only was reasonably substantial. Similarly, the evidence base comparing delivery agents, and modes of delivery was reasonably substantial.
- The comparative evidence base on settings for alcohol education which focuses mainly on school vs. community, family and welfare services was also substantial, although specificity of different underpinning approaches to some settings than others means direct comparisons are not always appropriate. Differences in context and objectives between school and college based educational interventions were noted.

Typical aims of educational alcohol interventions and programmes noted in the scoping study were:

- Provision or strengthening of knowledge and skills to encourage healthy, informed choices about alcohol.
- Increased awareness of the risks of harmful drinking behaviours and encouraging positive attitudes towards responsible alcohol consumption (including compliance with legal restrictions).
- Strengthening social skills and resistance strategies that may be protective against hazardous alcohol consumption.
- Support strategies for endogenous psychological traits that may be protective against hazardous alcohol consumption, for example building self-efficacy, training in higher order thinking and problem-solving.
- Correction of misperceptions of alcohol norms such as peer drinking behaviours and prevalence of binge drinking.

Most common outcome measures noted in the scoping study were:

- Changes in self-reported range of alcohol behaviours, including age of initiation into alcohol consumption, frequency of consumption, frequency of episodic excessive alcohol consumption, overall consumption levels, nature and strength of alcoholic drinks consumed.
- Changes in prevalence or strength of known endogenous risk factors and protective traits for alcohol-related behaviours such as knowledge, attitudes, perceptions of normal and acceptable behaviours, self-efficacy.
- The persistence of any measured effects over time.
- Changes in prevalence or strength of protective skills against substance misuse such as problem-solving, resistance to peer pressure.
- Changes in frequency or severity of consequences of alcohol-related behaviours such as alcohol-related injury.

Weaknesses and gaps in the evidence base observed in the scoping study:

- The scoping exercise identified many substantial gaps in the UK-specific evidence base. A very large proportion of published studies for alcohol, illicit drugs, and tobacco are N American, specifically the USA. For example, Faggiano et al (2008)⁵⁹ included 29 randomized controlled trials (RCTs) in a review of the effectiveness of school-based illicit drug preventive interventions, and the European authors reported that 28 of these were US-based. It is not clear how differences in culture, educational infra-structure and the legislative environment impact both delivery and outcomes of interventions.
- A diversity of outcome measures, the use of proxy measures, such as delinquent behaviour, and more distal measures, such as personal injury, and the use of

pooled effects measures were common features of reported studies. This makes evaluating and comparing effectiveness of interventions more challenging.

- Inadequate reporting of process evaluation and a lack of consistency in intermediate measures were reported in many of the reviews. This is also noted as a significant weakness of the evidence base.
- A paucity of research on how school-based education fits with broader-based multi-component strategies and how alcohol education might support more effective intervention strategies was noted.

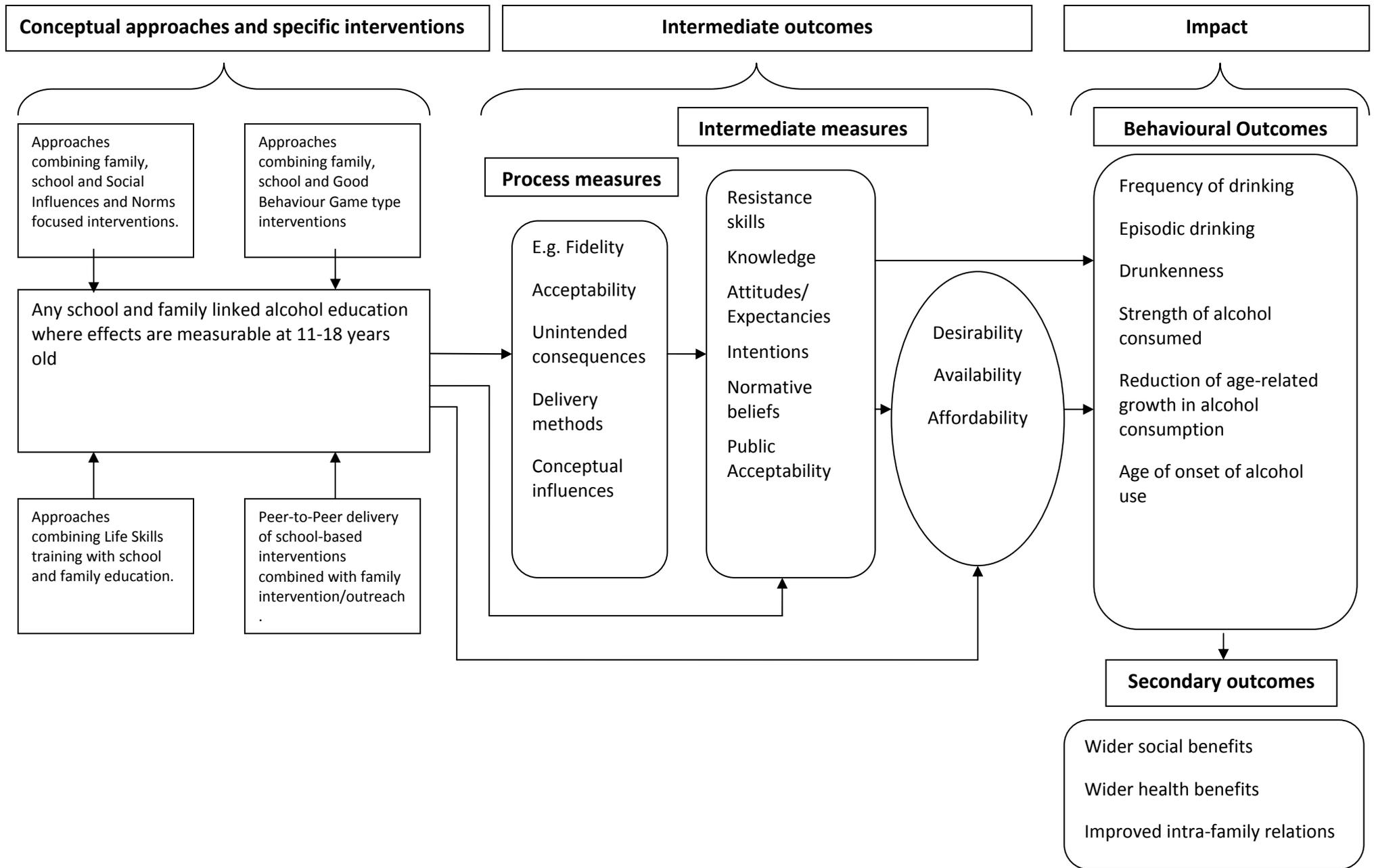
Based on these findings and after extended discussions between ISM, AERC and DAT, the research objectives for the second stage of the study were refined. Initially, the objectives were broad: Identification of elements necessary for school-based educational interventions to make a positive contribution to alcohol-related harm. Following further discussions and assessment of feasibility, the precise scope of the study was further refined to examine critical elements of effectiveness in school and family linked approaches to alcohol education.

The research questions finally agreed and guiding this study are:

- What are the critical elements of effective school and family linked education aimed at the prevention or reduction of alcohol misuse by young people aged eleven-eighteen years?
- Is there evidence that school- and family-linked alcohol education integrated with broader, behavioural influencing strategies is more, no more or less effective than as a stand-alone educational intervention?
- What is the quantitative evidence that education as one component of multi-component programmes makes a measurable positive contribution to harm reduction?
- What is the qualitative evidence that education as one component of multi-component programmes makes a measurable positive contribution to harm reduction?
- What is the evidence of change in knowledge and attitudes of young people participating in school and family linked alcohol education programmes?
- What is the evidence of short- and long-term change in behaviours of young people participating in school and family linked alcohol education programmes?

A logic model outlining the conceptual basis for the scope and focus of the research is presented as Figure 1 below.

Figure 1: Overview of Research Process and Logic



2. Methods

2.1 Background

Systematic research methodologies were used to ensure the identification and analysis of evaluation studies was as far as possible comprehensive, transparent, replicable and unbiased.

Systematic review methods are designed to capture and synthesise the research evidence to answer pre-specified research questions. Systematic reviews are also designed to minimise bias. A systematic review follows a detailed protocol, which is specified in advance, and which documents all steps and decisions involved in the process (Littell et al, 2008)⁶⁰.

2.2 Research Parameters

Universal and Selected Populations

Interventions targeting universal and selected populations using the US Institute of Medicine (IOM) definitions (IOM, 1994)⁶¹ were included. This framework for classification is based on Gordon's (1987)⁶² operational classification of disease prevention. The IOM model divides the continuum of services into three parts: prevention, treatment, and maintenance. The prevention category is divided into three classifications – universal (whole populations), selective (population sub-groups with higher risk profiles which includes individuals not at risk as well some at greater risk of harm) and indicated prevention (individuals or groups identified as at risk of harm). The complete definitions of these three classifications are included in the Appendices.

Ages and Settings

Subjects were of secondary school age (eleven-eighteen). For most studies, the intervention was delivered during this period of the life course. This age range was selected because one of the inclusion criteria for this review was that the intervention should include some measure of effect on levels of alcohol consumption. Very few evaluations can look at changes in alcohol consumption for those aged less than eleven years, partly due to the ethical issues involved in research projects which measure any regular or semi-regular reported alcohol consumption in this age group. Interventions which were initiated before participants reached this age group were eligible for inclusion if the study included measures of behavioural impact at eleven-eighteen years of age.

The focus of this review was school-and family-linked interventions. School-linked is defined as interventions which include participants who were targeted and/or recruited through school and/or were delivered some component of the intervention through schools. Family-linked was defined as any intervention that included activities directly involving or targeting parents, even if no direct personal contact was involved.

2.3 Search Strategy

Evaluation reports and studies were searched for using electronic literature databases and targeted internet searches alongside recommendations from relevant authors, experts and other contacts.

Three separate searches were run in the literature databases for the approaches identified in the previous chapter. These consisted of one search for family-based approaches, one for interventions which included a peer-to-peer component and one search which combined disruptive behaviour modification, addressing social influences and life skills. These three approaches were combined into one search after the piloting of the family-based and peer-to-peer searches. An example of the type of search terms used in the databases' title, abstract and keywords fields is included in the Appendices. This strategy was adapted to each database's search terminology, or simplified for a database if it did not support that depth of research. The databases we searched contained health, social science and educational literature and included:

(i) Subscription-only electronic databases:

- Australian Education Index
- British Education Index
- CINAHL
- The Cochrane Central Register of Controlled Trials
- ERIC: Educational Resources Information Center
- IBSS: International Bibliography of the Social Sciences
- Index to Thesis (Great Britain and Ireland universities)
- MEDLINE
- PsycInfo
- Sociological Abstracts
- Web of Science (Arts & Humanities, Science & Social Sciences Indices)

(ii) Open-access databases & websites:

- Copac National, Academic, and Specialist Library Catalogue
- ESRC Society Today
- Karlsruhe Virtual Catalog KVK
- National Research Register Archive
- OpenSIGLE (System for Information on Grey Literature in Europe)
- UK Clinical Research Network Study Portfolio

The open –access databases were searched using selected terms from the literature search strategy. The results of these searches were screened using the exclusion criteria described above.

(iii) Internet searches

Using selected terms from the literature search strategy, we searched for relevant publications available on the internet using the Google search engine. In addition to this, systematic searches of a selection of internet domains identified reports and publications from governmental departments and academic research in the relevant geographical areas. Selected search terms were combined in Google advanced search with domain limiters such as .edu, .ac.uk, .gov, .eu.

Searches were also conducted of stakeholder organisations' websites for relevant studies. The Appendices provide a list of websites included in these searches.

Alcohol Use Measures

The primary focus of this review was to identify promising approaches which exhibited some evidence (including mixed or partial evidence) of a positive behavioural change in alcohol use/misuse. This review focused on the following (usually self-reported) alcohol use measures as indicators of effectiveness:

- Frequency of drinking
- Episodic heavy (binge) drinking
- Drunkenness
- Strength of alcohol consumed
- Reduction of age-related growth in alcohol consumption
- Age of onset of alcohol use.
- Tendency to use alcohol

Intermediate measures such as resistance skills, increased knowledge regarding alcohol, changes to attitudes/expectancies, changes to intentions regarding alcohol, normative beliefs and public acceptability were also recorded where available. Secondary outcome measures such as wider social and health benefits and improved intra-family relations are also noted where these have been reported in the primary research.

Babor et al (2010)²⁹ has noted that alcohol education projects such as the US Drug Abuse Resistance Education (D.A.R.E.) remain widely popular despite many evaluations reaching the conclusion that the D.A.R.E. curriculum is ineffective in affecting alcohol-related behaviour. For the purposes of this study, for an intervention to be classed as effective, some evidence of a positive behavioural change in alcohol use/misuse was required.

2.4 Exclusion Criteria

The list of suggestions given in the final brief and all studies identified from the systematic searches were screened against the following exclusion criteria.

Studies were excluded if they:

- Were not a primary study of alcohol and other substance misuse education intervention (e.g. review, editorial, background discussion)
- Did not measure behavioural outcomes.
- Did not report on subjects within the age range (eleven-eighteen)
- Did not include a family-linked component
- Did not include a school-linked component
- Were not located in Western Europe, Australasia or North America
- Were not available in English
- Only measured the intervention process
- Only measured intermediate knowledge and attitudes

This review looked at universal and selected population interventions. Indicated interventions, which targeted those persons exhibiting early stages of substance misuse or related problem behaviour, were excluded due to their lack of generalisability.

Studies were excluded if they did not include both a school-linked component (as defined above) and some form of parental/guardian involvement such as leaflets mailed to parents or focus groups involving students and their families.

2.5 Quality Appraisal and Weight of Evidence

Quality Appraisal

The project did not aim to rigorously examine efficacy. Some evidence of effectiveness was required as an indicator that the included study was reporting a 'promising' intervention. Quality appraisal therefore was not used to screen and select studies or to grade strength of evidence. The quality appraisal framework was used only to determine if the evidence it generated conformed to minimum methodological standards of reliability and validity. A simple four item checklist, developed by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI Centre) was used to appraise and classify all included studies as 'sound' or 'unsound' (EPPI, 1999)⁶³. A copy of the framework and the results of appraisal is included in this report in the Appendices.

Evidence Weighting

As noted previously, many interventions produce only small effects sizes. Large sample sizes are required to detect small effects at statistically significant levels. Some interventions may report positive effects which do not achieve statistical significance but do demonstrate consistency in the direction of change across multiple measures or multiple intervention cases. The evidence could be described as 'promising' rather than convincing.

To ensure that this project was able to capture as much evidence as possible on 'promising approaches', we adopted an inclusive approach to assessing weight of evidence, in addition to the quality appraisal. We adopted a grading system based on a well-established guide on interpretation of effect sizes (Cohen, 1988)⁶⁴, in combination with reported statistical significance of measured effect. The grading system was applied to the pooled evidence relevant to each identified intervention. In other words, all the studies reporting on any specific intervention were assessed and graded collectively, which generated an overall weighting of evidence for the intervention. Interventions were therefore classified as convincing evidence of positive effects or equivocal evidence of positive effects or no effects. A copy of the framework and the results of the quality appraisal and weight of evidence grading is included in the Appendices.

2.6 Reliability and Validity

Bias

Systematic review methods cannot make up for poor quality of the primary research. Previous researchers have noted that in general there is much room for improvement in the quality of evaluations of alcohol education interventions. The purpose of this project was to identify elements or characteristics of interventions that appear to be associated with positive effects. This required studies to report both evidence of favourable behaviour change and sufficient detail on the intervention and its implementation for our secondary analysis to identify which variables might be contributing to the favourable change. The pooling of data increased the chances of detecting links between positive change and common elements associated with this change. It is not sufficiently rigorous however to be interpreted as robust evidence of best practice.

Publication bias should be considered in the analysis and interpretation of results. Publication bias refers to the over-reporting of studies which produced statistically significant effects and the under-representation of studies which produced null and negative effects. Studies with positive and statistically significant results are more likely to be published than those with small effects sizes or negative results, resulting in a non-random sample of available studies.

Validity

The studies identified were not originally intended for the purposes of this review. There are therefore some limits in the interpretation of the studies because some data relevant to our research questions may be missing or incomplete. Some of the gaps can be filled by pooling data. Pooling of data may draw on multiple studies reporting on a single intervention or programme or on combinations of individual studies reporting on interventions with similar methods and/or conceptual foundations.

Precautionary Screening

There are reported cases of interventions generating adverse outcomes, such as increased alcohol consumption or binge drinking. It was important that this less

rigorous and inclusive approach to quality appraisal and weighting did not inadvertently fail to recognise iatrogenic activities. Including evidence of behavioural effects as one of the inclusion criteria in screening and selection ensured that we did not inadvertently endorse any iatrogenic interventions in our conclusions on critical elements of effectiveness. We have included details of all the interventions that met initial inclusion criteria and were subsequently found to report negative effects in Appendix 2.

Data Extraction

Data extraction of the studies was conducted by three reviewers. See Appendix 1 for the data extraction tables for the 39 papers covering 25 interventions.

Analysis

A formal meta-analysis was considered but the quality and level of data detail in the studies identified was not sufficient to conduct a combined quantitative analysis. Instead, interventions were coded using a 23 item checklist of key process and outcome indicators. This was used to systematically review the identified evidence for trends and key features associated with effectiveness and ineffectiveness. The results of coding and subsequent analysis were used to answer the pre-specified research questions, and are presented in the Results Section.

Identified interventions were also screened for component approaches and delivery methods of particular interest for this study. A thematic analysis for each of the pre-specified priority approaches (life skills, social norms, addressing early disruptive behaviours); interventions that were based on other approaches and the priority delivery method (peer-to-peer) were also conducted. Each thematic analysis drew on the evidence of all interventions that incorporated the approach or delivery mechanism of interest. The collated evidence has been presented as a series of narrative syntheses in the Results Section.

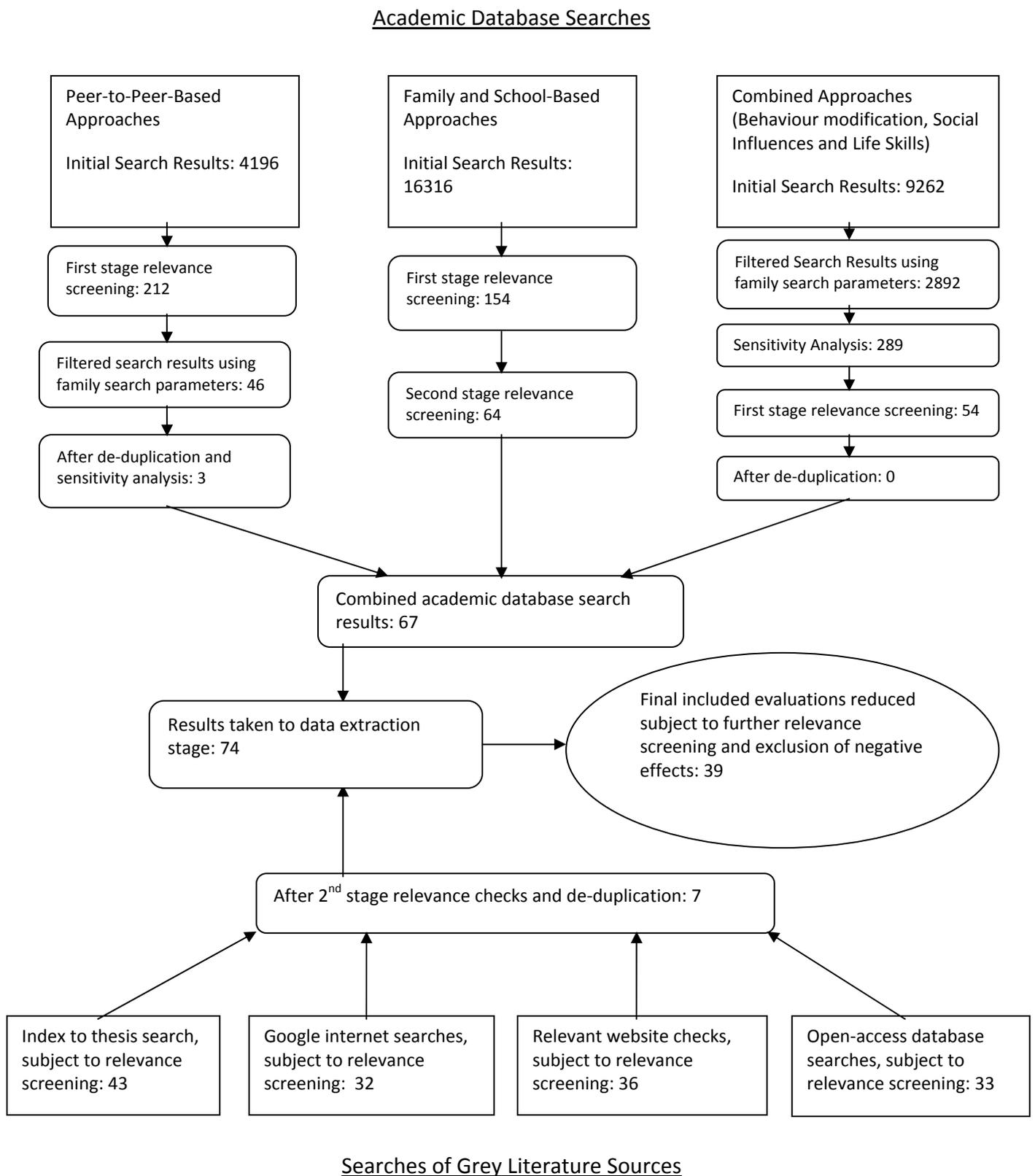
Inter-rater reliability

To ensure consistency of decisions and interpretation of evidence, inter-rater reliability tests were conducted at relevance screening, quality appraisal, weight of evidence rating and data extraction stages.

2.7 Ethics approval

Ethical approval was not required as no primary research was carried out.

Figure 2 : Flow Diagram of Search Process



3. Results

3.1 Overview

Figure 2 illustrates the search process. Seventy-four evaluation studies met initial inclusion criteria. Ten of these studies reported on one or more adverse effects on alcohol behaviours. All studies which reported adverse outcomes were eliminated from all further analysis. Identifying details of all studies excluded because of reports of negative effects are provided in Appendix 2. An additional 25 studies were excluded following a further relevance screening.

The 39 remaining studies collectively identified 29 interventions. Almost all interventions used more than one theoretical basis to inform design and/or delivery. The most popular combination of approaches was Life Skills Training (LST) and Social Norms, which were combined in ten interventions.

In order to fully examine the strength of evidence for promising approaches and to identify most common characteristics of interventions (elements of effectiveness) that were associated with some positive behavioural change, we adopted a two-step approach to assessment of weighting and quality of evidence.

Weighting of Evidence: We assessed and reported the aggregate evidence for effect magnitude of each included intervention, as convincing, equivocal or no effect. Evaluation studies reported convincing evidence of effectiveness for sixteen interventions, and equivocal evidence for six interventions. No evidence of effectiveness was reported for seven interventions identified for this review.

Quality Appraisal: We assessed the methodological quality of evidence using a four item checklist originally developed and reported by the EPI Centre (subsequently renamed EPPI Centre)⁶³. Four interventions received a quality assessment of unsound and were therefore excluded from further analysis. Further details of the results of the quality appraisal can be found in the Appendices. Exclusion of these four studies resulted in a final total of 25 interventions for detailed analysis.

3.2 Thematic Analysis of Promising Approaches and Delivery Methods

3.2.1 Social Norms Approaches

Evidence Sources

Eleven of the 25 interventions which met inclusion criteria utilised a social norms approach. Effect sizes for seven were convincing, three were equivocal and one was graded as no effect. A further intervention (Going Places) included social norms elements but received an unsound QA rating. This rating, coupled with the intervention reporting no effects, resulted in its exclusion from this section of the analysis.

Ten of the included interventions combined a social norms approach with LST and only one intervention utilised social norms without combining it with another approach. Babor et al (2010)²⁹ has noted that many school-based intervention programmes combine normative education with resistance skills (life skills) training.

Four of the eleven interventions also utilised a peer-to-peer method of delivery. Effect size for two of these four interventions was convincing, one was equivocal and one was rated no effect.

Seven of the eleven interventions lasted for one year or less and all seven were associated with either convincing or equivocal positive effects.

Target Audience

All of the included interventions incorporating social norms were universal in target.

Social norms approaches may employ personalised, individually-tailored normative feedback or mass/social marketing methods. Of the eleven interventions which included social norms, ten adopted a mass marketing approach. They drew on a range of behavioural frameworks to provide examples of 'normal' alcohol use (eg Brown et al, 2005)⁶⁵. Only one intervention (which targeted eighteen year olds, about to enter college) was based on personalised feedback comparing the individual's alcohol use against normative information (Wood et al, 2010)⁶⁶.

Behavioural Norms Perceptions

Social norms approaches aim to affect change in individuals' knowledge of harms, risks and mainstream behaviours as well as increasing self-efficacy.

Five of the seven interventions which were most successful in reducing alcohol use (rated as convincing) measured alcohol use by peers and presented this information to correct misconceptions regarding the 'normal' alcohol consumption patterns. Six of the social norms interventions, such as Unplugged and All Stars Plus also reinforced awareness that most adolescents do not use psychoactive substances, and aimed to correct erroneous beliefs that drug use is common and acceptable amongst peers.

Many interventions sought to adjust alcohol-related attitudes and intentions. However, measured changes in attitudes and intentions were not found to be reliable predictors of reduced alcohol use. Perceptions on access to alcohol were also found to be a weak predictor of alcohol use (Komro et al, 2001)⁶⁷.

Moreira et al (2009)⁶⁸ suggest that enhanced alcohol-related knowledge is an important factor in altering normative beliefs and in turn altering alcohol behaviours. However, in this study, only two out of the six interventions that aimed to increase alcohol-related knowledge, found this to be a significant contributing factor (Lennox and Cecchini, 2008; Morgenstern, 2009)^{69 70}.

Some interventions also measured and reported on normative estimates and expectations but overall did not demonstrate that this was a significant influence on alcohol behaviours.

Perceived Benefits of Consuming Alcohol

We examined reports of individuals' attitudes towards the social acceptability of drinking alcohol and alcohol-related expectancies and any links with favourable change in alcohol use. Some interventions, such as Project Northland, offered alternatives to drinking alcohol; some interventions aimed to establish healthy

beliefs and expectancies regarding the use/misuse of alcohol. Project Northland, along with All Stars Core and All Stars Plus, measured functional meanings (reasons for not using alcohol) and whether or not these meanings were significant to altering alcohol consumption. Alcohol use was presented as a lifestyle choice that could interfere with adolescents' future goals. Targeting these intermediate variables was not found to favourably alter alcohol behaviours.

Student Bonding with School

Five of the eleven social norms interventions aimed to encourage positive attitudes amongst students towards their school and their academic achievement. Overall, students' feeling of belonging decreased over time, but intervention students demonstrated smaller declines than the control group.

Some interventions, such as Project Northland, All Stars Core and All Stars Plus, were specifically designed to tackle negative attitudes towards school and increase feelings of acceptance and attachment. Favourable changes were effective in reducing alcohol consumption; all three reported convincing effects sizes. Two interventions (Raising Healthy Children and Schleswig-Holstein) which sought to enhance students' academic achievement and school performance alongside social and cognitive skills were found to be less effective.

Measures Used to Track Change in Alcohol Consumption

The seven social norms interventions reporting convincing effects sizes were based on self reported measures of changes in tendency to use alcohol (Project Northland), prevalence of alcohol use (Communities that Care), frequency of drunkenness in the past 30 days (Unplugged, All Stars Core and All Stars Plus), growth in alcohol use (Project Family: PDFY) and heavy episodic drinking (Brief motivational intervention (BMI) and Parent-based intervention (PBI)).

Some interventions examined changes in individuals' commitment to avoid alcohol use. Students exposed to All Stars Core reported increased commitment to avoid drug use. Other interventions looked at students' self-regulation and the implementation of a drinking strategy as a component of a brief motivational intervention (BMI). However, drinking strategies and self regulation were not found to be mediators of BMI effects (Wood et al, 2010)⁶⁶.

Secondary Outcomes

Dependent variables such as crime and disorder, delinquent behaviour and risky sexual behaviour were also targeted and measured in many of the included interventions.

Six of the eleven social norms interventions examined engagement in delinquent behaviour. Interventions such as All Stars Core and All Stars Plus presented high-risk behaviour as a barrier to desired lifestyles (lifestyle incongruence). Changes in delinquent behaviour correlated with positive change in alcohol use in four of the interventions.

Attitudes of Families

Parental involvement was found to be a key feature of many social norms interventions. Parents are known to influence alcohol-related beliefs (Turrisi et al, 2000)⁷¹. Many social norms interventions seek to educate parents and enhance their ability to advise their children against alcohol misuse, to question their own consumption levels and to act as role models for their son/daughter. Interventions also usually seek to enhance parent-child interactions and increase pro-social involvement within the family unit.

Encouraging parents to set clear standards for behaviour (All Stars Core and All Stars Plus); addressing parents' frequency of alcohol use (Schleswig-Holstein); and demonstrating disapproval of their children's alcohol use (BMI + PBI, Project Northland) were found to be significant mediating factors in favourable changes in alcohol use.

Levels of family involvement in intervention design varied considerably; from the handbook-based interventions and take-home assignments offered in the BMI + PBI intervention and Narconon, to multiple-session parenting workshops and home-based sessions offered in Project Northland and Raising Healthy Children. Five of the social norms interventions involved no direct personal contact with parents with parental involvement limited to homework or booklets either mailed directly or taken home by the students and parents. Four interventions provided personal contact through external specialists and two relied on teaching staff. No clear association or pattern was apparent with either engagement strategies with a mix of effects and no effects results.

Improvements in parent-child communication and more specifically improvements in family communication regarding alcohol use were associated with positive change in alcohol use (All Stars Core, All Stars Plus and Project Northland). Parental education regarding alcohol use appears to be a key component in improving family communication on alcohol use.

Attitudes of Significant Others

Negative peer group influence was identified as a mediating factor in four interventions. The more effective interventions, such as Project Northland and Communities that Care, aimed to increase students' tendency to affiliate with pro-social peers.

Three interventions combined social norms with community side change. Project Northland, Project Northland Chicago and Communities that Care all aimed to mobilise the local community to work together to reduce risk factors within the local community (Hawkins et al, 2009)⁷². The Communities that Care intervention reported that involving community leaders and participatory identification of priority risk factors within the local community delayed age of onset for alcohol use. The researchers suggest this may offer community benefits such as lower rates of delinquency as well as public health benefits. Project Northland engaged community-wide task forces in various activities, including community education. However, Project Northland was conducted in a rural area of Minnesota with a mostly white population. The problem of translating this approach to a more urban,

mixed population was evident in the lack of effectiveness exhibited in Project Northland Chicago. Mobilising community volunteers was also reported to be less successful and less publicly acceptable in an inner-city area than a rural area (Komro et al, 2008)⁷³.

Involving the community in devising alternatives to alcohol misuse was found to positively contribute to reductions in alcohol consumption. Komro et al, (2001)⁶⁷ suggest that making changes to the larger social environment is especially important in sustaining effects.

Critical Elements of Effectiveness

- Decreasing association with peers engaged in alcohol misuse and affiliation with pro-social peers
- Parental normative alcohol education
- Supporting parent-child communication
- Increasing functional meanings supportive of non-use.
- Enhanced school bonding

3.2.2 Life Skills Training and Family Approaches

We identified fifteen projects which included a LST approach and a family component. Three of the reported interventions included a comparative analysis with other intervention approaches providing insight into eighteen interventions overall. The majority (eleven) of these interventions reported convincing effects, three reported equivocal effects and four demonstrated no effects.

Characteristics of Student Components

LST is an approach to alcohol education that aims to prevent or reduce alcohol use behaviours by enhancing personal characteristics and social skills thought to protect or offset risk factors for substance use. The main thrust of the argument behind LST is that children lack the characteristics or skills necessary to resist the use of substances and benefit from specialist training to combat this deficiency. This approach underlines peer pressure explanations of substance use.

Negative Peer Association and Stress Coping Skills

Only one intervention measured and reported upon negative peer association and this had convincing effects on alcohol behaviours. In the Linking the Interests of Families and Teachers (LIFT) project, the authors noted that for three years following the intervention, students in the control group were more likely to associate with 'misbehaving peers' than the students that had received the intervention (Eddy et al, 2000, p.172)⁷⁴.

One intervention considered students' ability to cope. This was Project Northland, which reported significant small effects on alcohol use. The researchers behind this

intervention found that at eighth grade, intervention students felt more able to deal with peer influence than the reference group. Differences, however, were also found between baseline alcohol users and non-users. Baseline non-users in the intervention group had significantly lower scores on the Peer Influence scale compared to the control post intervention, while baseline alcohol user scores showed no significant difference to those of the control group (Perry et al, 1996)⁷⁵, suggesting this was not a significant contributing element for effectiveness.

Decision-making Skills

Three interventions measured and reported upon decision-making skills. Only one (Narconon) demonstrated any improvement and this intervention had mixed effects on alcohol behaviour. In the Narconon intervention, students were more likely to report that they had sufficient information to make a decision about drugs (Lennox and Cecchini, 2008)⁶⁸. The other two interventions that considered decision-making were All Stars Core and All Stars Plus (Hansen and Dusenbury, 2004)⁷⁶. At post-test, students in both groups demonstrated a decline in decision-making skills with the All Stars Plus showing a smaller decline compared to All Stars Core and the control group. No statistical difference, however, was found between the groups.

Inter-personal Skills

Only one intervention discussed any impact on student's inter-personal skills. The LIFT intervention, which had small positive effects on alcohol behaviour and also utilised a Good Behaviour Game approach, found that children in the intervention group demonstrated lower playground aggression at the first post-intervention follow-up. (DeGarmo et al, 2009)⁷⁷.

Communication Skills

One intervention which reported mixed effects on alcohol use behaviour, Narconon, measured and reported on students' general communication skills, finding no difference between the intervention and control group (Lennox and Cecchini, 2008)⁶⁹.

Resistance Skills

Four interventions which achieved some positive impact on alcohol behaviour and one intervention that had no effect measured and reported upon students' resistance skills. The All Stars project (including Core and Plus programs) found improvement but no significant differences between the groups (Hansen and Dusenbury, 2004)⁷⁶. Evaluators of Project Northland found that there were no significant differences between intervention and control groups in relation to resistance skills but did find that baseline non-users in the intervention group felt significantly more confident in refusing alcohol than the reference group (Perry et al, 1996)⁷⁴. Those evaluating Narconon found that intervention students felt more able to resist drug use pressures (Lennox and Cecchini, 2008)⁶⁹. In Project Northland Chicago, though the difference was not significant, researchers found lower resistance skills amongst the control group compared to the intervention group (Komro et al, 2008)⁷³.

Bonding to School

Only four interventions considered students bonding to school within the evaluations. Three of these interventions demonstrated small positive effects and one had no effect on alcohol behaviour. In All Stars Core and All Stars Plus, attachment to school and feelings of acceptance was found to decline across both interventions and the control group (Hansen and Dusenbury, 2004)⁷⁶. However, the decline in bonding demonstrated in the two intervention groups was significantly smaller than the control group.

The Trelleborg project¹ which also demonstrated positive effects on alcohol use found a significant increase in the number of students disliking school over the study period (Stafstrom et al, 2006)⁷⁸. According to the trends reported, though not statistically significant, those students that disliked school were more likely to consume alcohol; to be involved in excessive drinking; to purchase alcohol; and to have alcohol provided by their parents.

Interactivity

Although parents were often in personal contact with teachers and/or external staff, discussing and developing their skills in relation to the issues involved, levels of interactivity appear to be quite limited. Interaction between parents and children was a more common feature. In interventions that provided training sessions to parents, adults would sometimes be separated from their children for one session, to be brought back together, an hour or so later, to practice the skills learnt in previous sessions. In other instances, parents and children would not be separated but would work through issues in training sessions together. Many other interventions provided only limited access to intervention staff, with most parents' involvement in interventions confined to participating in home-work activities with their children or receiving information in the post. Children's interaction with their parents during the intervention appears to be significant to the some indicators of intervention success. The researchers that conducted Project Northland Chicago noted that a child's interaction with a parent regarding an intervention increased the likelihood of parental participation. Komro and colleagues noticed that in the original Project Northland conducted in Minnesota, the participation of parents (75 per cent) was greatest in the first year of the intervention when children took home a workbook that involved carrying out activities with their parents (Komro et al, 2008)⁷³. In the second year, however, when parents were directly mailed intervention materials, their participation dropped dramatically to about a third. Recognising this, the researchers that led Project Northland Chicago, ensured that each year, intervention materials targeted at parents were sent home with their children. The result was a much higher participation rate in the second and third years of the intervention compared to the original Project Northland.

¹ The Trelleborg project was a cross-sectional survey, and all patterns were observed in relation to separate, successive cohorts of ninth grade students over a series of years so cannot be explained by age-related change in perception or behaviours. Analysis of the impact of survey year on the dependent variables of 'consumer of alcohol' etc used the first cohort year: 1999 as its reference.

However, it is important to note that interaction between parents and children was also a feature of interventions where there was almost no evidence that this contributed to intervention effects on alcohol behaviours.

Acceptability of Intervention to Parents

Few intervention reports discussed the acceptability of interventions to involved parents. Of the four interventions that did discuss this issue, three were found to have no effect on alcohol related behaviour. Nevertheless, parents within each of these interventions reported high satisfaction rates in relation to the intervention. In particular, 94 per cent of the parents involved in the Parent and Adolescent component intervention, as part of Parents Who Care, reported that they would recommend the programme to a friend (Haggerty et al, 2007)⁷⁹. The one intervention (LIFT) that demonstrated a positive effect upon alcohol behaviour and also reported on the acceptability of the intervention to parents also found that upwards of 90 per cent would recommend the program and almost 80 per cent found the program 'helpful' or 'quite helpful' (Eddy et al, 2000)⁷⁴.

Many of the interventions using LST described special measures to improve the acceptability of interventions and engage parents. Discussion of this issue was not confined to those projects which had positive effects on alcohol behaviour (four) but also projects with mixed (one) and no effects (three). All four of the projects with small positive effects described training sessions for parents in the evenings, with the likely intention that more parents would be able to attend in the evening. One project also provided a weekday session in addition to evening sessions to increase flexibility further. Two projects, one considered effective and the other having no effect also provided support with regard to child-care. The effective intervention (LIFT) provided free child care to participating parents; and the intervention with no effect (Parent & Adolescent Group of Parents Who Care) provided reimbursement for the cost of child care (Haggerty et al, 2007)⁷⁹. Additional features of LIFT intended to support parents' involvement in the programme included a prize draw at the end of each session; weekly newsletters; a phone line and answering service installed in classrooms to enable communication with teaching staff (Eddy et al, 2000)⁷⁴. Intervention staff would also contact parents on a regular basis to discuss progress. Regular contact with parents was also a feature of both component parts of Parents Who Care, where intervention staff would contact parents to remind them of upcoming sessions or record activities, motivate and address particular issues. Both component interventions on Parents Who Care were found to have no effect on alcohol behaviour.

One intervention that had mixed effects, Raising Healthy Children, went to extra lengths to ensure continued involvement of families in interventions (Brown et al, 2005)⁶⁵. Where families moved out of the geographic area, intervention materials were sent to new addresses and the intervention was completed over the phone. However, the researchers presented no evidence to suggest that these efforts had a positive impact upon study attrition.

Fidelity of Implementation and Participant Completion

Not all reports of interventions commented upon attendance at sessions, particularly as some did not involve any training sessions for parents. Of those that did, this included interventions that were effective, of mixed effect and no effect. Commonly, those that reported this issue reported high rates of attendance. Greater variance in attendance is noticeable when considering the number of sessions attended. For example, within the LIFT intervention, only 28 per cent of parents attended all six sessions provided. However, on average, for each session, 59 per cent attended, 23 per cent received materials in the post, and thirteen per cent accepted a home visit and five per cent refused to participate.

Family Relations

Only two projects considered the impact of interventions on family relations. One of these had a convincing effect on alcohol behaviour whilst the other had no effect. The intervention which had a convincing effect, the LIFT project, reported significant increases in family problem-solving, which in turn were associated with a decline in alcohol use (DeGarmo et al, 2009)⁷⁷. Project Northland Chicago which had no effect on alcohol behaviours, found that students in the control group demonstrated greater parent-child communication, in the short-term, than the intervention group, although the differences were not significant (Komro et al, 2006)⁸⁰. Over the longer term, those evaluating Project Northland Chicago found that students' involvement with their parents declined more for intervention students compared to the controls, though these differences were not significant (Komro et al, 2008)⁷³.

Parental Control

Four interventions which showed small positive effects on alcohol also considered the impact on parental control. Two of this group found no significant changes in parental control for the relevant intervention group, but in the Trelleborg intervention, the proportion of students that received alcohol from their parents declined twice within the study period but at the end this trend reversed and parental supply increased back to baseline levels (Stafstrom et al, 2006)⁷⁸. Compared to All Stars Core and the control group, students in the All Stars Plus group reported increased parental monitoring. Further, although there were no significant differences between the groups, All Stars Intervention students (Core and Plus) reported communicating with their parents about alcohol whereas control students had reported a decline in this communication.

In Project Northland, it was found that at the end of grade six, this group was more likely to report communication with their parents about alcohol. For the same intervention, it was found that at the end of grade eight (three years after intervention), intervention students were 'marginally' more likely to discuss the dangers of alcohol with their parents and to be set rules regarding alcohol use (Perry et, al, 1996: 962)⁷⁵. Project Northland also demonstrated a significant increase in the likelihood of intervention students' parents, at the end of eighth grade talking to their children about the consequences of their being caught using alcohol. In contrast to the results of Project Northland, short-term results from a subsequent version of this project, Project Northland Chicago, found that compared to the

intervention group, the control group had more family discussions about alcohol, although these differences were not significant (Komro et al, 2006)⁸⁰.

Parental Attitudes to Alcohol Use of Children

Only one intervention reported upon parental attitudes to children's alcohol use and this had a convincing effect on alcohol behaviour. This was the Preparing for the Drug Free Years (PDFY) component of Project Family, where it was found that parents of intervention students demonstrated a significant increase in norms against alcohol and drug use.

Critical Elements of Effectiveness

- Encouraging and supporting youth-parent communication
- Practical help for parents to compensate for participation burden and/or strategies to limit demands on time, travel etc.

3.2.3 Good Behaviour Game Linked with Family Interventions

Evidence Sources

We identified only one intervention combining the Good Behaviour Game (GBG) with family component in its design, reflecting the fact that GBG is usually delivered as a stand-alone approach. This was the LIFT intervention which did have a small positive effect on alcohol behaviour.

Audience and Methods

GBG is a tool used by classroom teachers which aims to tackle disruptive and anti-social behaviour amongst pupils, by rewarding positive behaviour towards peers. Typically, use of the GBG involves teachers dividing classes into groups and assigning each group a set number of points. Then throughout the period of the game, such as a day or a week, the teacher monitors the behaviour of the groups. Any disruptive or anti-social behaviour exhibited by individuals within a group incurs the deduction of points from the group's overall score. If at the end of the game period, a group's score is above a target threshold, they receive an award. The rationale behind the GBG is positive reinforcement. Children learn the benefits of developing good relationships with their peers and cooperating with their teachers. In turn, these children avoid social dislocation that is thought to lead to more serious problem behaviours such as delinquency and substance use (Eddy et al, 2000)⁷⁴.

In the LIFT intervention, GBG was used within the classroom component to promote positive behaviour on the playground, during the class recess, or break-time.

Assessing the Impact of the Good Behaviour Game

Reports of the LIFT intervention have commented on social skills and anti-social behaviours. In the spring follow-up² to the intervention, delivered the previous autumn, the researchers found that playground aggression had decreased in the intervention group compared to the control; whilst class teachers also reported that intervention students had increased social skills compared to counterparts in the control group (Eddy et al, 2000)⁷⁴. Three years following the intervention, it was reported that pupils in the fifth grade control group were more likely than intervention group pupils to associate with a negative peer group and to be arrested by the police (Eddy et al, 2000; Eddy et al, 2003)^{74 81}

Despite improvements in these behaviours, there is no evidence available to suggest that these positive changes in intervention cohorts also impacted positively on alcohol use behaviour. In a mediation analysis carried out by DeGarmo and colleagues, decreases in playground aggression in the months following the intervention were not found to have any significant association with students' alcohol use (DeGarmo et al, 2009)⁷⁷. DeGarmo and colleagues also concluded that observed increases in family problem-solving had a significant impact on reducing alcohol use within the fifth grade intervention cohort but that this is probably attributable to other elements of the LIFT intervention, particularly the family component, but few details for this were reported.

Critical Elements of Effectiveness

- Early response/anticipation of antisocial behaviour
- Improvement in family problem-solving

3.2.4 'Miscellaneous' Family and School Interventions

Intended Population and Effects

The search strategy identified a range of other approaches to alcohol education which included a parent/guardian component in addition to those of particular interest in this review.

Seven interventions were identified as not basing their approach on any of the following: the social norms approach; the Good Behaviour Game; LST; or peer-to-peer delivery. Five targeted a universal audience and two targeted a selected

² The LIFT intervention was actually delivered to first grade and fifth grade pupils but reports of alcohol related behavioural outcomes discussed elsewhere in this report, relate to long-term follow-up of the fifth grade cohort. It should be noted however, that in relation to reports of other outcomes, which are discussed here, it is not clear from the included literature whether the 'spring follow up' relates to the intervention in one or both grade cohorts.

audience (i.e. considered to be 'at risk' of problem behaviour). The selective interventions targeted families from economically disadvantaged areas (STARS for Families) and parents of urban Black and Latino girls (Especially for Daughters).

Three of the seven interventions were graded as convincing effects (STARS for Families, Planned Success and Örebro). Three interventions were graded as equivocal effects (Especially for Daughters, Project Sport and PAS), and one was graded No Effect (Family-school partnership).

Three further interventions received an unsound QA rating and were excluded from further analysis. These were Project Sport Plus Parent (convincing effects), Familias Unidas (no effect) and Resilient Families (no effect). The parental component of Project Sport Plus Parent had a stronger effect on heavy use of alcohol over time compared to the parallel Project Sport and Project Sport Plus interventions.

Theoretical Basis

Interventions found to have the most convincing effects were based on a variety of theoretical approaches. The STARS for Families intervention was founded on the Multi-component Motivational Stages prevention model which proposes a range of risk and protective factors, providing a framework for the prevention strategy (Werch et al, 2000)⁸².

The Örebro intervention was part of an alcohol prevention initiative begun by the Swedish National Institute of Public Health following the changes to Swedish alcohol policy in the wake of Sweden joining the EU in 1995. The relaxation of this policy resulted in increased availability and affordability of alcohol leading to a rise in alcohol use amongst teenagers (Koutakis et al, 2008)⁸³. The Planned Success intervention was based on a recently proposed paradigm called the 'Behaviour Image Model' (BIM). This model is based on the idea that creating new images of ourselves and attractive images of others can result in change across a range of health behaviours (Werch et al, 2010)⁸⁴.

The most common theoretical approach used by three interventions (Especially for Daughters, PAS, Family school-partnership), was the Theory of Planned Behaviour. Interventions which focused on the parents of adolescents utilised this theory to target parental behaviour change and in turn affect the behaviour of their children (O'Donnell et al, 2010)⁸⁵. However, these studies were found to have either equivocal or no effects.

Other theoretical approaches included social development theory (Especially for Daughters), Social Cognitive Theory (PAS,) gender theory (Especially for Daughters) and alternatives to drinking approaches (Project Sport).

Length of Intervention/Number of Sessions

Two of the most effective interventions (STARS for Families and Planned Success) consisted of brief one-on-one health consultations with trained healthcare professionals. These were both followed up by mailings of postcards with messages that paralleled those communicated in the consultations. However, STARS for Families was a two-year stage-based intervention compared to Planned Success which was a brief image-based prevention.

Project Örebro, which also reported convincing results, was delivered over five semesters and lasted over three years. The project worker attended a parent-teacher meeting once a semester (altogether five meetings).

Interventions which reported equivocal effects consisted of either a set of CDs (Especially for Daughters) or printed postcards (Project Sport) sent to parents or adolescents every few weeks. The PAS intervention consisted of two conditions, a parent intervention which was modelled on Örebro, and a student intervention which consisted of four digitally based lessons. Again, these interventions were relatively brief, lasting only a few months in total.

Interventions which reported no effects tended to run for longer and consist of more sessions, for example, a series of nine workshops running for seven weeks (Furr-Holden et al, 2004)⁸⁶.

Measurable Changes in Alcohol Consumption

The three 'miscellaneous' approaches reporting convincing effects measured heavy drinking (five or more drinks in a row for males, four for females) during the last 30 days and two weeks and frequency of use (STARS for Families, Planned Success). STARS for Families compared students from an inner-city 'neighbourhood' school and a 'magnet' school. Magnet schools are American public schools which exist outside of zoned school boundaries. The students attending the magnet school in the STARS for Families intervention travelled to and from the school using buses. Magnet schools are usually seen as having something to offer over and above a regular school which makes them an attractive choice to many students. In theory this also increases the diversity of the student population (Chen, 2007)⁸⁷. There were significant results for the magnet school sample with fewer students reporting that they had been drinking alcohol for the last 30 days to six months or more. Significantly less students in the magnet school reported that they intended to drink within the next six months compared to the control group. Secondary analysis examined the role of prior experience with alcohol and found that students receiving the intervention who reported at the conclusion of the first year of the programme that they had previously experienced alcohol-related negative consequences reported less frequency of alcohol consumption and less heavy drinking than those in the control group.

In the Örebro project, the intervention reduced 'drunkenness' and 'frequent drunkenness' in the intervention group. Also, youth drinking significantly increased over time for both intervention and control, but was significantly steeper for control group.

Interventions reporting equivocal effects measured previous use of alcohol (Especially for Daughters), alcohol use frequency (Project Sport), weekly drinking and heavy weekly drinking (PAS).

The intervention which reported no effect measured past 90 day alcohol consumption (Family-school partnership).

Level of Parental Involvement and Measurable Change in Parental Attitudes to Alcohol

The nine interventions described in this section have been included because they contained an element of parental involvement. However, parents/guardians were involved to various degrees.

The most effective interventions reported a limited level of parental involvement. STARS for Families and Planned Success consisted of no direct personal contact between the parents of the adolescents and the external specialists who administered the student component of the intervention. The aim of these interventions was to provide parents with key information on how their children could avoid alcohol. Activities were also provided for parents and children to complete together. STARS for Families included a contract that the children were to sign promising to avoid alcohol use. This was then combined with student elements consisting of consultations. Consistency of messages communicated by the parents with those conveyed in the consultations was considered to be an important objective (Werch et al, 2010)⁸⁴.

The Örebro intervention involved a far greater level of parental involvement as it was primarily involved in delivering information to parents through schools. Regular parent-teacher information meetings were used to advise parents to adopt a zero-tolerance approach to youth drinking and the importance of communicating clear rules to their children. Parents who were exposed to the intervention were found to be significantly more restrictive than control parents in their attitudes to alcohol use. It was also found that the parents in the intervention group retained their strict attitudes over time, while those in the control group became more permissive (Koutakis et al, 2008)⁸³.

The interventions which reported equivocal effects varied in their level of parental involvement. Especially for Daughters was primarily targeted at parents and found that the intervention parents expressed the highest self-efficacy to address alcohol with their daughters (O'Donnell et al, 2010)⁸⁴. Project Sport consisted of three postcards sent to either students or parents. PAS, which was modelled on Örebro, consisted of parent-teacher meetings coupled with information leaflets and reported no measurable change in parental attitudes to youth alcohol use (Koning et al, 2009)⁸⁸.

The Family-School Partnership intervention, which reported no effects, consisted of workshops for parents designed to improve parent-child communication and provide parents with effective teaching and child behaviour management strategies.

Acceptability of Intervention to Parents/Families

Acceptability of the STARS for Families and Örebro interventions was high. Data from the STARS for Families showed that between 94 per cent and 98 per cent of parents reported that they had talked with their child about the individual take-home lessons. In addition to this, between 95 per cent and 99 per cent of parents said they would suggest take-home lessons to other parents (Werch et al, 2000)⁸². Örebro was also reported as well received. Parents who dropped out of the intervention were found to have more lenient attitudes towards youth drinking at baseline than those

who remained in the intervention (Koutakis et al, 2008)⁸³. The Planned Success intervention did not report on attrition rates or rate of acceptance to parents/families.

A high rate of acceptance was reported in Especially for Daughters (80 per cent), PAS (80 per cent) and the Family-school partnership (84 per cent). A lower completion rate was reported for Project Sport with a total of 65 per cent of parents reporting that they received at least one postcard and 53 per cent reporting that they received all three.

Measurable Change in Parent-child Communication or Other Aspects of Family Relations e.g. Conflict Resolution

Of the three 'miscellaneous' studies which reported convincing effects, only STARS for Families reported a measurable change in parent-child communications. This study reported that parents receiving the postcards were more likely than those in the control group to have talked with their child about avoiding alcohol ten or more times in the past year. Intervention parents were also more likely to have talked to their child about avoiding alcohol in the last 30 days than control parents. The Planned Success and Örebro interventions did not report any measurable change in parent-child communication.

Interventions which reported equivocal effects found that parents were more likely to talk to their daughter about alcohol (Especially for Daughters) and reported a significant increase in parental monitoring (Project Sport).

Engaging in Risky or Delinquent Behaviour/ Changes in Social and Emotional Skills

The STARS for Families intervention reported a reduction in susceptibility to delinquency influences amongst students. In the Örebro intervention the increase in delinquency was steeper in the control group than the interventions group. Thus, there is some evidence of intervention effects on extending from alcohol use to delinquency.

Especially for Daughters, which was specifically targeted at young females with the goal of reducing risky sexual behaviour and alcohol use, reported that females in the intervention group were significantly less likely to report sexual risks than girls in the control condition.

Project Sport found that self-control behaviours increased over time following the exposure to the parent materials.

Motivations and Expectancies Regarding Alcohol/Level of Risk Attached

Two of the most effective 'miscellaneous' interventions addressed individuals' motivations and expectancies regarding alcohol. STARS for Families measured negative consequences experienced whilst under the influence of alcohol and intentions to drink. The results reported that students in the magnet school exhibited significantly less intentions to drink in the future. Intervention students in the magnet school also had a greater motivation to avoid drinking than control students. The intervention had a positive impact on expectancy beliefs in both schools (Werch et al, 2000; 2003)^{82 89}. The Planned Success intervention measured

health behaviour goal setting and reported that goal setting increased amongst drug-using youth receiving the intervention.

Critical Elements of Effectiveness

- Brief contact time with children
- Limiting parental contact time and demand
- Normative parental education about alcohol behaviours and risks associated with youth drinking
- Targeting a range of risk and protective factors
- Targeting and measuring heavy (binge) drinking (5 drinks or more) or frequency of use
- Addressing delinquent behaviour

3.2.5 Family and School and Peer-to-Peer Delivery

We identified four school- and family-linked approaches which incorporated significant peer-to-peer components in their delivery. None of the interventions linked peer-to-peer delivery with family components.

Three of the four projects reported convincing evidence of effects, and one reported no effect. None of the interventions were delivered as part of a whole school approach. Three of the four interventions included extracurricular activities (ECA) and all were described as interactive. The ages of participants and lengths of interventions varied, with no clear patterns emerging.

Operational Characteristics of Peer-to-Peer Delivery

Peer-to-peer or peer-led delivery usually involves students who are of similar age or slightly older than the target audience delivering an educational curriculum (Mellanby et al, 2000)⁹⁰. This is distinct from peer involvement where engagement is more interactive rather than didactic but not necessarily peer delivered. In interactive approaches, 'planned activities are used to stimulate active participation. Students may generate role plays, which provide a real world, age-appropriate experience. Interpersonal skills also may be modelled and rehearsed, and feedback may be received from peers' (Black et al, 1998, p.87)⁹¹. However, delivery may be by peer or an adult. Peer-to-peer delivery is also distinct from peer-planning or the inclusion of peer-driven components. Peer-planning entails active peer involvement in the designing of activities as part of the intervention, and entails more autonomy and creative engagement over just delivering part of a curriculum. Some interventions included community-based ECA where students designed the form and nature of it, such as Project Northland's T.E.E.N.S project where students planned alcohol-free day activities for seventh grade students (Perry et al, 1996)⁷⁵. Story et al

(2002)⁹² describes the divergence as often the difference between formal and informal peer education methods: formal referring to top-down initiatives, providing intensive training, adult supervised, and usually set in schools; informal peer education generally being delivered in community settings, with limited adult supervision and often with 'a stronger emphasis on peer development, peer ownership and peer empowerment' (Story et al, 2002, p.125)⁹².

Integration of Peer-to-Peer with Other Approaches and Delivery Methods

The four interventions were all multi-component. In all of these, peer-delivery was an add-on and never the main delivery mechanism of the project. For example, D.A.R.E. Plus augmented the original D.A.R.E curriculum by adding a four session 'On the Verge' programme which each included two classroom activities led by peer leaders (Perry et al, 2003)⁹⁴.

The duration of the peer delivered interventions varied, following the timetable of the classroom-based curricula components. Project Northland interventions were delivered over three years in grades six, seven and eight, and lasted from 30 to 45 minutes over an average of eight lessons (Komro et al, 2008)⁷³. Unplugged and D.A.R.E Plus involved less peer-to-peer delivery. Both were delivered over one academic year, Unplugged consisting of seven post-lesson, peer-led meetings, and D.A.R.E. Plus of two peer-led classroom activities over four lessons (van der Kreeft, 2005b; Perry et al, 2003)^{93 94}.

Although all the interventions included a family component, none of the peer-delivered components interacted directly with families. Peer-delivered components mainly took place in the classroom and family-based components were delivered in the home or community and often without direct personal contact.

Two interventions were developed from the same original design, Project Northland Phase I and Project Northland Chicago. In the sixth and seventh grade peers led small group activities within the drug education curricula. In the eighth grade, all students took turns leading the activities, and there were opportunities to volunteer in acting or producing a play for parents and community (Stigler et al, 2006)⁹⁵. In D.A.R.E Plus, as previously described, two classroom activities in each session were led by peer leaders, with five or six peer leaders per classroom (Perry et al, 2003)⁹⁴. In Unplugged, the EU-DAP trial programme, seven meetings were led by two peer leaders following the core intervention lesson (Faggiano et al, 2010)⁹⁶.

Selection and Training of Peers

A recent Australian review of the role of schools in alcohol education emphasises that peer leaders should engage with their peers, have good communication skills, and be credible and respected by students engaging in risky behaviours (NCETA, 2009)⁹⁷

The peer leaders were all described as elected or selected by their classmates. This strategy is intended to increase the likelihood that they will be respected and seen as credible and therefore more likely to have a desirable influence.

All peer leaders received training. In D.A.R.E. Plus training was unspecified. In Unplugged, peers received training by the national centre for the respective project

at the outset, with further support and contact at the middle and end of the programme. Peer leaders also participated in three briefing sessions in their own school (van der Kreeft, 2005a)⁹⁸. The studies reporting on Project Northland Phase I did not provide details on peer training or briefing methods. Project Northland Chicago involved different training sessions for each grade: two and half hours for the Slick Tracy programme (Grade six), seven hours for Amazing Alternatives (Grade seven), and no training for Powerlines at Grade eight, where peer-leaders alternate (Komro et al, 2008)⁷³.

Fidelity of Implementation and Participant Completion

Fidelity of implementation was not always routinely or thoroughly reported but appeared to vary across projects. The Unplugged programme reported low implementation in all its centres. Only eight per cent of classes conducted all seven peer-led meetings and 71 per cent did not conduct any meeting at all (Faggiano et al, 2010)⁹⁶. Faggiano has commented that peer-led activities, “usually require high level of leadership, not common in this age group. Therefore, a disproportion [sic] between the target’s age and the assigned task can be the main cause of poor implementation” (Faggiano et al, 2010: 62)⁹⁶. Further Faggiano notes that “the low reach...due to low implementation (peer program)...together with the limited size of each single arm can explain the absence of detectable effects of these additional components” (Faggiano et al, 2010: 62)⁹⁶.

In Project Northland Chicago the peer-led component was implemented in 93 to 100 per cent of schools each year (Komro et al, 2008)⁷³. However, due to student attrition, the average cumulative exposure to the classroom components was 53 per cent among the study cohort (Komro et al, 2008)⁷³. Project Northland Phase I and D.A.R.E Plus did not report any measures of fidelity or implementation.

Evidence for the Most Effective Elements and Characteristics of Peer-to-Peer Delivery

D.A.R.E. Plus reported significant positive effects on boys’ alcohol behaviours, whilst D.A.R.E did not. Although the ‘Plus’ curriculum, which included peer-delivery, appeared to contribute to effectiveness, it is not clear if or how the peer-led activities were critical elements of effectiveness. Perry et al (2003)⁹⁴, suggests the intervention may have been more effective for boys because the predominantly male police officers responsible for delivery to students acted as positive male role models; the interactive theatre style of part of the classroom component was engaging; and because they started with a higher baseline alcohol use level which increased the probability of detecting positive effects on alcohol use (Perry et al, 2003, p.6-7)⁹⁴.

Project Northland Phase I reported significant positive effects on alcohol use vs. control on students overall, and non-users at baselines (Komro et al, 2001)⁶⁷. Peer leadership in the intervention describes participation as a peer leader, rather than peer-delivery in classroom sessions. Mediation analysis found no statistically significant positive effects for the peer leadership component (Stigler et al, 2006)⁹⁵. The components that appear to have contributed to altering the normative trajectory were classroom curricula; ECA (planners only, not participants); and the

parent involvement programmes (Stigler et al, 2006)⁹⁵. Stigler et al (2006)⁹⁵ suggests that the discrepancy between the positive results for students who planned the ECA and the null results for those elected as peer leaders and/or participants in the ECA might be due to the form of peer involvement:

“These results might emphasize not just the need for youth-led interventions, but underscore the importance of youth-driven prevention. Students who planned activities were given a lot of independence, within a certain flexible yet focused framework (Komro et al, 1994; 1996). It may be that this characteristic of this component, through allowing young people to assume significant responsibilities not generally available to them in today’s society, was especially important to success (Carmona and Stewart, 1996, p.10)”.

All the effective projects were interactive. A previous systematic review has suggested this may be the key element of effectiveness, rather than the peer delivery per se (Black et al, 1998)⁹¹. Three out of four interventions also included ECAs. As well as peer-led components, D.A.R.E. Plus and Project Northland also contained elements which involved students in planning and implementation their own ECA activity. Although it is not demonstrated that this was related to effectiveness, researchers concerned with the evaluation of D.A.R.E. Plus and Project Northland suggest that the critical elements of peer-driven components may be as a result of engaging students in design and implementation of projects. This for example may lead to the development of messages with greater resonance and relevance and therefore credibility with the target youth group.

Linking with Family Components

None of the interventions linked peer-to-peer delivery with family components. Given that the rationale of peer-to-peer is to intervene in the shift from identification with parents and other adults, to the greater influence of the expectancies, attitudes and behaviours of those in their peer groups, it is perhaps not surprising that designs have not incorporated family components. This does however appear to be an implicit assumption in intervention planning that has not been tested. The influence of message consistency between families and peer leaders for example may be a useful moderating variable to investigate.

Critical Elements of Effectiveness

- Peer driven design, development and delivery
- Based on interactive activities
- Operationalised outside traditional school structure (e.g. ECA or community based)

3.3 Research Questions

3.3.1 Is there evidence that school and family linked alcohol education integrated with broader, behavioural influencing strategies is more, no more or less effective than as a stand-alone educational intervention?

Impact of Family Involvement in Interventions

All of the interventions reported in this review included some parent or family involvement but evidence of the impact of this element on alcohol behaviours is limited. To assess whether changes in the family environment have affected alcohol behaviour, measures of variables relating to this context are necessary, yet such measures have not been a common feature of evaluations. Parent attitudes to alcohol were measured and reported in five of the 25 interventions; family relations were measured and reported in eight of the 25 interventions.

Despite the limitation in the evidence available, it is useful to investigate the extent to which variables that describe family environments have been a feature of interventions that had some effect on alcohol use behaviours. A favourable change in parent attitudes to alcohol use was noted in three interventions that had convincing effects on alcohol use and one intervention that had equivocal effects. One intervention which reported no favourable change in parent attitudes did report convincing effects on alcohol behaviour. The mixed findings here suggest the need for some caution in attributing importance to improvements in family values, but the limited evidence does suggest some association between favourably influencing parental attitudes and reductions in youth alcohol use.

In terms of family relations, five interventions reported favourable change in family relations, with four of these having convincing effects on alcohol behaviour and one, equivocal effects. Three other interventions resulted in no favourable change in family relations. One of these interventions reported convincing effects on alcohol behaviour, one reported equivocal effects and another reported no effects. Although not particularly large, the body of evidence for improving family relations suggests that it can have a positive effect on reducing adolescent alcohol use.

Another issue which is important to considering the impact of involving families in interventions relates to attrition amongst families recruited to participate in an intervention. Attrition and attendance/response rates provide insight with regards to the extent parents were engaged in interventions. This, in turn may have implications for effectiveness. However, attrition rates were not a feature of every intervention report; and were only highlighted in relation to twelve of the 25 interventions. Of those that did report on attrition, eight had a convincing positive effect on alcohol use; three reported equivocal effects and two had no effect. This information suggests that rates of family attrition are of limited importance to the effectiveness of interventions yet the overall picture is slightly more complicated. Of the twelve interventions that presented information on family attrition, seven had a dropout rate of 30 per cent or less. Within this group, four interventions were associated with convincing effects on alcohol behaviour; two with equivocal effects;

and one had no effect. The five interventions reporting attrition rates of 30 per cent or more, showed a similar pattern of mixed outcomes: three had convincing effects on alcohol behaviour, one had equivocal effects and one had no effect. Given the variation and complexity of the results presented above it is very difficult to provide answers to such questions of whether co-operation of family members tends to result in greater intervention effectiveness.

Furthermore, other evidence identified in this study, suggests effective family involvement may be achieved without direct personal contact. Nine out of the 25 interventions reviewed reported no direct personal contact with parents and all of these had some effect on alcohol behaviour. Five reported convincing effects while four had equivocal effects. A further seven interventions combined contact with an external specialist and/or teaching staff with a no contact component. A majority of these (five) had convincing effects on alcohol behaviour and two had no effects.

Wider Community and Society

In some instances, alcohol education programmes have also attempted to take account of wider community and societal influences on adolescent alcohol behaviour by integrating specialist components into school-based interventions. Going beyond home and school, interventions have involved communities in attempting to change the immediate environment in which adolescents live. Initiatives include increasing provision of diversionary activities; confronting anti-social behaviour through neighbourhood action teams; reinforcing controls around the sale of alcohol and increasing resistance to alcohol marketing.

Only a minority of the interventions reviewed involved a community component in the programme. The extent of evidence available to examine the impact of including the wider community is again limited. Only five of the 25 interventions reviewed reported on attempts to alter the context of alcohol use within the community, or community factors which support or encourage alcohol demand. Despite the small number of interventions that attempted to alter the community context, the evidence does offer some insight that this is an influential factor. Four of the five in this identified interventions had convincing effects upon alcohol use.

Some interventions also sought to reduce adolescents' access to alcohol by ensuring regulations governing the sale of alcohol were not being flouted. However, as previously, only a very small number of interventions undertook such initiatives within their programmes. Of the 25 interventions reviewed, only three had attempted to combat alcohol supply issues within their community. Two reported convincing effects on alcohol behaviour and one was associated with no effects.

A minority of interventions also attempted to improve media literacy in order to combat the influence of alcohol marketing upon adolescent behaviours. Such efforts included modules that deconstructed advertising and media messages; and the teaching of resistance skills. Five out of the 25 interventions contained elements that attempted to improve media literacy, but only two of these interventions had convincing effects upon alcohol behaviour. Two other interventions had equivocal effects and one had no effect. The evidence on improving media literacy is probably too mixed to draw any meaningful conclusions but is not promising.

The limitations of the evidence relating to the impact of community and other environmental components within interventions are very apparent. However, a broader interpretation suggests that there is some association between improving the community context with regard to alcohol and reducing alcohol use amongst adolescents. Moreover, though the association with reductions in adolescent alcohol use may be weak, there may be some social benefits in reducing alcohol availability in a local area.

3.3.2 What is the quantitative evidence that education as one component of multi-component programmes makes a measurable positive contribution to harm reduction?

Twenty-five interventions met our exclusion criteria and received a quality assessment rating of sound. Of these 25 interventions, 60 per cent were rated as having convincing effects sizes, 24 per cent were rated as equivocal and sixteen per cent were found to have no effects on alcohol behaviours.

Content and Objectives

When the interventions are broken down into approaches, it is clear that LST was the most commonly used approach with a relatively high proportion of effectiveness. LST was a component of more than 70 per cent of the overall included interventions. Eleven interventions which incorporated LST were found to have convincing effects (61 per cent), three were found to be equivocal (seventeen per cent) and four demonstrated no effects (22 per cent).

The Social Norms approach was used in 44 per cent of included interventions. This approach also had a relatively high level of effectiveness but it should be noted that 91 per cent of those interventions which included Social Norms also included some form of LST. Seven interventions which incorporated a Social Norms approach were found to have convincing effects (64 per cent), three were found to be equivocal (twelve per cent) and one was graded as no effect (four per cent).

Seven interventions fell into the category of 'miscellaneous' approaches, this accounted for 28 per cent of the overall included interventions. Of these seven interventions, three were found to have convincing effects (43 per cent), three were found to have equivocal effects (43 per cent) and one was graded as no effect (fourteen per cent).

Peer-to-Peer delivery method was used in four interventions accounting for sixteen per cent of the overall included interventions. Of these four, three were reported to have convincing effects (75 per cent) and one reported no effect (25 per cent).

Only one intervention used the Good Behaviour Game and this accounted for four per cent of the overall included interventions.

Parental Education

Sixteen interventions (64 per cent) contained a family component which involved no direct personal contact either on its own or combined with an element of personal contact with external specialists or teaching staff. The majority (88 per cent) of the parental elements included in the interventions were based on educating the

parents/guardians and equipping them with knowledge about normative levels of alcohol use.

Forty eight per cent of interventions were designed to equip parents with family management skills, encouraging them to set clear standards for behaviour and aiming to increase parent-child communication. Twenty per cent of interventions reported improved family relations as well as reporting either convincing or equivocal evidence of behavioural outcomes

Four interventions (sixteen per cent) reported a favourable change in parental attitudes to alcohol use as well as reporting evidence of effects on behavioural outcomes (three were convincing, one was equivocal). There could be a relationship between targeting parental attitudes to drinking and a positive effect on alcohol consumption.

Suitability of School as the Intervention Setting

The age range of eleven to thirteen was the most common age range at which interventions were presented. Of the 21 interventions rated as convincing or equivocal, 67 per cent began their intervention between the ages of eleven and thirteen with 52 per cent reporting convincing effects. None of the interventions which reported no effects began the intervention at the most common mean age (twelve). The evidence therefore does indicate this is an effective age to begin alcohol education interventions. Sixty-eight per cent of the interventions lasted for one year or less which suggests that the most common age range for completion of the intervention was also eleven to thirteen. School is an efficient and comprehensive point of access to youth in this age range.

Six interventions (24 per cent) reported that they ran booster sessions with varying levels of success. Fifty per cent of these interventions were graded as reporting convincing levels of effects, 33 per cent reported equivocal effects and seventeen per cent reported no effects. Five of these interventions ran a booster session one year after the intervention was completed and one ran boosters at three months and six months after the intervention was completed.

Overall, the quantitative evidence that education can make a measurable positive contribution to harm reduction is mixed. Although the majority of included interventions (60 per cent) reported convincing positive effects on behavioural change, there were also many interventions which reported either equivocal (24 per cent) or a lack of effect (sixteen per cent). Various approaches are used to inform school-based interventions, with varying levels of effects. LST was the most commonly reported approach with a relatively high level of convincing effects (61 per cent). LST was frequently combined with Social Norms, again with a relatively high level of convincing effects (64 per cent). The age of twelve was found to be the most common as well as the most effective to begin an intervention and schools are seen as the most effective way to engage this age group. The majority of interventions focused their parental component on normative education and confidence building (88 per cent) but this was also found to have mixed effects on improving family relations and parental attitudes to alcohol. It is not possible to be

certain if these elements are proxy indicators of some other unidentified element for effectiveness or whether they directly influence alcohol behaviours.

3.3.3 What is the qualitative evidence that education as one component of multi-component programmes makes a measurable positive contribution to harm reduction?

Delivery of Interventions

Interventions were most commonly delivered to students and families through an external specialist (such as facilitators), who had often received specific training for the interventions. Fourteen interventions used this delivery method to students (with eleven rated as convincing) and ten used this method when delivering a component to parents/guardians (with six rated as convincing). Involving an external specialist does appear to increase the chances of reducing harmful and hazardous alcohol behaviours and avoids adding to the teaching load of teachers. Teaching staff are also involved in delivering interventions to parents/guardians. This obviously reflects the school-based nature of the interventions. Some interventions use more specialist staff who are experienced in family relations and parental education. These are more frequently used for selective and indicated intervention work and there is little comparative analysis available on whether teachers or specialists in parental education or family relations are the most suitable in universal prevention initiatives.

A large proportion of the interventions delivered the parent/guardian component through no direct personal contact. Family involvement may be in the form of a joint child and parent homework assignment or information sent out on postcards and many interventions have achieved measurable positive effects using this very limited level of engagement.

Effective Implementation

The evidence for the importance of interactivity in alcohol education is mixed. Of the projects and component interventions reviewed, eighteen were described as interactive. The majority of evaluation results presented convincing or equivocal effects; only four of these reported no statistically significant effects on alcohol behaviours. However, five interventions which reported convincing effects were limited in their level of interactivity in addition to three interventions which reported equivocal effects. Overall, the percentage of interactive interventions demonstrating some level of effectiveness (72 per cent) was higher than the percentage of interactive interventions which reported no effects (22 per cent).

It is not possible to suggest any association between the inclusion of ECA and effectiveness, because only four interventions reported the inclusion of ECAs. The involvement of youth in identifying, organising and running ECAs however, may be a useful strategy in engaging and learning from youth in the development and improvement of interventions. Fidelity of implementation is obviously a core implementation goal, and many evaluations report on this indicator of process. It is not always achieved. Forty per cent of the evaluations included in our review

reported adequate implementation fidelity. However, 75 per cent of interventions reporting no effect also reported adequate fidelity of implementation. Fidelity of implementation is clearly important but identifying critical success factors and planning flexibility in interpretation and implementation appears to be a prudent strategy.

Flexibility in interpretation is also a helpful strategy to nurture and refine the acceptability of interventions. Low levels of attrition increase the probability of effectiveness - 67 per cent of the interventions which reported convincing effects had student attrition rates of less than 30 per cent. Personnel who are adequately trained in the underlying principles and key features of a programme may retain youth and their families if they have some opportunities to adjust programme features that encourage retention such as child care provision; scheduling meetings to fit around working commitments; responding to youth preferences on aspects of delivery and content.

3.3.4 What is the evidence of change in knowledge and attitudes of children and young people participating in school and family linked alcohol education programmes?

Knowledge, psychosocial competence and attitudes are often targeted by interventions that aim to modify individual level behaviour. The underlying assumption is that these act as precursors to behaviours and that by modifying these precursors, less risky behaviours will follow. The evidence for this is however very mixed, and some research has found that modification of these variables is occasionally associated with negative behavioural effects. Consequently, although most interventions do aim to facilitate favourable knowledge, attitudes and perceptions (assumed knowledge) change, these variables have tended to shift from central to peripheral objectives of intervention programmes.

Knowledge Change

Only four studies reported on the effects of intervention on alcohol knowledge levels. Two of these found the intervention to have positive effects, and two reported no effects or reductions in knowledge. The two interventions reporting positive change (Narconon and Schleswig-Holstein) were both categorised as equivocal for evidence on behaviour outcomes. Narconon also reported positive changes on coping skills, student attitudes to alcohol use, parent attitude to alcohol use, and norms perception change. By contrast, Schleswig-Holstein reported no change or negative outcomes for student social skills; internal coping skills; attitude to alcohol use; and alcohol use norms perception change.

Interestingly, the two interventions reporting no change or negative change (Project Northland and STARS for Families) were rated convincing for positive effects on alcohol behaviour. For Project Northland and STARS for Families, it was reported that no change in descriptive norms regarding peer alcohol use post-intervention was detected. Project Northland reported positive change in social skills, internal coping skills and improved family relations, a decline in favourable student attitudes to alcohol use and favourable alcohol use norms perception change.

Norms Change

Seven studies reported on changes in perceived norms. Three of these reported positive effects, and four reported no favourable change. Of the three reporting positive changes in alcohol use norms / perceptions, one project reported no effect on alcohol behaviours (Project Northland Chicago), one reported equivocal evidence of behavioural change (Narconon) and one reported convincing evidence of positive changes in alcohol behaviours (BMI). Of those reporting no change or negative effects to norms/perceptions, two reported no effect (Project Northland Chicago and Going Places), two equivocal (Project Sport and Schleswig-Holstein) and three convincing evidence of behavioural effects (STARS for Families, Project Northland, and Project Sport Plus Parent).

Internal and External Personal Skills

Internal coping skills, such as dealing with anxiety and cognitive reasoning have replaced knowledge as an individual level aetiological target for interventions for adolescent alcohol misuse. Only seven studies reported intervention effects on internal coping skills. Two interventions reported favourable change, and five reported no effects. All those reporting favourable change in internal coping skills also reported positive behavioural change; and none of the studies that aimed to, but failed to improve internal coping skills reported positive behavioural change. The number of studies reporting is however small and therefore these observations cannot be interpreted as firm evidence of correlation.

Competency in social skills such as communication and defusing peer pressure to engage in risky behaviours is associated with lower alcohol misuse. The association may be proxy or causal, and again the evidence to date has not been able to confirm that improvements in skills will lead to beneficial behavioural change. Our review only identified positive change in social skills for one intervention. Three studies which reported a mix of behavioural effects and no behavioural effects found no measurable change in social skills, and twenty one interventions did not report any evaluation of social skills.

Attitudinal Change

Attitudinal change was only reported in six interventions. Three studies reported favourable change in student attitudes to alcohol use, and three reported no change or negative effects. The majority did not report on this measure. Of the three reporting no change or negative effects, two reported convincing (Project Sport (Printed) and Project Northland) and one equivocal evidence of behavioural change (Schleswig-Holstein).

Project Sport (Printed) and Schleswig-Holstein reported no change or negative intermediate effects across other measures. As previously noted, Project Northland reported a mix of positive, no change and negative intermediate outcomes.

Of the three studies reporting positive change, one reported no effect (Project Northland Chicago), one equivocal (Narconon) and one convincing (BMI) evidence of behavioural change. Project Northland Chicago reported favourable change in student attitude towards alcohol after the first year of the project, but none after

three years. Project Northland Chicago also reported short-term positive effects on favourable alcohol use norms perception change, but this did not lead to detectable behavioural outcomes. Evaluations also reported negative or no change outcomes on internal coping skills, social skills or improved family relations. Narconon, as previously mentioned, reported positive intermediate outcomes areas across multiple measures. BMI also reported positive outcomes on parent attitudes to alcohol use and alcohol use norms / perception and reported no change or negative effect on family relations.

There has been little specific investigation of knowledge and attitude change in children and young people participating in school- and family-linked education programmes. Overall, the evidence on changes in attitude and knowledge is partial and somewhat mixed. Few studies reported change in knowledge and attitudes. In those studies that have measured and reported, no correlation with effectiveness is apparent. Evaluations tended to attain some positive results for some measures and negative/no change for others. Furthermore, interventions associated with positive effects on some intermediate outcomes, often reported equivocal evidence of behavioural effects or no effects, and interventions associated with convincing effects on behaviours reported negative or no change on measures attitude, knowledge and other individual-level behaviour determinants.

3.3.5 What is the evidence of short- and long-term change in behaviours of children and young people participating in school and family linked alcohol education programmes?

Behavioural Change

The overall aim of all programmes in the study was to achieve favourable behavioural outcomes. More specifically, the objectives were usually delaying the age at which students initiate drinking; reducing alcohol use and frequency; and/or reducing binge drinking. As interventions are usually delivered during the years of initiation, reductions are usually assessed as relative gains, measured against the rates of control group equivalents.

Fifteen studies reported convincing behavioural effects on alcohol use on children and young people and were considered methodologically sound. Another six were considered to have equivocal effects, while four were rated as ineffective. Four studies were excluded from this part of the analysis because of concerns about methodological quality.

Sustainability is an important consideration in measuring a programme's effectiveness. While a programme may report positive results, this may be a temporary, short-lived effect. For the purposes of this analysis, follow-ups conducted a year or less after the intervention were considered short-term. Follow up evaluation a year or longer after intervention completion was considered long-term. Five out of fifteen projects with convincing results reported long-term outcomes, ten reported only short-term outcomes. Of the six projects reporting equivocal results, three reported short-term and three reported long-term.

There is evidence that several programmes produce convincing behavioural change in alcohol in the short-term. Many of those reporting short-term effects did report a

year after baseline, but involved longer term intervention, such as Project Northland's three year curriculum, and did not include a further year gap between intervention cessation and follow-up.

Programmes Reporting Convincing Effects	
Long-term	Short-term
BMI + PBI	All Stars Core
CaFay: LST + SFP:10-14	All Stars Plus
LIFT	Communities that Care
Project Family: ISFP	D.A.R.E. Plus(elements still going);
Project Family: PDFY	Örebro
	Planned success
	Project Northland
	Stars for families
	Trelleborg
	Unplugged

Long-term Behavioural Change

There is evidence for long-term behavioural change in children and young people participating in alcohol education programmes. Interestingly, the five studies reporting long-term behavioural change were all relatively brief interventions, each lasting a year, plus a booster session a year later in two cases.

BMI + PBI

Evidence for the BMI intervention demonstrated effects in the long-term, up to 22 months after intervention. The effect of BMI was found to be negligible at ten month follow-up (Cohen's d ranged from 0.02 to 0.07)⁶⁴ but increased to the equivalent of a small effect size at 22 months follow-up (ranged from 0.15 to 0.22) (Wood et al, 2010, p.349)⁶⁶. The delivery of a booster session may in part explain this improvement at 22 months.

CaFay: LST + SFP: 10-14

LST + SFP: 10-14 intervention reports behavioural effects lasting up to five and half years past baseline. At one year after the initiative, there were reduced rates of alcohol initiation reported, though non-significant. At two and a half years, alcohol initiation was significantly lower than for the control group. Initiation was still significantly lower at five and a half years past baseline.

Lower drunkenness was reported for intervention group against control at two and a half years past baseline, but only approached statistical significance (p=0.10). At five and a half years past baseline, the relative reduction for drunkenness against control was reported as 5.2 per cent for the intervention group, and 2.5 per cent for alcohol initiation. Booster sessions were offered for both the LST and SFP components a year after the initial interventions and achieved high take-up (70 per cent+) (Spath et al, 2002, p.131-2)⁹⁹.

LIFT

The LIFT intervention was delivered to the fifth grade and reported positive behavioural effects in follow-up evaluation at twelfth grade. Fifth grade students in the intervention group were found to be less likely to report 'patterned alcohol use' (at least once every two to three months) than the fifth grade control group at follow-ups in sixth, seventh and eighth grade (Eddy et al, 2003)⁸¹. During middle school (i.e. grades six to eight) the control group were more like to report patterned alcohol use (O.R.: 1.49). Analyses of outcomes at grade twelve found the intervention was associated with reduced risk in alcohol use ($\beta = -.07$, $p < 0.05$), equivalent to an odds ratios of a seven per cent reduction in risk (DeGarmo et al, 2009, p.213)⁷⁷.

Project Family: ISFP & PDFY Programmes

ISFP and PDFY were two separate short-term (duration of a year) interventions given to students in sixth grade as part of Project Family. The follow-ups collected data at several points, and the results for four (Spath et al, 2001)¹⁰⁰ and six years (Spath et al, 2004)¹⁰¹ after baseline were reported. ISFP shows evidence of effectiveness on behavioural change up to six years after baseline, while PDFY effects faded, but were still promising at the four year follow-up. At the four year follow-up, ISFP was found to have a relative reduction against control for 'ever drank alcohol' (RR: 26.4%; $p = 0.01$), 'ever drank without parental permission' (RR: 32%; $p = 0.01$) and 'ever been drunk' (RR: 40.1%; $p = 0.01$). PDFY also assessed relative reduction against control at this stage, but results were insignificant. PDFY did have slower rates of initiation and growth of drunkenness against control ($t(363) = 2.42$ $p = 0.05$ and $t(362) = 2.42$ $p = 0.05$, respectively). At the six year follow-up, effects had diminished. In 'time to initiation' measures, the ISFP significantly ($P < 0.05$) delayed 'Lifetime alcohol use without parental permission' (initiation beginning 12.4 months later for intervention group) and lifetime drunkenness (initiation beginning 13.3 months later for intervention group) (Spath et al, 2004, p.540)¹⁰¹. However, evaluation of PDFY did not report any significant difference in any of the alcohol initiation measures. The effects of ISFP do appear to persist long-term.

The evidence for long-term behavioural change in children and young participating in alcohol education programmes is limited, and effects clearly tend to diminish over time. However, there is evidence that programme effects, can be sustained up to six years after intervention completion in some cases.

3.3.6 What are the critical elements of effective school and family linked education aimed at the prevention or reduction of alcohol misuse by young people aged 11-18 years?

School-Based Elements

Delivery Agents

Sixty-seven per cent of interventions rated as sound used external specialists for some or all of educational component delivery. Just over 50 per cent of all interventions involved teaching staff, and twenty per cent of all interventions rated as sound involved peer-to-peer delivery. All three interventions relying on indirect

contact reported equivocal or no effects. The involvement of an external specialist in delivery of the intervention to students correlated quite strongly with positive behavioural effects. Eleven of the fifteen interventions reporting convincing effects used external specialist in delivery and only one of the four interventions that were rated as sound but achieving no effects involved external specialists.

Interactivity

Not all included studies reported levels of interactivity or sufficient detail for this review to assess levels of interactivity. Of the eighteen projects rated as interactive, just over 70 per cent (thirteen/eighteen) reported some positive effect; but a similar percentage of interventions described as being limited in interactivity also reported some positive effects. There is some evidence that the interactive nature of peer-to-peer delivery is a key benefit and that interactive/participatory development may be especially beneficial. This however, requires expert facilitation and guidance, as well as rigorous evaluation to ensure that impacts are as intended and positive.

Promoting Alternative Activities

Only four interventions promoted ECA and the behavioural outcomes associated with these interventions were a mix of positive, equivocal and no effects, so there is insufficient evidence to draw any conclusions on the contribution of this characteristic.

Duration of Programme and Intensity

The majority (68 per cent) of included interventions were delivered over twelve months or less. Seven were delivered over two to four years and only one was delivered for more than four years. Those with longest duration were more commonly associated with positive or promising outcomes. Six of the seven programmes delivered for over two to four years reported positive outcomes and the programme delivered for more than four years (Raising Healthy Children) demonstrated some, although equivocal effects. Just under half of the programmes of one year or less duration achieved convincing positive outcomes, and three of the shortest duration programmes reported no effects.

We examined the number of sessions deployed in delivery. Studies for two of the interventions rated as sound and convincing levels of evidence did not report this important implementation detail. One intervention involved no direct contact. Duration of sessions was most usually 30 minutes or less, and none exceeded two and half hours.

For those interventions where session frequency was reported, seven reported delivery of the programme over five sessions or less, one was delivered over six to ten sessions and six involved more than ten sessions. No clear pattern was apparent and for many interventions this data was not available.

Frequency, of sessions and perhaps therefore the overall volume of content is perhaps less significant as an element of effectiveness on its own, than overall exposure which is a function of duration and intensity. Our analysis suggests that

interventions delivered as less than five sessions can be effective, and extended duration intervention programmes also demonstrate effectiveness.

Optimal Student Age for Intervention Exposure

Age of first exposure ranged from six to eighteen and the most popular age range at which intervention delivery commenced was 11-13 years. This was also the most common age range for completion of the intervention delivery. This overlap is unsurprising, given most programme durations periods were reported as 12 months or less. There was no clear correlation between age of exposure and effectiveness although a weak trend of greater effectiveness associated with intervention exposure at age 11-13 years was apparent: eight of the fifteen interventions reporting convincing effects commenced with students aged 11-13, and four equivocal evidence of effects rated interventions also commenced with the same age range.

Booster

Only six interventions reported delivery of booster sessions. Three of these projects reported some convincing behavioural outcomes, but two were equivocal, so no clear evidence that this is an element critical to effectiveness.

Whole School

Included interventions were mainly delivered as single 'bolt-on' initiatives. Only two included interventions were delivered within a whole school policy intended to promote a positive health and social well being and an anti substance misuse ethos. Evidence of behavioural outcomes were convincing for one intervention (Trelleborg) and equivocal for the one (Raising Healthy Children). Therefore no conclusions on the contribution of this characteristic can be made.

Family-based Elements

Objectives

In relation to the issues that family-linked interventions should address in terms of the family environment and the parent-child relationship, it is possible to draw some tentative conclusions regarding correlation between improving parental attitudes to alcohol use and family relations and reductions in alcohol use amongst adolescents. Four of the five interventions that measured and reported on improved parental attitudes to alcohol use had either convincing or equivocal effects on alcohol use; while five of the eight interventions that measured and reported on improved parental relations had either convincing or equivocal effects. There does appear to be some merit in addressing these areas within an intervention.

Delivery Agent

According to the reporting of the reviewed interventions, there was a variety of delivery agents and methods used to connect with families. Interventions employed external specialists or teaching staff for personal contact; others used no personal

contact; and other interventions combined some or all of the above. In a situation where parents received no personal contact, family involvement in interventions was often through joint child and parent homework completion or information sent out on postcards. Due to the variety of combinations of delivery agents used within the interventions and the variety of effects on alcohol behaviours associated with these approaches it is difficult to draw robust conclusions regarding the most effective delivery agent. However, it is important to note the recurring presence of no personal contact within interventions. Of the 25 interventions reviewed, over half (sixteen) featured no personal contact or some combination of no personal contact, and involvement of an external specialist or teaching staff. Furthermore, a large majority of these interventions had some effect on alcohol behaviour, whether convincing or equivocal.

Settings and Acceptability

No critical elements of effectiveness can be derived from the evidence gathered in this review regarding the recruitment and attrition of families in interventions due to the large degree of variation in reporting. For every intervention that reported on this issue, there was another intervention that did not. Moreover, those interventions that did report on recruitment and attrition of families reported wide variations in their effect on alcohol behaviours of youth. However, despite the blurred importance of settings and acceptability, a number of interventions went to great effort to engage parents and support their involvement. Some interventions made sure training sessions for parents were available in evenings, most likely to avoid clashing with work commitments; and other interventions provided or paid for child care. If interventions require parents to take time out of their day to actively participate, then such measures are probably essential. However, there is some evidence that non-intensive contact with parents can also be effective.

Optimal Intensity, Duration and Nature of Exposure to Intervention

Interventions varied a great deal in intensity. From simple mail out of postcards (as in Project Sport) to Strengthening Families (ISFP, SFP: 10-14) which comprises of fourteen family skills training sessions and the PDFY programme which comprises five two hour skills training sessions.

Similarly, duration varies from less than one year (such as Planned Success) to more than two years (for example Örebro implemented over two and half years and Raising Healthy Children implemented over four years).

There is some promising evidence of effects across all levels of intensity and duration. The nature and its relevance and acceptability is perhaps a more critical factor for success.

4. Discussion

4.1 Families

Current Practice

Previous studies have shown family to be a significant influencing factor on young people's attitudes to alcohol (Bjarnason et al, 2003)⁴⁵. This has led to parents being targeted as a key component of many interventions, often without any explicit theoretical model or reasoning. These family-based interventions are often delivered in conjunction with school-based components. Family influence is commonly suggested as a protective factor for many young people, however, there are questions raised as to whether the influence of parents can cancel out the effect of peer influence. As children grow older, the influence their parents hold over their behaviour diminishes, this is coupled with an increase in peer influence. Examination of differential efficacy of approaches across the multiple developmental phases of adolescence deserves further investigation.

Evidence of the impact family components have on alcohol behaviours is limited. To assess whether changes in the family environment have affected alcohol behaviour, measures of variables relating to this context are necessary, yet such measures have not been a common feature of evaluations. Parent attitudes to alcohol were measured and reported in five of the 25 interventions. Improvements to family communication was measured and reported in eight of the 25 interventions. However, although the body of evidence is not very large, it does suggest some positive association. A favourable change in parental attitudes was reported in three interventions which produced convincing results and one which produced equivocal results. An increase in family communication was reported in four interventions which produced convincing results and one which produced equivocal results. An improvement in family management and problem-solving was also observed in some of the most effective examples of interventions.

Educating parents on norms and values appears to be one of the more effective support strategies for parents to address children's alcohol use. Information on the effects of alcohol and the risks associated with its consumption and misuse are common components of family-based alcohol interventions. Many of the parental components in the interventions identified in this study centred on equipping parents with knowledge regarding 'normal' behaviours and 'mainstream' values associated with drinking alcohol. Much of this work stems from the assumption that parents can influence their children, both positively and negatively.

A common intervention objective is to increase parents' knowledge surrounding the dangers of drinking. Many interventions also aim to encourage increased parent-child communication. Efforts to improve family management and promote increased problem-solving capacity are also often addressed in interventions. Increased communication within the family on secondary risks such as delinquent or risky sexual behaviour can also be intervention objectives. These aims are predicated on an assumption that projects can help parents set clear standards for their child's behaviour and that knowledge or capacity deficits are the main barriers to effective communication and parental control. Information deficit models have been

demonstrated to be ineffective and irrelevant to youth audiences, it may well be equally inappropriate to apply this paradigm to parental outreach. Furthermore, the mixed results on correlation analysis between parental skills and positive behavioural outcomes, suggests that capacity deficit models may also be inappropriate as a theoretical basis for intervention design and implementation. Social cognitive theory or the health belief model might be better conceptual foundations.

It is common in many European countries for the majority of the adult population to drink alcohol. Young people are therefore exposed to alcohol at an early age through their parents. Only a small amount of interventions addressed changes to parents' drinking habits, despite acknowledging the influence that parental role modelling can have over their children.

Most school-based approaches are universal in scope. A diverse range of family-based approaches have been implemented, from group sessions and meetings with teachers or external specialists, to mailed postcards or take home assignments. Family based approaches that link with schools are more commonly universal, although there are some examples of selected and indicated interventions coordinating with school-based interventions.

This review has identified that brief or no contact time with parents can be as effective as intensive interventions, although evidence for sustained effects is quite strongly associated with some of the longest duration interventions. The majority of interventions contained parental components which were administered through no direct personal contact with the parents. It is assumed in much of the literature that direct personal contact with parents increases the effectiveness of the intervention, so much so that efforts have often been made to increase parental attendance. However, there is evidence to suggest that interventions which offer minimal or no direct contact with parents can be just as effective. When direct personal contact was provided to parents, brief contact time was very common in many of the interventions and proved to be quite effective in interventions such as Project Family, All Stars Plus and BMI.

Interactivity is also recognised as an effective strategy to engage parents. However, again this review did not find strong correlation between reported interactivity and effectiveness.

Acceptability and Feasibility of Accessing all Families and Higher Risk Families

Low levels of attrition are often thought to increase the probability of effectiveness, however, no evidence was found to strongly support this. Some interventions sought to increase attendance by offering practical help to compensate for participation burden such as scheduling meeting around work and family commitments and offering child care provision.

In family-based alcohol education, the role of parents and other family members is perceived as crucial. There is evidence to suggest that the majority of participants in such interventions are parents who are already motivated and worried about their children's welfare (Koutakis et al, 2008)⁸³. There is evidence that some alcohol education interventions delivered to socially and economically disadvantaged

groups, such as some of the Strengthening Families Programmes in North America delivered in Native American communities, can have some impacts. However, as with the wider evidence base, evidence of effectiveness on behaviours is limited (Foxcroft et al, 2002)³. Strategies that engage families in which social and economic problems are prevalent are less common. A study conducted in Sweden for example, found that parents with lenient attitudes towards alcohol at pre-test were more likely to drop out of a parent targeted alcohol education/prevention programme (Koutakis et al, 2008)⁸³. Gauging the level of parental acceptance of the interventions was problematic due to the lack of reporting of this element in many of the evaluation studies.

The level of parental involvement can also depend greatly on the attitudes of the parents and the surrounding ethos of the community. What works in one context may not be as effective if it is relocated to another context. A prime example of this is evident in Project Northland Chicago (Komro et al, 2008)⁷³, where an effective intervention was relocated from a rural area to an inner-city urban environment where it had no significant effect on alcohol behaviours.

Other Limitations and Opportunities

An important element which appeared to be lacking in the vast majority of interventions was monitoring for message consistency between the parental component and the student component. Only a small proportion of interventions such as STARS for Families considered consistency of messages communicated to parents and children to be an important objective (Werch et al, 2010)⁸⁴. The evidence does not identify good integration or rationale for combining school and family interventions which appear to be often delivered as conceptually unconnected strands of activity.

Some critical elements identified in evaluation studies as significant may be proxy indicators of effectiveness, not causal factors/independent variables. For example, school bonding is measured in several interventions as a protective factor. Does increased school bonding have an effect on levels of risky behaviour or is a positive school environment associated with children's self esteem coupled with normative expectations and goals acting on levels of school attachment? Association between variables should be interpreted cautiously. Correlation may indicate a causal link but it may also be an insight on the intermediate steps in steps to change and be indicative of association not causation.

Most Effective Elements Identified in this Review and How This Compares to Existing Evidence Base

As mentioned above, brief or no contact time with parents was found to be more effective than intensive sessions. Educating parents on norms and values was the most common approach to including a parental element in school-based alcohol education. The level of interactivity may be a proxy indicator of the intervention being more relevant to the families involved. Interactivity does not currently stretch to designing and developing the intervention in a genuinely bottom-up manner and is often used more as a persuasion tool than a genuine attempt to include families. Levels of attrition were not found to be strongly associated with levels of

effectiveness. Both long and short durations of interventions were shown to have some effect so the evidence supports the hypothesis that relevancy to both the families and the students is a necessary condition and may be more important than the duration or level of personal contact with the families.

Linking Family Approaches to Other Approaches

Family approaches to alcohol education can link with wider contexts such as the local community. Families are regarded as an effective way to engage an entire community because they occupy both domains. Rather than focusing solely on individuals or groups, community systems involve an understanding of an entire population (Holder, 1998)⁵⁸. It is important that the intervention is tailored to the local population and there is a lack of evidence to suggest that this was the case. As mentioned above, different communities react differently to interventions. Project Northland Chicago reported great difficulty in engaging with the local community in an inner-city area (Werch et al, 2010)⁸⁴. A key feature of linking family approaches to communities is community ownership. These types of interventions are designed, driven, implemented by the local community rather than outsiders. This was not evident in the majority of interventions.

Significant Gaps in Evidence Base

The evidence base identified a significant lack of a lack of holistic perspectives. No evaluation of integration was present in the evidence, which tended to address risk factors without any specific perspective. The main approach appeared to be the acknowledgement that parents influence their children but there is little evidence to suggest that the route to behavioural change has been the product of a coherent strategy. Few parental components have gone beyond information deficit or capacity deficit paradigms. Evidence does not suggest that this is an appropriate paradigm when planning family components. Changing social norms and providing opportunities for parents to address youth behaviours and risks may be used as a strategy but a theoretical model such as social cognitive theory addressing the parents' role and responsibility would be useful to explore how effective family components can be.

One explanation for the limited correlation between attrition rates and effectiveness and interactivity and effectiveness may be that reported attrition and interactivity is a blunt measure of a more subtle but important quality of the intervention, namely relevance and credibility. Flexibility in interpretation and delivery may ensure that interventions are more shaped and appropriate to parental audiences. Some interventions improved parental retention by changing intervention coordination and logistics. Perhaps, the ability to change implementation also reflected a more interactive approach which responded to parental priorities and circumstances, and this contributed to effectiveness more than the practical changes? Similarly, perhaps some interventions described as interactive were only interactive in limited ways and did not respond to parental needs and goals? Qualitative evaluation of parental components could be used to investigate and measure relevance and credibility. Qualitative research and participatory planning and implementation methods could

also be used to shape and develop strategic aims and core content and develop a stronger conceptual basis for parental involvement.

4.2 School Setting

Current Practice

Current research is dominated by US, and to a lesser extent Australian work. In a recent review of the effectiveness of school-based illicit drug preventive interventions, the European authors noted that twenty eight of twenty nine randomized controlled trials (RCTs) were US-based (Faggiano et al, 2008)⁵⁹. There are concerns that differences in culture, educational infra-structure and the legislative environment impact both delivery and outcomes of interventions and therefore limit transferability of good practice. There are distinct differences in the way alcohol education is delivered in the US (normally adhering to a large scale, fairly rigid, formal programme approach), to the UK and Australia, which often deliver interventions that are eclectic, borrowing components from different approaches that seem appropriate (EPPI, 1999)⁶³.

Another area of diversity between North American alcohol education and many European programmes relates to the use of an abstinence model commonly found in the former, with a harm reduction/minimisation approach used extensively in the latter.

Despite a widely held belief that alcohol education interventions should be theory based, there is no clear consensus on the most appropriate frameworks. Social learning theory, social norms theory, social influences theory, and the community systems approach, have all been used to inform the development of interventions, all with mixed to limited success.

Acceptability and Feasibility of Accessing Youth Through School Settings

The school setting is a convenient and efficient route through which to reach almost all youth. Difficulties in including comprehensive alcohol education in an already crowded school curriculum can however cause problems, including pressures on time, resources and staff (Jones et al, 2007)². Training teachers who deliver alcohol education programmes can also be non-standard, limited or completely absent. Common standards and guidelines might be beneficial (McBride et al, 2003)¹⁰².

A more long-term approach to alcohol education, starting from early childhood, may have more impact. However, there is no firm evidence that targeting children at an early age is effective long-term without later reinforcement. Long-term approaches necessarily present a feasibility issue in terms of achieving exposure to all components as students relocate and change schools. This is demonstrated in one study where it was noted that booster sessions were unfeasible as the intervention group which had initially been recruited across six schools was by the end of the study distributed across 60, mostly outside original local education authority (Eddy et al, 2003)⁸¹.

Attendance for students in school-based alcohol education is usually not optional in the way it is for parents, and so classroom-based programmes can generally guarantee good reach. However, delivery can still be undermined by truancy and

other reasons for absence. One study (Project Northland Chicago) calculated the average cumulative exposure to its classroom curriculum for those in the intervention cohort as 53 per cent (Komro et al, 2008)⁷³. Absent students may disproportionately represent the hard to reach higher risk groups for future risky alcohol behaviours.

The school setting also affords an opportunity to evaluate universal interventions with youth from different backgrounds. The studies in the review mainly used universal approaches, although a few adopted selective approaches; for example targeting schools with a high percentage of population receiving free meals. There are also a very small number of school-based selective interventions: a school-based study not included in this review for example included an indicated intervention alongside universal intervention activities, using teachers to identify students exhibiting risky behaviours and then offering those assessed at risk and their parent(s) a brief personalised intervention (Connell et al, 2007)¹⁰³. Interventions in schools may best suit universal and selective approaches as identification of at risk individuals in non-clinical settings involves subjective judgements and is potentially stigmatising for the students chosen.

Most Effective Elements Identified in this Review and How This Compares to Overall Evidence Base

In the school setting, a number of variables can affect the impact of alcohol education interventions, irrespective of the quality of the programme. School culture has been tentatively but frequently identified as a potential influence on the success of interventions (Bissett et al, 2007)¹⁰⁴. School culture relates to a range of factors including how the school is run, how the curriculum is delivered, discipline, rewards, and activities, and motivation of teachers and other stakeholders. This review did not identify strong evidence to support this hypothesis and despite a widespread belief that school culture can add value to intervention activities, there appears to be very little empirical evidence to support this intuitive assumption. The possibility that school culture might be a proxy indicator for some other unidentified influencing variable such as self-selecting adolescent population with low intrapersonal endogenous risk factors rather than an external behaviour-influencing culture of low exogenous risk factors cannot be ruled out.

Short duration interventions, both in terms of fewer sessions and length of programme (e.g. completion in one academic year or less) appears to be most prevalent in current practice. There is evidence that such programmes can result in long-term behavioural effects. These may also represent less cost in terms of resources, and involve simpler management and coordination. The impact of short-term programmes could be planned into longer term strategic interventions. While maintaining brevity, interventions could be delivered at pre-determined points in the life course to a targeted cohort using a variety of evidence-based effective intervention at developmentally-appropriate moments. For example, this might include the Good Behaviour Game for primary school age, life skills during early secondary school and then normative education for mid secondary when drinking initiation is likely to have occurred. This sequence is suggested for illustrative

purposes only, and would require piloting and thorough evaluation before any recommendation could be made with confidence.

School-based interventions delivered wholly, or in part by an external specialist, as opposed to a teacher, appear to be frequently associated with effective outcomes. Perhaps loss-framed and directive messages around alcohol behaviour delivered by a teacher, representing an authoritative institution, do not resonate with students? It may limit the extent to which they can genuinely engage in discussion of illegal activities such as underage drinking for example. Perceived independence from institutional authority or favourable identification with external specialists might also be an explanation of their acceptability as much as credibility, competence, or novelty of the intervention or delivery agent. An example of this is the observational comments that gender-specific effects of the D.A.R.E. Plus intervention were due to male student identification with the male role police officers, and thereby suggesting that teachers were not seen as role models (Perry et al, 2003)⁹⁴.

Brief one-on-one consultations with trained health professionals may also represent a promising approach. These approaches target individuals' motivations and experience regarding alcohol. Interventions have had positive impact on expectancy and intention around drinking, and have been associated with effectiveness in alcohol behaviour change. Again relevance and credibility is also likely to be a contributing element to effectiveness detected in individual motivational approaches.

The involvement of young people in the design, development and implementation of alcohol education interventions has been recommended as an effective approach. Peer-led education takes this idea to its fullest extent, but some level of youth involvement in other intervention approaches has been proposed (Anderson and Baumberg, 2006)¹. A school setting provides a useful forum from which to build peer led activities including peer-to-peer education. Established relationships with school staff may however support or mitigate this dynamic. Peer involvement or delivery does not seem to be an effective element per se. In terms of classroom activities being led by a peer instead of a teacher, we did not find direct evidence on how peer involvement mediated effects. There is evidence that programmes may have most impact when peers are involved in a genuine bottom-up approach that allows for their steering of the project goals, priorities and roll out, rather than simply receiving training and following a fixed plan of activity.

In a recent review, high levels of interactivity of programmes, compared with more didactical methods, has been highlighted as a feature of best practice (NCETA, 2009)⁹⁷. Many effective interventions in this review have taken an interactive approach, yet a number of other effective programmes have featured limited interactivity and some interactive programmes have also demonstrated positive results. Perhaps other features of the intervention undermined the positive effects of interactivity? Or perhaps the ineffective interventions were not truly interactive? Or perhaps interaction is a proxy indicator of the ability of a programme to properly capture and adopt its target audience's priorities and perceived choice sets? Perhaps only those that are interactive in development and design as well as implementation benefit from interaction with their target audience because it reflects the enhanced relevance and credibility of the intervention?

In summary, delivery agents' efficacy varies, and impact may differ across developmental stage as well. Matching interventions to the correct developmental stage, such as peer delivery during adolescence, may be important. It may also be important to differentiate between interactive approaches where it is a mode for delivering pre-determined curricula, and those where there is genuine involvement and empowerment of students, to determine the direction of events, through peer-driven, rather than simply peer-led approaches.

Life skills based approaches to alcohol education appear to strengthen the ability of participants to make informed decisions about alcohol use. However this does not necessarily mean they will not drink or reduce their level of drinking. Resistance skills were frequently not found to be to be enhanced in effective programmes.

In this review reports of normative education were almost always associated with life skills training. Many effective programmes did aim to correct misconceptions around 'normal' alcohol consumption. As well as correcting misperceptions, social norms approaches do also potentially bring consistency of message and goals which other approaches may not.

The Good Behaviour Game has been shown to reduce playground aggression in the short-term and lower likelihood of association with negative peer group after three years. In the LIFT study, improved family problem-solving was positively associated with reduced alcohol use at grade five. The Good Behaviour Game, in contrast to the skills, information and attitudinal focus of other approaches, targets a mediator which would more commonly be the focus of family-centred interventions, disruptive child behaviour. LIFT, the intervention identified in the review which combined GBG and a family component, is a promising example of an early preventive initiative which provides useful insight on strategies and techniques to strengthen family-based protective factors in both school and family settings. This could bring insight on if and how school and family settings complement, are substitutable or differ in their utility to affect specific behaviour or behavioural precursor change such as conflict resolution skills.

There does appear to be a lack of holistic perspectives and coordination of family and school-based approaches. Family-and-school-focused interventions target individual level risk and protective factors. A disconnection, with school-focused programmes engaging families often indirectly and partially (e.g. through homework) and many parent-focused interventions using schools as the delivery and recruitment setting may be a lost opportunity to learn and strengthen practice. How these approaches fit or could synergistically fit with ecological approaches is also poorly conceptualised and under-researched.

The planning and evaluation of future interventions could innovatively contribute to the evidence base by systematically exploring which mediators of risk and risk reduction to target and through which channel and/or agent. Exploring the feasibility and impact of a programme that targeted these risk and protective factors through a planned series of developmentally-appropriate, brief programmes scheduled through the life course would also be a valuable contribution.

Consistent messaging and changes to the broader behavioural environment which align with appropriate behaviour norms may also help to establish clear behavioural boundaries and socially acceptable expectancies and choices.

However, extended duration and multiple components/points of intervention also create more costs and challenges such as greater coordination demands and risks of high levels of attrition and non-completion of the programme.

Coordination would perhaps need to be managed at wider geographic points, as in EU-Dap. Further investigation of the frequency of sessions in order for longer duration programmes to achieve sufficient impact would be an interesting and useful area of investigation of a potential element of optimal effectiveness. Investigation of the feasibility and efficacy of programme content being matched with youth developmental change would also be an interesting area of investigation

4.3 Evaluation Priorities

Robust, meaningful and useful evaluation of alcohol education interventions is as important an issue as the delivery and impact of such interventions. Only through appropriate evaluation and the transparent reporting of this can insight and learning be progressed, on processes and strategies that deliver desired outcomes and objectives; as well as what they do not deliver. The extent and quality of evaluation that has taken place in relation to alcohol education and other substance misuse interventions has previously been judged to be inadequate by many researchers and reviewers on many levels. This review has also encountered a number of flaws in the extent and quality of evaluation evidence and these are highlighted below.

Longevity of Outcomes

Alcohol education has previously been criticised for providing little evidence as to the long-term effectiveness of associated interventions (Foxcroft et al, 2002)³. Limited long-term evidence of effectiveness was also a feature of the interventions included in this review. Of the fifteen interventions that had convincing effects upon alcohol behaviour, only five of these had long-term effects lasting one year or more. This meant that the majority of interventions that had convincing effects could only confirm effectiveness on alcohol behaviour for one year or less. Considering that most interventions were conducted with adolescents aged eleven to thirteen, and allowed for limited evaluation of behaviour in important years of development following this period, commentators on alcohol education may wonder if investment in this area is worth the cost in terms of both time and funding.

Applicability to the UK Context

A major issue within evaluation research relating to alcohol education interventions is the dominance of US research in this field. As in other reviews, such as Faggiano and colleagues' (2008)⁵⁹ review of illicit drug education, this review has been dominated by US intervention studies. None of the interventions reviewed here were conducted in the UK; and only a handful of studies were conducted in one or more European countries. European evidence on alcohol education in this review is confined to interventions in Sweden, Germany, the Netherlands and a multiple centre study encompassing seven European countries. Given the substantial

differences in culture, society and infrastructure between the UK and the US, as well as the UK and other European countries, the applicability of those interventions, reviewed here, to the UK context is uncertain.

Reporting of Attrition, Acceptability and Fidelity

Knowledge of certain measures related to the implementation are necessary to evaluating alcohol interventions as they provide a context for greater understanding of how and why an intervention may or may not have been effective. In the interventions reviewed here, it was found that attrition in relation to adolescents was reported in relation to 23 of the 25 included interventions. Furthermore, it was found that 67 per cent of the interventions that had convincing effects on alcohol behaviour had reported an attrition rate of 30 per cent or less. However, one issue in the reporting of study attrition was that authors interpreted this differently, with some reporting attrition from only some survey waves and others presenting one overall attrition rate. In relation to the recruitment and attrition of families, the reporting was even more limited given it was only reported in twelve of the 25 interventions.

The acceptability of interventions to parents and teachers was a very small feature of the interventions reviewed. However of those consulted the response was largely positive. Reporting of implementation fidelity was highly variable within the interventions reviewed. Some evaluation researchers such as Brown and colleagues made special effort to set out and report on measures of fidelity within their intervention, including observation of teaching staff involved in delivering programmes and enumeration of children and parents involvement in intervention settings and contact with personnel (Brown et al, 2005)⁶⁵. However, in contrast, some intervention studies only briefly remark on fidelity, if at all.

Comparison of Outcome Measures and Statistical Techniques

Another important issue in the evaluation of alcohol education interventions is the extent to which evaluations report on the same or similar outcome measures or statistical techniques. The task of comparing the effectiveness of different interventions is less challenging when there is greater uniformity in the measures and methods of analysis employed. Clearly, a variety of measures are required to match the variety of objectives which may be preventive, precautionary harm reduction, or aiming to reverse behaviours for example. However, in the interventions reviewed here, there was very substantial variety and sometimes limited overlap in the behavioural outcomes reported. For example, where some interventions measured and reported initiation into alcohol use others would focus on measuring use in the last month or the last week; some would report on experience of drunkenness, where others would not. Further, some interventions combined behavioural outcomes with intermediate attitudinal outcomes to produce a proxy index, which has negative implications if one or other set of outcomes are the focus of intended learning; and few individual measures are reported. The interventions in this review demonstrated large variation with regard to statistical analysis. Where some researchers engaged in complex analysis including multi-variate logistic regression or growth curve analyses, others employed simple tests of independence between intervention and control groups.

Theory of Change and Logic Models

Many of the interventions reviewed here employed theoretical approaches to conducting their respective interventions, though the focus of these tended to relate to particular interpretations of adolescent alcohol use and/or the modes of delivery that would be most effective. What was mostly lacking in the interventions reviewed here and what could be of major benefit to the progress of evaluations of preventive alcohol and substance use interventions more generally, are theory of change and logic models.

Theory of change and logic models depart from the more traditional and linear treatment-effect experimental designs. This approach to evaluation more accurately reflects the complexity of factors involved in risky alcohol behaviours and interventions designed to prevent or reduce harmful effects. Logic models can recognise the potential intermediary role of behavioural precursors in achieving longer term behaviour change outcomes. They provide a structure for transparent and clearly defined testing of the theory and paradigms on which the programme is based. They also integrate both causal and intervention theory and directly relate these to outcome measures. Furthermore, because such frameworks recognise the close relationship between 'means' and the 'end' of a given intervention, they provide a mechanism for simultaneously collecting and interpreting process and outcome evaluation data.

Applying the theory of change to multi-component, alcohol-harm reduction interventions enable integrated, simultaneous evaluation of supply-side controls, as well as demand-side interventions. Shifting from conventional, research methods which aim to isolate individual variables, to research that examines the effects of combinations of exposures and the inter-dependence of relationships involved in causality and preventive intervention can improve the internal sensitivity of evaluations of multi-component programmes. More specifically, logic models could be used to assess the contribution of education as a marginal, inter-dependent contributor to harm reduction programmes. Overall, well designed programmes will utilise a range of measures to accurately capture the depth and breadth of impact of interventions. The challenge of alcohol misuse and harm reduction is that it is complex, and only partially understood. A reductionist approach to analysis and evaluation runs the risk of over-simplification; a flexible and nuanced approach can advance understanding, practice and ultimately policy progress.

5. Conclusions and Strategic Implications

The review of school- and family-linked alcohol education interventions identified a relatively broad range of interventions which included family- and school-based components. A small number included additional components such as community-based activities and regulatory change. The diversity of approaches and the mix of results on behavioural outcomes demonstrate that the evidence base is not clear enough for most effective or best practice to be identified. All of the approaches identified as priority interest showed promise but evidence of effects was generally also mixed. Variation in interpretation and implementation of intervention approaches and delivery is probably an important but under-recognised and under-reported moderating influence.

Potential moderating interpretation and implementation variables identified in this review were levels of interactivity and perhaps more specifically sensitivity to target audience response and motivation; acceptability of the intervention to target audiences (especially with regards to parents); capacity building of interpersonal skills (although which are critical is far from clear); and credible consistent impact on prevailing / perceived norms of both students and parents. Evaluative research that aims to investigate how and where these moderating variables impact the path from intervention to favourable outcomes at individual, group and institutional level is recommended to refine design of resources, training of involved personnel and strategic planning of intervention programmes.

The majority of identified interventions combined approaches and theories. Most effective combinations cannot be identified with certainty but some common themes associated with positive outcomes do emerge from the review:

Mass marketed social norms approaches are highly prevalent components and are associated with effective change. Social norm change objectives are most clearly demonstrated in school-based components but are also commonly present in family components, although not always so explicitly identified as targeted variables. It is likely that social norms initiatives are not always informed and supported by original formative research. This represents a risk that social norms messages and focus may not be fully aligned with the target audiences' own current perceptions and priorities. Nevertheless, it is apparent that social norms approaches are popular, often effective and are applicable to both school and family components. Social norms approaches therefore provide a platform from which to 'link and sync' the two components, achieve integration and therefore consistency of objectives, messages and modifications to intervention design and implementation.

Life skills training is also a very popular approach and is often combined with other approaches including initiatives intended to strengthen protective family factors and modify risk factors. There is evidence of effectiveness for family-based life skills training, although some is mixed and despite many years of research the path to effective change is not always clear. Critical elements for effective cultural transferability are still unclear. Given this approach has been developed extensively in the cultural context of the USA, this is an important consideration when considering its applicability and delivery. Its theoretical basis is explicit and therefore structured mediation analysis built into evaluation and/or piloting (for example Allen

et al, 2007)¹⁰⁵ on UK interventions could help to improve understanding of essential elements for effectiveness in the UK context. The delivery of life skills training is relatively resource intensive. It is therefore strategically appropriate to ensure that the approach is used during the developmental stages of adolescence when impact and cost efficiency is maximal. Combined Strengthening Family and Life Skills training does aim to influence multiple variables and does not focus on the 'information deficit' paradigm that is prevalent in many family components. This is almost certainly one of the critical elements of effectiveness of this approach.

Correcting parental perceived behaviour norms, providing support to operationalise these norms in the family context and reinforcing correct norms in other domains such as school and community is a theme detected but not explicitly articulated in many of the studies identified in this review. Such an approach offers great promise and could be further developed, refined and tested. Bandura's social cognitive theory (1977)⁵¹ is an appropriate and thoroughly validated framework from which to plan, manage and evaluate this as an approach. Social cognitive frameworks also fully incorporate the role of social norms and strengthening interpersonal skills and therefore offers a working structure for future development, roll out and evaluation of norms-based family- and school-linked educational approaches.

Peer-to-peer delivery is also supported by promising evidence. Variability in reported effects suggests that understanding efficacy is more complex and nuanced than simply delivering aspects of an intervention through peer-to-peer channels. We suggest that peer-to-peer and indeed levels of interactivity are also proxy indicators of sensitivity and responsiveness to target audiences' needs, motivations, priorities and perspectives. There was some indication in the review of evidence that peer-to-peer delivery is most effective when combined with peer driven approaches to planning and implementation. This reduces risk of activities being perceived as 'bolt-on' and losing the credibility amongst adolescent audiences that peer-to-peer offers.

Strategically, bottom-up planning, implementation and delivery is clearly a desirable goal, although logistically challenging. There is, however, a great deal of evidence and learning from other fields that could be used to support such a strategy.

Bottom-up planning, active engagement of target audiences and co-creation methods are also recognised as core to community-based interventions. This review identified only a small number of family- and school-linked interventions that included a community component and results were mixed. However, as discussed previously, there is strong evidence from the publicly available body of evidence that community interventions can be very effective providing community ownership is adequately built in. Family components are well placed to link with both school and community components and to act as the anchor or core of integrated multi-component programmes. A central component is a prudent precaution to ensure simultaneous and parallel development of various strands of activities remain consistent in goals, objectives messages etc.

Disruption of early childhood behaviours was also examined as part of this review. Identified evidence for this as part of family- and school-linked approaches was very limited but promising. Clearly this type of approach can contribute to positive

behaviour change but is unlikely to be sufficient if not reinforced at later stages of child and adolescent development.

The cumulative evidence identified in this review suggests that short duration interventions can be as effective as longer duration, especially with reinforcement in the form of booster or developmentally-matched reinforcing initiatives when youth are a little older.

There is a case for multi-stage multi-component intervention programmes, where a succession of short duration, developmentally appropriate approaches is employed through childhood and adolescence. The benefits of this are: reinforcement, consistency of message and goals, focused resource investment. The logistic challenges are however very substantial. Tracking and maintaining contact with young people and their families, adequate monitoring and evaluation for effectiveness and adverse outcomes, as well as costs associated with such large scale coordination would be huge. However, organisations responsible for delivering a portfolio of interventions and which target more than one age range could draw on this perspective to ensure there was coherence and consistency in overall operational strategy.

Finally, as reported many times previously, there remain real limitations to the quality and therefore utility of the evidence base. There is strong consensus that the prevention and control of harmful and hazardous alcohol consumption needs to be tackled using multiple methods and strategies and that these are interlinked and interdependent to some degree. Yet evaluation is most commonly based on linear measures of the relationship between a narrow set of influencers and outcomes. A more holistic approach to evaluation is highly recommended. Again, evidence and learning from other fields could be used to support such a strategy. Logic models and the underpinning concept of outcomes frameworks for planning and evaluation are emerging as very valuable tools for generating practice-based evidence.

It is recommended that future intervention programmes which include family- and school-linked alcohol education uses this or a similar structure to plan the design; select the components; organise and evaluate effectiveness. Such a structure both recognises that the contribution of family- and school-linked education is likely to be small; but can also reflect the positive contribution; illustrate how and where it fits in broader based policy and strategy and contribute to building an informative evidence base and future good practice.

6. Appendices

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
Brown, E.C., Catalano, R.F., Fleming, C.B., Haggerty, K.P. & Abbott, R.D. 2005 USA	Life Skills + Social Norms + peer-to-peer + parental involvement Intervention designed according to theory of social development model	Raising Healthy Children programme. Different strands of intervention included training for teachers. 1st and 2nd grade (age 6 - 8) pupil skills development. Grade 4-6 (age 9 – 11) pupils participated in after-school tutoring or study groups. Opportunities in elementary and middle school to learn and practice social skills in social environments inside and outside school (ages 6 to 14). Workshops and home support for families with children in grades 1-8 (ages 6 to 14).	2 arms, 4 wave cluster RCT. Annual, longitudinal survey between 6th and 10th year of study (age of pupils: 11-16).	Extensive measurement of intervention fidelity including teacher observation and enumeration of all activities intervention pupils were involved in. Attrition analysis found no statistically significant differences in students with missing data (n=81) in relation to intervention or control; first or second cohort; low income status or anti-social behaviour.	Use of 2 part latent growth model representing use vs. non use of alcohol and frequency of alcohol use. Use vs. non use was computed in a random effect logistic regression model involving linear, quadratic and piecewise growth factors	No significant difference between intervention and control students in use vs. non use. Intervention students were found to have a greater rate of decline in frequency of use compared to students in the control group in grades 8 to 10. Small-medium statistically significant effect size for adjusted mean difference in frequency of use at grade 10. Cohen's d = 0.40; parameter estimate: 0.199 (SE =.096) (p = 0.05)	
DeGarmo, D.S., Eddy, J.M. & Reid J.B. 2009 USA	Life Skills + parental involvement + Good Behaviour Game	Linking the Interests of Families and Teachers program (LIFT) delivered either to first or fifth grade pupils and their parents. Multiple components of	6 wave, 2 arm, cluster RCT. Baseline, simultaneous and annual follow up	Intermediate effects of intervention on physical aggression in the playground, family problem-solving were tested. Intervention effects on growth in alcohol use were found	Path modelling Cox survival analysis. Latent growth curve analysis	Direct effects of LIFT intervention: Reduced risk of initiation into alcohol use for intervention group. $\beta = -.07$, $p < 0.05$. Equivalent to a 7% reduction in risk for those in LIFT intervention compared to controls (Controlling for	

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
		program included training for parents and children, and increased communication opportunities between parents and teachers. Delivered in a single school year over 'few months'.	surveys. Focus upon outcomes for pupils that received intervention in grade 5.	to be partially mediated by improvements in family problem-solving.	Effect sizes estimated with partial η^2 using MANOVA and ITT analysis.	parental drinking and peer deviant association) Positive small effect of intervention on growth in alcohol use ($\beta = -0.15$).	
Eddy, J.M., Reid, J.B., Stoolmiller, M. & Fetrow, R.A. 2003 USA	Life Skills + parental involvement + Good Behaviour Game	Linking Interest of Families and Teachers (LIFT). Uses Oregon Social Learning Center's developmental model of anti-social behaviour. (Same intervention as described by DeGarmo et al 2009)	2 arm, 4 wave, cluster RCT.	Significant differences in treatment and control group at pre-intervention assessment. Control group parents more likely to be from an ethnic minority; better educated and older. Attrition and levels of participation over course of study ameliorated some of these differences. Attrition = 2.8% drop out by last wave.	Discrete – time survival analysis using logistic regression Helmert contrasts Log odds ratios, p values and odds ratios.	4th/fifth grade students in the intervention group less likely to report 'patterned alcohol use' in middle school than fifth grade control group. Log odds ratio = 0.40, $p < 0.01$ Control group students more likely to report patterned alcohol use in middle school (OR 1.49). No evidence to support additional hypothesis that those youths initially classed as "high risk" (reported substance abuse prior to middle school) at baseline were more likely to benefit from LIFT intervention	Patterned alcohol use defined as use of alcohol at least once every 2 to 3 months in the past year. Authors note study may not have enough power to test For the "high risk" hypothesis.
EU-Dap Study Group 2006 Multi-site (Austria, Belgium, Germany, Greece,	Social influence approach Life Skills + Social Norms + peer element + parental involvement	The Unplugged Program targeted 12 – 14 year students in 143 schools across 7 countries. 3 variants of programme: Basic (class curriculum only); curriculum with	4 arm; 2 wave cluster RCT. 7079 students stratified by social status and by catchment	Attrition analysis reported 27 schools dropped out after assignment, usually after teacher training. 23.5% of intervention arms, 4.4% of control.	Multilevel regression model. Prevalence Odds Ratios (POR).	At follow-up (1 year or more) Frequency of drunkenness in past 30 days reduced for 'at least once' by 28%) and regularly by 31% in intervention groups. Effectiveness of intervention vs.	

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
Italy, Spain, Sweden)		<p>peer activities; curriculum with activities involving parents.</p> <p>Targeted tobacco, alcohol and drug use.</p> <p>12 x 1 hour weekly sessions delivered by teachers supported by 3 day training course. Curriculum aimed to improve knowledge of substances, interpersonal skills, norm perceptions, intrapersonal skill.</p>	area and then randomised.	<p>No pattern of non-participation by socio-economic or study centre status.</p> <p>2.6% of students ineligible at baseline.</p>		<p>control:</p> <p>At least once over last 30 days drunkenness POR Basic 0.79 (0.57-1.09) 95% CI. Parents 0.61 (0.44-0.85) 95% CI. Peers 0.82 (0.60-1.12) 95%CI.</p> <p>Regular drunkenness POR Basic 0.66 (0.37-1.19), 95%CI. Parents 0.67 (0.40-1.13), 95%CI. Peers 0.76 (0.47-1.24), 95%CI</p> <p>Intervention by gender POR: Any over last 30 days drunkenness All 0.72 (0.58-0.90) 95% CI Boys 0.64 (0.49-0.85) 95% CI Girls 0.86 (0.63-1.18) 95% CI</p> <p>Regular drunkenness POR All 0.69 (0.48-0.99) 95% CI Boys 0.68 (0.45-1.04) 95% CI Girls 0.66 (0.37-1.18) 95% CI</p>	
<p>Furr-Holden, C. D.M., Ialongo, N.S., Anthony, J.C., Petras, H. & Kellam, S. G.</p> <p>2004</p> <p>USA</p>	Parental involvement	<p>Classroom Centred (CC) intervention and Family-School Partnership (FSP) intervention.</p> <p>Delivered to 1st grade pupils (age 6/7) by trained teachers.</p>	<p>3 arm, 4 wave cluster RCT.</p> <p>1st grade classes within schools (3 or more) randomly selected to receive 1 of 2 interventions</p>	Attrition across follow-ups not related to intervention status or other factors	<p>ITT analysis</p> <p>Logistic regression</p>	<p>Compared to students in the CC intervention, control group students had a greater relative risk of using alcohol without permission. Students in the FSP intervention had a higher relative risk of using alcohol without their parental permission than control group students. None of these differences were statistically</p>	Single alcohol use outcome measure.

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
			or control.			significant.	
Guyll, M., Spoth, R.L., Chao, W. Wickrama, K.A.S. & Russell, D. 2004 USA	Parent based intervention + Life Skills	Preparing for the Drug Free Years (PDFY) and Iowa Strengthening Families Program (ISFP) PDFY and ISFP delivered by trained members of local community (paid employment). Leaflets sent to control condition families	5 wave, 3 arm, cluster. PDFY and ISFP delivered as separate interventions.	Parent education was a significant predictor of participation from outset. Pre-intervention equivalence analysis showed similarities between treatment and control conditions. Attrition status correlated with younger parents; parents with less education; and child substance use at baseline	3 level growth curve model Use of composite index for alcohol use – log transformed for analysis of risk status	Students receiving ISFP intervention likely to have a lower level of final (end of study period) alcohol use (b = -0.30, p< 0.01) and a slower rate of alcohol use growth compared to control students (b = -0.06, p < 0.05). Students receiving PDFY - no significant difference in final alcohol use levels between students receiving intervention compared to control students. PDFY students did have a slower rate of growth in alcohol use compared to control students: b = -0.06, p < 0.05. Effect sizes were PDFY β -0.49 and ISFP β -0.24. Equivalent to a moderate effect size for PDFY and small effect size for ISFP.	Study also looked at effect of family risk status on intervention effect but did not find evidence that this was a found no significant moderator of effectiveness. .
Haggerty, K.P., Skinner, M.L. MacKenzie, E. & Catalano, R.F. 2007 USA	Parent involvement + Life Skills	Parents Who Care (PWC) programme: joint programme which aimed to enhance families' ability to address problem behaviour in children. Delivered in 2 formats to children in 8th grade and their parents. Both delivery formats overseen by individuals	4 wave, 3 arm, cluster RCT. 1 self-administered, intervention; 1 attended organised events intervention; 1 control	Perceived harm of substance abuse; favourable attitudes to substance use Fidelity and attrition measured and reported.	ITT analysis Logistic regression Only measure of alcohol behaviour was initiation of use. Other measures were pooled effects of intervention on substance use and	Intervention students in both groups demonstrated lower initiation of alcohol use at 24 month follow-up. Sample size was small and results were not statistically significant.	Study mainly considers intermediate outcomes for all substance use.

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
		experienced in working with parents and adolescents.	group.		sexual activity.		
Hansen, W.B. & Dusenbury, L. 2004 USA	Life Skills + parental involvement + Social Norms.	All Stars Core and All Stars Plus involved 14 and 11 classroom sessions, respectively. All Star Core program attempted to reduce motivation to use drugs by focusing on promotion of specific qualities amongst children e.g. normative beliefs; parental attention. All Star Plus built upon All Star Core program, adding decision-making, goal setting and resistance skills. Children also encouraged to complete homework activities with parents. Interventions delivered to children aged 12 years by a mixture of experienced and inexperienced teachers.	3 arm, pre/post-test pilot study with non-randomised, convenience sampling.	Intermediate measured outcomes: normative beliefs; understanding of effect of drug use on lifestyle; commitment to not using drugs; bonding to school; communication with parent; parental monitoring levels; resistance skills; goal setting; persistence; decision-making; and impulsivity. Attrition rate was 18% Both programmes improved norms perception and persistence in goal setting and Core Plus also improved parental attention levels.	Targeted behaviours analysed using ANOVA and standardised mean differences.	Effect size of Core program compared to control was small (d = 0.175); and effect size of Plus program compared to control was also small (d = 0.202). Reduction in drunkenness among All Star Core and All Star Plus groups was small (effect size for both d = 0.17)	
Hawkins, J. D., Oesterle, S., Brown, E., Arthur, M.W., Abbott, R.E., Fagan, A.A. & Catalano, R.F.	Life Skills, parental involvement, Social Norms, peer-led.	Community Youth Development Survey (CYDS) using Communities that Care prevention system. Establishment of	4 waves, 2 arm matched control trial. Randomisations within matched pairs.	Differences in alcohol use behaviours at baseline, not statistically significant. No systematic bias due to differences in	Multi-level discrete-time survival analysis used to consider incidence of alcohol use. Prevalence of	Statistically lower growth in incidence of alcohol use among intervention group, between grades 7 and 8, compared to control group $t = 2.72$, $p = 0.03$. (2 tailed) Adjusted odds ratio = 1.60.	Difficult to draw conclusions on critical elements as such a variety of programs were used across communities

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
2009 USA		community coalitions that analyse data on risk factors within their communities and based on this information decide which prevention programs to implement in their community. Various programs employed chosen e.g. Life Skills Training, Strengthening Families; Lion's Quest. Program implementers determined by type of program e.g. school teachers delivered school programs. Delivered to students in grade 5 (age 11/12)		accretion or attrition in intervention or control groups. Sample increased by 25% in grade 6. Survey results screened for validity in relation to inaccurate self-report.	alcohol use in grade 8 analysed using mixed model ANCOVA. Omnibus t test. Adjusted odds ratios.	Statistically lower prevalence rate for alcohol use in the last 30 days for 8th grade students in the intervention group compared to control. $t_8 = 2.48, p = 0.04$ (2 tailed). Adjusted odds ratio = 1.25. Statistically lower prevalence rate for binge drinking for 8th grade intervention students compared to control students $t_8 = 2.59, p = 0.03$ (2 tailed)	
Komro, K. A., Perry, C. L., Veblen-Mortenson, S., Farbaksh, K., Kugler, K. C., Alfano, K. A., Dudovitz, B. S., Williams, C. L., & Jones-Webb, R. 2006 USA	Strengthening Families + peer-to-peer	Year 1 of Project Northland Chicago. Adaptation of the 'Slick Tracy Home Team Program'. Home-based alcohol prevention program for 6th to 8th grade students and families. Intervention included classroom sessions led by peer-leaders and teachers, a poster fair at the school for parents and community	2 arm, 2 wave RCT	Attrition analysis found students lost at follow-up were older and had higher levels of alcohol use at baseline compared with those present at follow-up. No significant differences on normative estimates $F = 0.62; p = 0.44$), outcome expectancies ($F = 0.54; p = 0.47$), parent/child communication	Mixed model regression methods, with study unit specified as nested random effect; Measured at baseline and 6 month follow-up (Fall 2002 – Spring 2003). Students excluded if exaggerated or inconsistent	Alcohol use onset: No significant differences in alcohol use behaviour or intentions between baseline and follow up ($F = 0.24, p = 0.63$).	Normative expectations - less likely to think students who drink are more grown up, popular, and have more friends. Outcomes expectations - more likely to think that negative outcomes would occur if they drank alcohol.

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
		members, home-based program of activity booklets. Conducted by teachers and trained peer leaders.		($F=0.84$; $p = 0.37$), or family alcohol discussions ($F=0.61$; $p = 0.44$). Intervention groups had a significantly lower score than control groups for normative expectations ($F = 22$, $p < 0.01$) and outcome expectations ($F = 5.1$, $p = 0.03$)	responses (4%).		Both previously found to be important mediators of the effects of the original Project Northland intervention on reductions in alcohol use among young adolescents (Komro et al., 2001)
Komro, K. A., Perry, C. L., Veblen-Mortenson, S., Farbaksh, K., Toomey, T.L., Stigler, M. H., Jones-Webb, R. Kugler, K. C., Pasch, K. E., & Williams, C. L. 2008 USA	Social Norms + Resistance Skills + family and community components + peer-to-peer. Theory of triadic influence and social behavioural theory. Some intervention communities conducted 'merchant pledges' to limit access to alcohol.	'Project Northland Chicago' Alcohol use preventive intervention. Students in 6th grade (12 years) to 8th grade. Peer led classroom curricula, parental involvement (home based sessions), peer leadership and youth-planned community service organizing and environmental neighbourhood change. Control = prevention as normal.	2 arm, 4 wave RCT	Attrition analysis found no differential attrition by treatment condition, and no differential attrition by treatment condition on demographic characteristics or alcohol use. At baseline, the alcohol use scale was significantly lower in the intervention group compared to the control group ($p = 0.04$) and alcohol intentions were marginally significant ($p = 0.07$). No difference between intervention and control at 3 year follow	Mixed effect regression models (repeated measures, 3 level linear) Mixed ANOVA 3 level growth curve analysis Regression models (with time based covariates)	Over 3 years, no statistically significant difference in growth rate of alcohol use between intervention and control groups. Alcohol use $\chi^2 = 0.03$, $p = 0.86$ and intentions $\chi^2 = 0.07$, $p = 0.80$ Higher participation in home programs component was associated with a lower rate of alcohol growth over time, and approached significance ($p = 0.06$) For community organising (merchant pledges): non-significant trend in reduced access to alcohol in intervention group, ($\chi^2 = 0.04$, $p = 0.33$, SE intervention - 0.06, control -0.05). However intervention group had more	Intervention not effective overall in urban and disadvantaged environment. Home based programs which were allocated through classroom component showed some promise.

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
				up		difficulty to access alcohol at baseline.	
Komro, K. A., Perry, C. L., Williams, C. L., Stigler, M. H., Farbaksh, K., & Veblen-Mortenson, S. 2001 USA	Social Norms + Life Skills + family and community components + peer-to-peer.	'Project Northland' Alcohol use preventive intervention. Students in 6th grade (12 years) to 8th grade. School curricula, peer leadership, family education and involvement and community-wide activities.	2 arm, 4 wave RCT	Statistically significant mediators included parent-child alcohol related communication items 1 and 4, the peer influence scale, the functional meaning scale, and the MMPI-A proneness scale. Marginally significant indicators were the peer non-use norm item and the parent-child alcohol-related communication item 2 No significant differences between those lost to follow-up and those who remained.	Mixed effects regression models.	Amongst all students, and in non-users at baseline, the intervention had significant effects on alcohol use: Intervention students (entire cohort and non-users at baseline) had lower alcohol use at grade 8 than control. There were no intervention effects for students who reported previous lifetime alcohol use at baseline. Exact alcohol use measures not reported.	Analysis conducted twice: on the entire cohort of students; and on those students who reported no previous lifetime use of alcohol at baseline.
Koning, I. M., Vollebergh, W. A. M., Smit, F., Verdurmen, J. E. E., van den Eijnden, R. J. J. M., ter Bogt, T. F. M., Stattin, H., & Engels, R. C. M. E. 2009	Family influences. Based on the theory of planned behaviour and social cognitive theory	Modelled on Swedish Orebro Prevention Program. Parental intervention to encourage rule-setting; student intervention consisting of four digitally based lessons. First year high school students (mean age 12.7 years).	4, arm, 3 wave, cluster RCT. Assigned to parent intervention; student intervention; combined intervention or control.	ITT analysis Attrition analysis. No significant differences found.	Logistic multiple regression methods. Measured at baseline, 10 and 22 months after baseline.	Positive effect on frequency of drinking for combined intervention for heavy weekly drinking at T1 (OR= 0.36; p = 0.02; NNT= 45.3) but no significant effects were found at T2. Positive effect on weekly drinking frequency for combined intervention at T1 (OR = 0.67; p = 0.04; NNT = 39.1) and T2 (OR = 0.71; p = 0.02; NNT = 17.2).	

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Netherlands						<p>Students in the combined intervention drank significantly less frequently than students in the control at T1 and T2 (beta = -0.26; $p = 0.00$).</p> <p>No significant effects when interventions were carried out separately.</p>	
Koutakis, N.; Stattin, H.; & Kerr, M. 2008 Sweden	Parent-targeted intervention. Part of an alcohol prevention initiative begun by the Swedish National Institute of Public Health following a rise in alcohol use amongst teenagers after changes in Swedish alcohol policy due to joining EU in 1995	Orebro Prevention Program: Project workers attended parent meetings in junior schools at beginning of teaching semesters emphasizing the need for strict attitudes towards children's use of alcohol and greater promotion of leisure activities. Parents and children also received multiple mailings each semester including information on leisure activities within the area. Intervention began when school pupils were in grade 7 and ended in grade 9 (ages 13-16)	3 wave pre-post, longitudinal, study involving matched intervention and control schools. After baseline survey, participating children and parents surveyed 1½ and 2½ years after intervention.	<p>Intervention parents significantly stricter than control parents in their attitudes to alcohol use ($p < 0.01$)</p> <p>Attrition analysis found control group drop out associated with reported greater frequency of drunkenness at baseline.</p> <p>Highly significant group x time interaction ($P < 0.001$). Parents in the intervention group maintained strict attitudes over time, while those in the control group became more permissive.</p>	<p>Independent t-tests to examine baseline equivalence</p> <p>General linear modelling (GLM) with repeated measures used to examine changes in drunkenness and delinquency over 2½ years between intervention and control youth.</p> <p>ITT analysis.</p> <p>Cohen's d and NNT to measure effect sizes.</p> <p>Post-test ANCOVAs used to examine whether attrition had any impact on effect sizes.</p>	<p>Youth drinking significantly increased over time for both intervention and control, but was significantly steeper for control group ($p < 0.001$).</p> <p>The intervention reduced 'drunkenness' ($p < 0.001$) and 'frequent drunkenness' ($p < 0.001$) in the intervention group.</p> <p>Authors report $d = 0.35$. Within group effects sizes for GLM was 0.45 for drunkenness, which can be considered low-medium, to medium size effects.</p> <p>NNT = 7.7 for being drunk in the last month; = 7.1 for being frequently drunk.</p>	<p>Authors definitions:</p> <p>Drunkenness = how many times in the last 4 weeks felt drunk</p> <p>Frequent drunkenness = been drunk several times during the last month</p>
Lennox, R. D., and	Life skills +	Narconon drug education	2 arm, 3	Improved knowledge	ANCOVA.	Reported as marginal effects on	

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Cecchini, M. A. 2008 USA	Social Norms Based on drug abuse aetiology, program quality management data and prevention theory.	curriculum. An intensive, 8 module educational curriculum. Professionally trained facilitators delivered an interactive curriculum. Includes 'take home' component which involves parents.	wave, non-randomised trial.	and understanding of alcohol (F = 6.03, df = 11, p < 0.001). After 6 months greater tendency to plan to get drunk in the year following the 6 month follow up amongst the control group (F = 1.65, df = 11, p = 0.003). More intervention students believed drinking was wrong for someone their age (F = 3.15, df = 11, p < 0.001) Analysed for attrition and selection bias.	Baseline, 1 month and 6 month follow up data collection.	alcohol usage in past 30 days (F = 1.87, df = 11, p = 0.040) and being drunk in past 30 days (F = 169, df = 11, p = 0.073).	
Morgenstern, M., Wiborg, G., Isensee, B. & Hanewinkel, R. 2009 Germany	Social Norms + Life Skills + parental Involvement Based on Hansen et al's (2007) theoretical approaches: addressing social influences and enhancing motivation to avoid substance use.	The intervention consisted of 4 interactive lessons conducted by trained teachers, booklets for students and booklets for parents. 7th grade students (mean age 13).	2 arm, 3 wave, cluster RCT.	Increased knowledge regarding alcohol. Less impact on attitudes towards alcohol. No impact on alcohol-related intentions. Significant attrition-condition interactions for 'life-time drunkenness' (P = 0.020) and 'binge drinking' (P = 0.011).	Logistic regression analysis. Tested for baseline equivalence. ITT analysis. Effects were tested with generalised linear latent and mixed models. Assessed at baseline, 4 and 12 months after intervention.	Significant positive effect on binge drinking at 4 month (OR = 0.56; p value = 0.000) and 12 month follow-up (OR = 0.74; p value = 0.031). No statistically significant effect for life-time alcohol use at 4 month (OR = 0.81; p value = 0.246) or 12-month follow up (OR = 0.90; p value = 0.494). No statistically significant effect for life-time drunkenness at 4 month post-test (OR = 0.70; p value = 0.062) and 12 month follow up (OR = 0.77; p value =	

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						0.171).	
O'Donnell, L., Myint-U, A., Duran, R., & Stueve, A. 2010 USA	Parental Involvement Grounded in social development theory, theory of planned behaviour and gender theories	'Especially for Daughters' Aimed at Black and Latino parents of 6 th grade girls to delay sexual initiation and alcohol use. The intervention consisted of 4 audio CDs of dramatic role-model stories. Stories aimed to increase parents' awareness and help them be supportive. Stories developed with extensive community input. A separate groups received the 'attention-controlled' treatment which consisted of similar content to CD in 4 booklet format, mailed to families..	3 arm, 4 wave RCT	Intervention parents more likely to talk to their daughter about alcohol (AOR = 5.74, CI = 2.36-13.97, p < 0.001). Intervention parents expressed more self-efficacy to address alcohol issues with their daughters (AOR = 7.45, CI = 2.19-25.25, P < 0.05). Differences existed between the attention control group and the control but these were not significant.	ITT analysis. Logistic regression. 3 year study.	Positive effect on alcohol use. Females in the intervention condition were less likely to report alcohol use than the control condition (Adjusted OR = 0.38, CI = 0.15-0.97, p = 0 .05). Differences between the intervention and control groups but these were not significant RR of 1.86 for control group versus both the intervention and attention control groups.	
Park, J., Kosterman, R., Hawkins, J. D., Haggerty, K. P., Duncan, T. E., Duncan, S. C., & Spoth, R. 2000 USA	Social Norms + peer resistance skills + family targeted Intervention Based on social development model.	PDFY; 5 session, multi-media skills training program for parents of children aged 11-14 years. Young adolescents attended one of the sessions which focused on peer resistance skills. Implemented by trained local workshop leaders.	2 arm, 5 wave, cluster RCT.	Parents in the PDFY condition showed significantly more improvement than the control group in norms against alcohol and other drug use. Attrition analysis.	Latent Growth Modelling (LGM). Measured at pre-test, post-test and 1, 2 and 3 ½ years post-test.	Significantly less growth in alcohol use among youths in the PDFY group over time when compared with controls (standardised mean difference at 3 ½ year follow up d = 0.22.	

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Perry, C. L., Komro, K. A., Veblen-Mortenson, S., Bosma, L. M., Farbaksh, K., Munson, K. A., Stigler, M. H., & Lytle, L. A. 2003 USA	Peer-led + Life Skills + parental Involvement Community leaders organised action teams to address neighbourhood and school-wide issues.	'D.A.R.E.' and 'D.A.R.E. Plus': 10 session, school-based curriculum plus peer-led parental involvement classroom program, youth-led extra-curricular activities (ECA), community adult action teams, postcard mailings to parents. Grades 7 and 8. Taught by trained police officers, 13 out of 18 police officers were male. Led by elected and trained peer leaders.	3 arm, 3 wave, RCT	Among boys, those in the D.A.R.E. Plus schools were less likely than those in the control schools to show increases in alcohol use behaviour and intentions ($p = 0.04$) Significant differences among boys between D.A.R.E. Plus and control for tobacco and multidrug use and victimisation	3-level linear random coefficients model. Growth curve analysis. 18 month evaluation.	No significant differences between D.A.R.E. only and controls ($p = 0.13$) for use of alcohol. Significant differences among boys between D.A.R.E. Plus and control for alcohol ($p = .04$) No significant behavioural differences among girls between any condition ($p = 0.37, 0.30, 0.19$) except girls in D.A.R.E. Plus less likely than girls in D.A.R.E. only to have 'ever been drunk' $p < 0.05$ but differences between D.A.R.E. plus and controls ($p = 0.11$), or between D.A.R.E. and controls ($p = 0.33$) not significant.	Alcohol intentions, and use in last year showed increased growth in D.A.R.E. girls vs. controls (i.e. negative effects), not statistically significant.
Prado, G., Birones, E., Schwartz, S. J., Feaster, D., Huang, S., Sullivan, S., Tapia, M. I., Sabillon, E., Lopez, B., & Szapocznik, J. 2007 USA	Family-centred (Strengthening Families) approach. Eco-developmental theory (social ecological framework).	Familias Unidas Hispanic-specific, parent-centred intervention) + Parent Pre Adolescent Training for HIV Prevention (PATH). Parents and pupils in 8th grade. Adolescent participation limited to a small number of family visits and discussion circles. Delivered by trained facilitators.	3 arm, 5 wave RCT.	No significant differences in intervention conditions on alcohol use prior to baseline ($p = 0.91$) Familias Unidas +PATH reduced smoking Initiation; cigarette and illicit drug use, unsafe sexual behaviour. The effects of Familias Unidas + PATH on cigarette and illicit drug use found to be partially mediated by	Growth curve modelling ITT analysis Mediation analyses	Familias Unidas +PATH condition did not prevent or reduce alcohol use. Alcohol use rates not reported. Post hoc analyses on substance use initiation found no significant differences in initiation rates of alcohol across any condition	

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				improvements in family functioning.			
Shortt, A.L., Hutchinson, D. M., Chapman, R., & Toumbourou, J. W. 2007 Australia	Strengthening Families	The 'Resilient Families Program' for Grade 7 students (mean age 12.3 years). Aimed at enhancing parenting skills and encourage a positive relationship between parents and adolescents. Consists of student curriculum covering relationship problem-solving, communication, emotional awareness, peer resistance skills and conflict resolution; brief parent education, comprising of a professionally facilitated, Parenting Adolescents Quiz (PAQ) night for parents/carers; extended parent education consisting of 8 professionally facilitated group sessions for parents/carers. Study concentrated on 3 components: student curriculum; brief family education; and extended parent education, which are implemented in the first year.	Two arm, two wave RCT	Students exposed to the intervention were more likely to report high family attachment, and students whose parents attended the extended parent education group (8-week PACE group) were more than twice as likely as their peers to report positive problem-solving a follow-up. Students in the intervention schools reported receiving more school rewards and less school absence. Students with parent(s) who attended brief parent education were less likely to report low academic grades or bullying; also more likely to report aggression towards their parents. Attrition analysis.	Logistic regression analysis. Multivariate analysis Baseline and 1 year follow up. Program was not fully complete at one year.	Based on student-self report outcomes, exposure to the intervention was not a significant predictor of year 8 alcohol use, once adjustments were made for other significant student-reported influences. School curriculum OR = 1.03; brief parent education OR = 0.64; extended parent education OR = 1.09 'Brief parent education' component of intervention found to be significantly protective of adolescent alcohol use at year 8 (OR = 0.60, $p < 0.05$) when based on parent-self report of outcomes, but not significant when based on student-self report outcomes.	High level of alcohol use (33%) observed at baseline. Suggested intervention may be more useful if implemented before this age to be preventive. Alcohol use had increased to 47% of all students by 1 year.
Simons-Morton,	Social Norms +	The 'Going Places	2 arm, 5 wave	Positive effect on	Latent Growth	Non significant effects on	

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B., Haynie, D., Saylor, K., Crump, A. D., & Chen, R. 2005 USA	Life Skills + parental component Based on environmental change, social development, and social cognitive theories.	Program' targeted students in 6th to 9th grade. Aimed to increase social skills and prevent multiple problem behaviours, including smoking, drinking, and antisocial behaviour. Includes a social skills curriculum, parent education and school environment enhancement designed to increase academic engagement and commitment to school; alter perceptions, attitudes, and expectations about substance use and antisocial behaviour; and reduce multiple problem behaviours.	RCT	smoking progression. No effect on perceptions of school climate or on school engagement. Both also declined over time in treatment and control groups. Attrition analysis.	curve analysis. Measured at 5 stages from 6th to 9th grade.	drinking behaviour. Effects size not reported.	
Spoth, R., Redmond, C., Trudeau, L. & Shin, C. 2002 USA	Strengthening Families + Life Skills	CaFaY: LST + SFP: 10-14 Combined family and school-based approaches. 7 th grade students from 36 schools in rural Midwest. LST- 15 session (40-45min, classroom) at 7th grade. 5 booster session 1 year later. Additional booster sessions to	Randomised block; 3 arm, 7 waves RCT. (LST+SFP; LST; control)	Controlled for attrition.	Multilevel (mixed model) analysis of covariance	1 year follow up results New alcohol user rates at 1 year Relative Reduction: LST: 4.1%, non-significant LST + SFP: 30.0%, non-significant Rates of initiation LST+ SFP vs. control: F: 4.47, p = 0.05 LST vs. control: F 3.43, p = 0.05	

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		<p>subset from two intervention conditions in 11th grade.</p> <p>SFP 10-14: 7 sessions, consecutive weeks at 7th grade, 2nd semester: 1 hour concurrent parent and youth sessions, followed by joint 1 hour session. Invited for 4 booster sessions a1 year later. Further family-focused booster for 6 intervention schools in 11th grade.</p>					
<p>Spoth, R., Randall, K. G., Shin, C., & Redmond, C.</p> <p>2005</p> <p>USA</p>	As above	As above	As above	As above	<p>Multi-level ANCOVA, growth curve analysis.</p> <p>Measured at 1 and 2½ years past baseline.</p>	<p>Substance use initiation for the LST + SFP10–14 condition was significantly lower than for the control group, $t(1, 4049) = 2.67, p = 0.01$, and the LST-only group, $t(1, 4049) = 1.68, p = 0.05$. At 2 ½ years past baseline data collection point difference in the adjusted mean SII score between the LST + SFP 10–14 and control groups approached significance, $t(1, 4049) = 1.57, p = 0.06$.</p> <p>Weekly drunkenness for the LST + SFP 10–14 condition was significantly different from the control condition at the follow-up assessment 2 ½ years past baseline, $t(1, 65) = 1.87, p =$</p>	

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						<p>0.03. The LST-only adjusted mean also was lower than that for controls, $t(1, 65) = 1.44, p = 0.08$. Both intervention conditions were found to be lower than the control condition but only approached statistical significance</p> <p>No statistically significant intervention effects found for regular alcohol use. The LST + SFP 10–14 group increased at a slower rate than the control group but only approached statistical significance, $T(1, 65) = 1.35, p = 0.10$.</p>	
<p>Spoth, R., Randall, K. G., Trudeau, L., Shin, C., & Redmond, C.</p> <p>2008</p> <p>USA</p>	As above	As above	As above	<p>No differential attrition ruled out.</p> <p>Fidelity: SFP 10-14: Coverage of components averaged in 90th per centile for</p> <p>LST: Adherence 85%.</p> <p>Moderation analysis found control groups had lower risk students than intervention groups (15% vs. 22% high risk, defined as initiation of 2 substances at pre-test).</p>	<p>ITT analysis.</p> <p>5 ½ year duration (baseline, 6-months post, then yearly through 12th grade)</p>	<p>Growth trajectories in alcohol initiation were slower than control for LST+SFP intervention ($t: 1.73, p = 0.04$) and LST ($t: 1.33, p=0.09$). Also for drunkenness LST+SFP ($t:1.99, p=0.02$) LST ($t:2.24, p=0.01$)</p> <p>Not for 12th grade alcohol initiation LST+SFP intervention ($t: 0.87, \text{non-sig}$) and LST ($t: 0.67, \text{non-sig}$) or drunkenness initiation LST+SFP ($\text{non-sig}; t:0.76$) LST $p<0.1; t:1.56$)</p> <p>Relative Reduction Alcohol Initiation LST+SFP: 2.5%</p>	<p>Reports results 5 ½ year past baseline. Researchers comments, many students had already initiated at 7th grade, suboptimal conditions for intervention</p>

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						<p>LST: 2.0% Drunkenness LST+SFP: 5.2% LST: 10.6%</p> <p>12th grade results for higher-risk students: Alcohol Frequency: LST vs. control: $t=2.14$, $p=0.02$ LST + SFP vs. control: $t=1.19$, non-significant.</p> <p>Drunkenness Frequency: LST vs. control: $t=1.93$, $p=0.03$ LST + SFP vs. control: $t=1.23$, non-significant</p> <p>Difference between intervention groups not statistically significant.</p>	
<p>Spoth, R., Redmond, C., Shin, C., & Azevedo, K. 2004 USA</p>	<p>Family-based + Life Skills</p> <p>Biopsychosocial model (ISFP) and empirically-supported risk and protective factor models.</p> <p>+</p> <p>Family competency training (PDFY)</p>	<p>Project Family: ISFP & PDFY</p> <p>33 rural schools randomised assignment to 3 conditions.</p> <p>Participants: 6th grade, followed to 12th.</p> <p>Substance Target: alcohol, tobacco, and marijuana.</p> <p>Programme Iowa Strengthening Families Program (ISFP) -</p>	<p>Randomised block; 3 arm (ISFP; PDFY; control);; 6 wave (at approx 6, 18, 30, 48, and 72 months following the pre-test);</p>	<p>ITT: all intervention-group students whether or not families attended.</p> <p>Attrition: No significant condition x attrition interaction effects were found for any of the variables between pre-test and 12th-grade follow-up (2 factor ANOVA).</p> <p>Some evidence of increased attrition</p>	<p>Nonlinear logistic growth curve analysis.</p> <p>6 year study.</p>	<p>For ISFP vs control: Significantly slower growth for lifetime alcohol use for ISFP vs controls: $y_1: -0.023$; $p < 0.05$)</p> <p>Significant difference in 'lifetime alcohol use without parental permission' but explained by significant difference in pre-test rates, with lower level for ISFP than controls (.030; $p < 0.05$). So growth rate for ISFP was similar to controls but lagged behind.</p> <p>Significant differences in time</p>	<p>Sample was rural and virtually all white families so degree of generalisation to diverse or urban populations unclear Small sample size, roughly $n = 13$ per school</p>

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		<p>7 2-h sessions; concurrent parent and children sessions followed by joint session.</p> <p>Preparing for the Drug Free Years Program (PDFY) - 5-session; weekday evenings; 4 for parents only.</p> <p>Minimal control condition: mailed four leaflets describing aspects of adolescent development, concurrent with implementation of PDFY and ISFP.</p>		among alcohol-using adolescents was found across all conditions.		<p>to inflection points for ACUI (alcohol composite use index) ISFP 12.8 months slower than controls ($p < 0.05$); and for 'lifetime drunkenness' ISFP 13.3 months behind controls, $p < 0.05$. Control growth rates reached maximum before ISFP.</p> <p>For time to initiation rates there were two significant outcomes ($p < 0.05$): initiation into alcohol use without parental permission was 12.4 months delayed in ISFP compared to controls, and 'drunkenness' was delayed by 13.3 months.</p> <p>For PDFY vs. control:</p> <p>No significant differences for alcohol measures. Failed to show significant time to initiation and inflection point differences.</p> <p>For 'lifetime drunkenness' controls took 3.5 months longer than PDFY to reach maximum growth, although this was not statistically significant.</p>	
Spoth, R., Shin, C., Gyll, M., Redmond, C., &	As above	<p>Project Family: ISFP & PDFY</p> <p>As above</p>	As above	Both interventions provided comparable benefits on both outcome measures,	Curvilinear logistic growth curve analyses	ISFP intervention group reached alcohol initiation 14.0 months later than control group ($p < 0.01$). For higher risk,	Families in study were 90% representative of general

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Azevedo, K. 2006 USA		<p>Families classified as higher-risk or lower-risk based on aggregated measure of parent marital status; parent education; household income; family financial strain; mother internalising (anxiety and depression); mother externalising (verbal and physical aggression); father internalising; father externalising; child internalising; child externalising</p> <p>Minimal control condition: mailed four leaflets describing aspects of adolescent development, concurrent with implementation of PDFY and ISFP.</p> <p>Rural setting, almost entirely Caucasian.</p>		<p>regardless of family risk status.</p> <p>Test for risk moderation effects on substance use trajectories of initiation of alcohol and illicit substance use. No evidence of risk moderation</p> <p>Alcohol initiation index concerning three lifetime use behaviours – lifetime use; lifetime use without parental permission; lifetime drunkenness.</p> <p>Fidelity of PDFY - Observers reported some variability, but all key concepts covered. And on average covered 69% of component tasks.</p> <p>Fidelity of ISFP - Observers reported coverage of key concepts scores in 80th per centile.</p> <p>No evidence of differential attrition. Level comparable to other longitudinal</p>		<p>at 12.9 month and for lower-risk at 14.7 months ($p < 0.01$). No significant difference in intervention effects by intervention x risk groups, supporting universality of effects hypothesis.</p> <p>PDFY = non-significant effects.</p>	<p>population in region, but predominantly Caucasian. Therefore limited generalisability.</p>

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				studies.			
Spoth, R., Trudeau, L., Guyll, M., Shin, C., & Redmond, C. 2009 USA	As above	Project Family: ISFP & PDFY As above	3 arm; reporting 7th wave,	As above	Hierarchical latent growth curve analyses Structural equation modelling Compared direct and indirect model fit with Yuan-Bentler T2* χ^2 test statistic. Maximum likelihood estimation, χ^2 value, RMSEA and CFI Relative Reduction Rates (cut-off point: for 'drunkenness' being drunk 2 or more times per month; for 'alcohol related problems'.	10 years after intervention implementation (~21 year olds) Significant ISFP direct effects found for drunkenness frequency (p= 0.05). Significant direct effects of PDFY found on alcohol-related problems (p= 0.05). More variance was explained by indirect effects model than direct effects model: for ISFP, drunkenness frequency, direct effects model: R ² :0.105; indirect effects R ² :0.223; for PDFY: direct R ² :0.114 indirect R ² :0.236 The model supports intervention effects on outcomes conveyed indirectly through effects on adolescent substance initiation. Model-based estimates of Relative Reduction Rates for Intervention indirect effects: ISFP vs. control Drunkenness: 19% (p= 0.01) alcohol-related problems: 23% (p= 0.01) PDFY vs. control Drunkenness: 9% (p =0.05) Alcohol-related problems: 11%	Alcohol-related problems: short, modified form of the Rutgers Alcohol Problems Index (White & Labouvie, 1989) consisting of 8 items.

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						(p = 0.05)	
Spoth, R., Redmond, C., & Shin, C. 2001 USA	As above	Project Family: ISFP & PDFY As above	As above	ANCOVA + Z-tests Analysis of family attendance and outcomes found No significant difference. 44% of pretested families declined to participate. PDFY attendance lower than ISFP but difference not significant. No significant differences between ISFP vs. control and PDFY vs. control on any socio-demographic etc variables, except smoking – more in PDFY.	ITT analysis Multilevel (mixed model) analyses of covariance Growth curve analyses	4 year follow-up results: Relative reduction: Ever drank alcohol PDFY vs. Control: RR: 11.3%, non-sig. ISFP vs. Control: RR: 26.4%. p = 0.01 Ever drank without parent permission PDFY vs. Control: RR 12.3%, non-sig ISFP vs. Control: RR: 32.0%; p = 0.01 Ever been drunk PDFY vs. Control: RR: 19.4%. non-sig. ISFP vs. Control: RR: 40.1%, p = 0.01. Past month alcohol use: PDFY vs. Control RR: 40.6%, z= 2.97 ISFP vs. Control RR: 30%; z =2.19 Growth curve analyses: New user proportions increased for control vs. ISFP for alcohol use: t(322) = 3.29, p = 0.01; control vs. PDFY for drunkenness: t(363) = 2.42 p = 0.05.	

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						<p>Rate of linear growth for drunkenness, PDFY vs. control: $t(362)=2.42$ $p = 0.05$</p> <p>Mean frequencies for alcohol use across waves: PDFY-control: $t(364) = 2.49$, $p = 0.05$. ISFP vs. control: $t(379) = 1.86$, $p = 0.06$</p> <p>Multilevel ANCOVA: Past month frequency of alcohol use ISFP vs. control: $t: 2.25$, $p = 0.05$; ES: 0.26. PDFY vs. control: $t: 2.39$ ($p = 0.05$); ES: 0.31.</p> <p>Alcohol index ISFP $t: 3.28$, $p = 0.01$; ES: 0.38 PDFY $t: 2.19$ $p = 0.05$; ES: 0.27</p>	
Spoth, R., Randall, G.K. & Shin, C. 2008 USA	As above	Project Family: ISFP & PDFY As above.	As above.	As above.	Structural equation modelling χ^2 difference.	<p>Doesn't tell much: Compared means over time periods</p> <p>Alcohol initiation index (0-4) ISFP - time1: .22; time2: .24 Control: time1: .27 time2: .41</p>	Testing models of pathways to secondary outcomes such as academic school success.
Stafstrom, M., Östergren, P.O., Larsson, S., Lindgren, B. & Lundborg, P.	Life Skills+ community systems and integrated theory of	The Trelleborg Project. Local community was responsible for putting the interventions into action in 5 schools..	Cross sectional, 4 wave study. Compared	Insignificant reduction in availability of alcohol	Stepwise logistic regression analysis. Kendall's tau-c-test	<p>Significant decline in 4 consecutive years in use of alcohol:</p> <p>Consumer of alcohol - Kendalls</p>	Setting became more conducive to alcohol access during the intervention

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
2006 Sweden	drinking behaviour + parental Component	7 components: Community policy and action plan; school policy and action plan; police and city administration developed approach to inspecting grocery and convenience stores; curriculum for local primary and secondary schools; a curriculum for parents of 7 th -9 th graders; mailing of leaflets to parents; a survey of adolescent alcohol and drug use in the community was publicised in the local media.	with national and regional data outside Trelleborg.		Bivariate and multivariable stepwise logistic regression Assessed at baseline, twice during intervention and once post-intervention.	Tau-c = -0.12, p < 0.000 Excessive drinking - Kendall's Tau-c = -0.13, p < 0.000 Heavy episodic drinking- Kendall's Tau-c = -0.15, p < 0.000	(increased opening hours, cheaper wine and spirits).
Stigler, M.H., Perry, C.L., Komro, K.A., Cudeck, R. & Williams, C.L. 2006 USA	Social Norms + Life Skills + peer-to-peer	Project Northland: classroom curricula; peer leadership; youth-driven ECA; parental involvement programs; and community activism		Self-efficacy measures; peer influence; and perceived access. No synergistic interaction between components detected.	Growth curve analysis Mixed effects models.	3 components appeared to have significantly contributed to altering the "normative trajectory" of alcohol use (as measured by Tendency to Use Alcohol) in Phase I: classroom curricula (p = 0.08); extra-curricular activities (planners only) (p = 0.05); parental involvement programs (p = 0.04). No statistically significant effects for peer leadership; extra-curricular activities; community activism.	Post-hoc component analysis to estimate the effects of the 5 intervention components on 4 outcome. Probably insufficient sample size and therefore power for analysis of some components E.g. only 20% of

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
							students participated as peer leaders in any year.
Werch, C., Moore, M., DiClemente, C.C., Owen, D.M. Jobli, E. & Bledsoe, R. 2003a USA (Werch, 2003a)	Alternatives to drinking Based on social cognitive theory; health belief model; behavioural self-control theory; theory of planned behaviour, social bonding theory, and the multi component motivational stages (McMOS) prevention model	'Sport', 'Sport Plus' and 'Sport Plus Parent'. Fitness-based intervention for preventing substance abuse. 'Sport' consisted of a health screening followed by 10 minute sport consultation with trained nurses. 'Sport Plus' consisted of the 'Sport intervention as above, plus an alcohol preventive consultation. 'Sport Plus Parent' consisted of all of the above plus postcards mailed to parents.	3 arm, randomised assignment to 1 of 3 interventions. No control group.	At baseline significant differences were found for mean alcohol problems. Sport Plus intervention $m = 0.92$, $SD = 0.13$; Sport Plus Parents $m = 0.51$, $SD = 0.13$; Sport intervention $m = 0.30$, $SD = 0.13$; $p = 0.005$. Perceptions of prevalence of peer alcohol use reduced in Sport Plus group only. Greatest increase in the number of days exercising in the last week for Sport Plus Parent ($p = 0.04$).	Baseline measures analysed using χ^2 tests for categorical data and ANOVAs for continuous scores. Outcome measures analysed using repeated measures ANOVAs Data collected at baseline and 3 months post intervention.	Significant effects were found on 3 of 6 alcohol measures and both exercise measures for all 3 groups: 30-day heavy drinking declined over time, $F(1,441) = 4.05$, $p = 0.04$, as did alcohol problems, $F(1,438) = 4.07$, $p = 0.04$, and alcohol use initiation, $F(1,441) = 4.27$, $p = 0.03$. No significant interactions between exercise and alcohol measures detected Amongst pre-intervention drinkers: Sport Plus Parent and Sport only intervention youths reduced quantity of alcohol use ($p = 0.001$) and alcohol initiation ($p = 0.002$). Sport only intervention youths reduced their length of alcohol use ($p = 0.001$). Sport Plus Parent intervention youths reduced heavy use over time ($p = 0.001$).	Interaction effects suggest the parent materials may have been particularly useful in enhancing alcohol use self-control.

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
Werch, C.E., Owen, D.M., Carlson, J.M., DiClemente, C.C., Edgemon, P. & Moore, M. 2003b USA	Parental component. Based on multi-component motivational stages prevention model.	'STARS for Families Program', a 2 year multi-component intervention consisting of: 1 on 1 nurse consultations; a series of prevention postcards mailed to parents; follow-up nurse consultations; and family take-home lessons Consultations with 6th grade students carried out by trained nurses.	4 arm, 2 wave Intervention lasts two years. 1 year follow-up of the	For the magnet school sample, significantly fewer (5%) intervention students were planning to drink in the next 6 months than control students (18%), $\chi^2 = 11.53, 1 \text{ d.f.}, p = 0.001$. Magnet school intervention students also had less intentions to drink in the future, greater motivation to avoid drinking and less total alcohol risk than control students ($p = 0.05$). For the neighbourhood school, intervention students ($m = 7.90, SD = 1.87$) had less total alcohol risk than control students ($m = 8.42, SD = 1.83$), $F(1,205) = 4.09, p = 0.04$. Attrition analysis was conducted	χ^2 analysis for dichotomous variables and ANOVAs for continuous measures. Follow-up outcome data were analysed using MANOVAs	For magnet school fewer intervention students (13%) were in more advanced stages of alcohol acquisition (i.e. contemplation– maintenance) vs. control students (21%) and fewer intervention students (11%) drank alcohol for any length of time (i.e. 30 days to 6 months or more) vs. control students (21%). Differences only approached significance ($p = 0.06$). MANOVA for alcohol use was significant, $F(5,294) = 2.82, p = 0.01$. Neighbourhood school intervention students had positive effects for all 7 alcohol measures vs. control students, but not significant. Mean alcohol consumption on all 4 measures of use was lower for neighbourhood students receiving the intervention vs. control students, but differences not statistically significant.	Power analysis for both χ^2 and ANOVA tests indicated sample size insufficient to detect any small effect sizes.
Werch, C.E., Bian, H., DiClemente, C.C., Moore, M.J., Thombs, D.,	Parental Component Based on	The 'Planned Success' intervention, consisted of a tailored in person communication	2 arm, 2 wave, RCT.	Fidelity was monitored and attrition analysis was conducted.	Analysed using repeated measures MANOVAs and ANOVAs.	Treatment x time interaction, alcohol use Cohen's $d = 0.21, p = 0.06$; frequency $d = 0.18, p = 0.05$.	Illicit drug using students receiving Planned Success also experienced

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
Ames, S.C., Hunag, I.C. & Pokorny, S. 2010 USA	behaviour image model.	(screening survey, consultation and goal plan) and a follow-up series of parent/guardian print materials. Delivered by nurses and certified health education specialists.		No significant differences between groups in substance use at baseline	Data collected at baseline and 3 month follow up.	No differences between treatment groups for alcohol heavy use. Students who used alcohol prior to receiving the brief intervention significantly reduced their frequency of alcohol use $d = 0.39$, $p = 0.01$; heavy use of alcohol, $d = 0.32$, $p = 0.01$. Reduction in quantity effect size $d = 0.28$, but not statistically significant ($p = 0.07$).	fewer alcohol/drug problems than drug-using adolescents receiving usual care, $d = 0.43$, $p = 0.01$.
Werch, C.E., Carlson, J.M., Pappas, D.M., Edgemon, P. & DiClemente, C.C. 2002 USA	Parental Component	Pilot study to examine the feasibility and efficacy of a modified version of the 'STARS for Families Program', a multi-component intervention consisting of: physical examinations, telephone nurse consultations; a series of prevention postcards mailed to parents; follow-up telephone nurse consultations. Consultations carried out by trained nurses. 7 th to 9 th grade students (average age 13).	2 arm, 2 wave, randomised assignment.	Fewer intervention youth than control youth intended to drink alcohol in the next 6 months.	Study was limited to a small sample so no statistical analysis was reported. Data collected at baseline and 6 months post intervention.	Reported fewer intervention youth than control youth drank during the past 30 days and drank heavily in the past 30 days (not defined).	Targets student athletes.
Werch, C. E.; Moore, M. J. and	Alternatives to drinking	Developed from 'Project Sport'.	2 arm, w wave RCT.	Prior current drug use was associated with	Repeated measures MANOVAS and	Reduced frequency of alcohol use for students in the parental	

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
DiClemente, C. C. 2008 USA	Image-based brief intervention based on behaviour modification + parental component	2 variants: parents were mailed a series of 3 postcards to encourage parent-youth communication through fitness promotion and alcohol avoidance or adolescents were mailed a series of 3 flyers pairing healthy lifestyles with fitness promotion and alcohol avoidance messages. 9th and 11th grade students		lower alcohol initiation amongst adolescents receiving parent print messages. $F(1,327) = 8.26, p = 0.004$ and frequency $F(1,342) = 11.57, p = 0.001$. Intervention fidelity and attrition analyses were conducted using χ^2 and independent sample t-tests.	factorial repeated measures MANOVAS. Measured at baseline and at 4 months post baseline.	variant of intervention. $F(4,344) = 2.48, p = 0.04$.	
Werch, C.E., Pappas, D.M., Carlson, J.M., Edgemon, P., Sinder, J.A. & DiClemente, C.C. 2000 USA	Parental component. Founded on Multi-component Motivational Stages prevention model.	The STARS for Families Program', a multi-component intervention consisting of: 1 on 1 nurse consultations; a series of prevention postcards mailed to parents; follow-up nurse consultations; and family take-home lessons Consultations carried out by trained nurses. 6th grade students.	Four arm, two wave. Students from two schools were randomly assigned to either prevention or control group.	Students receiving the intervention who had experienced prior alcohol related consequences had less frequency of drinking compared to those receiving the control. Attrition analysis was conducted and no interaction effects were found. Significant differences at baseline meant that schools were treated as separate samples during outcome analyses – magnet	Posttest outcome data were analysed using MANOVAS and factorial MANOVAS. Intervention lasts for 2 years.	For the magnet school sample, fewer intervention students drank alcohol ($p = 0.04$; 9% vs 18%). Fewer intervention subjects drank heavily in past 30 days ($p=0.4$; 4% vs 9%). Fewer intervention students were in more advanced stages of alcohol initiation ($p = 0.03$; 7% vs 16%) Although neighbourhood school students used less alcohol on 4 of the 5 measures, these results were not statistically significant. Furthermore, more intervention students than control started drinking in the last 6 months, although this did	Insufficient power to detect relatively moderate effect sizes in neighbourhood school, due to attrition and small sample size

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
				school and neighbourhood school.		not reach significance (3.1% vs 1%)	
Wood, M.D., Fairlie, A.M., Fernandez, A.C., Borsari, B. & Capone, C. 2010 USA	Social Norms + parental component	Assessed 2 forms of intervention for incoming college students (17-21 years of age). Brief Motivational Intervention (BMI) consists of motivational interviewing (empathic and reflective listening) with trained interventionists and individualised feedback on students alcohol use as well as normative information on college student drinking behaviours. Parent Based Intervention (PBI) handbook-based intervention mailed to parents, consists of parent-teen communication, disapproval of drinking and parental monitoring	4 arm, 3 wave with students) and 2 waves with parents, RCT.	Greater readiness to change at 10 months associated with a lower likelihood of transitioning to heavy episodic drinking. No evidence of self-regulation of alcohol as a mediator. Drinking strategies did not mediate BMI effects. Perceived parental permissiveness for drinking at 10 months was associated with a greater likelihood of transitioning to heavy episodic drinking (b = 0.36, SE = 0.08, p = 0.001). Perceived parental disapproval at 10 months was associated with a lower likelihood of transitioning to heavy episodic drinking (b = -1.01, SE = 0.34, p = 0.01) and consequences (b = -0.60, SE = 0.26, p = 0.05). Tests for indirect	2 part latent growth modelling (LGM), mediation analysis. Examined over a 22 month follow-up period.	BMI participants ly less likely than non-BMI participants to initiate heavy episodic drinking and to begin experiencing alcohol-related consequences. Effect sizes were minimal at 10 months (Cohen's d ranged from 0.02 to 0.07) and were small at 22 months (ranged from 0.15 to 0.22). PBI did not reduce growth or delay the onset of heavy episodic drinking or consequences. Evidence for the combined effect of BMI and PBI on alcohol Consequence. No combined effect for heavy episodic drinking.	

Author/s; Year Published and Country	Approach	Intervention	Type of Study	Intermediate Measures and Outcomes	Evaluation and Analysis Methods	Behavioural Effects	Notes
				<p>effects were not significant.</p> <p>Parental monitoring at 10 months not significantly associated with any outcomes.</p> <p>Fidelity and attrition reported acceptable.</p>			

Studies Excluded due to Negative Effects

Study Details	Negative Effects
Allen, D., Coombes, L., & Foxcroft, D.R. 2007	Intervention group increased drinking of 5+ drinks in a row in last 30 days by 4% compared to control group who reduce this behaviour by 5%.
Dedobbeleer, N. & Desjardins, S. 2001	Intervention group in 8th grade had a significantly higher alcohol use frequency than control group at post test 2 (chi-square = 9.87; p value < 0.05. Also experimental group demonstrated significantly higher amount of alcohol use on any one occasion than the control group at post test 1 and 2: chi-square = 8.14; p value < 0.05; chi-square = 6.04, p < 0.05, respectively.
Eischens, A., Komro, K. A., Perry, C.L., Bosma, L. M. & Farbaksh K. 2004	Girls taking part in extra-curricular activities had increased tobacco outcomes compared to those who did not take part.
Ellickson, P.L., McCaffrey, D.F., Ghosh-Dastidar, B. & Longshore D.L. 2003	Higher mean scores of high risk drinking among medium risk students in intervention groups compared to control group (not statistically significant) Higher per centage of past month users of marijuana amongst high risk students in intervention group compared to control group (not statistically significant)
Ichiyama, M.A., Fairlie, A.M., Wood, M.D., Turrisi, R., Francis, D.P., Ray, A.E. & Stanger, L.A. 2009	Male students in intervention condition showed significantly higher growth in number of drinks per week than male students in control group. $b = 1.46$ (S.E. = 0.40) $p < 0.001$.
Mallett, K.A., Ray, A.E., Turrisi, R., Belden, C., Bachrach, R.L. & Larimer, M.E. 2010	Negative effect on peak drinking means for abstainers at baseline. An iatrogenic effect was observed among individuals in The PBI condition who initiated at age 14 or younger in that they drank significantly more than their age-matched controls.
Perry, C. L., Williams, C.L., Komro, K.A., Veblen-Mortenson, S., Stigler, M.H., Munson, K.A., Farbaksh K., Jones, R.M. & Forster, J.L. 2002	The lack of intervention in the interim phase had a significant and negative effect on alcohol use.
Piper, D.L, Moberg, D.P., King, M.J. 2000	Significant negative treatment effect (increased alcohol use) for both the Age Appropriate and Intensive conditions in the 9th and 10th grades.
Smit, F., Cuijpers, P., Lemmers, L., Jonkers, R. & De Weerd, I. 2003	Two adverse effects showed p-values under 0.10: being a girl in the third grade of the high-school and having parents who forbid teenage drinking.
West, B., Abatemarco, D., Ohman-Strickland, P.A., Zec, V., Russo, A. & Milic, R. 2008	At year 3, boys in the intervention group had higher means and standard errors across all behaviour and intention measures, compared to the control group. Though changes from baseline to year 3 were not statistically significant.

Quality Appraisal – Final Designations of Soundness Including Category of Effect

Project	Category of Effect	Category of Soundness
All Stars (Core)	Convincing	Sound
All Stars (Plus)	Convincing	Sound
B.M.I + P.B.I	Convincing	Sound
Capable Families and Youth (SFP + LST)	Convincing	Sound
Communities that Care	Convincing	Sound
D.A.R.E Plus	Convincing	Sound
Especially for Daughters	Equivocal	Sound
Family School Partnership	No effect	Sound (see note 1)
Familias Unidas + PATH	No effect	Unsound
Going Places	No effect	Unsound
LIFT	Convincing	Sound
Narconon	Equivocal	Sound
Orebo	Convincing	Sound
PAS (using Orebro & HSD)	Equivocal	Sound
Parents Who Care (Parent and Adolescent Group)	No effect	Sound
Parents Who Care (Self Administered with telephone support)	No effect	Sound
Planned Success	Convincing	Sound
Project Family (IFSP)	Convincing	Sound
Project Family (PDFY)	Convincing	Sound
Project Northland	Convincing	Sound
Project Northland Chicago	No effect	Sound
Project Sport (Printed)	Equivocal	Sound
Project Sport plus parent	Convincing	Unsound
Raising Healthy Children	Equivocal	Sound (see note 1)
Resilient Families	No effect	Unsound
Schleswig-Holstein	Equivocal	Sound
STARS for Families	Convincing	Sound
Trelleborg	Convincing	Sound (see note2)
Unplugged	Convincing	Sound

Notes:

1. The interventions, Family School Partnership and Raising Healthy Children did not collect data prior to baseline, due to the fact that both programmes were delivered to children of primary school age. Instead outcomes relating to substance use were collected at a later point in students' development.

2. The Trelleborg project did not employ a control group but compared cross-sectional data with local and national Swedish data.

Quality Appraisal Framework

For A Study Investigating the Effectiveness of Education in Relation to Alcohol

Quality Assessment Criteria:

- Study provides pre-intervention data for all respondents on alcohol use.
- Study reports post-intervention data for all respondents.
- Study employs a control/comparison group equivalent to the intervention group on socio-demographic and main outcome variables.
- Study reports outcomes for all stated measures of effects on alcohol use.

Studies must meet all four criteria to be classed as sound. Studies that do not meet all 4 criteria classed as 'unsound' methodologically. Any studies where the above quality evaluation criteria were not applicable without modification are noted in the Quality Appraisal Results Report.

Source : EPPI Centre (1999) A Review of the Effectiveness and Appropriateness of peer-delivered health promotion interventions for young people. Available at <http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=IOQDS7Cngkk%3d&tabid=255&mid=1071&language=en-US>

Evidence Grading

Approximate Magnitude of Effects Equivalents

	Trivial (substantively non- significant)	Small	Medium/moderate	Large
Standardised mean difference (SMD/d)	0.1	≥ 0.2	≥ 0.5	≥ 0.8
Correlation coefficient (r)	< 0.1	≥ 0.1	≥ 0.25	≥ 0.4
r transformed to Fischer's Z values	< 0.1	≥ 0.1	≥ 0.3	≥ 0.5
Odds Ratio	1.0	≥ 1.4	≥ 2.5	≥ 4.5
Relative Risk	1.0	≥ 1.0	≥ 1.5	≥ 2
1 way ANOVA (F)	< 0.1	≥ 0.1	≥ 0.25	≥ 0.4
Multiple regression (Cohen's f ²)		≈ 0.02	≈ 0.15	≈ 0.35
Chi-square (χ ²)	< 0.1	≥ 0.1	≥ 0.3	≥ 0.5
χ ² transformed to log (Cramer's phi/phi/h value)	< 0.1	≥ 0.1	≥ 0.3	≥ 0.5

Evidence Levels

All interventions assessed as reporting convincing or equivocal evidence were classified as interventions reporting promising evidence.

Convincing Evidence: Evaluation studies collectively report at least two statistically significant measures of 'small' positive effects on alcohol behaviours or at least one statistically significant medium size effect for intervention.

Equivocal Evidence: Evaluation studies, aggregated, report mixed evidence of effects on behavioural outcomes (one statistically significant small effect size, p=0.05/confidence interval equivalent or more than one 'small' effect at p value 0.1 or equivalent) for intervention.

No effect: ≤ one non-significant effects or no effects.

Adapted from:

Cohen, J. (1988) Statistical power analysis for behavioural sciences

Siegel, S. (1956) Non-parametric statistics for the behavioural sciences

Garson (2011) correlation, <http://faculty.chass.ncsu.edu/garson/PA765/correl.htm> accessed 5.4.11

Definitions for Indicated/Selected/Universal Approaches

The Institute of Medicine (IOM 1994) proposed framework for classifying prevention based on Gordon's (1987) operational classification of disease prevention. The IOM model divides the continuum of services into three parts: prevention, treatment, and maintenance. The prevention category is divided into three classifications--universal, selective and indicated prevention.

Universal

A Universal prevention strategy addresses the entire population (national, local community, school, and neighborhood) with messages and programs aimed at preventing or delaying the abuse of alcohol, tobacco, and other drugs. For example, it would include the general population and subgroups such as pregnant women, children, adolescents, and the elderly. The mission of universal prevention is to prevent the problem. All members of the population share the same general risk for substance abuse, although the risk may vary greatly among individuals. Universal prevention programs are delivered to large groups without any prior screening for substance abuse risk. The entire population is assessed as at-risk for substance abuse and capable of benefiting from prevention programs.

Selective

Selective prevention strategies target subsets of the total population that are deemed to be at risk for substance abuse by virtue of their membership in a particular population segment--for example, children of adult alcoholics, dropouts, or students who are failing academically. Risk groups may be identified on the basis of biological, psychological, social, or environmental risk factors known to be associated with substance abuse (IOM 1994), and targeted subgroups may be defined by age, gender, family history, place of residence such as high drug-use or low-income neighborhoods, and victimization by physical and/or sexual abuse. Selective prevention targets the entire subgroup regardless of the degree of risk of any individual within the group. One individual in the subgroup may not be at personal risk for substance abuse, while another person in the same subgroup may be abusing substances. The selective prevention program is presented to the entire subgroup because the subgroup as a whole is at higher risk for substance abuse than the general population. An individual's personal risk is not specifically assessed or identified and is based solely on a presumption given his or her membership in the at-risk subgroup.

Indicated

Indicated prevention strategies are designed to prevent the onset of substance abuse in individuals who do not meet DSM-IV criteria for addiction, but who are showing early danger signs, such as falling grades and consumption of alcohol and other gateway drugs. The mission of indicated prevention is to identify individuals who are exhibiting early signs of substance abuse and other problem behaviors associated with substance abuse and to target them with special programs. The individuals are exhibiting substance abuse-like behavior, but at a sub-clinical level

(IOM 1994). Indicated prevention approaches are used for individuals who may or may not be abusing substances, but exhibit risk factors that increase their chances of developing a drug abuse problem. Indicated prevention programs address risk factors associated with the individual, such as conduct disorders, and alienation from parents, school, and positive peer groups. Less emphasis is placed on assessing or addressing environmental influences, such as community values. The aim of indicated prevention programs is not only the reduction in first-time substance abuse, but also reduction in the length of time the signs continue, delay of onset of substance abuse, and/or reduction in the severity of substance abuse. Individuals can be referred to indicated prevention programs by parents, teachers, school counselors, school nurses, youth workers, friends, or the courts. Young people may volunteer to participate in indicated prevention programs.

Explanatory Guide to School Grade Structures and Corresponding Ages of Pupils in Relevant Countries

The interventions reported in this review were delivered in the context of many different educational systems. This appendix provides an insight into the variations within different countries' educational structures and in particular, highlights the school years associated with the 11 -18 age group.

North America

Canada

In Canada, children typically start school at the age of five and continue in compulsory education until the age of 16. Exceptions to this are the provinces of Ontario and New Brunswick where formal schooling ends at the age of eighteen.

Education in Canada is administered by individual provinces allowing for significant variation amongst different areas. Variation also occurs within provinces and from one school to another. This also applies to the school grade structure. Canadian children typically begin school in kindergarten and then progress through grades 1 to 8 in elementary school. Grade 5 applies to 10 to 11 year olds and Grade 6 applies to 11 to twelve year olds. After completing grade 8 at the age of 13/14, children then move on to high school for grades 9 to 12 (ages 14 – 18). In some provinces, pupils can remain in school beyond 18. The age limits for schooling beyond eighteen vary between 9 and 21, depending on the province.

After finishing high school, school pupils with a high school diploma can go on to attend college or university. In Canada, colleges mostly offer vocational or professional courses or courses that prepare students to go onto university at a later stage. In Quebec, students can follow this route after finishing high school in grade 11. The median age of college students in Canada in 2006 was 21.6 years; and the median age of university students for 2007 was 22.8 years³.

USA

In the USA, children generally begin compulsory schooling at the age of five when they start their kindergarten year in elementary school. After kindergarten, a child progresses through grades 1 to 5, and finishes their primary education at the age of 10/11. After leaving elementary school, children go to middle school from the ages of 11-14 (grades 6 to 8), followed by high school from 14 to 16/18 (grades 9 to 10/12).

The age at which school pupils can leave compulsory education varies between 16 and 18. If a student leaves before turning eighteen and therefore completing twelfth grade, they are not considered to have completed high school or eligible for a high school diploma and graduation.

³ <http://www.statcan.gc.ca/pub/81-004-x/2010005/article/11386-eng.htm>

Students looking to go onto higher education in the USA can either attend a local community college or a university (generally known as college). For most students the minimum requirement for entry to either institution is possession of a high school diploma which is only achieved by the completion of twelfth grade at high school.

Community colleges generally offer two year study programmes compared to colleges that offer three or four year courses. The community college operates similar to further education colleges in the UK, in that they offer a variety of opportunities. Students that have just left high school can attend community college to undertake further programmes of study or prepare for later attendance at the college level (university). However, community college also attracts older students: individuals that may have left secondary school some years before and may be in employment, who wish to supplement their skills, or change direction. As a result, the age group of community college students varies. According to the website of the American Association of Community Colleges, in 2007/2008 the average age of community college students was 28; and 39% of students were 21 or younger⁴. It appears that many people go to community college at 18 but if a student is particularly talented they may be admitted before this age. Some community colleges allow students to start earning credits whilst still working towards their high school diploma.

The same also applies to colleges. Exceptional pupils may be admitted before the age of eighteen but the majority are likely to be eighteen on entrance, particularly because of the requirement for a high school diploma.

Australasia

Australia

Similar to the situation in Canada, individual states within Australia have responsibility for the extent and nature of secondary school provision in respective areas. However, in general, Australian children begin their schooling by starting at primary school at the age of five. Compulsory schooling ends between the ages of fifteen and seventeen depending upon the state. After starting primary school, children pass through years 1 to 6/7. Year 7 which relates to pupils aged approximately 12/13, again depending on the state, can be included at the end of primary school or the beginning of secondary school. Australian school children can therefore finish primary school at the age of 11/12 or 12/13. The school years at secondary school extend to year 12. Year 12 pupils can be aged between 17 and 19

After leaving secondary school, school pupils can choose to go to university or a college of technical and further education (TAFE). The minimum requirement for entry to university in Australia is completion of year 12 at secondary school. In line with ages at which school pupils can leave compulsory education, TAFE institutions will accept students who are younger than eighteen.

⁴ <http://www.aacc.nche.edu/AboutCC/Pages/fastfacts.aspx>

Europe

Germany

In Germany, compulsory schooling begins at the age of 6, when children begin at *grundschule* in grade 1. Having completed grades 1 to 4, pupils then leave to begin their secondary education at the age of ten⁵.

The secondary education system in Germany is highly diverse, with a range of schools provided to meet the needs and aspirations of school pupils. From grade 5, pupils entering secondary school are enrolled in schools that offer different programmes of vocational education and schools that aim to prepare children for further academic study such as at university. For this reason, secondary schooling can last another five to nine years, depending upon the type of school in which a child starts. The youngest age at which German pupils can finish their education is fifteen. Those that finish school at this stage can choose to go into work or an apprenticeship or continue at a more academic school for a further period of study. As students wishing to attend a university level institution typically attend the relevant secondary school for nine years after the age of ten, most begin university at the age of nineteen.

The Netherlands

Dutch children begin full-time compulsory education at the age of four or five, by entering primary school grade 1. Pupils then remain in primary school until the end of grade 8, or the age of twelve, when they transfer to secondary school. On entering secondary school, students are assigned to one of three different secondary education pathways including vocational; general and pre-university programmes; which last approximately four, five or six years, respectively. Some pupils intending to transfer to university after their secondary education typically finish school at the end of grade 14 or age 18.

Sweden

Children living in Sweden are engaged in compulsory education from the age of 7 until 16. During this period of nine years, school pupils attend *grundskola* which combines primary and early secondary education⁶. On completion of *grundskola*, and achievement of the final year leaving certificate, students can stay in education by entering *gymnasieskola*, which provides upper secondary education in the form of both vocational and academic study programmes. Here, students can continue in education for another four years, up to the age of twenty. After this point, adult upper secondary education is available. The longer duration of secondary education in Sweden, compared to other western countries, means that Swedish students are more likely to move onto Higher education institutions, such as university, beyond the age of 18.

⁵ The duration of *grundschule* in Germany can be greater than four years according to respective Lander, but four years is most common.

⁶ For the purpose of this review which focuses on upon behavioural outcomes for 11 to 18 year olds, the corresponding school year for children aged 11 to 12 is year 5. The final year of compulsory education (age 15 -16) is year 9.

United Kingdom

Primary and Secondary school education

In the UK, compulsory education for most children begins at the age of four or five and ends at the age of 16. All children first attend primary school and progress to secondary school just prior to their teenage years. However, despite this commonality, the UK does not operate a uniform educational system across its constituent countries, which translates to important differences in the educational experience of children living in the UK.

England & Wales

After entering primary school, children will move through the school years 1 to 6; and leave for secondary school at the age of 11. Secondary schooling then encompasses years 7 to 11, at the end of which (age 16), pupils can choose to leave formal education or continue their studies in the sixth form. A sixth form curriculum mostly involving A level qualifications can be undertaken at secondary school but is also available at sixth form colleges. Students that choose to stay in education beyond 16, typically remain in school or college until the age of 18.

Scotland

In Scotland, children remain in primary school until the age of twelve, having completed primary classes 1 to 7. At secondary school, Scottish children then progress through years 1 to 6, with some children leaving at the end of fourth year, aged 16. In fifth and sixth year, pupils that have chosen to stay on at school generally undertake Higher qualifications, which take a year to complete. At the end of fifth year, students can choose to leave school or continue into sixth year where they can take further Highers or a Certificate of Sixth Year Studies in certain subjects.

Northern Ireland

Schooling in Northern Ireland is very similar to that provided in England and Wales in that a child will progress to secondary school after finishing primary school at the age of 11; and continue in compulsory education until age 16. A key difference between the two systems, however, is that Northern Irish children generally start compulsory education at the age of four. As in England and Wales, students that decide to stay in education beyond their 16th birthday can undertake A level qualifications at secondary school or go on to study at a further education college.

Post Secondary School Education

Beyond secondary schooling, UK students can choose to continue education via a number of routes. Whilst further education colleges can support students to undertake secondary school qualifications, they also provide educational courses for those wishing to leave school at 16 (or later), to undertake vocational qualifications. Students who wish to go on to university after leaving school tend to start at an institution at the age of 18. In Scotland, students can start university at the age of seventeen, as the entry requirement for 'x' no of Higher qualifications can be achieved in one year. As in other education systems mentioned,

UK universities will accept talented students younger than 17 or 18 but only in exceptional circumstances.

Sample Search Strategy: Topic: Family-Targeted interventions**Database: Medline; Interface: PubMed**

1. adolescen*[tiab]
2. "adolescent"[MeSH]
3. "adolescent behavior"[MeSH]
4. boy[tiab]
5. boys[tiab]
6. child[tiab]
7. children*[tiab]
8. child[MeSH]
9. early adult*[tiab]
10. girl[tiab] OR girls[tiab]
11. kid[tiab] OR kids[tiab]
12. minors[tiab]
13. minors[MeSH]
14. school age*[tiab]
15. school pupil*[tiab]
16. schoolchild*[tiab]
17. student*[tiab]
18. students[MeSH]
19. teen*[tiab]
20. young[tiab]
21. youth*[tiab]
22. academy[tiab] OR academies[tiab]
23. class room*[tiab]
24. classroom*[tiab]
25. classes[tiab]
26. college*[tiab]
27. "Curriculum"[MeSH]
28. education*[tiab]
29. "Faculty"[MeSH]
30. further education*[tiab]
31. grammar school*[tiab]
32. high school*[tiab]
33. higher education*[tiab]
34. highschool*[tiab]
35. junior high*[tiab]
36. middle school*[tiab]
37. schools[MeSH]
38. school*-based[tiab]
39. "School Health Services"[MeSH]
40. secondary school*[tiab]
41. sixth form*[tiab]
42. "student health services"[MeSH]
43. tertiary education[tiab]
44. #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #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 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43
45. alcohol abuse*[tiab]
46. alcohol drink*[tiab]
47. "alcohol drinking"[MeSH]
48. alcohol education[tiab]
49. alcohol intervention*[tiab]
50. alcohol misuse*[tiab]
51. alcohol program*[tiab]
52. "Alcohol-Related Disorders/prevention and control"[MeSH]
53. alcohol use*[tiab]
54. alcohol*[tiab]
55. "alcoholic beverages"[MeSH]
56. "Alcoholic Intoxication"[MeSH]
57. binge drink*[tiab]

58. drug education[tiab]
59. drug abuse[tiab]
60. drug misuse[tiab]
61. drug use[tiab]
62. drugs education[tiab]
63. drugs abuse[tiab]
64. drugs misuse[tiab]
65. drugs use[tiab]
66. drunk*[tiab]
67. "health education"[MeSH]
68. "Health Promotion/education"[MeSH]
69. intoxicat*[tiab]
70. liquor[tiab]
71. substance* abuse[tiab]
72. substance* misuse[tiab]
73. substance* use[tiab]
74. "substance-related disorders"[MeSH]
75. #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR #68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74
76. brother[tiab] OR brothers[tiab]
77. families[tw] OR family[tw]
78. Family[MeSH]
79. "Family Conflict"[MeSH]
80. "Family Therapy"[MeSH]
81. "Family relations"[MeSH]
82. father[tiab]
83. "Intergenerational Relations"[MeSH]
84. mother[tiab]
85. parent[tw] OR parents[tw] OR parenting[tw]
86. "Parent-child relations"[MeSH]
87. "Parenting"[MeSH]
88. Parents[MeSH]
89. Sibling relations[MeSH]
90. sibling*[tiab]
91. sister[tiab] OR sisters[tiab]
92. #76 OR #77 OR #78 OR #79 OR #80 OR #81 OR #82 OR #83 OR #84 OR #85 OR #86 OR #87 OR #88 OR #89 OR #90 OR #91
93. #44 AND #75 AND #92
94. #93 AND "humans"[MeSH Terms]
95. #94 AND ("2000/11"[PDAT] : "2010"[PDAT])
#95 AND English

Relevant Journals

Addiction (ISSN: 0965-2140)
Addiction Research & Theory (ISSN: 1606-6359)
Addictive Behaviors (ISSN: 0306-4603)
Adolescence (ISSN: 0001-8449)
Alcohol and Alcoholism (ISSN: 0735-0414)
Alcohol Research & Health (ISSN: 1535-7414)
American Journal on Addictions (ISSN: 1055-0496)
Archives of Pediatrics & Adolescent Medicine (ISSN: 1072-4710)
Drug and Alcohol Dependence (ISSN: 0376-8716)
Drug and Alcohol Review (ISSN: 0959-5236)
Drugs: Education, Prevention and Policy (ISSN: 0968-7637)
European Addiction Research (ISSN: 1022-6877)
Health Education & Behavior (ISSN: 1090-1981)
Health Education Journal (ISSN: 0017-8969)
Health Education Research (ISSN: 0268-1153)
Journal of Adolescence (ISSN: 0140-1971)
Journal of Adolescent Health (ISSN: 1054-139X)
Journal of Adolescent Research (ISSN: 0743-5584)
Journal of Child & Adolescent Substance Abuse (ISSN: 1067-828)
Journal of Drug Education (ISSN: 0047-2379)
Journal of Research on Adolescence (ISSN: 1050-8392)
Journal of Studies on Alcohol and Drugs (ISSN: 1937-1888)
Journal of Youth and Adolescence (ISSN: 0047-2891)
Preventive Medicine (ISSN: 0091-7435)

Relevant Websites

AIM (Alcohol In Moderation) Gateway
 Alcohol Concern
 Alcohol Education and Research Council
 Alcohol, Drug and Tobacco Study Group
 Alcohol: Problems and Solutions
 Alcoholic Beverage Medical Research Foundation : ABMRF
 Botvin Lifeskills Training
 British Institute of Innkeepers
 Center for Prevention Research and Development
 Centre for Addiction Research and Education Scotland (CARES)
 Centre for Social Research on Alcohol and Drugs (SoRAD)
 Community Alcohol Action Network
 Drinkaware
 Drinksinitiatives.eu
 DrugInfo Clearinghouse
 Drugscope
 Eurocare (The European Alcohol Policy Alliance)
 European Gateway on Alcohol, Drugs and Addictions
 European School Survey Project on Alcohol and Other Drugs (ESPAD)
 Exchange on Drug Demand Reduction Action (EDDRA)
 Fundacion Alcohol Y Sociedad
 Health Canada
[Healthy Schools](#)
 Hub of Commissioned Alcohol Projects and Policies (HubCAPP)
 Institute of Alcohol Studies
 International Center for Alcohol Policies
 Joseph Rowntree Foundation
 Life Education Centres
 National Clearinghouse for Alcohol and Drug Information (NCADI)
 National Institute on Alcohol Abuse and Alcoholism
 Portman Group
 RAND Corporation
 RAYPRO
 Robert Wood Johnson Foundation
 Schools Alcohol Awareness Project
[School Health and Alcohol Harm Reduction Project \(SHAHRP\)](#)
 TACADE
 The National Documentation Centre on Drug Use
 U.S. Department of Education's Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention

Glossary

Abbreviation	Full name
AERC	Alcohol Education and Research Council
BMA	British Medical Association
DAT	Drink Aware Trust
ECA	Extracurricular Activities
EPPI Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
IOM	Institute of Medicine
ISM	Institute for Social Marketing
OECD	Organisation for Economic Co-operation and Development
RCT	Randomised Control Trial

Interventions

Abbreviation	Full name
BMI	Brief Motivational Intervention
D.A.R.E.	Drug Abuse Resistance Education
GBG	Good Behaviour Game
ISFP	Iowa Strengthening Families Project
LST	Life Skills Training
LIFT	Linking the Interests of Families and Teens
PAS	Preventing heavy alcohol use in adolescents
PBI	Parent-based intervention
PDFY	Preparing for the Drug Free Years
STARS for Families	Start taking Alcohol Risks Seriously for Families
SFP: 10-14	Strengthening Families Project 10-14

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