A review of the effectiveness and cost-effectiveness of personal, social and health education in secondary schools focusing on sex and relationships and alcohol education for young people aged 11 to 19 years

FINAL REPORT

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Table of Contents

Appendices

Tables of figures

Table of tables

Glossary

Abstinence-only programmes	Programmes that encourage and promote abstinence as the best and only way to prevent pregnancy, HIV and other STIs.
Abstinence-plus programmes	Programmes that emphasise abstinence as the safest way to prevent pregnancy, HIV and other STIs, but also promote safer sex through the use of contraceptives.
American school grades	Education is divided into 3 levels: elementary school, junior high (or middle) school and high school.
Bias	Deviation of results or inferences from the truth, or processes leading to such deviation. Any trend in the collection, analysis, interpretation, publication or review of data that can lead to conclusions that are systematically different from the truth.
Binge drinking	Consuming large quantities of alcohol over a short period of time. Often associated with drinking to become intoxicated.
Cluster randomisation	A trial where the unit of randomisation is a cluster of participants (e.g. a school).
Controlled before and after study (CBA)	Intervention groups are tested and data collected before and after the intervention has been administered. Differ from controlled non-randomised trials in that participants are not allocated to intervention or control groups, but rather a 'convenience' control sample is used.
Drug education programmes	Programmes that include a focus on illegal drugs or tobacco in addition to alcohol.
Effect size	Effect size is a term used for a family of indices that measure the magnitude of the relationship between variables or treatment effect. Effect sizes are commonly used in meta-analyses as unlike significance tests these indices are independent of sample size.
General health education programmes	Programmes that are health based but include aspects and outcomes relating to alcohol or sex and relationships
HIV and sexual risk-reduction programmes	Programmes that focus on HIV prevention and HIV risk-behaviour, sexual risk-behaviour or a combination of both.
Intention to treat analysis	A method of data analysis in which all participants are analysed in the group they were assigned to at randomisation regardless of treatment adherence.
Internal validity	How well the study has minimised sources of bias and how likely it is that the intervention caused the observed outcomes.
Key stage	Pupils' progress through school is measured in key stages. Each key stage covers a number of school years. Starting at key stage 1 and finishing at key stage 4.
Long-term outcome	Study outcomes as evaluated at over one year post-intervention.
Medium-term outcome	Study outcomes as evaluated at six months to one year post-intervention.
Mean difference	The difference between two means divided by an estimate of the within group standard deviation.
Meta-analysis	The combination of quantitative evidence from a number of studies.
Non-Randomised Controlled Trial	These are trials where participants or clusters are allocated between intervention and control groups but the allocation is

	not randomised or quasi-randomised (e.g. alternate allocation).
Odds ratio	The odds of the event occurring in one group (e.g. intervention) divided by the odds of the event occurring in the other group (e.g. control).
Randomised Controlled Trial	Individuals or, defined groups of individuals (clusters) are randomised to either an intervention or a control group. If well implemented, randomisation should ensure that intervention and control groups only differ in their exposure to treatment.
Risk ratio	The risk of the event in the one group (e.g. intervention) divided by the risk of the event in the other group (e.g. control).
Short-term outcomes	Study outcomes evaluated at less than six months post-intervention.
Social development programmes	Programmes that aim to impact upon alcohol use or sex and relationships through social development education
Systematic review	A method of locating, appraising and synthesising evidence from primary studies, which adheres to a scientific methodology.
Uncontrolled before and after study	Intervention groups are tested and data collected before and after the intervention has been administered. No control group is used for comparison purposes.

Abbreviations

AAPT	Adolescent Alcohol Prevention Trial
AMPS	Alcohol Misuse Prevention Study
BPBR	Be Proud! Be Responsible
CBA	Controlled before and after study
CARE	Community Awareness and Relationship Education
CBT	Cognitive Behavioural Therapy
CEA	Cost-effectiveness analysis
DARE	Drug Abuse Resistance Education
DfES	Department for Education And Skills
DH	Department of Health
HBM	Health Belief Model
HIV	Human immunodeficiency virus
I-LST	Infused Life Skills Training
ICER	Incremental cost-effectiveness ratio
ICU	Information about Consequences of Use
ITS	Interrupted times series
ITT	Intention to treat
LST	Life Skills Training
MMP	Midwest Prevention Project
MPM	Managing the Pressures before Marriage
MCMF	My Choice, My Future!
NICE	National Institute for Health and Clinical Excellence
NR	Not reported
NRCT	Non-Randomised Controlled Trial
OR	Odds Ratio
PID	Pelvic inflammatory disease
PSHE	Personal Social and Health Education
PT	Post-test
PY/PM	Protecting You/Protecting Me
QCA	Qualifications and Curriculum Authority
RAPP	Rochester AIDS Prevention Project for Youth
RCT	Randomised Controlled Trial
RCV	Re-capturing the Vision
RHC	Raising Healthy Children
SHARE	Sexual Health and Relationships: Safe, Happy and Responsible
SLT	Social Learning Theory
SR	Systematic Review
SRE	Sex and relationships education
STARS	Start Taking Alcohol Risks Seriously

STI	Sexually transmitted infection
SWAAT	Students Working Against AIDS Together
UBA	Uncontrolled before and after study
YTCs	Youth Training Centres
YAPP	Youth AIDS Prevention Project

EXECUTIVE SUMMARY

OBJECTIVES

This review sought to identify effective and cost-effective interventions and programmes that focus on alcohol education and sex and relationships education for secondary school aged children.

METHODS

The methods for the review followed NICE protocols for the development of NICE public health guidance. Sixteen databases were searched for effectiveness and cost-effectiveness studies published since 1990. Two reviewers independently screened all titles and abstracts. Data extraction and quality assessment were undertaken by one reviewer and checked for accuracy by a second reviewer. Each study was also graded (++, + or -) based on the extent to which the design and execution of the study minimised the potential sources of bias. Results of the data extraction and quality assessment for each study of effectiveness and cost-effectiveness were presented in structured tables and as a narrative summary.

ALCOHOL AND DRUG EDUCATION PROGRAMMES

A total of 119 articles met the criteria for inclusion in the review of alcohol and drug education programmes. Fourteen articles were systematic reviews and meta-analyses, 103 articles reported on the evaluation of an alcohol or substance use education programme, and two articles were economic evaluation studies. Of the 103 articles, 74 reported on evaluations of classroom-based programmes; 20 of which were alcohol specific, and 54 of which focused on substance use including alcohol. Also identified were 15 articles that reported on evaluations of brief behavioural or single session interventions, nine articles reporting on two multicomponent school- and community-based programmes and five articles reporting on evaluations of peer support and/or counselling programmes.

Systematic reviews and meta-analyses

A total of 14 systematic reviews and meta-analyses were identified for inclusion. The majority of the reviews identified examined the effectiveness of programmes targeting substance use including alcohol, and only three reviews focused specifically on the prevention of alcohol use. A good quality review found that there was no consistent evidence to determine which programmes were effective over the short to medium-term, but highlighted three programmes which were effective over the longer term. These included the family-based, Strengthening Families programme, and two school-based programmes, Botvin's LST and a culturally-focused curriculum for Native American students. A second review highlighted promising evidence from six additional programmes, Keepin it REAL, the Midwest Prevention Project, Project Northland, Healthy School and Drugs, Project ALERT, and the SHAHRP. Two reviews identified evidence to suggest that peer leaders strengthened the effects of school-based interventions, although another review found that any beneficial effects of peer involvement were lost when they were combined with teacher-led activities. One review did not find any evidence to suggest that any particular agency or external contributor was more effective than another.

Evidence statement 1

1 (a) There is strong evidence from two systematic reviews to suggest that a secondary-level school-based programme, Botvin's LST, can produce long-term reductions (greater than 3 years) in alcohol use. Other promising intervention approaches include: Keepin it REAL, the Midwest Prevention Project, Project Northland, Healthy School and Drugs, Project ALERT, and SHAHRP.

1 (b) There is moderate evidence from two systematic reviews to suggest that programmes delivered by peer leaders may be more beneficial than programmes delivered by teachers or other contributors.

Classroom-based programmes

A total of 74 articles were identified for inclusion that reported on evaluations of classroom-based programmes. Overall, 20 articles were identified for inclusion that reported on the evaluation of 12 alcohol education programmes across 15 studies and 54 articles were identified that examined 22 classroom-based substance use (including alcohol) prevention programmes across 34 studies.

Of the 15 studies identified for inclusion that examined alcohol education programmes, nine studies were RCTs, three were NRCTs and three were CBA studies. The 12 alcohol education programmes were primarily classroom-based curriculums, but two programmes incorporated additional materials and activities for parents. The programmes identified targeted students across a range of age groups; eight programmes targeted students aged 14 or younger and four programmes were targeted at older adolescents. Across eight studies that examined intervention effects on knowledge related to alcohol use there were indications that alcohol-specific education programmes generally increased alcohol or curriculum knowledge over the short-term. However, effects on medium- and long-term knowledge acquisition were weaker. Eight studies examined young people's alcohol-related attitudes and values, finding non-significant programme effects across the majority of programmes. However, the SHAHRP programme, which was based on a harm reduction approach, had positive short- and long-term effects on students' alcohol-related attitudes. Short-term increases in safer alcohol-related attitudes were also reported in a study that examined a highly-role specific programme compared to a less-role specific alcohol programme. Few studies examined intervention effects on personal and social skills. Intervention impacts on a range of alcohol-related measures were examined across the included studies. The SHAHRP programme appeared to have the most consistent effects on short-term alcohol use, and additionally had effects on hazardous/harmful drinking. Medium- to long-term effects on alcohol consumption were found to be limited. Studies were either methodologically poor, as in the case of the AAPT programme, or reported conflicting or diminished effects. For example, 17-months after delivery of the SHAHRP programme the positive short-term effects appeared to be declining. Although intervention effects favoured SHAHRP, differences between intervention and control students in terms of their alcohol consumption and other measures of alcohol use including harmful/hazardous drinking were no longer significant. There were no long-term effects of a longer term version of the AMPS programme on alcohol consumption, but there did appear to be intervention effects on alcohol misuse.

Evidence statement 2

2 (a) There is strong evidence from four RCTs, two NRCTs and two CBA studies to suggest that classroom-based alcohol specific programmes are effective at increasing alcohol-related knowledge in the short-term, but have inconsistent or mixed effects on alcohol-related knowledge in the medium- to long-term. Findings may only be partially applicable to the UK as studies were implemented within Australia, Germany and the USA and may not be generalisable beyond the populations studied.

2 (b) Overall, there is inconsistent evidence from four RCTS, three NRCTs and one CBA study to determine the effects of alcohol specific education programmes on attitudes and values relating to alcohol. However, there is moderate evidence from one NRCT to suggest that programmes based on a harm reduction approach may have positive short- to long-term effects on students' alcohol-related attitudes. In addition, there is weak evidence from one NRCT to suggest that programmes with a high level of role-specification for providers may have short-term positive impacts on attitudes and values.

2 (c) There is inconsistent evidence from one RCT and one CBA study to determine the effects of programmes focusing on reducing the harm from drinking and driving on drink driving measures.

2 (d) There is moderate evidence from five RCTs, three NRCTs and two CBA studies to suggest that alcohol-specific education programmes may have mixed short-term effects on health outcomes relating to alcohol use. One NRCT of a programme focusing on harm reduction through skills-based activities (SHAHRP), showed short-term reductions in alcohol use. In particular effects were seen on risky drinking behaviours such as drunkenness and binge drinking. Findings may only be partially applicable to the UK as this study was conducted in Australia and may not be generalisable beyond the populations studied.

2 (e) There is moderate evidence from eight RCTS, one NRCT and one CBA study to suggest that alcohol-specific education programmes have limited medium- to long-term effects on health outcomes related to alcohol use, such as frequency of alcohol consumption and drunkenness. Findings may only be partially applicable to the UK as studies were implemented outside the UK and may not be generalisable beyond the populations studied.

Of the 34 studies, which examined 22 classroom-based substance use (including alcohol) prevention programmes, 23 were based on RCT designs, seven were NRCTs and four were CBA studies. Although all of the programmes were primarily classroom-based, five programmes combined school components with family- and/or community-based components. Two studies combined two originally school-based only programmes (DARE and LST, respectively) with components targeting parents. The majority of programmes targeted students aged 14 or younger. Four studies, including evaluations of LST, AMPS, DARE, and the Healthy School and Drugs Project, respectively, examined programme effects on alcohol-related knowledge. Overall both short and medium-term increases in alcohol knowledge were reported but these were not sustained long-term. Twenty-one studies

reported outcomes relating to alcohol or substance use attitudes and behavioural intentions. There were inconsistent effects on attitudes towards alcohol use and peer norms, but eight studies, which examined behavioural intentions indicated generally positive programme effects on intentions to drink or get drunk. Intervention effects on personal and social skills were examined across a small number of programmes but found to be inconsistent. Four programmes, the Positive Youth Development Programme, the Unplugged programme, a revised version of Project Alert, and the Healthy School and Drug Project had positive short-term programme effects on alcohol use. However, the findings of Positive Youth Development Programme were limited by the poor quality of the study. Positive longer term effects were demonstrated for two programmes, Keepin It REAL and Be Under Your Own Influence/All Stars, which combined school and media intervention components. The strongest evidence of effectiveness came from a series of studies which examined Botvin's LST. Two studies found positive short- and medium-term effects on drinking frequency and binge-drinking, and these were sustained long-term. However, replication of the programme by other research groups suggests that there may be issues with the transferability of LST to other settings.

Evidence statement 3

3 (a) There is moderate evidence from two RCTs, one NRCT and one CBA study to suggest that classroom-based substance use programmes are effective at improving knowledge relating to substance use and its effects in the short- to medium-term, but that these effects are not sustained in the long-term. Findings may only be partially applicable to the UK as studies were implemented outside the UK and may not be generalisable beyond the populations studied.

3 (b) There is moderate evidence from 12 RCTs, seven NRCTs and two CBA studies to suggest that classroom-based substance use programmes may have mixed effects on student's substance use-related attitudes and values. There is moderate evidence from seven RCTs, four NRCTs and two CBA studies to suggest that these programmes may impact on attitudes to substance use in the short- to medium-term and further evidence from five RCTs and three NRCTs to suggest that they may have a positive impact on long-term behavioural intentions. There is weak evidence from six RCTs, one NRCT and one CBA study to suggest that classroom-based substance use programmes have no medium- to long-term effects on peer norms. Findings may only be partially applicable to the UK as studies were implemented in the USA and may not be generalisable beyond the populations studied.

3 (c) There is weak and inconsistent evidence from one RCT, three NRCTs and one CBA study to determine the effects of classroom-based substance use programmes on young peoples' personal and social skills.

3 (d) There is moderate evidence from 14 RCTs, two NRCTs and two CBA studies to suggest that the following classroom-based substance use programmes may have inconsistent or no effects on alcohol use: DARE, Going Places, Lion's Quest SFA, All Stars Senior, Project Alert, Project SMART, Project TND, NARCONON drug education curriculum. In addition, there is weak

evidence from one CBA study to suggest that the Adolescent Decision Making Programme may have potentially harmful long-term effects on alcohol consumption.

3 (e) There is weak evidence from two RCTs and one NRCT to suggest that programmes that combine school-based curriculums with additional components may have positive effects on alcohol consumption. The Healthy School and Drugs Project, a three-year programme, which included a nine lesson teacher-led curriculum, formulation of school policy on substance use and involvement of parents, had short-term effects on alcohol use, but longer term effects of the programme have not been examined. Positive longer term effects were demonstrated for two programmes, Keepin It REAL and Be Under Your Own Influence/All Stars, which combined school-based curriculums with media intervention components. Findings may only be partially applicable to the UK as studies were implemented in the Netherlands and the USA and may not be generalisable beyond the populations studied.

3 (f) There is moderate evidence from three RCTs to suggest that LST has positive short-, medium- and long-term effects on drinking frequency and binge drinking. However, there is moderate evidence from three RCTs and one NRCT to suggest that there may be issues with the transferability of LST to other settings. Findings may only be partially applicable to the UK as studies were implemented in Spain and the USA and may not be generalisable beyond the populations studied.

Brief behavioural or single session interventions

A total of 15 articles were identified that reported on evaluations of seven brief behavioural or single session intervention approaches across 13 studies. Of the 13 studies, 11 studies were RCTs, one was an NRCT and one was a CBA study. All thirteen studies were primarily school-based but six studies examined interventions which incorporated materials targeting parents. A range of providers were utilised including school nurses, physicians, teachers, fitness professionals, consultants, trained research staff and motivational speakers. Two studies were based on mailed intervention materials and therefore did not involve a provider in the delivery.

None of the studies examined intervention effects on knowledge or understanding but eleven studies examined intervention effects on students' attitudes and values. Across these studies, there was an indication of positive intervention effects in the short-term, resulting in increases in negative views of alcohol and/or its consequences and a decrease in alcohol-related expectancies. Brief behavioural or single session intervention approaches appeared to have inconsistent short- and medium-term effects on student's intentions to drink. Few studies examined intervention effects on personal and social skills, and for two studies that examined impacts on self-control and parent-child relationships intervention effects were mixed. Eight studies that examined STARS for Families and Project SPORT, two intervention approaches based on brief nurse consultations, indicated mixed, but generally positive effects of this programme approach on alcohol consumption and heavy drinking in the short- to medium-term. An alcohol tailored beverage programme and an intervention founded on the Behaviour-Image Model had inconsistent effects on alcohol use, and two further programmes, a

single session on the dangers of binge drinking, and the one week long Programme "Kickoff", had no effects on alcohol use.

Evidence statement 4

4 (a) There is moderate evidence from nine RCTs, one NRCT and one CBA study to suggest that brief behavioural or single session intervention approaches relating to alcohol use may have mixed effects on attitudes and values relating to alcohol use. There is moderate evidence from four RCT, one NRCT and one CBA study to suggest that these programmes may have positive short-term effects on how student's view alcohol use and its consequences and further evidence from five RCTs and one NRCT to suggest that brief behavioural interventions have mixed or inconsistent effects on intentions to drink. Findings may only be partially applicable to the UK as the majority of studies were implemented in the USA and may not be generalisable beyond the populations studied. In addition, the emphasis of the STARS for Families and Project SPORT interventions on abstinence may be of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

4 (b) There is inconsistent evidence from two studies to determine the effects of brief behavioural and single session intervention approaches on personal and social skills.

4 (c) There is moderate evidence from five RCTs to suggest that brief behavioural interventions based on nurse-led consultations, such as the STARS for Families and Project SPORT programmes, can produce short-term reductions in alcohol use, but further moderate evidence from three RCTs to suggest that these effects may not be sustained in the medium-term. There is weak evidence from two RCTs, one NRCT and one CBA study to suggest that other brief behavioural and single session intervention approaches may have a limited impact on alcohol consumption. These findings may only be partially applicable to the UK as the majority of studies were implemented in the USA and may not be generalisable beyond the populations studied. In addition, the emphasis of the STARS programme on abstinence may be of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

Multicomponent school- and community-based programmes

Nine studies were identified that examined two multicomponent, school- and community-based programmes: Project Northland and the Midwest Prevention Project. Both programmes were based in communities in the USA and combined comprehensive school-based curriculums, with community-based activities and parental involvement components. All nine studies identified for inclusion were based on an RCT design.

None of the studies examined intervention effects on knowledge or understanding, or personal and social skills. There no were effects of Project Northland on attitudes and values and neither of the studies of the MPP examined intervention effects on these outcomes. Project Northland significantly reduced growth in binge drinking and tendency to use alcohol during Phase I and II of the programme, however, during the interim phase of the programme growth in alcohol use was greater among intervention students than control students. The three-year MPP did not have significant effects on

alcohol use in one cohort of ninth/tenth grade students, but a short-term secondary prevention effect was reported in a second cohort.

Evidence statement 5

5 (a) There is no evidence from eight RCTs to determine the impact of multicomponent, school- and community-based programmes on knowledge, or personal and social skills.

5 (b) There is moderate evidence from three RCTs to suggest that Project Northland, a long-term multicomponent, school- and community-based programme, has no effects on attitudes and values related to alcohol consumption.

5 (c) There is moderate evidence from two RCTs to suggest that the Midwest Prevention Project has no effects on alcohol consumption and inconsistent evidence from five RCTs to suggest that Project Northland may have mixed effects on alcohol consumption. Two RCTs showed reductions in alcohol consumption, particularly among younger adolescents, but replication of the programme among an urban sample showed that the programme was not effective. Findings may only be partially applicable to the UK as studies were implemented in the USA and may not be generalisable beyond the populations studied.

Peer support and counselling programmes

Five studies examined five peer support and counselling programmes. Of the five studies identified for inclusion, one study was based on an RCT design; two studies were NRCTs; and two studies were based on CBA designs. All five programmes were school-based only and the provider for three peer support programmes was peers alone. The two counselling programmes were delivered by health counsellor or educational psychology students, respectively.

None of the studies examined intervention effects on knowledge or understanding, or personal and social skills. Three studies examined short-term intervention effects on attitudes and values. For two peer leadership programmes there appeared to be modest impacts on attitudes to alcohol and one study of a counselling programme found that the programme had a positive impact on the number of psychological problems that students' attributed to their alcohol use. Neither of the counselling programmes was shown to be effective in reducing alcohol consumption, and one programme had potentially harmful effects on high school students' alcohol consumption. There were inconsistent effects of peer support programmes on alcohol use.

Evidence statement 6

There is inconsistent evidence from one RCT, two NRCTs and two CBA studies to determine the effectiveness of counselling and peer support on attitudinal and behavioural outcomes related to alcohol use. Findings may only be partially applicable to the UK as studies were implemented in the USA and may not be generalisable beyond the populations studied.

Review of published economic evaluations

Two studies were identified that met the criteria for inclusion in the review of published economic evaluations. One study assessed the cost-effectiveness of standard and infused LST, and a second

study assessed the costs, benefits and cost-effectiveness of the MPP. The standard LST programme was found to be more cost effective than I-LST by $33.46 per student after 1 year of intervention delivery. In the second year, however, standard LST had no effects and the authors concluded that I-LST was more cost-effective. The 3-year total costs of the two programmes were estimated at $109,429.04 and $93,088.17, respectively. The results of the cost-benefit analysis (CBA) of the MPP demonstrated a $700 net saving per family per year resulting from a reduction in the incidence of monthly drunkenness. Cost benefits ratios were also shown to be favourable (ratio to $1 spent on prevention to saving is $1:1.69). Compared to "usual" drug education the ICER of the MPP was reported to be equal to the ratio of its incremental cost per incremental effects, equivalent to $10 per net reduction in the incidence of monthly drunkenness.

Evidence statement 7

There is inconsistent evidence from two economic evaluation studies to determine the cost-effectiveness of school-based interventions that aim to prevent or reduce alcohol use in young people under 18 years old. This evidence may be of limited applicability to a UK context because cost and benefit estimates were based on data from studies conducted in the USA.

SEX AND RELATIONSHIPS EDUCATION

A total of 75 articles met the criteria for inclusion in the review of sex and relationships education programme. Nine articles were systematic reviews and meta-analyses, 65 articles reported on evaluations of sex and relationships education interventions, and one article was an economic evaluation study.

Systematic reviews and meta-analyses

Nine systematic reviews evaluated abstinence only and abstinence plus safer-sex promotion programmes (Underhill et al., 2007, 2008; Bennett & Assefi, 2005), safer-sex promotion (Oakley et al., 1995; Franklin et al., 2007; Kirby et al.,1994; Pedlow and Carey, 2003; Robin et al., 2004) and sexuality-focused interventions (Sales et al., 2006). Findings from three reviews that examined abstinence-only and abstinence-plus programmes (Underhill et al., 2007, 2008; Bennett and Assefi, 2005) indicated that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours. In addition, Oakley et al (1995) found evidence to suggest that abstinence only education may have an adverse effect and actually increase sexual experimentation among students. For programmes that incorporated information on safe sex and use of contraception, there was evidence from five reviews (Underhill et al., 2008; Pedlow & Carey, 2003; Franklin et al., 1997; Kirby et al., 1994; Oakley et al., 1995) to suggest that interventions may have effects on preventing sexual risk behaviours, but that these effects tend to be modest. There was no evidence that sexuality and AIDS education increased sexual activity.

Evidence statement 8

8 (a) There is strong evidence from three systematic reviews to suggest that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours.

8 (b) There is moderate evidence from five systematic reviews to suggest that interventions incorporating information on safer sex and contraceptive use may have positive, but limited effects on preventing sexual risk behaviours. There is no evidence that such programmes increase the occurrence of sexual activity among young people.

8 (c) There is moderate evidence from four systematic reviews to suggest that effective characteristics of sexual risk reduction interventions include: (1) a theoretical basis; (2) use of trained adult health educators as providers; and (3) provision of highly specific content focusing on sexual risk reduction.

UK-based studies

Twelve UK studies, evaluating seven programmes, were identified that could be defined as predominantly sex and relationships education. Of the 12 studies, six were RCTs, two studies were based on an NRCT design, and five were CBA studies. Seven studies (Henderson et al., 2007; Mellanby et al., 1995; 2001; Stephenson et al., 2004; 2008; Tucker et al., 2007; Wight et al., 2002) reported on evaluations of three comprehensive school-based programmes, A PAUSE, RIPPLE and SHARE, respectively. Two studies (Gillies et al., 1990; Bellingham et al., 1993) reported on evaluations of the Streetwize UK, AIDS education comic, Denman et al (1995) examined a theatre in education programme and two studies (Graham et al., 2002; Magnusson et al., 2004) examined single lessons on emergency contraception and contraceptive services, respectively.

Across four studies (Tucker et al., 2007, Wight et al., 2002; Stephenson et al., 2004; Mellanby et al., 2001) that examined three comprehensive school-based programmes, there were indications that these programmes had significant effects on knowledge about STIs. Three studies (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990) that examined a theatre in AIDS/HIV education programme and the Streetwize UK comic, respectively, had positive impacts on knowledge about HIV, and a teacher-led intervention about emergency contraception (Graham et al., 2002) increased knowledge relating to contraception. The effects of three comprehensive SRE programmes on attitudes were mixed. There were inconsistent or no effects of the peer-led RIPPLE programme and A PAUSE, but there were positive programme effects of the SHARE programme (Tucker et al., 2007) on attitudes concerning condom use and STI prevention, and on self-efficacy to use condoms. Other intervention approaches focusing on HIV prevention (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990) and emergency contraception (Graham et al., 2002) had limited impacts on attitudes and values. Results for skills outcomes were limited with few studies reporting on these outcomes. In addition, few of the studies found significant programme effects on health outcomes related to sexual health. There were positive medium- and long-term effects of the A PAUSE (Mellanby et al., 1995) and RIPPLE (Stephenson et al., 2004) programmes on the number of students who reported ever having had sex, although for RIPPLE this effect was only apparent among

females at the 18-month follow-up. There were no effects of either the RIPPLE (Stephenson et al., 2004; 2008) or SHARE (Wight et al., 2002) programmes on use of condoms or other forms of contraception. There was mixed evidence on the effects of these programmes on pregnancy. There were no medium-term effects of the SHARE (Wight et al., 2002) or RIPPLE (Stephenson et al., 2004) programmes on rates of unintended pregnancies, however, Stephenson et al (2008) found that at age 20, students who participated in the peer-led RIPPLE programme were less likely to have been pregnant. There were no long-term effects of the RIPPLE (Stephenson et al., 2008) or SHARE (Henderson et al., 2006) programmes on abortion rates. Other intervention approaches focusing on HIV prevention (Denman et al., 1995; Bellingham and Gillies, 1993), and single lessons regarding emergency contraception (Graham et al., 2002) and contraceptive services (Magnusson et al., 2004), respectively, had no impact on sexual behaviours.

Evidence statement 9

9 (a) There is moderate evidence from two RCTs and two CBA studies to suggest that comprehensive sex education programmes may be effective at increasing students' knowledge about STIs in the short- to long-term. In addition, there is weak evidence from one RCT and two CBA studies to suggest that brief interventions focusing on HIV prevention, such as theatre in education or a comic-based intervention, may have short-term positive effects on knowledge about HIV/AIDs. This evidence is directly applicable as these studies were conducted in the UK.

9 (b) Overall, there is inconsistent evidence from two RCTs and two CBA studies to determine the effects of comprehensive sex education programmes on attitudes and values relating to sexual health. However, there is weak evidence from one CBA study to suggest that a two-year sex education programme aimed at reducing unsafe sexual behaviour and unwanted pregnancy (SHARE) may have positive effects on long-term attitudes and intentions regarding condoms. There is moderate evidence from two RCTs, one NRCT and two CBA studies to suggest that brief or single session interventions focusing on HIV prevention or contraceptives and contraceptive services may have a limited impact on students' attitudes and values. This evidence is directly applicable as the study was conducted in the UK.

9 (c) There is inconsistent evidence from two RCTs and one CBA study to determine the effects of UK-based SRE approaches on personal and social skills.

9 (d) There is moderate evidence from one RCT and one NRCT to suggest that comprehensive SRE programmes, that include peer-led sessions such as RIPPLE and A PAUSE, may delay sexual initiation, but strong evidence from three RCTs and one NRCT to suggest that SRE programmes and single session interventions focusing on contraceptives and contraceptive services may have no impacts on condom or contraceptive use. This evidence is directly applicable as the studies were conducted in the UK.

9 (e) There is mixed evidence from three RCTs on the effects of comprehensive SRE programmes on outcomes relating to pregnancy. There is moderate evidence from one RCT of the peer-led

RIPPLE programme to suggest that this programme may reduce teenage pregnancy, but not abortion, rates in the long-term and strong evidence from one RCT of the teacher-led SHARE programme to suggest that this programme has no long-term effects on conceptions or terminations. This evidence is directly applicable as the studies were conducted in the UK.

Abstinence-only programmes

Ten articles were identified that evaluated eight programmes defined as abstinence-only programmes across nine studies. These programmes encouraged and promoted abstinence as the best and only way to prevent pregnancy, HIV and other STIs. Of the nine studies, two were RCTs and seven were NRCTs. Four programmes were teacher-led and one was peer-led. The provider for three programmes was not reported. Abstinence-only programmes were generally targeted at students younger than 14 years, with the exception of the Sex Can Wait programme, which consists of upper elementary, middle and high school components.

Overall, abstinence-only programmes appeared to be effective at increasing knowledge related to STIs in the short- to medium-term. Evidence was lacking on the longer term effects of abstinence-only programmes on knowledge. Eight studies examined effects on attitudes and values, and abstinence-only programmes were generally found to have had a positive effect on participants' beliefs and attitudes towards abstinence, and no programmes reported an adverse programme effect on attitudes towards abstinence or intentions to have sex. Results from the studies that examined intervention effects on parent-child communication indicated that abstinence-only programmes did not affect communication. Eight studies demonstrated that abstinence-only programmes had non-significant or inconsistent effects on the initiation of sexual activity. Two studies, which reported outcomes relating to contraception, found no impact on contraception use. One abstinence-only programme, Success Express, had a negative effect; at follow-up intervention students reported greater lifetime sexual experience than controls. However, in a replication study of this programme there was no difference between intervention and control students on this measure.

Evidence statement 10

10 (a) There is moderate evidence from one RCT and two NRCTs to suggest that abstinence only programmes may have positive short- to long-term effects on knowledge relating to STIs. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

10 (b) There is weak evidence from four NRCTs to suggest that abstinence only programmes may have short-term positive effects on attitudes and intentions towards sexual activity. There is weak evidence from one NRCT to judge the impact of abstinence programs on long-term intentions. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

10 (c)	There is moderate evidence from two RCTs and four NRCTs to suggest that abstinence only programmes may have no impact on the initiation of sexual behaviours or the maintenance of sexual abstinence. In addition, there is moderate evidence from one RCT and three NRCTs to suggest that abstinence only programmes may have no impact on or increase sexual activity. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.
10 (d)	There is weak evidence from one RCT to suggest that abstinence only education programmes may have no impact on long-term pregnancy rates and contraception use. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

Abstinence-plus programmes

A total of 24 articles were identified that reported on the evaluation of 15 abstinence plus programmes across 18 studies. Abstinence plus programmes were defined as those that reported an emphasis on abstinence as the safest way to avoid HIV/STI infection and pregnancy, but also promoted safer sex through the use of contraceptives. Of the 18 studies identified, ten were RCTs and eight were NRCTs. Two programmes, Safer Choices and YAPP, incorporated activities for parents and one programme, Protection Express, was exclusively peer-led. The programmes identified tended to target older adolescents (>14 years) or students across a range of ages, from the age of 13 upwards.

Thirteen studies examined intervention effects on sexual health knowledge, finding that abstinence-plus programmes were generally effective in improving sexual health knowledge in the short- and medium-term. In addition, three studies reported sustained long-term increases in knowledge among students exposed to abstinence plus programmes compared to controls. The results of 14 studies demonstrated that intervention effects on behavioural intentions, attitudes to sexual behaviour, and self-efficacy were inconsistent and there was no clear indication of the direction of effects. In addition, some programmes, such as Draw the Line/Respect the Line, had differing effects on male and female students. Across five programmes that incorporated skills building activities there were positive short- to medium-term effects on skills relating to sexual risk prevention. There was no indication of short-term intervention effects on the initiation of sexual involvement and at the medium-term follow-up, programme effects were largely inconsistent with four studies reporting no effects on initiation of sexual intercourse. In addition, intervention effects on frequency of sexual intercourse, number of sexual partners and contraceptive use were found to be inconsistent or non-existent in the short-, medium- and long-term. Two studies examined the medium- to long-term effects of a HLM-SLT curriculum and Reducing the Risk, respectively, on pregnancy. Neither study identified significant programme effects on this outcome.

Evidence statement 11

11 (a) There is moderate evidence from three RCTs and three NRCTs to suggest that programmes that emphasise abstinence but that also promote safer sex, may produce short- to long-term term improvements in sexual health-related knowledge. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

11 (b) There is inconsistent evidence from four RCTs and four NRCTs to determine the effects of abstinence-plus programmes on attitudes, behavioural intentions and self-efficacy relating to sexual behaviour.

11 (c) There is inconsistent evidence from one RCT and two NRCT to determine the long-term effects of abstinence-plus programmes on communication with parents. There is moderate evidence from one RCT and one NRCT to suggest abstinence-plus programmes that incorporate skills building activities may have positive, short and medium- to long-term effects on skills relevant to prevention. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

11 (d) There is moderate evidence from five RCTs and five NRCTs to suggest that abstinence-plus programmes may not have a consistent short-, medium- or long-term impact on the initiation of sexual activity or the maintenance of abstinence. In addition, there is moderate evidence from four RCTs and two NRCTs to suggest that abstinence plus programmes may not have an impact on frequency of sexual activity and risky sexual behaviours.

11 (e) There is moderate evidence from six RCTs and three NRCTs to suggest that abstinence-plus programmes may not have a consistent impact on condom and other contraceptive use, and moderate evidence from one RCT and one NRCT to suggest that abstinence-plus programmes have no medium- to long-term impact on pregnancy rates.

HIV and sexual risk-reduction programmes

Overall, 11 studies were identified that examined HIV and sexual risk-reduction programmes. Studies were defined by their specific focus on HIV prevention and HIV risk-behaviour, sexual risk-behaviour or a combination of both. Of the 11 included studies, eight were RCTs, two were NRCT and one was based on a CBA study design. All programmes were delivered in school time however one programme included six computer-based activities to be completed outside of school time. The included studies focused on different ages and school years. One programme targeted students aged 12-14 years, but in general, programmes were targeted at older adolescents.

Seven studies examined intervention effects on general HIV and sexual health knowledge, finding significant effects on knowledge over the short-term. Two studies, which explored medium- to long-term effects on knowledge of HIV and contraception, reported significant effects. Outcomes relating to attitudes were reported by seven studies. Condom self-efficacy, perception of social norms and

condom use/prevention intentions were the outcomes most commonly reported across these studies but intervention effects were found to be inconsistent with no clear direction of effect. Short-term programme effects on personal and social skills were predominantly positive and included positive programme effects on behavioural prevention skills and condom negotiation skills. However, none of the included studies examined medium- to long-term impacts on skills. Intervention impacts on sexual initiation were explored in four studies, which overall indicated inconsistent effects on this outcome. Further studies indicated no impact on sexual activity or the numbers of sexual partners. Six studies showed positive short-term programme effects on condom use and protected intercourse, but longer term programme effects on contraception use appeared to be limited. Limited outcomes were presented on HIV/STI testing, alcohol or drug use and pregnancy.

Evidence statement 12

12 (a) There is moderate evidence from five RCTs, two NRCTs and one CBA study to suggest that HIV and sexual risk-reduction programmes can improve sexual health and HIV knowledge in the short-, medium-and long-term. This evidence may be only partially applicable to the UK as five of the studies were conducted in the USA, one in Italy and one in the Netherlands and may not be generalisable beyond the populations studied.

12 (b) There is mixed evidence from four RCTs and one NRCT that examined the effects of HIV and sexual risk-reduction programmes on young people's (≥14 years) attitudes and values towards sexual health and alcohol. This evidence may be only partially applicable to the UK as studies were carried out in the USA, Italy and the Netherlands and may not be generalisable beyond the populations studied.

12 (c) There is moderate evidence from two RCTs, one NRCT and one CBA study to suggest that HIV and sexual risk-reduction programmes may improve personal and social skills including behavioural prevention skills and condom negotiation skills in the short-term. There was no evidence to determine the effects of HIV and sexual risk-reduction on personal and social skills in the medium- to long-term. This evidence may be only partially applicable to the UK as studies were carried out in the USA and Italy and may not be generalisable beyond the populations studied.

12 (d) There is moderate evidence from seven RCTs to suggest that HIV and sexual risk-reduction programmes may have no effects on sexual initiation, frequency of sexual activity or number of sexual partners. This evidence may be only partially applicable to the UK as studies were carried out in the USA, Norway, Italy and Netherlands and may not be generalisable beyond the populations studied.

12 (e) There is strong evidence from three RCTs, two NRCTs and one CBA study to suggest that HIV and sexual risk-reduction programmes can increase condom use or protected intercourse in the short- to medium-term. However, there was moderate evidence from two RCTs to suggest that the long-term effects of HIV and sexual risk-reduction programmes on contraceptive use may be limited. This evidence may be only partially applicable to the UK as

studies were carried out in the USA, Norway, and Sweden and may not be generalisable beyond the populations studied.

12 (f) There is moderate evidence from two RCTs to suggest that HIV and sexual risk-reduction programmes have no medium- to long-term effect on sexually transmitted infections, alcohol and drug use or on conceptions. As both studies were implemented in the USA findings may be only partially applicable to the UK and may not be generalisable beyond the populations studied.

Other school-based approaches

Seven studies were identified that reported on six different programme approaches relating to sexual health; one was an NRCT, five were CBA studies and one study was based on an interrupted time series design. Two studies examined school-based clinic programmes, two studies reported findings from one programme using baby simulators (Baby Think it Over), and three studies examined the effects of combined community and school-based programmes.

None of the studies examined intervention effects on knowledge or understanding. Three studies, which examined school-based health clinics and an infant simulation intervention, respectively, reported inconsistent effects on attitudes towards sexual health and only one study examined programme effects on personal and social skills. There were no effects of the Baby Think it Over infant simulation programme on any of the sexual behaviour measures examined. Three studies that examined a school and community partnership approach to tackling teenage pregnancy, generally found that although there were reductions in pregnancy rates among 14-17 year olds at the intervention sites, these reductions were not found to be significant compared to non-intervention sites. However, one study that examined pregnancy rates over 20 years concluded that the intervention had had a positive effect on teenage pregnancies. Two studies, which examined the long-term effects of school-based health centres, found that these programmes did not have consistent effects on participant's sexual behaviour.

Evidence statement 13

13 (a) There is inconsistent evidence from one NRCT and two CBAs to determine the effects of school-based clinics or an infant simulation intervention on knowledge, attitudes, values and personal and social skills.

13 (b) There is weak evidence from one NRCT and one CBA study to suggest that infant simulation programmes have no effect on health outcomes related to sexual health. This evidence may be only partially applicable to the UK as studies were carried out in the USA and may not be generalisable beyond the populations studied.

13 (c) There is weak evidence from one CBA studies and two ITS to suggest that a comprehensive school- and community-based approach to teenage pregnancy may produce modest reductions in teenage pregnancy rates. This evidence may be only partially applicable to the UK as studies were carried out in the USA and may not be generalisable beyond the populations studied.

13 (d) There is inconsistent evidence from two CBAs to determine the effects of school-based clinics on health outcomes related to sexual health.

Review of published economic evaluations

One study was identified that met the criteria for inclusion in the review of published economic evaluations. The study evaluated the cost-effectiveness and cost benefits of a school-based sex and relationships education programme, Safer Choices. Overall the net benefit of the Safer Choices programmes was $174,276 and the benefit-cost ratio was 2.65, indicating that for every $1 spent on the programme, $2.65 were saved in medical and societal costs. The generalisbility of the study to a UK context was unclear as the data used in the evaluation was based on studies conducted in the USA, and utilised other US population estimates. However, the authors state that the methods and data used were conservative and it is possible that the intervention may be cost saving in a UK context.

Evidence statement 14

There is moderate evidence from one economic evaluation study to suggest that a sex and relationships education programme, Safer Choices, may be cost-effective and cost saving. This evidence may be of limited applicability to a UK context because cost and benefit estimates were based on data from studies conducted in the USA.

GENERAL HEALTH EDUCATION PROGRAMMES

Systematic reviews and meta-analyses

No systematic reviews or meta-analyses were identified for inclusion in the review of general health education programmes.

General health education programmes

Overall, nine studies reported on the evaluation of six general health education programmes that reported relevant alcohol and sexual education outcomes. Of the nine studies, eight were RCTs and one was a CBA study. All six programmes were primarily delivered in schools. Four programmes were solely school-based and two programmes incorporated both school and community elements. All six programmes targeted young adolescents aged less than 14 years.

One study examined programme effects on knowledge, finding no significant effects of Project Model Health on curriculum knowledge. However, there were positive medium-term effects of this programme on attitudes towards postponing sex and using contraceptives, and attitudes and intentions towards alcohol and other drugs. A second study found a medium-term impact on students' perceptions of peer attitudes towards alcohol and other drugs in those receiving the intensive condition of the Healthy for Life Programme. However, there was no longer term effect of this programme. None of the studies examined intervention effects on personal and social skills. Two programmes, the Reach for Health curriculum and the Aban Aya project, which incorporated community components, had positive effects on sexual behaviour in the medium- to long-term. Four

school-based programmes had either no effect or harmful effects on sexual behaviours and alcohol use.

Evidence statement 15

15 (a) There is inconsistent evidence from one RCT and one CBA study to determine the effect of general health education programmes on knowledge, attitudes and values relating to sexual health and alcohol use.

15 (b) There is moderate evidence from three RCTs to suggest that general health education programmes incorporating an intensive community intervention element in conjunction with a curriculum base may have a positive effect on sexual behaviour and substance use. The evidence may only be partially applicable to the UK as programmes were implemented in the USA and focused primarily on black and minority ethnic groups. As such their generalisbility may be limited to the populations studied.

15 (c) There is moderate evidence from five RCTs to suggest that curriculum-based, general health education programmes have no impact on, and in some cases may have a negative impact on, sexual behaviours and alcohol use. Studies were based on two programmes conducted in the USA and Australia and therefore the evidence may not be generalisable beyond the populations studied.

Review of published economic evaluations

No published economic evaluation studies were identified for inclusion in the review of general health education programmes.

CONCLUSIONS

Alcohol and drug education programmes

The evidence suggests that classroom-based programmes, regardless of whether the focus is on alcohol alone or as one of a number of substances, may have beneficial effects on alcohol-related knowledge, particularly in the short- to medium-term. Programme effects on attitudes and values were mixed and inconsistent across a range of intervention approaches and the evidence was insufficient to draw conclusions about the impact of these programmes on personal and social skills. Overall, the findings of the review of alcohol and drug education programmes highlight that there is a lack of clear, medium- to long-term evidence for the effectiveness of school-based alcohol education programmes on health and social outcomes relating to alcohol use. In addition, the applicability to a UK context of those programmes that have demonstrated effectiveness, such as LST, STARS for Families and Project SPORT, is limited. There is lack of evidence on which to draw conclusions about the cost-effectiveness of alcohol and drug education programmes. Further good quality UK-based research of promising or novel intervention approaches, including assessment of cost-effectiveness, is required in order to improve the evidence base on which to make UK-based policy and practice recommendations for PSHE focusing on alcohol education.

Sex and relationships education programmes

There were consistently positive programme effects on acquisition of sexual health knowledge, across the SRE education programmes that examined this outcome, regardless of whether the programme emphasised abstinence or not. A range of outcomes were reported with regards to attitudes and values and programme effects were mixed or inconsistent across these measures. It was therefore not possible to draw unequivocal conclusions about the impact of SRE programmes on attitudes and values relating to sexual health. The evidence suggests that while abstinence-only programmes have no effects on health and social outcomes related to sexual health, programmes that incorporate information on safer sex and contraceptive use may have positive, but limited effects on the prevention of sexual risk behaviours, in particular limited effects on contraceptive use. Although the applicability of some of these programmes to a UK context is limited, these conclusions are supported by the evidence drawn from studies conducted in the UK. There is lack of evidence on which to draw conclusions about the cost-effectiveness of SRE programmes. Further good quality UK-based research of promising or novel intervention approaches, including assessment of cost-effectiveness, is required in order to build on the evidence base on which to make UK-based policy and practice recommendations for PSHE focusing on SRE.

General health education programmes

There was a lack of evidence on which to draw clear conclusions about the effects of the general health education programmes on knowledge, and attitudes and values relating to alcohol use and sexual health. The evidence suggests that general health education programmes, which incorporate an intensive community intervention element in conjunction with a curriculum base may have a positive effect on sexual behaviour and substance use. There were no effects, or in some cases harmful effects on sexual health and alcohol use outcomes for curriculum-based, general health education programmes. In addition, the applicability of these programmes to a UK context was limited.

1 Introduction

1.1 Aims and objectives

This review was undertaken to support the development of guidance by the National Institute for Health and Clinical Excellence (NICE) aimed at promoting school, college and community-based personal, social and health education (PSHE), with particular reference to sexual health behaviours and alcohol use behaviours. As such, the review sought to identify effective and cost-effective interventions and programmes that focus on modifying attitudinal and behavioural outcomes in relation to alcohol use and sexual health.

1.2 Research question

The following key questions were addressed:

1. What services, interventions, programmes, policies or strategies for children and young people aged 11 years and above are effective and cost effective in contributing to the achievement of the “Every child matters” outcomes for PSHE, related to sexual health and alcohol?

2. What elements/components of those services, interventions, programmes, policies or strategies for children and young people aged 11 years and above are effective and cost effective in contributing to the achievement of the “Every child matters” outcomes for PSHE, related to sexual health and alcohol?

2 Background

Alcohol use and sexual health in addition to being independent issues of public health concern (see section 2 in Jones et al., 2009), are also interrelated public health issues. Research findings suggest that generally alcohol use per se, and binge drinking in particular, is associated with being sexually active (Miller et al., 2007; Ramisetty-Mikler et al., 2004). Specifically, research has indicated that early regular alcohol consumption (usually before age 16 years) is associated with early onset sexual activity (Choquet et al., 1992; Robertson and Plant, 1988). Further research implies that early alcohol consumption and a high level of alcohol consumption results in an increased likelihood of a higher number of sexual partners (Lowry et al., 1994; Ramisetty-Mikler et al., 2004). Alcohol use at first sexual intercourse has also been associated with greater risk-taking behaviours such as lower levels of condom use (Dye and Upchurch, 2006); and studies have found lower levels of condom use in those who binge drink or who have alcohol-related problems (Kim-Godwin et al., 2007). Furthermore, alcohol use has been reported as a substance used to facilitate sexual encounters (Bellis et al., 2008). Thus, the misuse of alcohol has been linked to unprotected sex (Hibell et al., 2004) and to some extent to regretted sex (Hibell et al., 2004; Bellis et al., 2008) and forced sex (Miller et al., 2007) also. In addition, alcohol consumption, particularly increased levels of alcohol consumption, has been associated with females becoming pregnant or males making a female pregnant (Miller et al., 2007). Recent work has further highlighted the relationship between teenage pregnancy and alcohol consumption (Bellis et al., 2009), with findings indicating a link between alcohol-related hospital admissions and conception rates. Even after accounting for deprivation data showed the highest conception rates to be in areas with the highest alcohol-related hospital admissions. This emphasises the importance of SRE and alcohol education, particularly in secondary schools, prior to the onset of sexual activity and alcohol consumption and the uptake of risky behaviours.

Many young people under age 18 are aware that they consume more alcohol now than same age people would have ten years ago (Department of Health, 2007). Furthermore, alcohol is associated with crime and anti-social behaviour which is estimated to cost £7.3 billion; with an annual cost of £6.4 billion due to alcohol-related loss of productivity in the workplace; and the human and emotional impact of alcohol-related crime estimated to cost £4.7 billion (The Strategy Unit, 2004). It is important to measure the health costs in addition to the social costs of alcohol use. In 2008 research was carried out to measure the impact of alcohol on health. Findings revealed that males aged 16-24 years have the highest proportion of deaths attributable to alcohol (26.6%). Furthermore, hospital admission for mental and behavioural disorders due to alcohol use were the most common cause of admission in both males and females aged under 45 years in England (Jones et al., 2008).

In addition to the long-term negative health outcomes related to alcohol there is also the contribution of poor sexual health which disproportionally affects young people. Rates of sexually transmitted infections for the top five infections (Chlamydia, gonorrhoea, syphilis, herpes and warts) are increasing. Infections in females aged 16-19 years have increased 15% from 2004 to 2008 and in young males aged 16-19 years numbers of infections have increased by 23% (Health Protection

Agency, 2009). Limited information exists on the wider financial and health costs of poor sexual health. However, they are likely to be considerable. Thus separately, preventing alcohol use and poor sexual health can have social and health benefits and addressing the two together, beginning in PSHE classes, could compound the benefits.

2.1 Personal, Social Health education (PSHE)

(For details of PSHE in primary schools please see section 2.2 in Jones et al., 2009).

Progress is currently being made towards making PSHE statutory within UK schools. Currently Key Stages 3 and 4 there are themes to the curriculum that ought to incorporate points as follows:

National Curriculum Science

Key stage 3

- That fertilisation in humans is the fusion of a male and female cell.
- About the physical and emotional changes that take place during adolescence.
- About the human reproductive system, including the menstrual cycle and fertilisation.
- How the foetus develops in the uterus how the growth of bacteria and the replication of viruses can affect health.

Key stage 4

- The way in which hormonal control occurs, including the effects of sex hormones.
- Some medical uses of hormones, including the control and promotion of fertility.
- The defence mechanisms of the body.
- How sex is determined in humans.

Sex and relationship education curriculum and standards guidance (Department for Education and Employment, 2000) states that at secondary school level, sex and relationship education (SRE) should contribute to PSHE education by preparing young people for and adult life and ensuring that they can:

- Develop positive values and a moral framework that will guide their decisions, judgements and behaviour;
- Be aware of their sexuality and understand human sexuality;
- Understand the arguments for delaying sexual activity;
- Understand the reasons for having protected sex;
- Understand the consequences of their actions and behave responsibly within sexual and pastoral relationships;
- Have the confidence and self-esteem to value themselves and others and respect for individual conscience and the skills to judge what kind of relationships they want;
- Communicate effectively;

- Have sufficient information and skills to protect themselves and, where they have one, their partner from unintended/unwanted conceptions, and sexually transmitted infections including HIV;
- Avoid being exploited or exploiting others;
- Avoid being pressured into unwanted or unprotected sex;
- Access confidential sexual health advice, support and if necessary treatment; and
- Know how the law applies to sexual relationships.

Alcohol education is also included in the wider provision for PSHE and according to curriculum guidance (Qualifications and Curriculum Authority, 2007) it ought to teach the facts and laws about drug, alcohol and tobacco use and misuse, and the personal and social consequences of misuse for themselves and for others. The Department for Children Schools and Families (2008) recognises the need to address the issue of high quality and consistent sex and relationship education within further education institutions such as colleges, particularly for those post-16 years and those aged 14-19 years in non-school education. It also recognised that, since further education colleges are the main provider of post-16 education for those with learning difficulties and disabilities it is important to address inequalities in service provision as their sexual health needs may have previously been overlooked (Department for Education and Skills, 2007).

2.2 Government policy

(For further details of government policies related to PSHE please see section 2.3 in Jones et al., 2009).

Sex and relationship and alcohol education are intrinsic to the whole school approach promoted in the healthy schools programme (Department of Health, 2005). In order to gain healthy schools status for PSHE the Department of Health (2005) states that schools must demonstrate that they have met the criteria in the following:

- uses the PSHE framework to deliver a planned programme of PSHE, in line with DfES/Qualifications and Curriculum Authority (QCA) guidance;
- monitors and evaluates PSHE provision to ensure the quality of teaching and learning;
- assesses pupils' progress and achievement in line with QCA guidance;
- has a named member of staff responsible for PSHE provision with status, training and appropriate senior management support within the school;
- has up to date policies in place – developed through wide consultation, implemented, and monitored and evaluated for impact – covering sex and relationship education, drug education and incidents, child protection, and confidentiality;
- has an implemented non-smoking policy, or is working towards being smoke free by September 2007;

- involves professionals from appropriate external agencies to create specialist teams to support PSHE delivery and to improve skills and knowledge, such as a school nurse, sexual health outreach workers and drug education advisers;
- has arrangements in place to refer pupils to specialist services who can give professional advice on matters such as contraception, sexual health and drugs;
- uses local data and information to inform activities and support important national priorities such as reducing teenage pregnancies, sexually transmitted infections and drug/alcohol misuse;
- ensures provision of appropriate PSHE professional development opportunities for staff – such as the Certification Programmes for teachers and nurses offered by DH/DfES; and
- has mechanisms in place to ensure all pupils' views are reflected in curriculum planning, teaching and learning, and the whole school environment, including those with special educational needs and specific health conditions, as well as disaffected pupils, young carers and teenage parents.

An extended schools approach to education promotes the general, sexual and substance-related health of adolescents aged 11 to 19 years through improving access to contraceptive and sexual health advice and targeted specialist substance use prevention services (Department for Educational and Skills, 2006). Sexual health services in education settings that are most successful are those that bring together a range of partners including those in the key areas of health, education, social services, and youth support services (Department for Education and Skills, 2007). Sexual health service provision within further education includes a wide variety of people involved in setting up services from PCT and local authorities, further education, and the surrounding community.

The Department of Health (2009) provided additional funding of £26.8m in 2008 to support improved access to contraceptive services. Progress has been made relating to the provision of young people's sexual health clinics linked to educational institutions. However, the Sex Education forum (Emmerson, 2008 and 2007) carried out a national mapping survey of sexual health services in educational settings. Findings showed that 29% of secondary schools have on-site sexual health services, with pupil referral units providing a greater level of on-site services (34.4%). However, a much larger proportion (72%) of further education settings, including sixth-forms provided some sexual health service for their students.

3 Methodology

3.1 Search strategy

Systematic searches of electronic databases and websites were undertaken to identify studies that examined the effectiveness and/or cost-effectiveness of alcohol education and/or SRE delivered in isolation or as part of a wider programme of study such as PSHE or its equivalents. Searches were conducted across a range of health, education and social care databases as shown in Box 3.1.

Box 3.1. Health, education and social care databases

- ASSIA (Applied Social Science Index and Abstracts)
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Database of Abstracts of Reviews of Effectiveness (DARE)
- The Cochrane Library
- EMBASE
- ERIC
- British Education Index
- Australian Education Index
- HMIC (or Kings Fund catalogue and DH data)
- MEDLINE
- PsycINFO
- Sociological Abstracts
- Social Science Citation Index
- EPPI Centre databases
- The Campbell Collaboration
- C2-SPECTR & C2-PROT Campbell Collaboration

Economic evaluation studies were identified by searching the following major health economics databases:

- NHS Economic Evaluations Database (NHS EED)
- EconLit

3.2 Inclusion and exclusion criteria

3.2.1 Population

Studies were eligible for inclusion if they included children aged 11 to 19 years old in full time education. This included children in secondary schools, sixth form and further education colleges and those receiving education outside of a mainstream school setting including:

- Children receiving home education
- Children receiving education in pupil referral units

Studies were eligible for inclusion if they were undertaken in the UK, Western Europe, Australia, New Zealand, Canada and the USA.

3.2.2 Interventions

Studies were eligible for inclusion if they examined interventions that focused on SRE and/or alcohol education. Relevant intervention approaches included:

- Interventions and programmes agreed, planned or delivered by teachers or other professionals
- Interventions and programmes planned and/or delivered by external agencies and individuals
- Intervention involving the 'informal' and extended school curriculum
- Peer led education

3.2.3 Comparator(s)

Studies were eligible for inclusion if they compared the intervention of interest against a no intervention control or against another intervention approach.

3.2.4 Outcomes

Studies from outside of the UK were eligible for inclusion only if they examined the primary outcome of interest:

- Health and social outcomes relating to alcohol use and sexual health

The following secondary outcomes were assessed but, unless the study was conducted in the UK, only where a study reported primary outcomes of interest:

- Knowledge and understanding
- Personal and social skills
- Attitudes and values

3.2.5 Study design

Systematic reviews, randomised controlled trials, controlled non-randomised studies and, controlled before and after studies that compared a school-based intervention against no intervention or another type of intervention were eligible for inclusion in the assessment of effectiveness.

Studies were eligible for inclusion in the assessment of cost-effectiveness if they were economic evaluations conducted alongside trials, modelling studies and analyses of administrative databases. Only full economic evaluations that compared two or more options and considered both costs and consequences (including cost-effectiveness, cost utility and cost-benefit analyses) were included.

3.3 Data extraction strategy

All titles and abstracts retrieved were screened independently by two reviewers (LJ, GB, JD, HS, KS) according to the inclusion/exclusion criteria described above. Disagreements were resolved through consensus and where necessary a third reviewer was consulted. Relevant articles were retrieved in full and full text screening was undertaken independently by two reviewers (LJ, GB, HS, OW).

One reviewer (LJ, GB, HS, OW) independently extracted and assessed the quality of the individual studies into an Access database. All data extraction and quality assessment were independently checked for accuracy by a second reviewer. The results of the data extraction are presented in an addendum to this report.

3.4 Quality assessment strategy

The quality of the studies was assessed according to criteria set out in the NICE Centre for Public Health Excellence Methods Manual (2009). Each of the effectiveness and cost-effectiveness studies was graded using a code, ++, + or – based on the extent to which the potential sources of bias had been minimised:

- ++ All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions are thought very unlikely to alter.
- + Some of the criteria have been fulfilled. These criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.
- - Few or no criteria have been fulfilled. The conclusions of the study are thought likely or very likely to alter.

Results of the quality assessment are presented in Appendix 4 and 5.

3.5 Methods of analysis/synthesis

3.5.1 Effectiveness studies

The results of the data extraction and quality assessment for each study of effectiveness are presented in structured tables and as a narrative summary. The possible effects of study quality on the effectiveness data and review findings are also discussed within the text of the review.

Studies are grouped according to intervention focus (e.g. alcohol, substance use, abstinence) and for alcohol studies by approach (e.g. single session, classroom-based) and the outcomes examined. Where sufficient data were available, intervention effect sizes have been calculated and presented as odds ratios (OR) for dichotomous data and as mean differences for continuous data. Where study authors reported intervention effect sizes, these have been extracted directly as risk ratios (RR) or OR

as reported in the original publication. Forest plots were generated for single studies using RevMan (version 5) and are presented in an addendum to this report. Heterogeneity between the included studies was assessed by considering differences in (a) the study population, (b) intervention approach, (c) outcome measures, and (d) study quality. However, given the anticipated heterogeneity between the included studies it was judged to be unlikely that pooling would be appropriate or feasible.

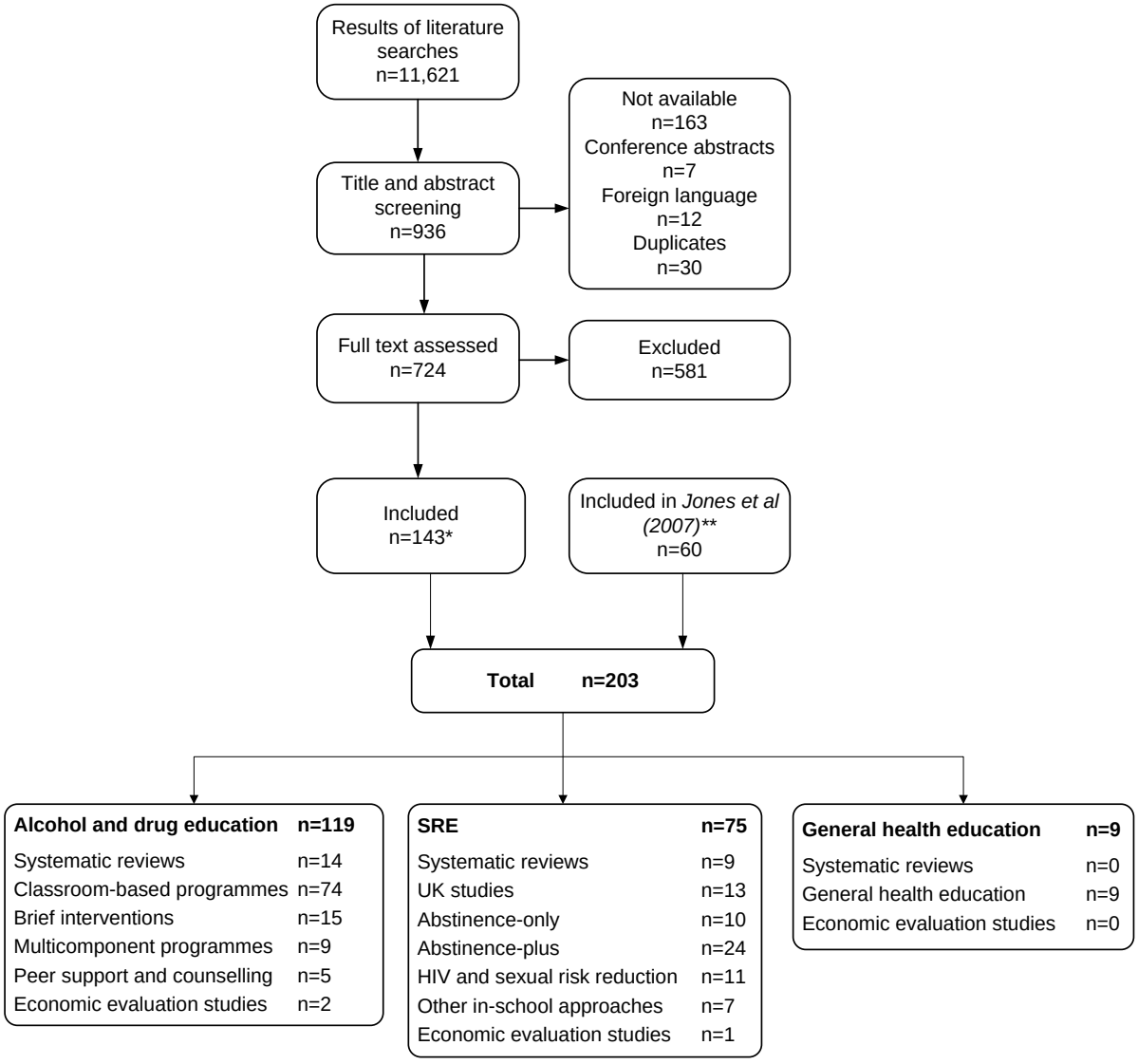
3.5.2 Published economic evaluations

Details of each identified published economic evaluation, together with a critical appraisal of its quality were presented in structured tables and as a narrative summary. For economic studies conducted alongside trials, the validity of the included studies was assessed by considering the source of the resource use and effectiveness data, the methods used to measure and calculate costs, the methods of analysis used and the generalisbility of the results to the UK population.

4 Summary of study identification

4.1 Review of effectiveness and cost-effectiveness

A total of 11,621 references were identified from the literature searches. Following screening of titles and abstracts, 936 articles were identified as potentially relevant and attempts were made to source the full text articles. Of these articles, 163 were not available, seven were conference abstracts and 12 were foreign language articles. These studies were therefore not subject to further screening and a total of 724 full-text articles were screened against the inclusion criteria for the study. The process of study selection is summarised in Figure 1.



*Includes a further 49 studies included in *Jones et al (2007)*

**Not identified in the literature searches conducted for this review

Figure 4.1. Process of study selection

4.1.1 Included studies

A total of 143 articles met the criteria for inclusion. A further 60 articles that were included in a systematic review of the effectiveness and cost-effectiveness of interventions in primary and secondary schools to prevent and/or reduce alcohol use, previously conducted by the lead author and colleagues (Jones et al., 2007), but not identified in the searches conducted for this review, also met the criteria for inclusion. Therefore a total of 203 articles were identified for inclusion in the review of effectiveness and cost-effectiveness. Of these, 119 articles focused on alcohol and drug education programmes, 75 articles focused on sex and relationships education and the remaining nine articles examined general education programmes which targeted both alcohol, and sex and relationships. Twenty-three articles were systematic reviews and/or meta-analyses, 152 studies were based on experimental designs of which 111 used random assignment. Twenty-five observational studies were identified for inclusion including 22 controlled before and after (CBA) studies, two interrupted time series (ITS) and one uncontrolled before and after study[1] (UBA). Three economic evaluation studies were also identified.

Table 4.1. Summary of study designs identified for inclusion

Section	Total	SR/MA	RCT	NRCT	CBA	Other	Economic evaluation
Alcohol	119	14	72	19	12	0	2
SRE	75	9	31	22	9	3*	1
General	9	-	8	-	1	0	-
Total	203	23	111	41	22	3	3
*one UBA study and two ITS							

4.1.2 Excluded studies

A total of 581 articles did not meet the criteria for inclusion in the review and were excluded for the following reasons:

- Study design did not meet design criteria for inclusion in the review, n=320
- Population targeted by the intervention(s) did not meet the review criteria, n=202
- Intervention examined was not based in a school setting, n=38
- Intervention or intervention was not alcohol education or SRE related, n=17
- Intervention targeted at risk or high risk population, n=4

References for the excluded studies are presented in Appendix 2.

[1] This study was included because it was related to two UK-based RCTs of the RIPPLE programme.

5 Alcohol and drug education programmes

A total of 119 articles met the criteria for inclusion in the review of alcohol and drug education programmes. Fourteen articles were systematic reviews and meta-analyses, 103 articles reported on the evaluation of an alcohol or substance use education programme, and two articles were economic evaluation studies. Of the 103 articles, 74 reported on evaluations of classroom-based programmes; 20 of which were alcohol specific, and 54 of which focused on substance use including alcohol. Also identified were 15 articles that reported on evaluations of brief or single session interventions, nine articles reporting on two multicomponent school- and community-based programmes and five articles reporting on evaluations of peer support and/or counselling programmes.

5.1 Systematic reviews and meta-analyses

5.1.1 Overview of evidence identified

Fourteen systematic reviews and meta-analyses were identified for inclusion, which examined interventions targeting alcohol and other substance use.

5.1.2 Quality assessment

Four reviews (Foxcroft et al., 2002; White et al., 2004; Spoth et al., 2008; Gottfredson & Wilson, 2003) were rated good quality (++ rating), eight reviews (Coggans et al., 2003; Dusenbury et al., 1997; Loveland-Cherry, 2003; Skara & Sussman, 2003; Tobler, 1993; Tobler et al., 1997, 2000; Werch & Owen, 2002) were rated moderate quality (+ rating) and the remaining two reviews (Bruvold, 1990; Cuijpers, 2002) were rated poor quality (- rating). All 14 reviews addressed an appropriate and clearly focused question, but descriptions of the methodology used were poorly reported in four reviews (Bruvold, 1990; Coggans et al., 2003; Cuijpers, 2002; Dusenbury et al., 1997) as details about data extraction and quality assessment were not reported. In one review (Bruvold, 1990), details were also lacking on how studies were located for inclusion and so it was not possible to determine whether the literature review was sufficiently rigorous. For four further reviews (Cuijpers, 2002; Tobler, 1993; Tobler et al., 1997, 2000) details of the literature search were poorly reported. Five reviews (Foxcroft et al., 2002; Loveland-Cherry, 2003; Tobler et al., 1997, 2000; Gottfredson and Wilson, 2003) fully assessed and took study quality into account when reporting findings and this was judged to have been adequately done in four further reviews (Dusenbury et al., 1997; Tobler, 1993; White et al., 2004; Spoth et al., 2008). The remaining reviews (Bruvold, 1990; Coggans et al., 2003; Cuijpers, 2002; Skara & Sussman, 2003; Werch & Owen, 2002) did not adequately assess study quality. The majority of the reviews presented findings in a narrative synthesis, and of the studies that statistically combined studies the methods used appeared to have been suitable.

5.1.3 Findings

5.1.3.1 Classroom-based programmes

Seven reviews (Loveland-Cherry, 2003; Tobler, 1993; Tobler et al., 1997, 2000; Cuijpers, 2002; Gottfredson and Wilson, 2003) examined the effectiveness of school-based programmes delivered within classroom-based curriculums. Four articles were identified that reported on a series of meta-analyses undertaken by Tobler (1993; Tobler et al., 1997; Tobler et al., 2000; Black et al., 1998).

Loveland-Cherry (2003) reported that among programmes that lasted for three months or less, decreases in potential drinking were reported. However, overall the author reported that the effects of the programmes examined were inconsistent, relatively small and short-lived, and that few studies demonstrated long-term results. The most recent meta-analysis undertaken by Tobler and colleagues (2000; SR +) reported that for programmes targeting alcohol use, there was a small, but nonsignificant difference between non-interactive and interactive programmes, in favour of interactive programmes. In a subset of high-quality programmes, the difference between non-interactive and interactive programmes targeting alcohol was found to be significantly in favour of interactive programmes. Based on the evidence reviewed, Cuijpers (2002) proposed evidence-based quality criteria for drug prevention programmes. They stated that programmes should be based on well-designed scientific research demonstrating effectiveness, use interactive delivery methods, be based on the social influence model and focus on normative education, commitment not to use substances, and intentions not to use. In addition, the authors reported that adding community interventions, life-skills training and/or the use of peer leaders strengthened the effects of school-based interventions. Gottfredson and Wilson (2003) combined data from 94 studies of school-based prevention activities. Assessment of the relationship between programme effectiveness and age, suggested an advantage for programmes delivered to middle/junior high school students (equivalent to ages 11-15 years) compared to programmes targeting elementary or senior school age students (although the difference was not statistically significant). Neither programme length nor duration was found to be predictive of student outcomes. Examination of providers revealed a positive benefit of the involvement of peers as leaders but this benefit disappeared in studies which combined peer and teacher involvement.

5.1.3.2 Multicomponent programmes

Five reviews (Dusenbury et al., 1997; Foxcroft et al., 2002; Gottfredson & Wilson, 2003; Skara & Sussman, 2003; Spoth et al., 2008) examined the effects of a range of substance use prevention programmes. Two reviews (Foxcroft et al., 2002; Spoth et al., 2008) specifically focused on interventions aimed at the prevention or reduction of alcohol use.

Foxcroft et al (2002) reported that it was difficult to draw firm conclusions about the effectiveness of interventions delivered over the short- and medium-term because of mixed findings. Three programmes were found to have long-term effects on alcohol use, Botvin's Life Skills Training (LST), a culturally tailored curriculum for Native Americans and the family-based Strengthening Families Programme. The Strengthening Families Programme was highlighted as showing particular promise as an effective intervention. Based on a reanalysis of data to account for participants lost to follow-up,

the authors calculated a number needed to treat (NNT) of 9 for three alcohol use behaviours: ever used alcohol (95% CI: 5 to ∞), ever used alcohol without permission (95% CI: 5 to 160), and ever been drunk (95% CI: 5 to 327). This indicated that for every nine individuals who received the intervention, 4 years later there would be one fewer young person reporting that they had ever used alcohol, used alcohol without permission or ever been drunk. Ten drug prevention curricula were included in the review by Dusenbury and colleagues (1997). The authors reported that the substance use curricula reviewed had been shown to effectively reduce substance use, and that in particular LST has been shown to have effects into young adulthood. Six curricula (Alcohol Misuse Prevention Project, Growing Healthy, Know Your Body, LST, Project Northland and STAR) were shown to have intervention effects lasting for at least two years after the pretest. The authors report that two programmes (Project Alert and DARE) did not appear to have sustained effects on drug use, although they had variable success at reducing substance use in the short-term. Skara and Sussman (2003) reported very little data that was specific to alcohol use, but two studies that reported on the Healthy School and Drugs Project and the Midwest Prevention Project, respectively, provided sufficient information for the calculation of the percentage reduction in weekly alcohol use rates from baseline to follow-up (for experimental conditions relative to control conditions). Long-term reductions were 6.9% and 11.7% for the two programmes, respectively. Of six studies assessing alcohol or cannabis use, the authors reported that five had maintained long-term reductions in alcohol use at the end of the study period. Spoth et al (2008) examined the literature on preventive interventions for underage drinking. Forty-one interventions met the criteria for inclusion in the review; 12 met the criteria for "most promising" evidence and 29 met the criteria for "mixed or emerging" evidence. For young people aged 10-15 years eight school-based or multicomponent interventions were highlighted as "most promising": Keepin it REAL, Midwest Prevention Project, Project Northland, BiCultural Competence Skills programme, Healthy School and Drugs, LST, Project ALERT, School Health and Harm Reduction Project.

5.1.3.3 Specific intervention approaches

Bruvold (1990) and Coggans et al (2003) reviewed the effectiveness of specific intervention approaches, the California school-based risk reduction programme and Botvin's Life Skills Training (LST) programme, respectively.

Coggan et al (2003) mainly focused on the effects of LST on illicit drug use outcomes. The authors commented that in terms of alcohol use, effects of the LST programme "can be positive if relatively modest in scale" but that completeness of delivery and fidelity were important in maximising the effects of LST. The authors also reported that there was some evidence that the positive impact of LST on alcohol and smoking could reduce likelihood of progression to illicit drug use, but that the evidence was not conclusive. The authors also reported that a well-implemented LST programme could positively affect knowledge, attitudes and behaviour with respect to alcohol use. Bruvold (1990) calculated study effect sizes for alcohol behavioural outcomes. Programmes based on rational theory were found to have a smaller effect on alcohol use behaviours than programmes based on developmental theory (effect size [ES] 0.02 vs. 0.20, respectively). However, given the small number

of developmental-based programmes included in the meta-analysis (n=2) the authors stated that this result should be interpreted with caution.

5.1.3.4 Other reviews

Two reviews examined other aspects of the effectiveness of alcohol and drug education programmes. Werch and Owen (2002) undertook a systematic analysis of published studies to determine whether iatrogenic effects occurred, and where harmful effects occurred, under what circumstances. White et al (2004) undertook a review of the role of external contributors in delivering substance use education.

Werch and Owen (2002) identified 17 studies for inclusion in their review of iatrogenic programme effects. Of these studies, 47% with negative substance outcomes were focused on the prevention of alcohol use. The alcohol prevention programmes reviewed (n=8) resulted in 19 harmful effects, or an average of 2.4 negative outcomes for every programme. The majority were non-behavioural measures (58%); examples provided by the authors included increased estimates of alcohol offers, pro-alcohol attitudes and increased expectations about drinking in the future. For all programmes overall, the greatest number of negative programme effects was associated with social-influence based programmes (59%), and the next largest harmful were programmes associated with knowledge/attitudes/values models (23%). Werch and Owen (2002) suggested that the social influence-based strategy of teaching students' resistance skills training may be the element of these studies that results in negative effects.

White et al (2004) identified evaluations on the use of 16 different types of external contributors. The authors found that there was no evidence to suggest that any particular agency or external contributor was more effective (in terms of being well received by pupils and teachers and/or leading to knowledge, attitude or behaviour change in the pupils) than any other in providing drug education. There was some evidence that the DARE programme could achieve short-term changes in knowledge, attitudes and behaviour, but that these effects were found to decay rapidly. However, the authors report that police officers could provide a valuable contribution (e.g. bringing specialist knowledge) to drug education when used in a supplementary role. Peer-delivered education, theatre in education and Life Education Centre programmes were evaluated but there was insufficient evidence to judge their effects on behaviour change. The authors reported that programmes delivered by nurses were shown to produce short-term knowledge gains, and to have effects on knowledge and alcohol use for up to 6 months.

5.1.4 Summary and evidence statements

A total of 14 systematic reviews and meta-analyses were identified for inclusion. The majority of the reviews identified examined the effectiveness of programmes targeting substance use including alcohol, and only three reviews (Foxcroft et al., 2002; Loveland-Cherry, 2003; Spoth et al., 2008) focused specifically on the prevention of alcohol use.

Foxcroft et al (2002) found that there was no consistent evidence to determine which programmes were effective over the short to medium-term, but highlighted three programmes which were effective over the longer term. These included the family-based, Strengthening Families programme, and two

school-based programmes, Botvin's LST and a culturally-focused curriculum for Native American students. Spoth et al (2008) highlighted promising evidence from six additional programmes, Keepin it REAL, the Midwest Prevention Project, Project Northland, Healthy School and Drugs, Project ALERT, and the School Health and Harm Reduction Project. Two reviews (Cuijpers, 2002; Gottfredson and Wilson, 2003) identified evidence to suggest that peer leaders strengthened the effects of school-based interventions, although Gottfredson and Wilson (2003) found that any beneficial effects of peer involvement were lost when they were combined with teacher-led activities. White et al (2004) did not find any evidence to suggest that any particular agency or external contributor was more effective than another.

Evidence statement 1

1 (c) There is strong evidence from two systematic reviews[1] to suggest that a secondary-level school-based programme, Botvin's LST, can produce long-term reductions (greater than 3 years) in alcohol use. Other promising intervention approaches include: Keepin it REAL, the Midwest Prevention Project, Project Northland, Healthy School and Drugs, Project ALERT, and the School Health and Harm Reduction Project.

1 (d) There is moderate evidence from two systematic reviews[2] to suggest that programmes delivered by peer leaders may be more beneficial than programmes delivered by teachers or other contributors. However, there is strong evidence from one systematic review[3] to suggest that the positive benefits of peer involvement may disappear if teachers were also involved in delivery.

[1] Foxcroft et al., 2002; 2003 (SR ++); Spoth et al., 2008 (SR ++)

[2] Gottfredson and Wilson, 2003 (SR ++); Cuijpers, 2002 (SR -)

[3] Gottfredson and Wilson, 2003 (SR ++)

Table 5.1. Alcohol education: systematic reviews and meta-analyses

Author (Year)	Design	Inclusion/exclusion	Number of studies	Findings
Bruvold 1990	SR -	Outcome evaluations of Californian programmes delivered to 4th to 8th graders	8 studies	Programmes based on rational model had more impact on knowledge (ES = 0.61) than developmental programmes (ES = 0.26); less effect on attitudinal outcomes (ES = -0.01; 0.04). Rational based programmes had less of an effect on alcohol use behaviours than developmental programmes (ES = 0.02 vs. 0.20).
Coggan et al., 2003	SR +	Evaluations of Botvin's LST programme	45 reports	The authors reported that there was some evidence that positive impact of LST on alcohol and smoking could reduce likelihood of progression, but the data were not conclusive. A well-implemented LST programme can positively affect knowledge, attitudes and behaviour with respect to smoking and alcohol use.
Cuijpers 2002	SR -	Universal school-based drug prevention aimed at tobacco, alcohol and illegal drugs	30 studies	Evidence-based quality criteria for programmes proposed, see evidence table for full details.
Dusenbury et al., 1997	SR +	Primary prevention of alcohol and/or drug use; classroom-based curricula	47 programmes	Eight programmes were shown to be effective at reducing tobacco or drug use in at least some studies. LST has been shown to have effects into young adulthood. In addition, six curricula (Alcohol Misuse Prevention Project, Growing Healthy, Know Your Body, LST, Project Northland and STAR) were shown to have intervention effects lasting for at least two years after the pretest. Project Alert and DARE did not appear to have sustained effects on drug use
Foxcroft et al., 2002, 2003	SR ++	Psychosocial and educational interventions aimed at the primary prevention of alcohol misuse by young people aged up to 25 years	56 studies	Twenty studies demonstrated evidence of ineffectiveness. No firm conclusions about the effectiveness of prevention in the short and medium-term were possible. But over the longer term (>3 years), the Strengthening Families Programme showed more promise as an effective prevention intervention.
Gottfredson & Wilson, 2003	SR ++	Interventions to reduce problem behaviours that measured effects on alcohol and other drug use	94 studies	Reported an advantage for programmes delivered to middle/junior high school students (equivalent to ages 11-15 years) compared to programmes targeting elementary or senior school age students (although the difference was not statistically significant). Neither programme length nor duration was found to be predictive of student outcomes. Positive benefit of peer involvement, but this disappeared when combined with teacher involvement.
Loveland-Cherry, 2003	SR +	Interventions that prevent alcohol use in children and adolescents.	73 studies	Overall the effects of the programmes were inconsistent, relatively small and short lived. Few studies have demonstrated long-term results. An increase in alcohol knowledge was reported by several studies.

Author (Year)	Design	Inclusion/exclusion	Number of studies	Findings
Skara and Sussman 2003	SR +	Controlled evaluations of school- and community-based prevention programmes providing at least a 2-years follow-up.	25 studies	Very little data specific to alcohol use. Two studies provided sufficient information for calculation of the % reduction in weekly alcohol use rates from baseline to follow-up; long-term reductions were 6.9 and 11.7%, respectively.
Spoth et al., 2008	SR ++	Interventions that reduce problem behaviours in children and include outcomes related to substance use	41 studies	Eight school-based or multicomponent interventions were highlighted as "most promising": Keepin it REAL, Midwest Prevention Project, Project Northland, BiCultural Competence Skills programme, Healthy School and Drugs, LST, Project ALERT, School Health and Harm Reduction Project.
Tobler 1993; Tobler et al. 1997, 2000, Black et al., 1998	SR +	School-based drug prevention programmes	207 programmes	Small, but nonsignificant difference between non-interactive and interactive programmes, in favour of interactive programmes. In a subset of high-quality programmes, the difference between non-interactive and interactive programs targeting alcohol was found to be significantly in favour of interactive programmes.
Werch and Owen 2002	SR +	Programmes aimed at either slowing onset of substances, or reducing use;	17 studies	Alcohol prevention programmes (n=8) resulted in 19 harmful effects, or an average of 2.4 negative outcomes for every programme. The majority were non-behavioural measures (58%).
White et al., 2004	SR ++	Studies that evaluated the contribution of external contributors to classroom-based interventions or targeted groups within the school context/curriculum	114 reports	No evidence to suggest that any particular agency or external contributor was more effective (in terms of being well received by pupils and teachers and/or leading to knowledge, attitude or behaviour change in the pupils) than any other.

5.2 Classroom-based programmes: alcohol specific

5.2.1 Overview of evidence identified

Twenty articles were identified for inclusion that reported on the evaluation of 12 alcohol education programmes across 15 studies. Three articles (McBride et al., 2000, 2003, 2004) examined the effectiveness of the School Health and Alcohol Harm Reduction Project (SHAHRP) across the same sample of students and were grouped together as a single study. In addition, five articles (Hansen & Graham, 1991; Donaldson et al., 1995; Donaldson et al., 2000; Palmer et al., 1998; Kreft, 1998) examined the effectiveness of the Adolescent Alcohol Prevention Trial (AAPT) curriculum across the same sample of 11,995 students. Hansen and Graham (1991) examined data from students who received the main programme in seventh grade, and two further articles (Kreft 1998; Palmer et al., 1998) reanalysed data for this sample. These three articles were grouped as one study and two articles by Donaldson et al (1995, 2000), which examined data for the whole sample of students, were grouped as a second study of the AAPT. A summary of the programme content across the 15 studies identified is presented in Table 5.2.

Eight studies were conducted in the USA, four in Australia, and one each in the UK, Germany and Norway. All 12 programmes were primarily classroom-based curriculums; two programmes, Resilient Families (Shortt et al., 2007) and an alcohol education programme (Morgenstern et al., 2009) incorporated materials and activities for parents. Teachers were the sole provider for nine programmes (Alcohol Education Package [Bagnall, 1990]; Project SAAV [Baumann, 2006]; SHAHRP [McBride et al., 2000, 2003, 2004]; two unnamed alcohol education curriculums [Morgenstern et al., 2009; Schnepf, 2002]; Resisting Pressures to Drink and Drive [Newman et al., 1992]; CLIMATE schools [Newton et al., 2009; Vogl et al., 2009]; AMPS [Shope et al., 1994; Shope et al., 1996a]; Resilient Families [Shortt et al., 2007]) and two programmes (Students Against Drink Driving [Klitzner et al., 1994]; and an unnamed alcohol education curriculum [Wilhelmsen et al., 1994]) combined teacher- and peer-led activities. One programme (AAPT [Donaldson et al., 1995, 2000; Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998]) was delivered by external project staff.

The theoretical basis for the programme or intervention was not reported for five programmes. Two programmes, Project SAAV (Baumann, 2006) and Resisting Pressures to Drink and Drive (Newman et al., 1992) were based on a combination of theories. The most commonly applied theory across the 12 programmes was the social influence theory (n=3 programmes). Other theories applied included social learning theory and social cognitive theory.

The number of students recruited for participation across the 15 studies ranged from 45 to over 10,000 students. Evaluation of eight programmes was based on sample sizes of greater than 1,500 students: Alcohol Education Package (Bagnall, 1990); an unnamed alcohol education curriculum (Morgenstern et al., 2009); AMPS (Shope et al., 1994, 1996a); Resilient Families (Shortt et al., 2007); SHAHRP (McBride et al., 2000; 2003; 2004); Resisting Pressures to Drink and Drive (Newman et al., 1992); Students Against Drink Driving (Klitzner et al., 1994); and the AAPT (Donaldson et al., 1995, 2000; Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998).

Table 5.2. Summary of programme content: classroom-based (alcohol specific)

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998	RCT -	USA n=3,011[a] 7th grade	School	**AAPT** : One year programme; Resistance Skills Training + ICU (8 lessons); Normative Education + ICU (8 lessons); Resistance Skills Training + Normative Education (10 lessons)	Social influence theory	Project staff
Donaldson et al., 1995; 2000	RCT -	USA n=11,995[b] 8th grade	School	**AAPT**: One year programme; see Hansen & Graham, 1991 for details	Social influence theory	Project staff
Bagnall, 1990	CBA -	UK n=1,560 12-13 years	School	**Alcohol Education Package**: 4 or 5 social education lessons including group work, optional role play exercises	Social influence theory	Seconded specialist teachers or regular classroom teachers
Shope et al., 1996a	CBA +	USA n=2,031[c] 10th-11th grade	School	**AMPS:** 4 sessions delivered over 4 weeks in first year (5th and 6th grade classes); 3 booster sessions in second year; 5 sessions in 10th grade	Social learning theory	Teachers
Newton et al., 2009	RCT +	Australia n=944 mean 13.1 years	School	**CLIMATE Schools**: Six lessons (40 minutes each); 15-20 min computer-based lesson and classroom based activities	NR	Teachers
Vogl et al., 2009	RCT +	Australia N=1,466 mean 13 years	School	**CLIMATE Schools**: Six-lesson harm minimization course; 15–20-minute computer-based lesson and class activities.	NR	Teachers
Shope et al., 1994	RCT -	USA N=3,704 6th-8th grade	School	**Enhanced AMPS**: 8 sessions in 6th grade; 5 sessions in 7th grade; 4 sessions in 8th grade	Social learning theory	Teachers
Baumann, 2006	RCT -	USA n=256 mean 17.1 years	School	**Project SAAV**: Three sessions (50-minutes each); information and discussion, coping skills, homework assignment	Problem-behaviour theory, self-regulation theory, transtheoretical model of change	Teachers

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Shortt et al., 2007	RCT +	Australia n=2,315 mean 12.3 years	School, family	**Resilient Families**: One year programme; relationship problem solving, communication, emotional awareness, peer resistance skills, conflict resolution, quiz for parents	NR	Teachers
Newman et al., 1992	RCT -	USA n=~3,500 14-15 years	School	**Resisting Pressures to Drink and Drive**: Two year programme, 10 lessons; resistance skills training, video based drama, student workbook	Problem behaviour theory, social cognitive theory, role theory, educational immunization	Teachers
McBride et al., 2000; 2003; 2004	NRCT +	Australia n=2,343 12-13 years	School	**SHAHRP**: 17 consecutive skills-based activities; 12 activities including skill rehearsal, and group decision-making and discussion in second year	Social inoculation	Teachers
Klitzner et al., 1994	CBA +	USA n=4,174 9th-12th grade	School	**Students Against Drink Driving:** Assembly, student committee, 15 session curriculum (10th grade), 'contract for life'	NR	Teachers, Peers
Morgenstern et al., 2009	RCT ++	Germany n=1,686 mean 13 years	School, family	Four class units, a student booklet and a parent booklet; addressed social influences, enhancing motivation to avoid substances, consequences of alcohol use, media/advertising literacy, resistance skills and normative beliefs	NR	Teachers
Schnepf, 2002	NRCT -	USA n=45 mean 15.2 years	School	7 sessions (40 minutes each); peer- vs. teacher-led alcohol education curriculum	NR	Teachers
Wilhelmsen et al., 1994	NRCT -	Norway 7th grade n=915	School	10 lessons over two month; highly role specific vs. less role specific; alcohol use and social traditions, norms for alcohol use, managing drinking pressures, attitudes to alcohol use	Social cognitive theory	Teachers, Peers

[a] Examined data from AAPT students who received the main programme in 7th grade; [b] Examined data for the whole sample of AAPT students; [c] Followed up a sample of students who had received the AMPS curriculum as 6th-8th graders and an additional five sessions in 10th grade.

Eight programmes targeted students aged 14 or younger and of these seven were taught to students aged 12-13 years. Four programmes, Resisting Pressures to Drink and Drive, Students Against Drink Driving, an unnamed alcohol education curriculum (Schnepf, 2002), and Project SAAV were targeted at older adolescents (aged >14 years) and one programme, AMPS, targeted students in the 6th to the 10th grade (11-15 years).

Four programmes were based on immediate post-test follow-up only: Alcohol Education Package, two unnamed alcohol education curriculums (Schnepf, 2002; Wilhelmsen et al., 1994) and the enhanced AMPS (Shope et al., 1994). Five studies (Shortt et al., 2007; McBride et al., 2000, 2003, 2004; Shope et al., 1996a; Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998 Donaldson et al., 1995; 2000) reported on follow-ups greater than 12 months.

5.2.2 Quality assessment

Of the 15 studies identified, nine studies were RCTs, three were non-randomised controlled trials and three were controlled before and after studies. All nine RCTs were based on cluster randomisation. Study quality was mixed across the studies. One study (Morgenstern et al., 2009), an RCT was rated good quality, six studies (Klitzner et al., 1994; McBride et al., 2004; Newton et al., 2009; Shope et al., 1996a; Shortt et al., 2007; Vogl et al., 2009) were rated moderate quality, and eight studies (Bagnall, 1990; Baumann, 2006; Donaldson et al., 2000; Hansen & Graham, 1991; Newman et al., 1992; Schnepf, 2002; Shope et al., 1994; Wilhelmsen et al., 1994) were rated poor quality. All nine RCTs were reported as randomised but only one study (Morgenstern et al., 2009) reported that allocation was concealed appropriately. Outcomes measures were reliable across most of the RCTs and NRCTs, but three studies (Hansen & Graham, 1991; Klitzner et al., 1994; Shope et al., 1996a) either did not report on the validity or reliability of the outcome measures used or this aspect of study design was poorly reported. Important and relevant outcomes were reported across all of the included studies. The baseline comparability of the intervention and control groups was poorly or not reported in eight studies (Shortt et al., 2007; Baumann, 2006; Donaldson et al., 1995, 2000; Newman et al., 1992; Shope et al., 1994; McBride et al., 2000, 2003, 2004; Wilhelmsen et al., 1994; Bagnall, 2003) and in three studies (Bagnall, 2003; Donaldson et al., 1995, 2000; Newman et al., 1992) it was not clear how many participants were assigned to intervention and control groups. Only one study (Morgenstern et al., 2009) reported that an ITT analysis had been undertaken.

5.2.3 Findings

5.2.3.1 Short-term results (<6 months)

Eleven studies (Bagnall, 1990; Donaldson et al.,1995; Baumann, 2006; Klitzner et al., 1994; McBride et al., 2000, 2003, 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Shope et al., 1994; Vogl et al., 2009; Wilhelmsen et al., 1994) reported short-term follow-up data for 10 programmes: Alcohol Education Package, AAPT, Project SAAV, Students Against Drink Driving, SHAHRP, CLIMATE, the AMPS curriculum and three unnamed curricula.

Knowledge and understanding

Seven studies (Bagnall, 1990; McBride et al., 2000, 2003, 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Shope et al., 1994; Vogl et al., 2009) examined short-term intervention effects on knowledge related to alcohol use. Bagnall (1990) reported that the Alcohol Education Package curriculum had no impact on knowledge, but the remaining six studies (McBride et al., 2000, 2003, 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Shope et al., 1994; Vogl et al., 2009) reported that intervention students demonstrated significantly greater alcohol-related knowledge at follow-up than control students.

Attitudes and values

Eight studies (Bagnall, 1990; Baumann, 2006; McBride et al., 2000, 2003, 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Wilhelmsen et al., 1994) examined short-term intervention effects on students' attitudes and values. Of five studies (Bagnall, 1990; Morgenstern et al., 2009; McBride et al., 2000, 2003, 2004; Schnepf, 2002; Wilhelmsen et al., 1994) that examined programme effects on attitudes, three studies (Bagnall, 1990; Morgenstern et al., 2009; Schnepf, 2002) reported no effects on alcohol-related attitudes. McBride et al (2000; 2003; 2004) reported that students who participated in SHAHRP showed significantly safer alcohol-related attitudes and Wilhelmsen et al (1994) found a highly-role specific prevention programme had positive impacts on students' attitudes to abstention. Two studies (Morgenstern et al., 2009; Wilhelmsen et al., 1994) examined intervention effects on students' intentions towards alcohol. Morgenstern et al (2009) reported no intervention impact, but Wilhelmsen et al (1994) found that students who participated in a highly-role specific prevention programme were more likely to report an intention to abstain from alcohol than control students. They also reported high norms to abstain. Three studies (Baumann, 2006; Newton et al., 2009; Vogl et al., 2009) examined changes in alcohol-related expectancies. Baumann (2006) reported that there were no effects of the Project SAAV programme on alcohol-related expectancies. Two studies (Newton et al., 2009; Vogl et al., 2009) which examined the Clinical Management and Treatment Education (CLIMATE) schools model, based around a computerised harm minimisation course, reported conflicting results. Vogl et al (2009) found that the increase in positive alcohol-related expectancies was significantly less for females in CLIMATE schools compared to control females ($p<0.001$), and that boys in CLIMATE schools reported a decrease on this measure compared to an increase among control males ($p<0.01$). Newton et al (2009), who reported on a cross-validation of the study by Vogl et al (2009) found no difference in alcohol-related expectancies between CLIMATE schools and control schools.

Personal and social skills

One study (Klitzner et al., 1994) examined the effects of a programme designed to address drinking and driving, on drinking and driving behaviour. At post-test, Klitzner et al (1994) found that the intervention had no impact on an index of driving while intoxicated or riding with impaired drivers.

Health and social outcomes relating to alcohol use and sexual health

Eleven studies (Bagnall, 1990; Donaldson et al., 1995; Baumann, 2006; Klitzner et al., 1994; McBride et al., 2000, 2003, 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Shope et al.,

1994; Vogl et al., 2009; Wilhelmsen et al., 1994) reported short-term follow-up data related to alcohol use for 10 programmes.

Six studies (Bagnall, 1990; Baumann, 2006; Donaldson et al., 1995; McBride et al., 2000, 2003, 2004; Newton et al., 2009; Wilhelmsen et al., 1994) reported on programmes that demonstrated evidence of reducing alcohol use. Students who participated in the first year of the SHAHRP programme (McBride et al., 2001, 2003, 2004) consumed significantly less alcohol overall and per occasion than students in the control groups. Intervention students who received the Alcohol Education Package (Bagnall, 1990) were significantly less likely than students in the control group to have drunk alcohol in the last 7 days, but the intervention had no impact on frequency of use. Students participating in Project SAAV (Baumann, 2006) reported drinking less frequently over time than controls. Donaldson et al (1995) reported a positive relationship between participation in a seventh grade refusal skills programme, but the relationship was only significant among students who believed it was not acceptable to drink at baseline. Among students in CLIMATE schools who participated in a computerised harm minimisation programme (Newton et al., 2009), average alcohol consumption decreased over the short-term compared to an increase among control students. However, another study of the CLIMATE schools programme by Vogl et al (2009) found no short-term effects of the programme on alcohol consumption. Students who received a highly-role specific programme (Wilhelmsen et al., 1994) reported drinking less than both control students and students who received a less-role specific programme. There were no differences observed between students who received the less-role specific programme and control students. Four studies (Klitzner et al., 1994; Morgenstern et al., 2009; Shope et al., 1994; Schnepf, 2002) reported on programmes that had no effects on alcohol use in young people.

Eight studies examined intervention effects on measures of excessive alcohol consumption. Five studies (Bagnall, 1990; Newton et al., 2009; Schnepf, 2002; Shope et al., 1994; Vogl et al., 2009) found no intervention effects of excessive and problem drinking. Baumann (2006) reported that compared to students in the control groups, students participating in Project SAAV reported binge drinking less frequently over time and SHAHRP students (McBride et al., 2000, 2003, 2004) were significantly less likely than comparison students to report consuming alcohol to harmful or hazardous levels[2] once a month or more. Morgenstern et al (2009) found that there was no statistically significant effect of the intervention on lifetime drunkenness, but that intervention students were significantly less likely than control students to report life-time binge drinking.

Five studies (Bagnall, 1990; Baumann, 2006; McBride et al., 2000, 2003, 2004; Newton et al., 2009; Vogl et al., 2009) examined harms resulting from alcohol use. Two studies (Newton et al., 2009; Vogl et al., 2009) that examined the impact of the CLIMATE schools programme found no intervention effects on harm associated with students' own use of alcohol. SHAHRP students reported less harm associated with their own use of alcohol over the previous 12 months compared to the comparison group (McBride et al., 2000, 2003, 2004). Bagnall (1990) found that there was no difference in the number of intervention and control students reporting that they had ever had a hangover or an

[2] Defined as consuming more than 2 (for females) or 4 (for males) standard drinks (10g alcohol) per occasion.

alcohol-induced stomach upset. Baumann (2006) reported that students participating in Project SAAV had fewer alcohol-related consequences than control students.

5.2.3.2 Medium-term results (up to 12 months)

Seven studies (Donaldson et al., 2000; Hansen & Graham, 1991; Klitzner et al., 1994; Morgenstern et al., 2009; Newman et al., 1992; Newton et al., 2009; Vogl et al., 2009) reported medium-term follow data for five programmes: AAPT, Students Against Drink Driving, an alcohol education intervention, Resisting Pressures to Drink and Drive, and CLIMATE schools.

Knowledge and understanding

Four studies (Morgenstern et al., 2009; Newman et al., 1992; Newton et al., 2009; Vogl et al., 2009) examined medium-term intervention effects on alcohol-related knowledge. Two studies (Morgenstern et al., 2009; Newman et al., 1992) reported positive intervention effects on knowledge , and two studies (Newton et al., 2009; Vogl et al., 2009) found that despite finding short-term effects, there were no medium-term effects on knowledge for the CLIMATE schools programme.

Attitudes and values

Three studies (Morgenstern et al., 2009; Newton et al., 2009; Vogl et al., 2009) examined medium-term intervention effects of alcohol-related attitudes and values. Morgenstern et al (2009) found that an alcohol education intervention did not impact on alcohol attitudes or intentions. Two studies (Newton et al., 2009; Vogl et al., 2009) that examined a computerised harm minimisation intervention (CLIMATE schools programme) reported conflicting medium-term results on alcohol-related expectancies. Vogl et al (2009) reported that although expectancies increased over time in both the intervention and control group, the increase among intervention females was smaller. At 12-month follow-up, both males and females in the intervention group did not report as great an increase in positive alcohol-related expectancies as did students in the control group. At 6-month follow-up, in a cross-validation of this study, Newton et al (2009) reported no intervention effects on alcohol-related expectancies.

Personal and social skills

Two studies (Klitzner et al., 1994; Newman et al., 1992) of two drink driving programmes examined intervention effects on outcomes related to drinking and driving. At the 1-year follow-up, there were no effects of the Students Against Drink Driving programme (Klitzner et al., 1994) on an index of driving while intoxicated or riding with impaired drivers. The second study, of the Resisting the Pressures to Drink and Drive curriculum (Newman et al., 1992), found that although the number of times students had ridden with a drinking driver in the last 30 days increased in both the intervention and control groups, the increase among intervention students was significantly less.

Health and social outcomes relating to alcohol use and sexual health

Seven studies (Donaldson et al., 2000; Hansen & Graham, 1991; Klitzner et al., 1994; Morgenstern et al., 2009; Newman et al., 1992; Newton et al., 2009; Vogl et al., 2009) examined medium-term intervention effects on health outcomes related to alcohol use. Three studies (Hansen & Graham

1991; Donaldson et al., 2000; Kreft 1998) reported 1-year follow-up data for the AAPT. One study (Hansen & Graham, 1991) reported that students who received normative education had lower rates of alcohol consumption, although based on analyses conducted at the classroom level (Kreft, 1998) the programme (including the normative education component) was shown to not be effective. In a second study of the AAPT (Donaldson et al., 2000), lower rates of lifetime and 30-day alcohol consumption were only found among a subgroup of public school students who received the normative education component. Three further programmes were shown to have no medium-term effects on alcohol use: Students Against Drink Driving (Klitzner et al., 1994); an alcohol education intervention (Morgenstern et al., 2009); and Resisting Pressures to Drink and Drive (Newman et al., 1992).

Inconsistent results were found for the harm minimisation intervention examined in the CLIMATE school programme (Newton et al., 2009; Vogl et al., 2009). Vogl et al (2009) reported that among females, average alcohol consumption remained relatively constant between baseline and 6-month follow-up for the intervention group and increased in the control group ($p<0.001$ for comparison). At 12 months, control group students reported a greater increase in average alcohol consumption compared to the intervention group ($p<0.05$ for comparison). For boys there were no significant differences between intervention groups. Lack of significant effects was also noted in the cross-validation study by Newton et al (2009); finding no significant difference in average weekly alcohol consumption between intervention and control groups at the 6-month follow-up.

Four studies (Donaldson et al., 2000; Morgenstern et al., 2009; Newton et al., 2009; Vogl et al., 2009) examined medium-term intervention effects on excessive alcohol consumption. Morgenstern et al (2009) found that although the alcohol education curriculum examined did not impact on lifetime drunkenness (adjusted OR 0.77 95% CI: 0.52, 1.12), intervention students were significantly less likely than control students to report lifetime binge drinking (adjusted OR 0.74; 95% CI 0.57, 0.97). Donaldson et al (2000) reported an impact of the AAPT on drunkenness; students who attended public schools and who received the normative education component of the intervention reported lower rates of drunkenness. Two studies (Vogl et al., 2009; Newton et al., 2009) of the CLIMATE schools alcohol programme examined intervention impact on harms arising from students' alcohol use. At 6-month follow-up (Vogl et al., 2009; Newton et al., 2009) there were no differences in the number of harms experienced between intervention and control students, however, at the 12-months follow-up (Vogl et al., 2009) females in the intervention group had significantly less of an increase in harm than the control students ($p<0.05$).

5.2.3.3 Long-term (>12 months)

Long-term follow-up data were reported for four programmes: AAPT (Donaldson et al., 2000; Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998); SHAHRP (McBride et al., 2000, 2003, 2004); AMPS (Shope et al., 1996a); and Resilient Families (Shortt et al., 2007).

Knowledge and understanding

Two studies (McBride et al., 2004; Shope et al., 1996a) reported on long-term intervention effects on knowledge. McBride et al (2004) found that impacts on alcohol-related knowledge among students who participated in SHAHRP were not maintained 17-months later. A study based on data from a sample of students who had received the AMPS curriculum as sixth through eighth graders and additional sessions in 10th grade (Shope et al., 1996a) found that intervention students had significantly more alcohol-related knowledge than comparison students at the end of 12th grade.

Attitudes and values

Positive effects of the SHAHRP programme on alcohol-related attitudes were shown to have been maintained to the end of the study, 17 months after the final phase of the intervention (McBride et al., 2004).

Personal and social skills

None of the included studies examined long-term programme effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Shope et al (1996a) followed up high school-aged students who had received the AMPS curriculum in sixth grade. Delivery of the sixth grade curriculum had no long-term effects on alcohol use in high school, and following delivery of a tenth grade curriculum, there were no differences in alcohol use between intervention and comparison students at follow-up two years later in 12th grade. At the final follow-up of the SHAHRP programme, 17 months after delivery, McBride et al (2004) reported that the total amount of alcohol consumed by intervention and comparison students was beginning to converge (significance not reported) and the short-term effects of the intervention on alcohol use were not maintained. Palmer et al (1998) examined the long-term effects of the AAPT curriculum. Normative education was found to be more effective than information only control in terms of reducing alcohol use, two years after delivery of the programme. A second study that examined the AAPT curriculum (Donaldson et al., 2000) found that, for a sample of students attending public schools, those who received normative education reported significantly lower scores on the alcohol index measure and significantly lower rates of lifetime alcohol use in the ninth and tenth grades (2- and 3-year follow-ups, respectively) and lower rates of 30-day alcohol use in the tenth grade compared to students receiving comparison interventions. Shortt et al (2007) found that the Resilient Families intervention had no effects on alcohol use status. Three studies (Donaldson et al., 2000; McBride et al., 2004; Shope et al., 1996a) reported long-term intervention effects on measures of excessive drinking. Donaldson et al (2000) found that the normative education component of the AAPT programme was associated with lower rates of drunkenness among students attending public schools at the 2-year but not the 3-year follow-up, when students were in 10th grade. Following delivery of the AMPS tenth grade curriculum (Shope et al., 1996a), students who received the intervention reported significantly less alcohol misuse than comparison students at the end of twelfth grade. There were no long-term intervention effects of the SHAHRP programme on hazardous or harmful drinking, but intervention students reported experiencing less harm from their drinking than control students.

5.2.4 Summary and evidence statements

Overall, 20 articles were identified for inclusion that reported on the evaluation of 12 alcohol education programmes across 15 studies. The majority of the included studies were conducted in the USA, but four studies were conducted in Australia and one each in the UK, Germany and Norway. All 12 programmes were primarily classroom-based curriculums, but two programmes incorporated additional materials and activities for parents. Programmes were largely teacher-led. However, two programmes, Students Against Drink Driving (Klitzner et al., 1994) and an unnamed alcohol education curriculum (Wilhelmsen et al., 1994) combined teacher- and peer-led activities, and one programme, the AAPT, (Donaldson et al., 1995, 2000; Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998) was delivered exclusively by external project staff. The programmes identified targeted students across a range of age groups; eight programmes targeted students aged 14 or younger and four programmes were targeted at older adolescents.

5.2.4.1 Knowledge and understanding

Eight studies (Bagnall, 1990; McBride et al., 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Newman et al., 1992; Shope et al., 1996a) examined intervention effects on knowledge related to alcohol use. These studies demonstrated that alcohol-specific education programmes generally increased alcohol or curriculum knowledge over the short-term. Effects on medium-term knowledge were weaker across four studies (Morgenstern et al., 2009; Newman et al., 1992; Newton et al., 2009; Vogl et al., 2009) and for two studies that examined programme effects on the long-term acquisition of knowledge, for SHAHRP (McBride et al., 2004) and AMPS (Shope et al., 1996b), results were limited or inconsistent.

5.2.4.2 Attitudes and values

Eight studies (Bagnall, 1990; Baumann, 2006; McBride et al., 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Wilhelmsen et al., 1994) examined young people's alcohol-related attitudes and values. The majority of studies reported no significant programme effects on alcohol-related attitudes. Short-term increases in safer alcohol-related attitudes were reported by Wilhelmsen et al (1994) who examined a highly-role specific programme compared to a less-role specific alcohol programme. Improvements were also found among intervention students in the highly-role specific programme in attitudes towards alcohol abstinence and intentions to abstain from alcohol. The SHAHRP programme (McBride et al., 2004) also had positive short- and long-term effects on students' alcohol-related attitudes. Medium-term effects on attitudes and skills were also mixed. Two studies (Newton et al., 2009; Vogl et al., 2009) of the CLIMATE schools programmes reported conflicting effects on alcohol-related expectancies and another alcohol education intervention (Morgenstern et al., 2009) had no impact on attitudes and values.

5.2.4.3 Personal and social skills

Two studies (Klitzner et al., 1994; Newman et al., 1992) examined short- and medium-term effects of two programmes, which primarily focused on reducing the harm from drinking and driving. There were no short- or medium-term effects of the Students Against Drink Driving programme (Klitzner et al.,

1994) on drink driving measures but a second programme, Resisting the Pressures to Drink and Drive (Newman et al., 1992) reduced the number of students who reported riding with a drinking driver at the medium-term follow-up.

5.2.4.4 Health and social outcomes relating to alcohol use and sexual health

Programme effects on alcohol consumption were examined across all studies. However a range of measures of alcohol consumption were reported across the included studies. Ten studies (Bagnall, 1990; Donaldson et al., 1995; Baumann, 2006; Klitzner et al., 1994; McBride et al., 2000; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Wilhelmsen et al., 1994) that examined short-term effects on alcohol consumption, in general, reported inconsistent findings. The SHAHRP programme (McBride et al., 2004) appeared to have the most consistent effects on short-term alcohol use, and additionally had effects on hazardous/harmful drinking. Seven further studies (Bagnall, 1990; Baumann, 2006; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Shope et al., 1994; Vogl et al., 2009) examined programme impacts on heavy drinking, with two studies (Baumann, 2006; Morgenstern et al., 2009) reporting beneficial effects of Project SAAV and an unnamed alcohol education programme, respectively, on binge drinking. Medium- to long-term effects on alcohol consumption were found to be limited across nine alcohol education programmes (Donaldson et al., 2000; Palmer et al., 1998; Klitzner et al., 1994; McBride et al., 2004; Morgenstern et al., 2009; Newman et al., 1992; Newton et al., 2009; Shope et al., 1994; Shortt et al., 2007; Vogl et al., 2009). There appeared to be long-term effects of the normative education component of the AAPT programme (Donaldson et al., 2000; Palmer et al., 1998), but these findings were limited by the poor quality of the studies that examined this programme. In addition, based on additional analyses conducted using the classroom as unit of analysis, Kreft (1998) concluded the whole programme to be ineffective. Two studies of the CLIMATE schools programme (Newton et al., 2009; Vogl et al., 2009) reported conflicting medium-term effects and 17-months after delivery of the SHAHRP programme (McBride et al., 2004) the positive short-term effects appeared to be declining. Although intervention effects favoured SHAHRP, differences between intervention and control students in terms of their alcohol consumption and other measures of alcohol use including harmful/hazardous drinking were no longer significant. There were no long-term effects of a long-term version of the AMPS programme (Shope et al., 1996a) on alcohol consumption, but there did appear to be intervention effects on alcohol misuse.

Evidence statement 2

2 (f) There is strong evidence from four RCTs, two NRCTs and two CBA studies[1] to suggest that classroom-based alcohol specific programmes are effective at increasing alcohol-related knowledge in the short-term, but have inconsistent or mixed effects on alcohol-related knowledge in the medium- to long-term. Findings may only be partially applicable to the UK as studies were implemented within Australia, Germany and the USA and may not be generalisable beyond the populations studied.

2 (g) Overall, there is inconsistent evidence from four RCTs, three NRCTs and one CBA study[2] to determine the effects of alcohol specific education programmes on attitudes and values relating

to alcohol. However, there is moderate evidence from one NRCT[3] to suggest that programmes based on a harm reduction approach may have positive short- to long-term effects on students' alcohol-related attitudes. In addition, there is weak evidence from one NRCT[4] to suggest that programmes with a high level of role-specification for providers may have short-term positive impacts on attitudes and values.

2 (h) There is inconsistent evidence from one RCT and one CBA study[5] to determine the effects of programmes focusing on reducing the harm from drinking and driving on drink driving measures.

2 (i) There is moderate evidence from five RCTs, three NRCTs and two CBA studies[6] to suggest that alcohol-specific education programmes may have mixed short-term effects on health outcomes relating to alcohol use. One NRCT[7] of a programme focusing on harm reduction through skills-based activities (SHAHRP), showed short-term reductions in alcohol use. In particular effects were seen on risky drinking behaviours such as drunkenness and binge drinking. Findings may only be partially applicable to the UK as this study was conducted in Australia and may not be generalisable beyond the populations studied.

2 (j) There is moderate evidence from eight RCTs, one NRCT and one CBA study[8] to suggest that alcohol-specific education programmes have limited medium- to long-term effects on health outcomes related to alcohol use, such as frequency of alcohol consumption and drunkenness. Findings may only be partially applicable to the UK as studies were implemented outside the UK and may not be generalisable beyond the populations studied.

[1] Bagnall, 1990 (CBA -); McBride et al., 2004 (NRCT +); Morgenstern et al., 2009 (RCT ++); Newton et al., 2009 (RCT +); Schnepf, 2002 (NRCT -); Vogl et al., 2009 (RCT +); Newman et al., 1992 (RCT -); Shope et al., 1996a (CBA +)

[2] Bagnall, 1990 (CBA -); Baumann, 2006 (RCT -); McBride et al., 2004 (NRCT +); Morgenstern et al., 2009 (RCT ++); Newton et al., 2009 (RCT +); Schnepf, 2002 (NRCT -); Vogl et al., 2009 (RCT +); Wilhelmsen et al., 1994 (NRCT -)

[3] McBride et al., 2000; 2003; 2004 (NRCT +)

[4] Wilhelmsen et al., 1994 (NRCT -)

[5] Klitzner et al., 1994 (CBA +); Newman et al., 1992 (RCT -)

[6] Bagnall, 1990 (CBA -); Donaldson et al., 1995 (RCT -); Baumann, 2006 (RCT -); Klitzner et al., 1994 (CBA +); McBride et al., 2000 (NRCT +); Morgenstern et al., 2009 (RCT ++); Newton et al., 2009 (RCT +); Schnepf, 2002 (NRCT -); Vogl et al., 2009 (RCT +); Wilhelmsen et al., 1994 (NRCT -)

[7] McBride et al., 2000; 2003; 2004 (NRCT +)

[8] Donaldson et al., 2000 (RCT -); Palmer et al., 1998 (RCT -); Klitzner et al., 1994 (CBA +); McBride et al., 2004 (NRCT +); Morgenstern et al., 2009 (RCT ++); Newman et al., 1992 (RCT -); Newton et al., 2009 (RCT +); Shope et al., 1994 (RCT -); Shortt et al., 2007 (RCT +); Vogl et al., 2009 (RCT +)

Table 5.3. Classroom-based alcohol education programmes: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Bagnall, 1990	CBA -	Alcohol Education Package n=NR	No intervention n=NR	PT (10 months) n=NR	**NS** knowledge	**NS** negative attitudes towards alcohol	-
Baumann, 2006	RCT -	Project SAAV n=144	No intervention n=112	3 months (58%)	-	**NS** alcohol-related expectancies	-
Klitzner et al., 1994	CBA +	Students Against Drink Driving n=1,900	No intervention N=2,074	PT n=NR	-	-	**NS** index of driving while intoxicated or riding with impaired driver
McBride et al., 2000; 2003; 2004	NRCT +	SHAHRP n=1,111	No intervention N=1,232	PT n=NR	↑ knowledge***	↑ safer alcohol-related attitudes**	-
Morgenstern et al., 2009	RCT ++	Alcohol education intervention n=911	Usual curriculum N=964	PT (96%)	↑ alcohol knowledge**	**NS** alcohol attitudes and intentions	-
Newton et al., 2009	RCT +	CLIMATE Schools n=513	Usual curriculum N=431	PT (69%)	↑ knowledge scale**	**NS** alcohol-related expectancies	-
Schnepf, 2002	NRCT -	Unnamed programmes Peer led, n=13 Teacher led, n=19	Religious education n=13	PT n=NR	↑ alcohol knowledge***	**NS** negative attitudes towards alcohol	-
Shope et al., 1994	RCT -	Enhanced AMPS n=840	NR n=885	6^{th}-8^{th} grade NR	↑ curriculum knowledge*	-	-
Vogl et al., 2009	RCT +	CLIMATE Schools n=611	Usual curriculum N=855	PT (77.2%)	↑ knowledge***	↓ positive alcohol-related expectancies (females***/boys**)	-
Wilhelmsen et al., 1994	NRCT -	Highly-role specific, n=279 Less-role specific, n=314	Usual curriculum n=262	PT (95%)	-	↑ attitudes to abstention (highly role specific only)** ↑ Intention to abstain (highly role specific only)** ↑ Norms to abstain (highly role specific only)*	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.4. Classroom-based alcohol education programmes: short-term programme effects on health outcomes relating to alcohol use

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes		
					Alcohol use	Heavy alcohol use	Other
Bagnall, 1990	CBA -	Alcohol Education Package n=NR	No intervention n=NR	PT (10 months) n=NR	↓ drunk alcohol in last week* **NS** frequency of consumption	**NS** consumed >3 units alcohol	**NS** ever had a hangover **NS** alcohol-induced stomach upset
Donaldson et al., 1995	RCT -	AAPT n=NR	ICU only n=NR	PT (1 year) n=NR	↓ onset of alcohol use (believed it was not acceptable to drink; resistance skills training only*)	-	-
Baumann, 2006	RCT -	Project SAAV n=144	No intervention n=112	3 months (58%)	↓ drinking frequency**	↓ frequency of binge drinking*	↓ alcohol-related consequences*
Klitzner et al., 1994	CBA +	Students Against Drink Driving n=1,900	No intervention n=2,074	PT n=NR	**NS** drinking quantity	-	-
McBride et al., 2000; 2003; 2004	NRCT +	SHAHRP n=1,111	No intervention n=1,232	PT n=NR	↓ alcohol consumption*** ↓ alcohol per occasion*	↓ hazardous/harmful drinking*	↓ harm from own use* **NS** harm from others use
Morgenstern et al., 2009	RCT ++	Alcohol education intervention n=911	Usual curriculum n=964	PT (96%)	**NS** past alcohol month use **NS** lifetime alcohol use	**NS** lifetime drunkenness ↓ lifetime binge drinking*	-
Newton et al., 2009	RCT +	CLIMATE Schools n=513	Usual curriculum n=431	PT (69%)	↓ average consumption**	**NS** frequency of drinking to excess on a single occasion, past 3 months	**NS** harm associated with own use of alcohol
Schnepf, 2002	NRCT -	Peer led, n=13 Teacher led, n=19	Religious education n=13	PT n=NR	**NS** alcohol consumption	**NS** problem drinking	-
Shope et al., 1994	RCT -	Enhanced AMPS n=840	NR n=885	6^{th}-8^{th} grade NR	-	**NS** alcohol misuse	-
Vogl et al., 2009	RCT +	CLIMATE Schools n=611	Usual curriculum n=855	PT (77.2%)	**NS** average alcohol consumption	**NS** frequency of drinking to excess on a single occasion in the past 3 months	**NS** harms from own use of alcohol
Wilhelmsen et al., 1994	NRCT -	Highly-role specific, n=279 Less-role specific, n=314	Usual curriculum n=262	PT (95%)	↓ alcohol consumption (highly role specific only)**	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.5. Classroom-based alcohol education programmes: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Klitzner et al., 1994	CBA +	Students Against Drink Driving n=1,900	No intervention n=2,074	1 year (74%)	-	-	**NS** index of driving while intoxicated or riding with impaired driver
Morgenstern et al., 2009	RCT ++	Alcohol education intervention n=911	Usual curriculum n=964	1 year (85%)	↑ alcohol knowledge*	**NS** alcohol attitudes and intentions	-
Newman et al., 1992	RCT -	Resisting Pressures to Drink and Drive n=51 classes	Usual curriculum n=36 classes	1 year n=NR	↑ knowledge***	-	↓ ridden with a drinking driver*
Newton et al., 2009	RCT +	CLIMATE Schools n=513	Usual curriculum n=431	6 months (62%)	**NS** knowledge scale	**NS** alcohol-related expectancies	-
Vogl et al., 2009	RCT +	CLIMATE Schools n=611	Usual curriculum n=855	6 month (71.5%)	**NS** knowledge	↓ positive alcohol-related expectancies (females only**)	-
				12 months (70.9%)	**NS** knowledge	↓ positive alcohol-related expectancies (females***/boys**)	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.6. Classroom-based alcohol education programmes: medium-term programme effects on health outcomes relating to alcohol use

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Donaldson et al., 2000	RCT -	AAPT n=NR	ICU only n=NR	8th grade (1 year)	Public schools students receiving normative education only[a]: ↓ scores on alcohol index measure** ↓ lifetime alcohol use** ↓ 30-day alcohol use***	Public schools students receiving normative education only[a]: ↓ drunkenness**	-
Hansen & Graham, 1991; Kreft, 1998; Palmer et al., 1998	RCT -	AAPT Resistance skills training, n=33 classes Normative education, n=27 classes Combined, n=26 classes	Information only n=32 classes	1 year N=2,416 (80%)	**NS** composite measure of alcohol use	-	-
Klitzner et al., 1994	CBA +	Students Against Drink Driving n=1,900	No intervention n=2,074	1 year (74%)	**NS** drinking quantity	-	-
Morgenstern et al., 2009	RCT ++	Alcohol education intervention n=911	Usual curriculum n=964	1 year (85%)	**NS** past alcohol month use **NS** lifetime alcohol use	**NS** lifetime drunkenness ↓ lifetime binge drinking*	**-**
Newman et al., 1992	RCT -	Resisting Pressures to Drink and Drive n=51 classes	Usual curriculum n=36 classes	1 year n=NR	**NS** drinking behaviours	-	-
Newton et al., 2009	RCT +	CLIMATE Schools n=513	Usual curriculum n=431	6 months (62%)	**NS** average consumption	**NS** frequency of drinking to excess on a single occasion, past 3 months	**NS** harm associated with own use of alcohol
Vogl et al., 2009	RCT +	CLIMATE Schools n=611	Usual curriculum n=855	6 month (71.5%)	↓ average alcohol consumption (females only**)	↓ frequency of drinking to excess on a single occasion, past 3 months (females only*)	**NS** harms from own use of alcohol
				12 months (70.9%)	↓ average alcohol consumption (females only*)	↓ frequency of drinking to excess on a single occasion, past 3 months (females only**)	↓ harms from own use of alcohol (females only*)

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] For students in private schools, and those assigned to other intervention conditions all findings were **NS**

Table 5.7. Classroom-based alcohol education programmes: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
McBride et al., 2000; 2003; 2004	NRCT +	SHAHRP n=1,111	No intervention n=1,232	17 months n=1,778 (76%)	**NS** knowledge	↑ safer alcohol-related attitudes*	-
Shope et al., 1996a	CBA +	AMPS n=507	NR n=530	2 years NR	↑ knowledge*	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.8. Classroom-based alcohol education programmes: long-term programme effects on health outcomes

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Donaldson et al., 2000	RCT -	AAPT n=NR	ICU only n=NR	9th grade (2 years)	Public schools students receiving normative education only[a]: ↓ scores on alcohol index measure** ↓ lifetime alcohol use** **NS** 30-day alcohol use	For public schools students receiving normative education only[a]: ↓ drunkenness**	-
				10th grade (3 years)	Public schools students receiving normative education only[a]: ↓ scores on alcohol index measure* ↓ lifetime alcohol use* ↓ 30-day alcohol use*	**NS** drunkenness	-
Palmer et al., 1998	RCT -	AAPT Resistance skills training, n=33 classes Normative education, n=27 classes Combined, n=26 classes	Information only n=32 classes	2 years (46%)	↓ composite measure of alcohol use (normative education only**)	-	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
McBride et al., 2000; 2003; 2004	NRCT +	SHAHRP n=1,111	No intervention n=1,232	17 months n=1,778 (76%)	**NS** alcohol consumption **NS** alcohol per occasion	**NS** hazardous/harmful drinking	↓ harm from own use [b] **NS** harm from others use
Shope et al., 1996a	CBA +	AMPS n=507	NR n=530	2 years NR	**NS** alcohol use	↓ alcohol misuse*	-
Shortt et al., 2007	RCT +	Resilient Families n=NR	Usual curriculum n=NR	14 months n=NR	**NS** alcohol use	**-**	**-**

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] For students in private schools, and those assigned to other intervention conditions all findings were NS, [b] p value not reported

5.3 Classroom-based: substances including alcohol

5.3.1 Overview of evidence identified

A total of 54 articles were identified that reported on evaluations of 22 classroom-based programmes targeting substance use (including alcohol) across 34 studies. Eleven articles reported on evaluations of the Drug Abuse Resistance Education (DARE) programme. Four articles by Clayton et al (1991; 1996), Bennett (1995) and Lynam et al (1999) examined the effectiveness of DARE in a cohort of sixth grade students in schools in Kentucky, USA and were grouped as a single study. Three articles reported on a cohort of students in Illinois, USA (Rosenbaum et al., 1994; Ennett et al., 1994; Rosenbaum & Hanson 1998), following students from sixth through twelfth grade. Dukes et al (1996; 1997) examined the long-term effectiveness of DARE, following a cohort of students in Colorado Springs, USA over six years and two additional studies (Ringwalt et al., 1991; Harmon 1993) examined the short-term effectiveness of DARE in two different student cohorts. Nine articles reported on evaluations of Botvin's Life Skills Training (LST) programme. Seven articles by Botvin et al (1990a, 1990b, 1995a, 1995b, 1997, 2001a, 2001b) reported on five studies of the programme. Two studies (Botvin et al., 1990a; 1990b; 1995a) focused on delivery of the LST programme among predominantly White, middle-class seventh grade students and three studies (Botvin et al., 1997, 2001a, 2001b; Griffin et al., 2003) focused on delivery of LST among populations of inner-city, minority students. Fraguela et al (2003) examined the effects of the LST programme in a Spanish school.

Thirty studies were conducted in the USA, and one each in Canada, Spain and the Netherlands. The EU-Dap study of the Unplugged programme (Faggiano et al., 2008) was conducted across seven European countries: Austria, Belgium, Germany, Greece, Italy, Spain and Sweden. Although all of the programmes were primarily classroom-based, five programmes (Unplugged, Project Alert, Coalition for Youth Quality of Life, Keepin it REAL and Be Under Your Own Influence/All Stars) combined school components with family- and/or community-based components. Two studies (Perry et al., 2003; Spoth et al., 2002, 2005, 2008) combined two originally school-based only programmes (DARE and LST, respectively) with components targeting parents. Perry et al (2003) examined the effectiveness of DARE Plus, which combined the core components of the DARE programme with a 4-session classroom-based peer-led, parental involvement programme, extracurricular activities and the formation of neighbourhood action teams. Spoth et al (2002; 2005; 2008) examined the combination of the standard LST programme (15 sessions in seventh grade) with the family-based Strengthening Families programme.

Table 5.9. Summary of programme content: classroom-based (substance use including alcohol)

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Snow et al., 1992; 1997	CBA -	USA n=1,360 6th grade	School	**Adolescent Decision Making programme**: Decision-making, group process skills, social network utilisation	NR	NR
Fearnow-Kenney et al., 2003	RCT -	USA n=653 13-18 years	School	**All Stars Senior**: Two activities per week,; general health education programme	NR	Teachers
Shope et al., 1996b; Shope et al., 1998	CBA -	USA n=422 5th-8th grade	School	**Based on AMPS**: Tobacco and drug use in addition to alcohol; 7 lessons in 5th-6th grade; 8 lessons in 7th-8th grade	NR	Teachers
Slater et al., 2006	RCT +	USA n=4,216 mean 12.2 years	School, community	**Be Under Your Own Influence/All Stars**: Two year programme, 13 sessions first year, 7 booster sessions second year; printed media material in school, community-based participation campaign with workshops	NR	Teachers, community leaders
Dedobbeleer & Desjardins, 2001	NRCT -	Canada n=791 6th and 8th grade	School, community, family	**Coalition for Youth Quality of Life**: Three year programme; youth educational programmes (first year only), parent education programmes, alternative activities, youth mobilisation and support systems for youth in trouble.	Refusal skills	Teachers
Dukes et al., 1996; 1997	CBA -	USA n=849 5th-6th grade	School	**DARE (Colorado Springs):** DARE curriculum	NR	NR
Ennett et al., 1994; Rosenbaum et al., 1994; Rosenbaum & Hanson, 1998	NRCT +	USA n=1,803 10-11 years	School	**DARE (Illinois):** standard 16 week DARE curriculum	Social influence theory	Police
Clayton et al., 1991	RCT -	USA n=2,091 11-12 years	School	**DARE (Kentucky):** 16 weeks; DARE curriculum	Social influence theory	External, police
Clayton et al., 1996	See Clayton et al., 1991	USA n=2,071 6th grade	School	**DARE (Kentucky):** 16 weeks; DARE curriculum	NR	External, police

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Bennett, 1995	See Clayton et al., 1991	USA n=1,801 6th grade	School	**DARE (Kentucky):** DARE curriculum		External, police
Lynam et al., 1999	See Clayton et al., 1991	USA n=1,002 11-12 years	School	**DARE (Kentucky):** DARE curriculum	NR	Police
Ringwalt et al., 1991	RCT -	USA n=1,402 mean 10.4 years	School	**DARE (North Carolina):** 17 sessions; core DARE curriculum	Social influence theory	Police
Harmon, 1993	CBA +	USA n=708 mean 10.3 years	School	**DARE (South Carolina):** DARE curriculum	NR	Police
Perry et al., 2003	RCT +	USA n=6,237 7th grade	School, family	**DARE vs. DARE Plus:** 10 session, core DARE curriculum; or DARE Plus, 10 session DARE curriculum + 4 session, peer-led, parental involvement programme, extracurricular activities over two school years, neighbourhood action teams	Social influence theory	Police, teachers, peers
Simons-Morton et al., 2005	RCT +	USA n=2,651 6th grade	School	**Going Places**: Three year programme, 18 sessions 6th grade, 12 sessions 7th grade, 6 sessions 8th grade; social skills curriculum, parent education, school environment change	Social skills training, social development theory, social cognitive theory	Teachers
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	The Netherlands n=1,930 mean 12.4 years	School	**Healthy School and Drugs Project**: Three year programme, three lessons per year; educational lessons, activities, videos and brochures, refusal skills, increasing self-esteem	Behaviour change theory	Teachers
Brewer, 1991	RCT +	USA n=54 10th grade	School	**Here's Looking at You 2000:** 9 sessions (40-minute duration); social skills training curriculum, videos.	Problem behaviour theory, social learning theory	Certified school psychologist
Hecht et al., 2003; Gosin et al., 2003; Kulis et al., 2005[a]; Kulis et al., 2007[b]	RCT -	USA n=6,035 mean 12.5 years	School, community	**Keepin it REAL:** 10 lessons (7th grade), booster sessions (8th grade); resistance and avoidance skills, classroom videos and televised PSAs	Social learning theory, communication competence theory	Teachers

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Warren et al., 2006	RCT +	USA n=4,734 7th grade	School	**Keepin it REAL:** see other Keepin it REAL	Social learning theory, communication competence theory	Teachers
Botvin et al., 1990a; Botvin et al., 1995a	RCT +	USA n=4,466 7th grade	School	**LST:** 15 sessions; booster sessions in grade 8 and 9; demonstration, behavioural rehearsal, feedback and reinforcement, homework assignments	Cognitive-behavioural theory, social influence theory	Teachers
Botvin et al., 1990b	RCT +	USA n=1,311 7th grade	School	**LST:** 20 sessions in 7th grade, with and without booster sessions; LST curriculum	NR	Teachers, Peers
Botvin et al., 1995b	RCT +	USA n=757 7th grade	School	**LST:** Two sessions per week (40-minutes duration); demonstration, behavioural rehearsal, feedback and reinforcement, homework assignments; peer-led story-telling, videos and demonstrations	NR	Teachers, Peers
Botvin et al., 1997	NRCT -	USA n=833 11-15 years	School	**LST:** 15 sessions; group discussion, demonstration, group modelling, behavioural rehearsal, feedback and reinforcement, and homework	NR	Teachers
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	USA n=3,621 mean 12.9 years	School	**LST:** 15 sessions, 10 booster sessions in 8th grade; group discussion, demonstration, modelling, behavioural rehearsal, feedback and reinforcement, homework	NR	Teachers
Fraguela et al., 2003	NRCT -	Spain n=1,029 14.3 years	School	**LST**: 16 sessions; LST curriculum + component focusing on leisure activities	NR	Teacher or research staff
Smith et al., 2004;Vicary et al., 2004	RCT +	USA n=732 7th grade	School	**LST: vs. Infused-LST**: LST: 15 sessions 7th grade, booster sessions 8th grade and 9th grade; standard LST curriculum I-LST: LST core components taught across different subject areas	NR	Teachers

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Spoth et al., 2002; 2005; 2008	RCT +	USA n=1,673 7th grade	School, family	**LST vs. LST + SFP 10-14** LST: 15 sessions 7th grade, booster sessions 8th grade; standard LST curriculum. LST + SFP 10-14: as above + 7 sessions SFP; discussions, skill-building activities, videotapes, games	SPF: biopsychosocial model LST: social learning theory, problem behaviour theory	SPF: facilitators LST: Teachers
Eisen et al., 2002	RCT +	USA n=7,426 11-14 years	School	**Lions Quest Skills for Adolescence**: One year programme, 40 sessions (35-45 minutes each); social competency and refusal skills training	NR	External
Lennox & Cecchini, 2008	NRCT +	USA n=995 12-20 years	School	**NARCONON™ drug education curriculum**: Eight modules; health motivation, social skills, social influence recognition, knowledge development.	NR	Other
Caplan et al., 1992	NRCT -	USA n=282 11-14 years	School	**Positive Youth Development Programme:** Six classes over 15 weeks (50-minutes each); curriculum covered stress management, self-esteem, problem solving, substance use and health information, promotion of social and personal competence.	Social skills training, social competence	Health educators, Teachers
Bell et al., 1993; Ellickson & Bell, 1990	RCT +	USA n=6,527 7th-8th grade	School, family	**Project ALERT:** 11 lessons (8 in 7th grade; 3 in 8th grade); reinforcement of group norms, role-play, skills rehearsal	Social influence theory, health belief model, social learning theory self-efficacy theory	Teachers, Peers
Ellickson et al., 2003	RCT +	USA n=4,689 7th-8th grade	School, family	**Revised Project ALERT:** Two year programme, 14 lessons (11 in 7th grade, 3 in 8th grade); normative education, social influence programme, resistance skills training	Social influence model, health belief model, social learning model, self-efficacy theory	Teachers
Graham et al., 1990	RCT +	USA n=5,070 12 years	School	**Project SMART**: 12 sessions; social skills programme, or affect management programme	NR	Health educators
Sussman et al., 1998; Sun et al., 2006	RCT +	USA n=1,578 mean 16.8 years	School (continuation high schools)	**Project TND:** Nine sessions; listening skills, alternative coping skills, making non-drug choices	NR	Health staff educators

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Dent et al., 2001	RCT -	USA n=1,208 14-17 years	School (general high school)	**Project TND:** Three week programme (9 sessions); drug abuse prevention, skills to change, effective listening skills, effective communication skills, self control, myths about drug use, nature and consequences of drug use, effects of drug use on others, decision making skills.	Decision skills	Teachers
Sussman et al., 2003	RCT +	USA n=1,037 mean 16.7 years	School	**Project TND:** 12 sessions (45 minutes each); cognitive misperception correction activities, social skills, listening skills, decision making skills	NR	Health educators (assisted self instruction)
Faggiano et al., 2008	RCT +	7 European countries n=7,079 12-14 years	School, family	**Unplugged**: 12 one-hour units. Delivered in three formats: basic curriculum, or with the addition of (1) peer activities or (2) parent activities (three interactive workshops).	Social influence theory	Teachers, peers

[a] Reported data on a subsample of students who reported their race or ethnicity as Mexican American, Mexican or Chicano; [b] Reported data on a subsample of students who reported current substance use at baseline

Ten programmes, All Stars Senior, Be Under Your Own Influence/All Stars, a curriculum based on the original AMPS, Coalition for Youth Quality of Life, Going Places, Healthy School and Drugs Project, Keepin it REAL, Lions Quest Skills for Adolescence, Project Alert and Project Towards No Drug Abuse (Project TND), were delivered solely by teachers. Project Alert and the Unplugged curriculum were taught primarily by teachers, with or without assistance from peer leaders, and versions of the Life Skills Training programme were designed to be delivered by teachers or peer leaders. The provider of the Adolescent Decision Making programme (Snow et al., 1992, 1997) was not reported and external facilitators including health educators (Project SAVE, Positive Youth Development programme), the police (DARE), and certified school psychologists (Here's Looking at You, 2000) were utilised as providers in the remaining programmes.

The theoretical framework was not reported for nine programmes (Adolescent Decision Making programme; All Stars Senior; a curriculum based on the original AMPS; Be Under Your Own Influence/All Stars; Coalition for Youth Quality of Life; Lions Quest Skills for Adolescence; NARCONON drug education curriculum; Positive Youth Development Programme; and Project SAVE. Six programmes (Going Places, Healthy School and Drugs Project, Here's Looking at You 2000, Keepin it REAL, LST, and Project ALERT) were based on a combination of theories. The most commonly applied theory was social influence theory (n=5 programmes).

The overall number of students recruited to participate in the included studies ranged from 54 to over 6,000 students. Evaluation of ten programmes (DARE, Project TND, Healthy School and Drugs Project, Going Places, Be Under Your Own Influence/All Stars, Project ALERT, Keepin it REAL, Project SAVE, Unplugged and Lion's Quest Skills for Adolescence) were based on sample sizes of more than 1,500 students.

The majority of programmes targeted students aged 14 or younger. Three programmes, All Star Seniors, Healthy School and Drugs Project and the NARCONON drug education curriculum targeted students over a broad range of ages, and two programmes, Project TND and Here's Looking at You 2000 targeted older adolescents.

Evaluations of two programmes were based on immediate post-test follow-up only: All Stars Senior and the Healthy School and Drugs Project. The Healthy School and Drugs Project was a 3-year programme but follow-up data were not reported beyond the final year of the programme. Long-term follow-up data were reported for nine programmes: DARE, LST, Keepin' it REAL, Project ALERT, Project TND, Adolescent Decision Making programme, a substance use prevention curriculum based on AMPS, Be Under Your Own Influence/All Stars, and the Coalition for Youth Quality of Life.

5.3.2 Quality assessment

Of the 34 studies, 23 were based on RCT designs, seven were non-randomised controlled trials and four were CBA studies. Twenty-two of the 23 RCTs were based on cluster randomisation. All RCTs were reported to have been based on random assignment but in the majority of studies the methods of randomisation and whether an adequate concealment method was used were not reported. Seven studies (Botvin et al., 1990b, 1995b; Brewer, 1991; Hecht et al., 2003; Warren et al., 2006; Caplan et

al., 1992; Ennett et al., 1994) did not report how many participants were lost to follow-up. Losses to follow-up greater than 20% were reported in seven studies (Bell et al., 1993; Botvin et al., 1990a; Clayton et al., 1991; Simons-Morton et al., 2005; Slater et al., 2006; Cuijpers et al., 2001; Dedobbeleer & Desjardins, 2001). Outcomes measures were reported as reliable across the majority of RCTs and NRCTs, but six studies (Clayton et al., 1991; Eisen et al., 2002; Ellickson et al., 2003; Hecht et al., 2003; Ennett et al., 1994; Fraguela et al., 2003) either did not report on the validity or reliability of the outcome measures used or this aspect of study design was poorly reported. Baseline comparability was poorly reported or not reported on in seven studies (Clayton et al., 1991; Fearnow-Kenney et al., 2003; Graham et al., 1990; Hecht et al., 2003; Simons-Morton et al., 2005; Sussman et al., 2003; Cuijpers et al., 2001) and in some studies it was not clear how many participants were assigned to intervention and control groups. Five studies (Bell et al., 1993; Brewer, 1991; Ellickson et al., 2003; Faggiano et al., 2008; Slater et al., 2006) reported that all participants had been analysed in intention to treat analyses. The quality of the four CBA studies was generally poor, but one study (Harmon, 1993) was rated moderate quality. None of the studies clearly examined baseline comparability between intervention and control groups and only one study (Harmon, 1993) reported on the follow-up of study participants.

5.3.3 Findings

5.3.3.1 Short-term results (<6 months)

Short-term follow-up data was presented for ten programmes: DARE (Bennett, 1995; Clayton et al., 1991; Ennett et al., 1994; Rosenbaum et al., 1994; Harmon, 1993; Ringwalt et al., 1991); LST (Botvin et al., 1990a; Botvin et al., 1995a; Botvin et al., 1997; Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003; Fraguela et al., 2003); infused LST (Smith et al., 2004; Vicary et al., 2004); Project ALERT (Ellickson & Bell, 1990; Bell et al., 1993); All Stars Senior (Fearnow-Kenney et al., 2003); a substance use curriculum based on AMPS (Shope et al., 1996b; Shope et al., 1998); Lions Quest Skills for Adolescence (Eisen et al., 2002), the Healthy School and Drugs Project (Cuijpers et al., 2001; Smit et al., 2003), the Positive Youth Development Programme (Caplan et al., 1992), and the Unplugged curriculum (Faggiano et al., 2008).

Knowledge and understanding

Short-term effects on knowledge were examined for three programmes, LST (Botvin et al., 1990a; 2001a), a programme based on the original AMPS curriculum (Shope et al., 1996b), and the Healthy School and Drugs Project (Cuijpers et al., 2001). Botvin et al (1990a) reported that drinking knowledge was significantly higher in students who had received at least 60% of the LST programme relative to the control group ($p<0.001$). Botvin et al (2001a) found that delivery of the LST programme to inner-city minority students was associated with greater drinking knowledge among intervention students compared to controls ($p<0.05$). Shope et al (1996b) found that delivery of a substance use prevention programme based on the AMPS curriculum had a significant effect on substance-related knowledge but not knowledge of pressures to use substances or skills knowledge. Cuijpers et al

(2001) reported that significant intervention effects of the Healthy School and Drugs programme were found on alcohol knowledge at both the end of the programme and at the mid-programme follow-up.

Attitudes and values

Short-term effects on attitudes and values were examined across four programmes, DARE (Bennett, 1995; Clayton et al., 1991; Ennett et al., 1994; Rosenbaum et al., 1994; Harmon, 1993; Ringwalt et al., 1991), LST (Botvin et al., 1990a; 1997; 2001a), the Healthy School and Drugs Project (Cuijpers et al., 2001) and the Positive Youth Development Programme (Caplan et al., 1992). Two studies of the delivery of DARE in Kentucky (Clayton et al., 1991; Bennett, 1995) found that students in the DARE group reported a significant increase in negative attitudes towards alcohol compared to students in the control group ($p<0.01$). Clayton et al (1991) also found that there were no effects of DARE on self-esteem or peer-pressure resistance. Ennett et al (1994) found that DARE had a significant, positive effect on participant's self-esteem, but no effects on any of the other variables measuring students' attitudes towards drugs. Rosenbaum et al (1994) reported that the only significant effect of DARE on attitudes and beliefs was a significant effect on the perceived media influence on beer drinking. Harmon (1993) found that DARE students reported higher levels of belief in prosocial norms ($p<0.01$), reported less association with drug using peers ($p<0.01$), had more negative attitudes towards substances ($p<0.01$). They found no difference between DARE and control students on commitment and attachment to school or self-esteem. Ringwalt et al (1991) found that compared with control students, DARE students perceived alcohol costs to be higher, and the media's portrayal of beer drinking to be more favourable. Botvin et al (1990a) found that among students who had received at least 60% of the LST programme there was no difference in drinking attitudes compared to control students. Based on a study among inner-city minority students, Botvin et al (1997) reported that future intentions to drink beer or wine within the next year were lower in the intervention group compared to the control group ($p<0.01$). There were no intervention effects on intentions to drink liquor. Intervention students reported significantly lower normative expectations for adult and peer drinking ($p<0.01$ and $p<0.001$, respectively). There was no difference between intervention and control students in terms of anti-drinking attitudes. Botvin et al (2001a) found LST students had lower peer and adult normative expectations for drinking (both $p<0.05$). Significant intervention effects were found for the Healthy School and Drugs Project (Cuijpers et al., 2001) on measures of attitudes towards alcohol at end of the second year of the three-year programme. However, findings were not significant at the end of the first year of the programme or at the end of the programme (three years from baseline). Measures of self-efficacy towards alcohol use showed significant intervention effects at the end of the first programme year, but not at the second or third years. Caplan et al (1992) found that relative to intervention students, the intentions of control students increased significantly with respect to beer and hard liquor (both $p<0.05$).

Personal and social skills

Short-term effects on personal and social skills were examined for DARE (Ennett et al., 1994; Harmon, 1993; Ringwalt et al., 1991) and LST (Botvin et al., 1997). Ennett et al (1994) found that there were no effects of DARE on social skills. Two studies (Ringwalt et al., 1991; Harmon, 1993) found that

compared to control students, students who participated in DARE had higher levels of assertiveness. Harmon (1993) also reported that DARE students had more positive or prosocial peer associations than control, but there were no differences between DARE and control students' use of coping strategies or social integration. Botvin et al (1997) found that inner-city minority students who participated in the LST programme were more likely than controls to report use of refusal skills ($p<0.05$). However, there was no difference between groups in terms of skills in relation to decision-making, anxiety reduction, communication and social assertiveness.

Health and social outcomes relating to alcohol use and sexual health

Short-term effects on health outcomes related to alcohol use were examined for ten programmes: DARE (Bennett, 1995; Clayton et al., 1991; Ennett et al., 1994; Rosenbaum et al., 1994; Harmon, 1993; Ringwalt et al., 1991), LST (Botvin et al., 1990a, 1995a, 1997, 2001a, 2001b; Fraguela et al., 2003); infused LST (Smith et al., 2004;Vicary et al., 2004), Project ALERT (Ellickson & Bell, 1990; Bell et al., 1993; Ellickson et al., 2003), Healthy School and Drugs Project (Cuijpers et al., 2001); All Stars Seniors (Fearnow-Kenney et al., 2003), a substance use prevention programme based on AMPS (Shope et al., 1996b, 1998), Lions Quest Skills for Adolescence (Eisen et al., 2002), the Positive Youth Development Programme (Caplan et al., 1992), and the Unplugged curriculum (Faggiano et al., 2008).

There were no short-term effects of All Stars Seniors (Fearnow-Kenney et al., 2003) or the Lions Quest Skills for Adolescence programme (Eisen et al., 2002; 2003) on alcohol use, and the short-term effects of the DARE programme on alcohol use were mixed. Five studies (Clayton et al., 1991; Bennett, 1995; Ennett et al., 1994; Rosenbaum et al., 1994; Ringwalt et al., 1991) found that there were no effects of the programme on alcohol use. Rosenbaum et al (1994) also found that DARE exposure had no effects on the initiation of alcohol use. Harmon (1993) found that DARE students reported less alcohol use in the last year compared to control students ($p<0.05$), but that students did not differ in terms of their alcohol use in the past month. Two studies (Botvin et al., 1990a; Fraguela et al., 2003) of LST found no effects of the intervention on alcohol use. Botvin et al (1990a) found that delivery of the LST programme over three years did not have significant effects on drinking frequency or amount in a high fidelity sample. The study by Fraguela et al (2003) replicated the LST programme with a sample of Spanish students, finding no impact of the intervention on alcohol use. Two studies reported positive intervention effects. Botvin et al (1997) found that compared to control students, inner-city minority students who received a 15-session LST programme reported drinking alcohol less often ($p<0.01$) and consumed significantly less alcohol ($p<0.001$). Among seventh grade inner-city students who participated in LST (Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003), mean scores for drinking frequency and drinking quantity were significantly lower in the intervention group than the control group (both $p<0.05$). However, when the intracluster correlations were taken into account these differences in alcohol use became non-significant. Smith et al (2004) found that at the end of seventh grade (immediate post-test), neither LST nor infused LST had significant effects on alcohol use in male students. In addition, for females a significant reduction in the frequency of alcohol use was observed in the LST condition only. Short-term follow-up results of the original

Project ALERT (Ellickson & Bell, 1990; Bell et al., 1993) were reported at the end of the seventh grade, midway through the two-year programme, and at the beginning and end of eighth grade (before and immediately after delivery of the second year of the curriculum). At the end of seventh grade, compared to control students, baseline non-drinkers were less likely to have initiated drinking in the subsequent 3-months ($p<0.05$) and were less likely to report drinking monthly ($p<0.05$). However, at the end of eighth grade follow-up (immediate post-test), there was no difference between intervention and control students on any measure of alcohol use, with the exceptions of students in the teen leader condition who reported more alcohol use in the past month than controls at the beginning of the eighth grade, although the difference was not significant. Ellickson et al (2003) found that there were no significant effects on initial or current drinking behaviours, but students who received the revised Project ALERT programme reported lower overall alcohol misuse scores ($p<0.05$) and fewer negative consequences arising from their alcohol use ($p<0.05$). Further analysis of the sample revealed that effects were greatest among students who had tried alcohol three or more times in the past month. Compared to students who had not received a substance abuse prevention programme based on AMPS (Shope et al., 1996b; Shope et al., 1998), intervention students reported significantly less use of alcohol ($p<0.001$). Cuijpers et al (2001) reported significant effects of the three-year Healthy School and Drugs programme on measures of alcohol use at all follow ups (1, 2 and 3 years from baseline, respectively). At the 2-year follow-up, after the delivery of the alcohol specific intervention components, significant positive effects were found for the proportion of students who drank, however none of the other outcomes relating to use of alcohol showed significant effects of the intervention. At the 3-year follow-up, when all intervention components had been delivered, the authors reported significant positive effects of the intervention on the proportion of weekly users of alcohol and measures of the number of drinks per week consumed and drinks per occasion, as well as the proportion of participants who reported drinking. Relative to control students, Caplan et al (1992) reported that intervention students who participated in the Positive Youth Development Programme significantly reduced their frequency of having three or more drinks on a single occasion ($p<0.05$), and the amount of beer, wine, or liquor they usually consumed on one occasion ($p<0.05$).

Three studies (Botvin et al., 1990a; 1997; 2001a) that examined the LST programme found positive intervention effects on drunkenness. Among students who were exposed to 60% or more of the curriculum, compared to control students, those who taught the programme by teachers who received training by video reported significantly fewer occasions of drunkenness ($p<0.05$). In two studies (Botvin et al., 1997; 2001a) utilising samples of inner-city students, students who received the LST programme were less likely than controls to have got drunk ($p<0.05$ and $p<0.01$, respectively). Smith et al (2004) found that for females both LST and infused LST were associated with a significant reduction in the frequency of binge drinking. Students who participated in a substance abuse prevention programme based on the AMPS curriculum reported significantly lower levels of alcohol misuse than controls. Students who received the revised Project ALERT programme (Ellickson et al., 2003) were significantly less likely to engage in drinking that resulted in negative consequences (including getting sick, getting in a physical fight, getting in trouble at home or school, or doing something they later regretted). Faggiano et al (2008) examined the effectiveness of the Unplugged

curriculum as part of the EU-Dap study. Three versions of the curriculum were examined, incorporating peer and parental components. However, the main analyses were conducted on all four intervention arms pooled together. A statistically significant effect of the Unplugged curriculum (Faggiano et al., 2008) was observed at the short-term follow-up (3 months) for any episode and for frequent episodes of drunkenness in the past 30 days. There were no effects of the Lions Quest Skills for Adolescence programme (Eisen et al., 2002) on binge drinking in the past month.

5.3.3.2 Medium-term results (up to 12 months)

Medium-term follow-up data were reported for 12 programmes: DARE (Bennett, 1995; Ennett et al., 1994); LST (Botvin et al., 1990b; Botvin et al., 2001a; Fraguela et al., 2003); LST + SPF (Spoth et al., 2002; 2005; 2008); infused LST (Smith et al., 2004; Vicary et al., 2004); Project TND (Sussman et al., 1998; Dent et al., 2001); a programme based on the original AMPS curriculum (Shope et al., 1996b; Shope et al., 1998); Going Places (Simons-Morton et al., 2005); Here's Looking at You 2000 (Brewer, 1991); Lions Quest Skills for Adolescence (Eisen et al., 2002); the NARCONON drug education curriculum (Lennox & Cecchini, 2008); Project Alert (Bell et al., 1993) and Project SAVE (Graham et al., 1990).

Knowledge and understanding

Medium-term effects on knowledge were examined for three programmes: LST (Botvin et al., 1990b; 2001a), a substance use prevention curriculum based on the original AMPS (Shope et al., 1996b; 1998); and the NARCONON drug education curriculum (Lennox & Cecchini, 2008). Two studies (Botvin et al., 1990b; Botvin et al., 2001a) of the LST programme among predominantly White, middle class students and inner-city students, respectively, found positive medium-term effects of the intervention on knowledge. Botvin et al (1990b) found that a 20-session version of the programme had significant effects on drinking knowledge among students in the peer-led booster and non-booster groups ($p<0.001$ and $p<0.01$, respectively), but not among students in the teacher-led booster group. Short-term effects on knowledge of the effects of substance use were maintained at the 1-year follow-up in a study of a substance abuse prevention programme based on the AMPS curriculum ($p<0.05$; Shope et al., 1996b; Shope et al., 1998). However, as reported at PT, there were no intervention effects on knowledge of pressures to use substances or knowledge of skills. At 6-months follow-up, Lennox and Cecchini (2008) found that students who received the NARCONON drug education curriculum had a significantly better knowledge of the content of the programme than control students.

Attitudes and values

Medium-term intervention effects on attitudes and values were examined across four programmes: DARE (Bennett, 1995; Ennett et al., 1994), LST (Botvin et al., 1990b; 2001a), Lion's Quest Skills for Adolescence (Eisen et al., 2002) and the NARCONON drug education curriculum (Lennox & Cecchini, 2008). Bennett (1995) reported that participation in DARE was associated with an increase in negative attitudes towards alcohol; however this finding only reached significance among students who were average achievers. A second study of the DARE curriculum (Ennett et al., 1994) found no effects of the intervention on attitudes towards drugs (including alcohol) or self-esteem. Among a

predominantly white sample of students, Botvin et al (1990b) found that participation in LST was associated with an increase in drinking attitudes (i.e. more negative attitudes towards alcohol) among those who received peer-led booster and non-booster sessions. Students who were assigned to the teacher-led booster condition reported more positive attitudes towards alcohol at the medium-term follow-up. A study based on a sample of inner-city students who participated in the LST programme (Botvin et al., 2000a, 2001b), found that the intervention reduced intentions to drink alcohol ($p<0.05$), increased negative attitudes towards alcohol ($p<0.01$) and decreased peer and adult normative expectations ($p<0.01$ and $p<0.05$, respectively). The Lion's Quest Skills for Adolescence programme (Eisen et al., 2002; 2003) did not impact on students' attitudes and beliefs in terms of self-efficacy, intentions, or perceived peer use. Lennox and Cecchini (2008) reported that after controlling for baseline differences, control group students reported a greater tendency to plan to get drunk in the next year compared with the intervention group ($p<0.01$).

Personal and social skills

One study (Ennett et al., 1994) reported on the medium-term impact of the DARE curriculum on social skills, finding no impact of the intervention on this measure.

Health and social outcomes relating to alcohol use and sexual health

Medium-term intervention effects on alcohol use were reported for 11 programmes: DARE (Bennett, 1995; Ennett et al., 1994); LST (Botvin et al., 1990b; 2001a; Fraguela et al., 2003); LST vs. LST + SPF 10-14 (Spoth et al., 2002); LST vs. I-LST (Smith et al., 2004; Vicary et al., 2004); Project TND (Sussman et al., 1998; Dent et al., 2001); a substance abuse prevention curriculum based on AMPS (Shope et al., 1996b; Shope et al., 1998); Going Places (Simons-Morton et al., 2005); Here's Looking at You 2000 (Brewer, 1991); Lions Quest SFA (Eisen et al., 2002; 2003); NARCONON drug education curriculum (Lennox et al., 2008); and Project SAVE (Graham et al., 1990).

Seven programmes, infused-LST (Smith et al., 2004), a substance abuse prevention curriculum based on AMPS (Shope et al., 1996b; Shope et al., 1998), Going Places (Simons-Morton et al., 2005), Here's Looking at You 2000 (Brewer, 1991), Lions Quest SFA (Eisen et al., 2002; 2003), the NARCONON drug education curriculum (Lennox et al., 2008), and Project Alert (Bell et al., 1993) were found to have no medium-term impact on alcohol use. The effects of DARE were weak; Bennett (1995) reported that intervention students who received the DARE curriculum reported lower rates of past year alcohol use, however this finding only reached significance among low achieving students only, and a second study of the medium-term effects of DARE (Ennett et al., 1994) reported no intervention impacts. Among predominantly white, middle class students, Botvin et al (1990b) found that LST had significant positive effects on weekly and monthly drinking, and drinking frequency at the 1-year follow-up. In addition, students in the peer booster condition reported consuming less alcohol per occasion than students in the control group ($p<0.05$). However, students in the teacher booster condition reported higher levels of both weekly and monthly drinking than control students (both $p<0.001$), and drank more frequently ($p<0.001$). Inner-city students who received the LST programme in seventh grade (Botvin et al., 2001a) reported drinking less frequently and consuming less alcohol that control students (both $p<0.01$) at the 1-year follow-up. These findings remained significant when

adjusted to account for clustering. Fraguela et al (2003) found that students who were taught the LST programme by members of their research team reported significantly lower consumption of beer (but not spirits) than control students at the 1-year follow-up. However, the significance of these findings was not reported. Spoth et al (2002; 2005) examined the combination of LST with the Strengthening Families Programme (SFP). Significantly fewer students in the LST + SFP group were 'new users' at the 1-year follow-up relative to the control and LST only groups (both $p<0.05$), but there were no statistically significant effects on regular alcohol use in either intervention group. Sussman et al (1998) found no effects of Project TND on alcohol use for the whole sample of students, however, further analyses based on baseline alcohol use showed that at the 1-year follow-up, continuation school students in the classroom-only group who reported higher levels of alcohol use at baseline had significantly lower alcohol use than control students ($p<0.01$). There were no effects of the programme in baseline nonusers. Dent et al (2001) examined the effects of Project TND in a general high school sample. They also found no effect of the curriculum on alcohol use among baseline nonusers and students reporting lower levels of alcohol use in a general high school sample. Among students who reported higher levels of baseline alcohol use, intervention students reported significantly lower alcohol use at the 1-year follow-up compared to the control students. The Project SMART programme (Graham et al., 1990) had significant effects on the alcohol use index ($p=0.03$) at 1-year follow-up.

Inner-city students who participated in LST (Botvin et al., 2001a; 2001b) reported getting drunk less frequently and significantly fewer occasions of binge drinking than controls (both $p<0.05$). Smith et al (2004) found no effects of LST or an infused-LST curriculum on binge drinking or drunkenness at the 1-year follow-up in this study. There were also no intervention effects for three further programmes: a substance use prevention programme based on AMPS (Shope et al., 1996; 1998), Lions Quest Skills for Adolescence (Eisen et al., 2002; 2003) and the NARCONON drug prevention curriculum (Lennox et al., 2008).

5.3.3.3 Long-term results (>12 months)

Long-term follow-up results were reported for 11 programmes: DARE (Bennett, 1995; Clayton et al., 1996; Dukes et al., 1996; 1997; Ennett et al., 1994; Rosenbaum & Hanson, 1998; Lynam et al., 1999); DARE Plus (Perry et al., 2003); LST (Botvin et al., 1990a; Botvin et al., 1995a; Botvin et al., 1995b; Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003; Fraguela et al., 2003); infused LST (Spoth et al., 2002; 2005; 2008); Keepin It REAL (Hecht et al., 2003; Gosin et al., 2003; Kulis et al., 2005, 2007; Warren et al., 2006); Project ALERT (Ellickson et al., 1993); Project TND (Sussman et al., 1998; Sun et al., 2006; Sussman et al., 2003); Adolescent Decision Making programme (Snow et al., 1992; 1997); a programme based on the original AMPS curriculum (Shope et al., 1996b; Shope et al., 1998); Be Under Your Own Influence/All Stars (Slater et al., 2006); and the Coalition for Youth Quality of Life (Dedobbeleer & Desjardins, 2001).

Knowledge and understanding

Two studies (Botvin et al., 2001a; Shope et al., 1996b) reported long-term intervention effects on knowledge for two programmes, LST, and a substance use curriculum based on AMPS. Neither programme had long-term impacts on knowledge, 2- and up to 6-years after intervention, respectively.

Attitudes and values

Long-term intervention effects on attitudes and values related to alcohol use were examined across five programmes: DARE (Bennett, 1995; Clayton et al., 1996; Dukes et al., 1996; 1997; Ennett et al., 1994; Lynam et al., 1999); DARE Plus (Perry et al., 2003); LST (Botvin et al., 1995b; Botvin et al., 2001a); Keepin it REAL (Hecht et al., 2003; Gosin et al., 2003; Kulis et al., 2005); and the Coalition for Youth Quality of Life (Dedobbeleer & Desjardins, 2001).

The long-term effects of DARE on attitudes were equivocal. Three studies (Bennett, 1995; Dukes et al., 1996; 1997; Ennett et al., 1994) found that DARE had no long-term effects on attitudes, but Clayton et al (1996) found that students who participated in DARE had more negative general and specific drug attitudes. Clayton et al (1996) also reported that the DARE curriculum had a long-term positive effect on capability to resist peer pressure and peer norms for drug use. However, two studies (Dukes et al., 1996, 1997; Lynam et al., 1999) reported no long-term effects on resistance to peer pressure, and there were no long-term effects of DARE on self-esteem (Ennett et al., 1994; Lynam et al., 1999). Perry et al (2003) examined the effectiveness of an enhanced version of the DARE programme, DARE Plus. At the 18-month follow-up, males who received the DARE Plus programme were less likely than those in the control group to show increases in alcohol intentions ($p<0.05$). There were no differences between intervention and control females. Botvin et al (1995b) found that minority students who received the LST programme reported significantly lower intentions to use beer or wine, or hard liquor in the future compared to the information only control group ($p<0.01$ and $p<0.05$, respectively). Students who received a culturally focused intervention reported significantly lower intentions to use beer or wine relative to the information only control ($p<0.01$), but only marginally fewer intentions to use hard liquor ($p=0.06$). At 2-years follow-up, Botvin et al (2001a) found that there were no effects of LST on drinking attitudes or peer drinking norms. Among students who participated in Keepin it REAL (Hecht et al., 2003; Gosin et al., 2003), significant intervention effects were on positive expectancies and descriptive norms. There were no intervention effects on alcohol resistance strategies, intentions, self-efficacy or norms. Among a subsample of students who reported their race or ethnicity as Mexican American, Mexican or Chicano, Kulis et al (2005) found that the intervention had no effects on attitudes and belief measures. Sixth grade students who participated in the Coalition for Youth Quality of Life project reported significantly greater change scores on the measure of self-esteem at the 10-month follow-up ($p<0.05$) (Dedobbeleer & Desjardins, 2001). However, there were no intervention effects on awareness of drug and alcohol problems, intentions to become involved in prevention activities, or enabling factors at either the 10- or 30-month follow-up.

Personal and social skills

Two studies (Ennett et al., 1994; Dedobbeleer & Desjardins, 2001) examined long-term programme effects on personal and social skills for two programmes, DARE and the Coalition for Youth Quality of Life, respectively. Ennett et al (1994) found that DARE had no long-term impact on students' social skills. Students who participated in the Coalition for Youth Quality of Life (Dedobbeleer & Desjardins, 2001) reported an increase in relationship quality with their fathers at the 18-month follow-up, but this effect was not sustained at the 30-month follow-up. There was no impact of the intervention on students' relationships with their mothers.

Health and social outcomes relating to alcohol use and sexual health

Long-term intervention effects on alcohol use were examined across 11 programmes and the following programmes were shown to have no long-term effects on alcohol use: DARE (Bennett, 1995; Clayton et al., 1996; Dukes et al., 1996; 1997; Ennett et al., 1994; Rosenbaum & Hanson, 1998; Lynam et al., 1999); Project ALERT (Ellickson et al., 1993); Project TND (Sussman et al., 1998; Sun et al., 2006; Sussman et al., 2003); Based on AMPS (Shope et al., 1996b; Shope et al., 1998); and the Coalition for Youth Quality of Life (Dedobbeleer & Desjardins, 2001). One programme, the Adolescent Decision Making Programme (Snow et al., 1992; 1997) was shown to have negative effects, with a higher proportion of intervention students than control students reporting alcohol use at the 2-year follow-up.

Five studies reported long-term follow-up data on Botvin's LST programme. Intervention with ethnic minority students produced reductions in drinking frequency and amount at 2 years (Botvin et al., 1995b). However, three studies, including two studies by other research groups (Botvin et al., 1990b; Fraguela et al., 2003; Smith et al., 2004) in Spain and the USA, respectively, found that LST did not have long-term positive effects indicating that there may be issues with the transferability of the programme to other settings. There were no long-term effects of LST or LST + SPF 10-14 on alcohol use (Spoth et al., 2005; 2008). Hecht et al (2003) reported that use of alcohol was found to have increased over time in both the intervention and control groups. However, the increase was significantly less in intervention students. Analysis of the Mexican American, Black/White, and Multicultural versions of 'Keepin' it REAL' revealed that students in each intervention condition reported increased alcohol use over the course of the study. However, increases were significantly smaller in each of the intervention conditions compared to control with regards to alcohol use at 14-months. Perry et al (2003) examined the effectiveness of an enhanced version of the DARE programme, DARE Plus. At the 18-month follow-up, boys who received the DARE Plus programme were less likely than those in the control group to show increases in past year and past month alcohol use ($p<0.05$). There were no differences between intervention and control conditions among girls.

Seven studies (Perry et al., 2003; Botvin et al., 1995a, 2001a; Spoth et al., 2002, 2005; Smith et al., 2004; Shope et al., 1996b, 1998) examined long-term intervention effects on excessive drinking across three programmes, DARE Plus, LST and a curriculum based on AMPS. There were no long-term effects of the AMPS-based curriculum on alcohol misuse and positive effects of the LST + SPF 10-14 curriculum on drunkenness were only significant at 2-year follow-up. At 18-month follow-up,

females who received the DARE Plus curriculum were less likely to report increases in ever having been drunk, compared with girls in DARE only schools ($p<0.05$). However, there were no other differences between conditions among girls. Three studies of LST (Botvin 1990a, 1995a, 2001a) examined intervention effects on excessive drinking. All three studies found significant, positive intervention effects on drunkenness and one study (Botvin et al., 2003) reported reduced rates of binge drinking among intervention students compared to control students, two years after intervention.

5.3.4 Summary and evidence statements

A total of 52 articles were identified that examined 17 classroom-based programmes aiming to prevent substance use (including alcohol) across 37 studies.

5.3.4.1 Knowledge and understanding

Overall, four studies (Botvin et al., 1990a; Botvin et al., 2001a; Shope et al., 1996b; Cuijpers et al., 2001), including evaluations of LST, AMPS, DARE, and the Healthy School and Drugs Project, respectively, examined programme effects on alcohol-related knowledge. Overall both short and medium-term increases in alcohol knowledge were reported but these were not sustained long-term.

5.3.4.2 Attitudes and values

Twenty-one studies reported outcomes relating to alcohol or substance use attitudes and behavioural intentions across the following programmes: DARE (Bennett, 1995; Clayton et al., 1991; Dukes et al, 1996; Ennett et al., 1994; Lynam et al., 1999; Rosenbaum et al., 1994; Harmon, 1993; Ringwalt et al., 1991), DARE Plus (Perry et al., 2003); LST (Botvin et al., 1990a; 1990b; 1995b; 1997; 2001a), the Healthy School and Drugs Project (Cuijpers et al., 2001), Lions Quest Skills for Adolescence (Eisen et al., 2002); Positive Youth Development programme (Caplan et al., 1992), NARCONON drug education curriculum (Lennox et al., 2008), the Coalition for Youth Quality of Life (Dedobbeleer & Desjardins, 2001) and Keepin' It REAL (Hecht et al., 2003; Kulis et al., 2005).

The majority of studies of the DARE programme found increases in negative views towards alcohol in the short-term (Bennett, 1995; Clayton et al., 1991; Ennett et al., 1994; Harmon, 1993; Ringwalt et al., 1991) but these effects were not consistently sustained in the medium to long-term (Bennett, 1995; Clayton et al., 1996; Dukes et al., 1996, 1997; Ennett et al., 1994). Studies of the LST programme showed primarily no programme effects on attitudes towards alcohol use in the short-term (Botvin et al., 1990a; 1997), but did show medium-term effects (Botvin et al., 1990b; 2001a), although these were not sustained long-term (Botvin et al., 2001a). No other studies demonstrated long-term effects on attitudes toward alcohol use (Caplan et al., 1992; Cuijpers et al., 2001).

Eight studies (Botvin et al., 1995b; 1997; 2001a; Caplan et al., 1992; Eisen et al., 2002; Lennox & Cecchini, 2008; Perry et al., 2003; Hecht et al., 2003) also examined programme impacts on behavioural intentions to drink (or use substances). With all but one study, of the Keepin it REAL programme (Hecht et al., 2003), showing a decrease in intentions to drink or get drunk. Findings relating to perceived peer norms regarding alcohol or substances were reported for evaluations of DARE (Harmon, 1993; Ringwalt et al., 1991; Clayton et al., 1996), LST (Botvin et al., 1997; 2001a), Lion's Quest Skills for Adolescence (Eisen et al., 2002) and Keepin it REAL (Hecht et al., 2003; Kulis

et al., 2005). There was no effect of Lion's Quest Skills for Adolescence or Keepin it REAL on peer norms for alcohol or substance use. DARE participants showed decreases in beliefs of positive peer views relating to drug use in the short-term, but these were not sustained long-term. Similarly studies evaluating LST showed only short-term effects on attitudes towards peer norms.

5.3.4.3 Personal and social skills

Five studies (Ennett et al., 1994; Harmon, 1993; Ringwalt et al., 1991; Botvin et al., 1997; Dedobbeleer & Desjardins, 2001), including evaluations of DARE, LST and the Coalition for Youth Quality of Life, reported on personal and social skills related to alcohol. There were no effects of DARE on social skills over the short-, medium- or longer term (Ennett et a., 1994), but there were short-term positive impacts of the programme on assertiveness and prosocial peer associations (Ringwalt et al., 1991; Harmon, 1993). There were also short-term impacts of LST on refusal skills (Botvin et al., 1997), but not on other skills relating to decision-making, anxiety reduction, communication and social assertiveness. One study (Dedobbeleer & Desjardins, 2001) examined programme effects of the Coalition for Youth Quality of Life on student's relationship quality with their parents, finding a long-term programme effect on relationship quality with fathers but not mothers.

5.3.4.4 Health and social outcomes relating to alcohol use and sexual health

Four programmes, the Positive Youth Development Programme, the Unplugged programme, a revised version of Project Alert, and the Healthy School and Drug Project had positive short-term programme effects on alcohol use. However, the findings of Positive Youth Development Programme (Caplan et al., 1992) were limited by the poor quality of the study. The study of the Healthy School and Drugs Project (Cuijpers et al., 2002) was good quality and significant effects on weekly drinking, and quantity per week and per occasion at the end of the three-year programme were reported. Statistically significant effects of the Unplugged curriculum (Faggiano et al., 2008) were found in relation to drunkenness, but the impact of the programme on other measures of alcohol use was not explored in the study. Effects on alcohol misuse were also found for a revised version of Project Alert (Ellickson et al., 2003) but the programme had no effects on initiation of, or current, alcohol consumption. Positive longer term effects were demonstrated for two programmes, Keepin It REAL (Hecht et al., 2003 and Be Under Your Own Influence/All Stars (Slater et al., 2006), which combined school and media intervention components. The two-year programme had significant, positive effects on alcohol use across all three versions of the programme, but effects were largest for the multicultural version of the curriculum. The strongest evidence of effectiveness came from a series of studies which examined Botvin's LST (Botvin et al., 1990a; 1990b; 1995b; 1997; 2001a; Fraguela et al., 2003). Two studies (Botvin et al., 1997; 2001a) found positive short- and medium-term effects on drinking frequency and binge-drinking, and these were sustained long-term (Botvin et al., 1995b; 2001a). However, replication of this study in a Spanish cohort of students (Fraguela et al., 2003) did not demonstrate that the programme was effective.

Eight programmes had inconsistent or no effects on alcohol use: DARE, Going Places, Here's Looking at You 2000, Lion's Quest SFA, All Stars Senior, Project Alert, Project SMART, Project TND,

NARCONON drug education curriculum. In addition, one programme, the Adolescent Decision Making programme (Snow et al., 1992; 1997) had potentially harmful long-term effects.

Evidence statement 3

3 (g) There is moderate evidence from two RCTs, one NRCT and one CBA study[1] to suggest that classroom-based substance use programmes are effective at improving knowledge relating to substance use and its effects in the short- to medium-term, but that these effects are not sustained in the long-term. Findings may only be partially applicable to the UK as studies were conducted outside the UK and may not be generalisable beyond the populations studied.

3 (h) There is moderate evidence from 12 RCTs, seven NRCTs and two CBA studies[2] to suggest that classroom-based substance use programmes may have mixed effects on students' substance use-related attitudes and values. There is moderate evidence from seven RCTs, four NRCTs and two CBA studies[3] to suggest that these programmes may impact on attitudes to substance use in the short- to medium-term, and further evidence from five RCTs and three NRCTs[4] to suggest that they may have a positive impact on long-term behavioural intentions. There is weak evidence from six RCTs, one NRCT and one CBA study[5] to suggest that classroom-based substance use programmes have no medium- to long-term effects on peer norms. Findings may only be partially applicable to the UK as studies were conducted in the USA and may not be generalisable beyond the populations studied.

3 (i) There is weak and inconsistent evidence from one RCT, three NRCTs and one CBA study[6] to determine the effects of classroom-based substance use programmes on young peoples' personal and social skills.

3 (j) There is moderate evidence from 14 RCTs, two NRCTs and two CBA studies[7] to suggest that the following classroom-based substance use programmes may have inconsistent or no effects on alcohol use: DARE, Going Places, Lion's Quest SFA, All Stars Senior, Project Alert, Project SMART, Project TND, NARCONON drug education curriculum. In addition, there is weak evidence from one CBA study[8] to suggest that the Adolescent Decision Making Programme may have potentially harmful long-term effects on alcohol consumption.

3 (k) There is weak evidence from two RCTs and one NRCT[9] to suggest that programmes which combine school-based curriculums with additional components may have positive effects on alcohol consumption. The Healthy School and Drugs Project, a three-year programme, which included a nine lesson teacher-led curriculum, formulation of school policy on substance use and involvement of parents, had short-term effects on alcohol use, but longer term effects of the programme have not been examined. Positive longer term effects were demonstrated for two programmes, Keepin It REAL and Be Under Your Own Influence/All Stars, which both combined school-based curriculums with media intervention components. Findings may only be partially applicable to the UK as studies were conducted in the Netherlands and the USA and may not be generalisable beyond the populations studied.

3 (l) There is moderate evidence from three RCTs[10] to suggest that Life Skills Training has positive short-, medium- and long-term effects on drinking frequency and binge drinking. However, there is moderate evidence from three RCTs and one NRCT[11] to suggest that there may be issues with the transferability of LST to other settings. Findings may only be partially applicable to the UK as studies were conducted in Spain and the USA and may not be generalisable beyond the populations studied.

[1] Botvin et al., 1990a (RCT +); Botvin et al., 2001a (RCT +); Shope et al., 1996b (CBA -); Cuijpers et al., 2001 (NRCT +)

[2] Bennett, 1995 (RCT -); Clayton et al., 1991 (RCT -); Dukes et al, 1996, 1997 (CBA –); Ennett et al., 1994 (NRCT +); Lynam et al., 1999 (RCT -); Rosenbaum et al., 1994 (NRCT +); Harmon, 1993 (CBA +); Ringwalt et al., 1991 (RCT -); Perry et al., 2003 (RCT +); Botvin et al., 1990a (RCT +); Botvin et al., 1990b (RCT +); Botvin et al., 1995b (RCT +); Botvin et al., 1997 (NRCT -); Botvin et al., 2001a (RCT +); Cuijpers et al., 2001 (NRCT +); Eisen et al., 2002 (RCT +); Caplan et al., 1992 (NRCT -); Lennox & Cecchini, 2008 (NRCT +); Dedobbeleer & Desjardins, 2001 (NRCT -); Hecht et al., 2003 (RCT -); Kulis et al., 2005 (RCT -)

[3] Bennett, 1995 (RCT -); Clayton et al., 1991 (RCT -); Clayton et al., 1991 (RCT -); Dukes et al, 1996, 1997 (CBA –); Ennett et al., 1994 (NRCT +); Harmon, 1993 (CBA +); Ringwalt et al., 1991 (RCT -); Botvin et al., 1990a (RCT +); Botvin et al., 1990b (RCT +); Botvin et al., 1997 (NRCT -); Botvin et al., 2001a (RCT +); Cuijpers et al., 2001 (NRCT +); Caplan et al., 1992 (NRCT -)

[4] Botvin et al., 1995b (RCT +); Botvin et al., 1997 (NRCT -); Botvin et al., 2001a (RCT +); Caplan et al., 1992 (NRCT -); Eisen et al., 2002 (RCT +); Lennox & Cecchini, 2008 (NRCT +); Perry et al., 2003 (RCT +); Hecht et al., 2003 (RCT -)

[5] Harmon, 1993 (CBA +); Ringwalt et al., 1991 (RCT -); Clayton et al., 1996 (RCT -); Botvin et al., 1997 (NRCT -); Botvin et al., 2001a (RCT +); Eisen et al., 2002 (RCT +); Hecht et al., 2003 (RCT -); Kulis et al., 2005 (RCT -)

[6] Ennett et al., 1994 (NRCT +); Harmon, 1993 (CBA +); Ringwalt et al., 1991 (RCT -); Botvin et al., 1997 (NRCT -); Dedobbeleer & Desjardins, 2001 (NRCT -)

[7] Bennett et al., 1995 (RCT -); Lynam et al., 1999 (RCT -); Dukes et al., 1996; 1997 (CBA -); Ennett et al., 1994 (NRCT +); Clayton et al., 1991, 1996 (RCT -); Ringwalt et al., 1991 (RCT -); Harmon, 1993 (CBA +); Eisen et al., 2002 (RCT +); Fearnow-Kenney et al., 2003 (RCT -); Bell et al., 1993 (RCT +); Ellickson et al., 2003 (RCT +); Graham et al., 1990 (RCT +); Simons-Morton et al., 2005 (RCT +); Brewer, 1991 (RCT +); Sussman et al., 1998 (RCT +); Sussman et al., 2003 (RCT +) Dent et al., 2001 RCT -); Lennox & Cecchini, 2008 (NRCT +)

[8] Snow et al., 1992; 1997 (CBA -)

[9] Cuijpers et al., 2002 (NRCT +); Hecht et al., 2003; Kulis et al., 2005, 2007 (all RCT -); Slater et al., 2006 (RCT +)

[10] Botvin et al., 1990a (RCT+); Botvin et al., 1995b (RCT +); Botvin et al., 2001a (RCT +)

[11] Botvin et al., 1990b (RCT +); Fraguela et al., 2003 (NRCT -); Smith et al., 2004 (RCT +); Spoth et al., 2005; 2008 (RCT +)

Table 5.10. Classroom-based substance use prevention programmes: short-term programme effects on knowledge, skills and attitudes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Bennett, 1995	RCT -	DARE n=NR	Drugs unit only n=NR	PT n=NR	-	↑ negative attitudes towards alcohol*	-
Botvin et al., 1990a; Botvin et al., 1995a	RCT +	LST 1-day teacher workshops or teacher training by video n=NR	NR n=NR	PT n=3,684[a] (83%)	↑ drinking knowledge***	**NS** drinking attitudes ↑ interpersonal skills knowledge[NR] **NS** communication skills knowledge **NS** personality variables	-
Botvin et al., 1997	NRCT -	LST n=NR	Usual curriculum n=NR	PT n=721 (87%)	-	↓ future intentions to drink beer or wine** **NS** future intentions to drink liquor ↓ normative expectations, peers** ↓ normative expectations, adults*** **NS** anti-drinking attitudes **NS** advertising	↑ refusal skills* **NS** anxiety reduction **NS** communication **NS** social assertiveness **NS** decision-making
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	end of 7th grade n=NR	↑ drinking knowledge*	↓ normative expectations, peers* ↓ normative expectations, adults*	-
Caplan et al., 1992	NRCT -	Positive Youth Development Programme n=109	No intervention n=173	PT NR	-	**NS** attitudes ↓ intentions to use beer* ↓ intentions to use hard liquor*	-
Clayton et al., 1991	RCT - (cluster)	DARE n=1,438	Drugs unit only n=487	PT (4 months) n=NR	-	↑ negative attitudes towards alcohol** **NS** self-esteem **NS** peer pressure resistance	-
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	1 year[b] n=1,405 (74%)	**NS** knowledge	**NS** attitudes ↑ self-efficacy*	-
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	2 years[b] n=1,405 (74%)	↑ knowledge***	↓ pro attitudes* **NS** self-efficacy	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Cuijpers et al., 2001;	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	3 years[b] n=1,405 (74%)	↑ knowledge***	**NS** attitudes **NS** self-efficacy	-
Ennett et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	PT n=NR	-	**NS** attitudes towards drugs ↑ self-esteem*	**NS** social skills
Harmon, 1993	CBA +	DARE n=341	No intervention n=367	20 weeks n=602 (85%)	-	↑ belief in prosocial norms** ↓ association with drug using peers** ↑ negative attitudes towards substances** **NS** commitment and attachment to school **NS** rebellious behaviour **NS** self-esteem	↑ assertiveness* ↑ positive or prosocial peer associations* **NS** coping strategies **NS** social integration
Ringwalt et al., 1991	RCT -	DARE n=685	Delayed intervention n=585	PT n=1270 (91%)	-	↑ perceived alcohol costs to be higher** ↑ negative attitudes towards drugs** ↓ belief in positive peer attitudes toward drug use*** **NS** self-esteem	↑ assertiveness
Rosenbaum et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	PT n=NR	-	↑ perceived media influence on beer drinking* **NS** other attitudes/beliefs	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=308	No intervention n=134	PT n=442 (23%)	↑ effects of substance use* **NS** pressures to use substances **NS** skills	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] High fidelity sample (students exposed to >60% or more of the programme; 62% of the original sample); [b] Follow-up from baseline

Table 5.11. Classroom-based substance use prevention programmes: short-term programme effects on health and social outcomes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Bennett, 1995	RCT -	DARE n=NR	Drugs unit only n=NR	PT	**NS** past year alcohol use	-	-
Clayton et al., 1991	RCT -	DARE n=1,438	Drugs unit only n=487	PT (4 months) n=NR	**NS** alcohol use	-	-
Ennett et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	PT n=NR	**NS** alcohol use (rural students only)	-	-
Rosenbaum et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	PT n=NR	**NS** initiation of alcohol use **NS** increased use of alcohol **NS** quitting behaviour	-	-
Harmon, 1993	CBA +	DARE n=341	No intervention n=367	20 weeks n=602 (85%)	↓ past year alcohol use* **NS** frequency alcohol use in past month	-	-
Ringwalt et al., 1991	RCT -	DARE n=685	Delayed intervention n=585	PT n=1270 (91%)	**NS** current alcohol use **NS** lifetime alcohol use	-	-
Botvin et al., 1990a; Botvin et al., 1995a	RCT +	LST 1-day teacher workshops or teacher training by video n=NR	NR n=NR	PT n=3,684[a] (83%)	**NS** drinking frequency **NS** drinking amount	↓ drunkenness (training by video only*)	-
Botvin et al., 1997	NRCT -	LST n=NR	Usual curriculum n=NR	PT n=721 (87%)	↓ drinking index** ↓ drinking amount***	↓ drunkenness*	-
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	end of 7th grade NR	↓ drinking frequency*[c] ↓ drinking quantity*[c]	↓ drunkenness frequency**	-
Fraguela et al., 2003	NRCT -	LST; researcher-(n=235) or teacher-led (n=309)	No intervention n=485	PT 80-90%	**NS** alcohol use	-	-
Smith et al., 2004;Vicary et al., 2004	RCT +	LST (n=234); I-LST (n=297)	No intervention n=201	end of 7th grade n=704 (96%)	↓ frequency (LST, females only)*	↓ binge drinking* (females only) **NS** drunkenness	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	**Heavy alcohol use**	**Other**
Ellickson & Bell, 1990	RCT +	Project ALERT Adult health educator, n=10 schools Adult health educator + peer leaders, n=10 schools	Usual curriculum n=10 schools	3 months[b] n=3,852 (60%)	*Non-users:* ↓ initiation (peer leader only*) ↓ current (peer leader only*) *Experimenters + users:* ↓ current (users, adult health educators only**) **NS** monthly[d] **NS** weekly[e]	-	-
				12 months[b] n=3,852 (60%)	*Non-users:* **NS** initiation **NS** current *Experimenters + users:* ↓ past month (experimenters, peer leader only*) **NS** monthly[d] **NS** weekly[e]		
				15 months[b] n=3,852 (60%)	*Non-users:* **NS** initiation **NS** current *Experimenters + users:* **NS** current **NS** monthly[d] **NS** weekly[e]		
Ellickson et al., 2003	RCT +	Project ALERT (revised) n=2,553	Usual curriculum n=1,723	18 months[b] n=4,276 (79%)	-	↓ overall alcohol misuse score* **NS** high risk drinking	↓ negative consequences*
Fearnow-Kenney et al., 2003	RCT -	All Stars Senior n=406	NR n=247	PT (~80%)	**NS** alcohol use	-	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=308	No intervention n=134	PT n=442 (23%)	↓ alcohol use***	-	-
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	1 year[b] n=1,405 (74%)	↓ proportion who drink* **NS** proportion weekly drinkers **NS** drinks/week ↓ drinks/occasion*** ↓ lifetime alcohol prevalence*	-	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	2 years[b] n=1,405 (74%)	↓ proportion who drink** **NS** proportion weekly drinkers **NS** drinks/week **NS** drinks/occasion ↓ lifetime alcohol prevalence**	-	-
Cuijpers et al., 2001; Smit et al., 2003	NRCT +	Healthy School and Drugs Project n=1,156	No intervention n=774	3 years[b] n=1,405 (74%)	↓ proportion who drink** ↓ proportion weekly drinkers* ↓ drinks/week*** ↓ drinks/occasion*** ↓ lifetime alcohol prevalence*	-	-
Eisen et al., 2002; 2003	RCT +	Lions Quest Skills for Adolescence n=NR	Usual curriculum n=NR	PT n=6,239 (84%)	**NS** alcohol use prevalence **NS** lifetime alcohol use **NS** 30-day alcohol use	**NS** 30-day binge drinking	-
Caplan et al., 1992	NRCT -	Positive Youth Development Programme n=109	No intervention n=173	PT NR	↓ alcohol per occasion*	↓ frequency of heavy drinking*	-
Faggiano et al., 2008	RCT +	Unplugged Basic, n=1,190 Parent, n=1,164 Peer, n=1,193	No intervention n=3,532	3 months n=6,370 (90%)	-	↓ any drunkenness, past 30 days* ↓ frequent drunkenness, past 30 days*	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] High fidelity sample (students exposed to >60% or more of the programme; 62% of the original sample); [b] Follow-up from baseline; [c] NS, when intraclass correlations were taken into account; [d] Eleven or more times in the past year or three or more days in the past month; [e] 6+ days in past month

Table 5.12. Classroom-based substance use prevention programmes: medium-term programme effects on knowledge, attitudes and skills

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Bennett, 1995	RCT -	DARE n=NR	Drugs unit only n=NR	7th grade	-	↑ negative attitudes towards alcohol (average achieving students only)*	-
Ennett et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	1 year	-	**NS** attitudes towards drugs **NS** self-esteem	**NS** social skills
Botvin et al., 1990b	RCT +	LST Teacher; peer; teacher + booster; peer + booster n=NR	NR n=NR	1 year n=998 (76%)	↑ drinking knowledge (peer + booster***/non-booster**)	↑ drinking attitudes** ↓ locus of control (peer + booster only**) *Teacher + booster vs. control:* ↑ pro drinking attitudes*	-
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	1 year NR	↑ drinking knowledge*	↓ intentions to drink alcohol* ↑ negative attitudes towards alcohol** ↓ normative expectations, peers** ↓ normative expectations, adults*	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=507	No intervention n=530	1 year N=442 (23%)	↑ effects of substance use* **NS** pressures to use substances **NS** skills	-	-
Eisen et al., 2002	RCT +	Lions Quest Skills for Adolescence n=NR	Usual curriculum n=NR	1 year n=5,691 (77%)	-	**NS** self-efficacy **NS** intentions to drink alcohol **NS** perceived harm **NS** refusal efficacy **NS** perceived peer use	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Lennox & Cecchini, 2008	NRCT +	NARCONON™ drug education curriculum n=464	Delayed control n=531	6 months n=726 (73%)	↑ programme content***	↑ people risk harming themselves by having one or two drinks nearly every day* **NS** people risk harming themselves by having five or more drinks ↓ intentions to get drunk** ↑ wrong to drink regularly***	-
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported							

Table 5.13. Classroom-based substance use prevention programmes: medium-term programme effects on health and social outcomes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Bennett, 1995	RCT -	DARE n=NR	Drugs unit only n=NR	7th grade n=NR	↓ past year alcohol use (low achieving students only*)	-	-
Ennett et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	1 year n=NR	**NS** alcohol use	-	-
Botvin et al., 1990b	RCT +	LST Teacher; peer; teacher + booster; peer + booster n=NR	NR n=NR	1 year n=998 (76%)	↓ weekly alcohol use*** ↓ monthly alcohol use*** ↓ drinking frequency** ↓ alcohol per occasion (peer + booster only*) *Teacher + booster vs. control:* ↑ weekly alcohol use*** ↑ monthly alcohol use*** ↑ drinking frequency***	-	-
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	1 year NR	↓ drinking frequency** ↓ drinking quantity**	↓ drunkenness frequency* ↓ binge drinking*	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Fraguela et al., 2003	NRCT -	LST; researcher-led (n=235) or teacher-led (n=309)	No intervention n=485	1 year NR	↓ consumption of beer (research-led only**) ↓ consumption of spirits (teacher-led only*)	-	-
Smith et al., 2004;Vicary et al., 2004	RCT +	LST (n=234); I-LST (n=297)	No intervention n=201	end of 8th grade n=659 (90%)	**NS** frequency	**NS** drunkenness **NS** binge drinking	-
Spoth et al., 2002; 2005; 2008	RCT +	LST, n=621; or LST + SFP 10-14, n=549	Four leaflets mailed to families n=494	1 year N=1,361 (82%)	↓ 'new users' (LST + SPF only*) **NS** regular alcohol use	-	-
Sussman et al., 1998	RCT +	Project TND Classroom, n=7 schools Classroom + school as community, n=7 schools	Usual curriculum n=7 schools	1 year n=1,074 (67%)	↓ alcohol use (high baseline users only**)	-	-
Dent et al., 2001	RCT -	Project TND n=13 classes	No intervention n=13 classes	1 year n=679 (63%)	↓ alcohol use (high baseline users only**)	-	-
Bell et al., 1993	RCT +	Project ALERT Adult health educator, n=10 schools Adult health educator + peer leaders, n=10 schools	Usual curriculum n=10 schools	12 months n=4,837 (74%)	**NS** initiation **NS** past month **NS** past year **NS** monthly **NS** weekly **NS** daily	-	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=507	No intervention n=530	1 year N=442 (23%)	**NS** alcohol use	**NS** alcohol misuse	
Simons-Morton et al., 2005	RCT +	Going Places n=692	No intervention n=628	up to 1 year n=1,320 (50%)	**NS** drinking stage	-	-
Brewer, 1991	RCT +	Here's Looking at You 2000 n=18	Videotape or no intervention n=36	6 months	**NS** alcohol use	-	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Eisen et al., 2002; 2003	RCT +	Lions Quest Skills for Adolescence n=NR	Usual curriculum n=NR	1 year n=5,691 (77%)	**NS** lifetime alcohol use **NS** 30-day alcohol use	**NS** 30-day binge drinking	-
Lennox & Cecchini, 2008	NRCT +	NARCONON™ drug education curriculum n=464	Delayed control n=531	6 months n=726 (73%)	**NS** alcohol use	**NS** drunkenness	-
Graham et al., 1990	RCT +	Project SAVE Social skills programme, n=6 schools; Affect management programme, n=6 schools	Usual curriculum n=12 schools	1 year (70%)	↓ alcohol use*	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.14. Classroom-based substance use prevention programmes: long-term programme effects on knowledge, attitudes and skills

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Bennett, 1995	RCT -	DARE n=NR	Drug unit only n=NR	8th grade	-	**NS** negative attitudes towards alcohol	-
				9th grade	-	**NS** negative attitudes towards alcohol	-
Clayton et al., 1996	RCT - (cluster)	DARE n=23 schools	Other drug education programmes n=8 schools	up to 5 years	-	↑ general and specific drug attitudes* ↑ capability to resist peer pressure* ↑ peer norms for drug use*	-
Dukes et al., 1996; 1997	CBA -	DARE n=497	Delayed intervention n=352	Up to 6 years n=NR	-	**NS** pro drug use attitudes **NS** resistance to peer pressure	-
Ennett et al., 1994	NRCT +	DARE n=18 schools	No intervention n=18 schools	2 years n=NR		**NS** attitudes towards drugs **NS** self-esteem	**NS** social skills

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Lynam et al., 1999	RCT -	DARE n=762	NR n=240	10 years n=NR	-	**NS** peer pressure resistance **NS** self-esteem	-
Perry et al., 2003	RCT +	DARE, n=2,226; DARE Plus, n=2,221	Delayed intervention n=1,790	Up to 18 months (84%)	-	↓ change in alcohol behaviour and intentions (DARE Plus, boys only*)	-
Botvin et al., 1995b	RCT +	LST, n=NR Culturally focused intervention (CFI), n=NR	Information only n=NR	2 years n=456 (60%)		↓ intentions to use beer or wine** ↓ intentions to use hard liquor (LST only*)	-
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	2 years NR	**NS** drinking knowledge	**NS** pro-drinking attitudes **NS** peer drinking norms	-
Hecht et al., 2003; Gosin et al., 2003	RCT -	Keepin it REAL n=25 schools	Usual curriculum n=10 schools	up to 14 months (84%)	-	↓ positive expectancies* ↑ descriptive norms* **NS** alcohol resistance strategies **NS** self-efficacy **NS** intentions **NS** norms	-
Kulis et al., 2005	RCT -	Keepin it REAL n=2,397	Usual curriculum n=1,005	14 months NR	-	**NS** refusal confidence **NS** intent to accept **NS** positive expectancies **NS** norms	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=308	No intervention n=134	up to 6 years	**NS** knowledge	-	-
Dedobbeleer & Desjardins, 2001	NRCT -	Coalition for Youth Quality of Life n=4 schools	No intervention n=6 schools	18 months NR	-	**NS** intentions to become involved in prevention activities ↑ self-esteem*	↑ relationship with father* **NS** relationship with mother
				30 months n=320 (40%)	-	**NS** drug and alcohol problems **NS** intentions to become involved in prevention activities **NS** self-esteem	**NS** relationship with father**/**mother

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.15. Classroom-based substance use prevention programmes: long-term programme effects on health and social outcomes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Bennett, 1995	RCT -	DARE n=NR	NR n=NR	8th grade	**NS** past year alcohol use	-	-
				9th grade	**NS** past year alcohol use	-	-
Clayton et al., 1996	RCT - (cluster)	DARE n=23 schools	Other drug education programmes n=8 schools	up to 5 years	**NS** alcohol use	-	-
Dukes et al., 1996; 1997	CBA -	DARE n=399	Delayed intervention n=271	Up to 6 years	**NS** alcohol use	-	-
Ennett et al., 1994	NRCT +	DARE n=6 schools	No intervention n=6 schools	2 years	**NS** alcohol use		-
Rosenbaum & Hanson, 1998	NRCT +	DARE n=975	No intervention n=823	up to 6 years	**NS** lifetime alcohol use **NS** last month alcohol use	**-**	**-**
Lynam et al., 1999	RCT -	DARE n=762	NR n=240	10 years	**NS** alcohol use	**-**	**-**
Perry et al., 2003	RCT +	DARE, n=2,226; DARE Plus, n=2,221	Delayed intervention n=1,790	Up to 18 months (84%)	**NS** alcohol use ↓ change in past year alcohol use (DARE Plus, boys only*) ↓ change in past month alcohol use (DARE Plus, boys only*)	↓ change in drunkenness (DARE Plus, girls only*)	**-**
Botvin et al., 1990a; Botvin et al., 1995a	RCT +	LST 1-day teacher workshops or teacher training by video n=NR	NR n=NR	3 years n=3,597 (81%)	**NS** weekly alcohol use **NS** monthly alcohol use	**NS** 3+ drinks per occasion ↓ drunkenness (workshops*/training by video**)	-
Botvin et al., 1995b	RCT +	LST, n=NR Culturally focused intervention (CFI), n=NR	Information only n=NR	2 years n=456 (60%)	↓ drinking frequency*** ↓ drinking amount***	↓ drunkenness***	**-**

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Botvin et al., 1995b	RCT +	Culturally focused intervention (CFI) n=NR	LST n=NR	2 years (60%)	↓ drinking frequency** ↓ drinking amount*	↓ drunkenness*	-
Botvin et al., 2001a; Botvin et al., 2001b; Griffin et al., 2003	RCT +	LST n=2,144	Usual curriculum n=1,477	2 years NR	-	↓ binge drinking**	-
Fraguela et al., 2003	NRCT -	LST; researcher-led n=235 teacher-led n=309	No intervention n=485	2-3 years 40-36%	**NS** alcohol use	-	-
Spoth et al., 2002; 2005; 2008	RCT +	LST, n=621; LST + SFP 10-14, n=549	Four leaflets mailed to families n=494	2 years n=1,198 (73%)	**NS** regular alcohol use	↓ weekly drunkenness (LST + SPF only*)	-
				5 years n=1,237 (74%)	**NS** 'new users'	**NS** drunkenness	-
Hecht et al., 2003; Gosin et al., 2003	RCT -	Keepin it REAL n=25 schools	Usual curriculum n=10 schools	up to 14 months (84%)	↓ change in alcohol use***	-	-
Kulis et al., 2005	RCT -	Keepin it REAL n=2,397	Usual curriculum n=1,005	14 months NR	↓ change in alcohol use**	-	-
Kulis et al., 2007	RCT -	Keepin it REAL n=1050	NR n=314	up to 14 months	↑ reduced or recently discontinued alcohol use*** ↑ transition to reduced alcohol use*	-	-
Warren et al., 2006	RCT +	Keepin it REAL n=3314	Usual curriculum n=1420	14 months NR	**NS** alcohol use	-	-
Sussman et al., 1998; Sun et al., 2006	RCT +	Project TND Classroom, n=7 schools Classroom + school as community, n=7 schools	Usual curriculum n=7 schools	up to 5 years	**NS** alcohol use	-	-
Sussman et al., 2003	RCT +	Project TND n=NR	Usual curriculum n=NR	2 years n=NR	**NS** alcohol use	-	-

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Ellickson et al., 1993	RCT +	Project ALERT n=3,247	Usual curriculum n=2,165	up to 12th grade	**NS** alcohol use	-	-
Snow et al., 1992; 1997	CBA -	Adolescent Decision Making programme n=680	NR n=680	2 years (79%)	↑ alcohol use*	-	-
Shope et al., 1996b; Shope et al., 1998	CBA -	Based on AMPS n=507	No intervention n=530	up to 6 years (25%)	**NS** alcohol use	**NS** alcohol misuse	-
Slater et al., 2006	RCT +	Be Under Your Own Influence/All Stars In-school media + All Stars; In-school media only; All Stars only n=NR	No intervention n=NR	2 years (69%)	↓ alcohol use (in-school media**/All Stars***[a])	-	-
Dedobbeleer & Desjardins, 2001	NRCT -	Coalition for Youth Quality of Life n=4 schools	No intervention n=6 schools	18 months n=NR	**NS** alcohol drinking frequency **NS** alcohol consumed per typical occasion	**NS** drug and alcohol problems	-
				30 months n=320 (40%)	**NS** alcohol drinking frequency **NS** alcohol consumed per typical occasion	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] Based on school as level of analysis

5.4 Brief behavioural or single session interventions

5.4.1 Overview of evidence identified

A total of 15 articles (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a, 1996b, 1998, 2000a, 2000b, 2001, 2003a, 2003b, 2005a, 2005b, 2005c, 2008a, 2008b) were identified that reported on evaluations of seven brief behavioural or single session intervention approaches across 13 studies. For the purposes of this review, brief behavioural and single session intervention approaches were defined as short (i.e. lasting no longer than one hour) or single session interventions, which were delivered outside of the lesson format or wider curriculum. Eight articles examined the STARS (Start Taking Alcohol Risks Seriously) for Families programme developed by Werch et al. Three articles (Werch et al., 2000a; 2001; 2003a) reported on a two-year version of the STARS programme and were grouped together as a single study.

Twelve of the studies were conducted in the USA and one study was conducted in the UK (Dempster et al., 2006). All thirteen studies were primarily school-based but six studies (Werch et al., 1998, 2000a, 2000b, 2003b, 2005a, 2008b) examined interventions which incorporated materials targeting parents. A range of providers were utilised across the included studies. Eight studies (Werch et al., 1996a, 1996b, 1998, 2000a, 2000b, 2003b, 2005a, 2005b) examined interventions delivered by school nurses, of which three studies (Werch et al., 1996a, 2003b, 2005b) combined delivery with a physician, teacher or fitness professional. Two studies (Werch et al., 2008a, 2008b) were based on mailed intervention materials and therefore did not involve a provider in the delivery. The remaining three studies (Dempster et al., 2006; Werch et al., 2005c; Argentos, 1991) were delivered by a consultant, trained research staff and a motivational speaker, respectively.

The theoretical framework for intervention was not reported for one study (Werch et al., 2005c). For studies that did report the theoretical framework, all but one study (Argentos, 1991) was based on multiple theories.

The sample sizes in the included studies ranged from 104 to 704 students. The programmes examined targeted students across a range of ages. Five studies (Werch et al., 1996a, 1996b, 1998, 2000a, 2005a) of the STAR for Families programmes and one study (Werch et al., 2003b) of the Project SPORT intervention targeted students aged 14 years or younger. Werch et al (2000b) examined a version of the STAR for Families programme which targeted students in junior high, aged 12-15 years. The six remaining studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 2005b, 2005c, 2008a, 2008b) examined programmes that targeted studies aged over 14 years, up to the age of 18. The length of follow-up across the included studies ranged from PT to 12 months. No studies reported on the long-term follow-up of brief behavioural or single session programmes.

Table 5.16. Alcohol education: brief behavioural or single session interventions

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Dempster et al., 2006	NRCT -	UK n=182 15-16 years	School	Single session (20 minutes) to communicate to young people the dangers of binge drinking	Theory of planned behaviour	Consultant
Werch et al., 1996a	RCT +	USA n=104 mean 13.8 years	School	**STARS for Families**: Self-instructional module and audiotape, brief health consultation with nurse or doctor, follow-up consultation with trained peers between PT and follow-up	Transtheoretical model of change, health belief model, social learning theory, behavioural self-control	Physician, School nurse
Werch et al., 1996b	RCT ++	USA N= 138 Mean age 12.2 years	School	**STARS for Families**: 6 focused weekly follow-up consultations; brief health consultation with nurse	Multi-component motivational stages prevention model, health belief model, social learning theory, behavioural self-control	School nurse
Werch et al., 1998	RCT +	USA n=211 mean 12.1 years	School, family	**STARS for Families**: Brief health consultation with nurse; letter to parents; up to 9 family-based prevention lessons	Multi-component motivational stages prevention model, health belief model, social learning theory, behavioural self-control	School nurse
Werch et al., 2000a; 2001; 2003a	RCT +	USA N=650 mean 12.1 years	School, family	**STARS for Families**: Brief health consultation with nurse; up to 10 prevention postcards sent to parents; follow-up consultation in second year; four family take-home lessons	Transtheoretical model of change, multi-component motivational stages prevention model,	School nurse
Werch et al., 2000b	RCT +	USA n=178 7th-9th grade	School, family	**STARS for Families**: Telephone-based nurse consultation; 10 prevention postcards sent to parents	Multi-component motivational stages prevention model, social cognitive theory	School nurse
Werch et al., 2003b	RCT ++	USA n=454 mean 13.2 years	School, family	**Project SPORT** Sport Plus: Health fitness screen and health consultation with a nurse, plus alcohol preventive consultation with a nurse Sport Plus Parent: As above, plus five parental cards mailed once a week	Social cognitive theory, multi-component motivational stages prevention model	School nurse, Teacher
Werch et al., 2005a	RCT +	USA N= 448 Mean 13.4 years	School, family	**STARS for Families:** Single vs. multiple drug prevention, brief health consultation with nurse, eight prevention postcards sent to parents	Health belief model, social cognitive theory, behavioural self control	School nurse

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Werch et al., 2005b	RCT ++	USA n=604 mean 15.2 years	School	**Project SPORT:** Health behaviour screen; brief health consultation; take-home fitness prescription and prevention flyer	Integrative Behaviour-Image Model	Nurse, fitness professionals
Werch et al., 2005c	RCT +	USA N= 232 mean 17 years	School	**Alcohol beverage tailored programme:** Brief screening instrument; brief alcohol risk reduction consultation; tip sheet reinforcing key messages	NR	Trained research staff
Argentos, 1991	CBA -	USA n=350 9th-10th grade	School	**Programme Kickoff:** 36 hours over one week; motivational speaker, prevention curriculum, group discussion and role play, t-shirts promoting drug free lifestyles	Social learning theory	Motivational speaker
Werch et al., 2008a	RCT +	USA n=375 mean 17 years	School	**Plan for Success:** printed text and scripted messages; health promotion and avoidance of health risks. Three interventions: (1) Plan for Success goal clarification survey; (2) goal clarification + goal planning; (3) goal clarification + career consultation.	Behaviour-image model, prospect theory and message framing.	NA
Werch et al., 2008b	RCT +	USA n=704 mean 15.2 years	School, family	**Brief image-based messages**: Three parent/ caregiver postcards, read and talk about each of four health and fitness facts found on the card with their teen	Prospect theory	NA

5.4.2 Quality assessment

Eleven studies (Werch et al., 1996a, 1996b, 1998, 2000a, 2000b, 2003b, 2005a, 2005b, 2005c, 2008a, 2008b) were based on RCT designs, and involved the randomisation of individual students to intervention and control groups. However, two studies by Werch et al (2003b, 2008a) involved randomisation to three intervention arms and did not utilise a control group for comparison. The study by Dempster et al (2006) was based on an NRCT design and Argentos et al (1991) reported on a CBA study. All 11 RCTs were rated good or moderate quality. Although detail on the methods of allocation were lacking in some studies, outcomes were reported to be valid and reliable across all of these studies and attrition rates were generally low. The study by Dempster et al (2006) was rated as poor quality because information was lacking on allocation and the baseline comparability between intervention and control students. In addition, although outcomes were generally well reported the scope of the analyses was lacking. The CBA study by Argentos (1991) was also rated poorly. Details of the study methodology were poorly reported, and it was not clear if the intervention and control groups were balanced at baseline as little information on the demographics of participants were reported.

5.4.3 Findings

5.4.3.1 Short-term results (<6 months)

Twelve studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a, 1996b, 1998, 2000a, 2003b, 2005a, 2005b, 2005c, 2008a, 2008b) reported on the short-term effects of brief behavioural and single session interventions.

Knowledge and understanding

None of studies examined short-term intervention effects on knowledge and understanding.

Attitudes and values

Ten studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a; 1996b; 2000a; 2003b; 2005a; 2005b; 2005c; 2008a) examined intervention effects on a range of measures related to attitudes and values in relation to alcohol use. Compared to students in the control group, students who participated in the one week Programme “Kickoff” (Argentos, 1991) reported an increased belief that their alcohol (and other drug) use might result in serious consequences ($p<0.01$). They also demonstrated significantly higher levels of understanding about popular myths regarding alcohol use and other drugs. Dempster et al (2006) reported that one month after receiving a single session on the dangers of binge drinking[3], intervention students appraised binge drinking behaviour more negatively and believed more strongly that they could control their binge drinking behaviour compared to the control group ($p<0.001$ and $p<0.01$, respectively). Intervention students also tended to show a stronger intention to stop binge drinking than the control group, but this finding did not reach significance. Four studies (Werch et al., 1996a; 1996b; 2000a; 2005a) examined the short-term

[3] Defined by the authors as drinking half the recommended maximum weekly consumption of alcohol in a single session.

effects of the STARS for Families programme. Werch et al (1996a) reported that 10 weeks after participating the programme, intervention students reported significantly fewer peer expectations to drink alcohol, less intention to use alcohol in the future, and less intention to try alcohol compared to students who received an alcohol education booklet (all $p<0.05$). Werch et al (1996b) found that compared to a no intervention control, STARS for Families had no effects on students' perceptions of drinking consequences or their intentions for future alcohol use. Werch et al (2005a) examined STARS for Families (alcohol only) versus a multiple substance intervention (STARS Plus), compared a post-card only control. There were no short-term effects of either intervention on perceived peer alcohol use, but students who received the alcohol only programme reported less susceptibility to peer alcohol use and greater levels of alcohol incompatibility than controls (both $p<0.05$). Evaluation of two-year version of the STARS for Families programmes (Werch et al., 2000a; 2001) revealed inconsistent effects of the intervention of risk factors for alcohol use. Following the first year of the programme there were no differences in alcohol risk factors between intervention and control students. However, at the end of the programme, students in commuter schools reported fewer expectancy beliefs, greater motivations to avoid alcohol use and an overall lower number of alcohol risk factors (all $p<0.05$). There was no difference on any of these measures among students in (inner-city) community schools. Two studies (Werch et al., 2003b; 2005b) examined effects of the Project SPORT intervention. Werch et al (2003b) reported that students who received the Sport Plus Parent programme had greater increases in negative expectancy beliefs and self-control over time than students in the Sport or Sport Plus groups. At 3 months, compared to a no intervention control (Werch et al., 2005b), Project SPORT youth reported significantly greater negative alcohol expectancy beliefs (indicating greater protection against alcohol use) ($p<0.05$), behavioural capability ($p<0.01$), perceived susceptibility ($p<0.05$), parental monitoring ($p<0.05$), and parent/child communication ($p<0.05$). There were no intervention effects on resistance self-efficacy, self-control, value incompatibility or positive parent/child relationship. SPORT participants showed less risk for alcohol use compared to control participants, on measures of intentions to drink in the future ($p<0.01$), alcohol attitudes ($p<0.05$), and 'influenceability' ($p<0.01$). No effects on positive expectancy beliefs, subjective norms or perceived peer prevalence of alcohol were found. An alcohol beverage tailored intervention (Werch et al., 2005c) had significant, positive effects (all $p<0.05$) on the following alcohol risk factors: 'influenceability' for beer, wine, distilled spirits, and malt liquor consumption; perceived peer prevalence for wine, flavoured coolers, and fortified wine consumption; perceived susceptibility for beer and wine consumption; and perceived severity for beer, wine and distilled spirit consumption. A brief behavioural intervention strategy addressing positive images, delivered alone or in combination with either goal setting or career consultation, was associated with reductions in intentions to use alcohol and increases in the belief that alcohol interferes with other behaviours (Werch et al., 2008a).

Personal and social skills

Two studies (Werch et al., 2003b; 2005b) examined the short-term effects of the Project SPORT intervention on personal and social skills. Students who received the SPORT intervention plus parental cards reported improvements in self-control following intervention, compared to no change

across the other versions of the programme examined. Compared to no intervention, there were no effects of Project SPORT on self-control or parent-child relationships.

Health and social outcomes relating to alcohol use and sexual health

Twelve studies examined short-term intervention effects on alcohol use. Six studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996b; Werch et al., 1998; Werch et al., 2003b; Werch et al., 2005c) found that the brief behavioural or single session intervention examined were not effective in reducing alcohol use.

Two studies (Werch et al., 1996a; 2001) demonstrated positive short-term effects of the STARS for Families intervention. Werch et al (1996a) reported that the STARS intervention had significant effects on 30-day quantity and frequency of alcohol use at 10 weeks follow-up (after delivery of the peer follow-up consultation), and STARS students reported using less alcohol than control students. However, there was no difference between intervention and control students who received an alcohol education booklet on the measure of recent alcohol use. Comparing community and specialist schools at the end of the first year of a two year intervention, Werch et al (2001) found intervention associated reductions in last week and last month drinking in STARS students in community schools (both $p<0.05$) but not in their specialist school counterparts. At the end of the two-year programme (Werch et al., 2000a) however, there was no difference between intervention and control students in community schools on any of the measures of alcohol use. Conversely, intervention students in specialist schools were more likely than control students to report that they did not drink and were less likely to reported heavy alcohol use (both $p<0.05$). There was no difference between intervention and control students in commuter schools on the measures of 7- or 30-day alcohol use.

Werch et al (2003b) found that there were reductions in alcohol use across all participants who received a sport consultation. Significant reductions were reported on 3 of 6 alcohol use measures: 30-day heavy drinking, alcohol problems and alcohol use initiation. However, there was no difference between groups (Sport, Sport Plus, or Sport Plus Parent). At 3-months follow up, students who received the Project SPORT intervention (Werch et al., 2005b) reported significantly less alcohol frequency, quantity and heavy use in the last 30 days compared to no intervention control students (all $p<0.001$). More students were in an earlier stage of alcohol initiation[4] ($p<0.001$) and length ($p<0.01$) of alcohol initiation was also less. Intervention based on brief behavioural intervention messages to parents which prompted them to discuss health and fitness with their children was associated with reduced alcohol use frequency compared to students who received fitness flyers ($p<0.05$).

Werch et al (2008a) examined the Plan for Success intervention, with and without a goal setting or career consultation component. There was no control arm included in the study. Across all three intervention arms there was a reduction in the length of time students had been drinking alcohol but no impact on quantity or frequency. For students whose parents received brief image-based

[4] This measure reflected student's stage of alcohol initiation ranging from a strong precontemplation stage (will never try alcohol) to a maintenance stage (drinking for longer than 6 months).

messages (Werch et al., 2008b) there was a reduction in alcohol use frequency and problems, four-months after intervention, compared to control students who received fitness flyers.

5.4.3.2 Medium-term results (up to 12 months)

Four studies (Werch et al., 1998; 2000b; 2003a; 2005b) examined medium-term intervention effects of three versions of the STARS for Families intervention and the Project SPORT intervention, respectively.

Knowledge and understanding

None of the included studies examined medium-term intervention effects on knowledge.

Attitudes and values

Three studies (Werch et al., 2000b; 2003a; 2005b) examined medium-term impacts on attitudes and values. Werch et al (2000b) examined the effects of the STARS programme among students attending sports physical examinations. At the 6-months post-test fewer intervention than control students from suburban and rural schools, but not urban schools, reported that they intended to use alcohol in next 6 months. At 12 months follow-up, after a two-year STARS intervention, Werch et al (2003a) reported that compared to control students, intervention students in specialist schools (but not community schools) were less likely to report intentions to use alcohol, had significantly greater motivations to avoid alcohol and an overall lower alcohol risk score (all $p<0.01$). There were no differences between intervention and control students in community or commuter schools on the measures of influenceability, peer prevalence or expectancy beliefs. At 12 months follow-up, Project SPORT participants reported significantly more protective factors and fewer risk factors for alcohol use. Further analyses showed that Project SPORT participants had significantly better parent/child communication ($p<0.01$), and marginally more positive parent/child relationships ($p=0.05$), compared to controls who received generic alcohol prevention and health promotion materials, but less protection on perceived susceptibility ($p<0.05$). There was no significant difference between intervention and control students in intentions to drink in the next 6 months.

Personal and social skills

None of the included studies examined medium-term intervention effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

One study (Werch et al., 2000b) examined the effect of the STARS programme at 6-months in a sample of students recruited from sports physical examinations. Compared to control students who received no intervention, fewer intervention students reported drinking during the previous month ($p<0.05$) and drinking heavily ($p<0.05$). There were no significant effects on drinking in the last 7 days. Two studies (Werch et al., 1998; Werch et al., 2003a) examined the effectiveness of the STARS for Families programme at 1 year. Neither version of the programme examined had significant effects on alcohol use behaviours in the medium-term, compared to an alcohol education booklet control. However, the analyses of 30-day heavy use showed an effect in favour of the 2-year version of the STARS for Families programme (Werch et al., 2003). The short-term effects of the Project SPORT programme had declined by the 1-year follow-up (Werch et al., 2005b), although the effects still

favoured the intervention, and intervention students reported using alcohol for a briefer period of time than control students ($p<0.05$).

5.4.3.3 Long-term results (>12 months)

None of the included studies reported long-term follow-up data.

5.4.4 Summary and evidence statements

Thirteen studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a; 1996b; 1998; 2000a; 2000b; 2003b; 2005a; 2005b; 2005c; 2008a; 2008b) were identified that examined seven brief behavioural or single session intervention approaches relevant to alcohol education. Eight studies (Werch et al., 1996a, 1996b, 1998, 2000a, 2000b, 2003b, 2005a, 2005b) examined interventions delivered by school nurses, of which three studies (Werch et al., 1996a, 2003b, 2005b) combined delivery with a physician, teacher or fitness professional. Three further studies (Dempster et al., 2006; Werch et al., 2005c; Argentos, 1991) were delivered by a consultant, trained research staff and a motivational speaker, respectively, and two studies (Werch et al., 2008a; 2008b were based on mailed intervention materials.

5.4.4.1 Knowledge and understanding

None of the studies examined intervention effects on knowledge or understanding.

5.4.4.2 Attitudes and values

Eleven studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a; 1996b; 2000a; 2003b; 2005a; 2005b; 2005c; 2008a) examined intervention effects on students' attitudes and values. Short-term increases in negative views of alcohol and/or its consequences were found in six studies, which included evaluations of the one week Programme 'Kickoff' (Argentos, 1991), a single session on the dangers of binge drinking (Dempster et al., 2006), Project SPORT (Werch et al., 2003b; 2005b), an alcohol beverage tailored programme (Werch et al., 2005c), and a brief behavioural intervention strategy addressing positive images (Werch et al., 2008a). Furthermore, a decrease in students' alcohol expectancies (their own or their views of their peers') was found for two studies of Project SPORT (Werch et al., 2003b; 2005b) and among students who attended specialist schools in one study of STARS for families (Werch et al., 2000a). Brief behavioural or single session intervention approaches appeared to have inconsistent short- and medium-term effects on student's intentions to drink. Across five studies (Werch et al., 1996a; 2000b; 2003a; 2005b; 2008a), which examined a range of brief behavioural intervention approaches, there were decreases in students' intentions to drink alcohol However, two studies (Dempster et al., 2006; Werch et al., 1996b) reported no effects on intentions to stop binge drinking or drinking alcohol respectively.

5.4.4.3 Personal and social skills

Short-term intervention effects of the Project SPORT intervention on personal and social skills were examined in two studies (Werch et al., 2003b; 2005b). There was no impact of the intervention on self-control or parent-child relationships compared to no intervention, but relative to other versions of the programme, students who received additional parental components reported greater self-control.

5.4.4.4 Health and social outcomes relating to alcohol use and sexual health

Six studies (Werch et al., 1996a; 1996b; 1998; 2000a; 2000b; 2005a) reported on the short- to medium-term effectiveness of various versions of the STARS for Families programme. The programme had inconsistent effects on the quantity and frequency of alcohol use, and alcohol use in the last 7- or 30-days in both the short- and medium-term. However, STARS for Families did have a positive effect on heavy drinking in the past month, and analyses of 30-day heavy use showed an effect in favour of the 2-year version of the STARS for Families programme (Werch et al., 2000a; 2001; 2003a). Two studies (Werch et al., 2003b; 2005b) reported on the short-term effects of two sport-based brief behavioural intervention programmes. There were no differential intervention effects for a sports consultation when students received an additional preventive consultation on alcohol (Werch et al., 2003b), but compared to no intervention (Werch et al., 2005b), Project SPORT was shown to have short-term effects on frequency and quantity of alcohol use, and heavy alcohol use in the past month. By the 1-year follow-up, programme effects had declined although the direction of effect still favoured the intervention. An intervention based on brief image-based messages for adolescents and their parents had positive, short-term effects on alcohol use frequency and problems (Werch et al., 2008b). An alcohol tailored beverage programme (Werch et al., 2005c) and a brief behavioural intervention founded on the Behaviour-Image Model (Werch et al., 2008a) had inconsistent effects on alcohol use, and two further programmes, a single session on the dangers of binge drinking (Dempster et al., 2006), and the one week Programme "Kickoff" (Argentos, 1991), had no effects on alcohol use.

Evidence statement 4

4 (d) There is moderate evidence from nine RCTs, one NRCT and one CBA study[1] to suggest that brief behavioural or single session intervention approaches relating to alcohol use may have mixed effects on attitudes and values relating to alcohol use. There is moderate evidence from four RCTs, one NRCT and one CBA study[2] to suggest that these programmes may have positive short-term effects on how student's view alcohol use and its consequences and further evidence from five RCTs and one NRCT[3] to suggest that brief behavioural intervention approaches have mixed or inconsistent effects on intentions to drink. Findings may only be partially applicable to the UK as the majority of studies were implemented in the USA and may not be generalisable beyond the populations studied. In addition, the emphasis of the STARS for Families and Project SPORT interventions on abstinence may be of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

4 (e) There is inconsistent evidence from two studies[4] to determine the effects of brief behavioural and single session intervention approaches on personal and social skills.

4 (f) There is moderate evidence from five RCTs[5] to suggest that brief behavioural intervention approaches based on nurse-led consultations, such as the STARS for Families and Project SPORT programmes, can produce short-term reductions in alcohol use, but further moderate evidence from three RCTs[6] to suggest that these effects may not be sustained in the medium-term. There is weak evidence from two RCTs, one NRCT and one CBA study[7] to suggest that

other brief behavioural and single session intervention approaches may have a limited impact on alcohol consumption. These findings may only be partially applicable to the UK as the majority of studies were implemented in the USA and may not be generalisable beyond the populations studied. In addition, the emphasis of the STARS programme on abstinence may be of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

[1] Argentos, 1991 (CBA -); Dempster et al., 2006 (NRCT -); Werch et al., 1996a (RCT +); Werch et al., 1996b (RCT ++); Werch et al., 2000a (RCT +); Werch et al., 2000b (RCT +); Werch et al., 2003b (RCT ++); Werch et al., 2005a (RCT +); Werch et al., 2005b (RCT ++); Werch et al., 2005c (RCT +); Werch et al., 2008a (RCT +)

[2] Argentos, 1991 (CBA -); Dempster et al., 2006 (NRCT -); Werch et al., 2003b (RCT ++); Werch et al., 2005b (RCT ++); Werch et al., 2005c (RCT +); Werch et al., 2008a (RCT +)

[3] Dempster et al., 2006 (NRCT -); Werch et al., 1996a (RCT +); Werch et al., 1996b (RCT ++); Werch et al., 2000b (RCT +);Werch et al., 2003a (RCT +); Werch et al., 2005b (RCT ++); Werch et al., 2008a (RCT +)

[4] Werch et al., 2003b (RCT ++); Werch et al., 2005b (RCT ++)

[5] Werch et al., 1996a (RCT +); Werch et al., 1996b (RCT ++); Werch et al., 2000a; 2001; (RCT +); Werch et al., 2005a (RCT +); Werch et al., 2005b (RCT ++)

[6] Werch et al., 1998 (RCT +); Werch et al., 2003a (RCT +); Werch et al., 2005b (RCT ++)

[7] Argentos, 1991 (CBA -); Dempster et al., 2006 (NRCT -); Werch et al., 2005c (RCT +); Werch et al., 2008a (RCT +);

Table 5.17. Brief behavioural and single session interventions: short-term programme effects on knowledge skills and attitudes

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Argentos, 1991	CBA -	Programme Kickoff n=280	No intervention n=70	PT NR	-	↑ belief that their alcohol (and other drug) use might result in serious consequences** ↑ understanding of popular myths regarding alcohol use and other drugs	-
Dempster et al., 2006	NRCT -	Alcohol brief intervention n=133	No intervention n=49	1 month n=NR	-	↑ negative appraisal binge drinking** ↑ belief could control binge drinking behaviours* **NS** intentions to stop binge drinking	-
Werch et al., 1996a	RCT +	STARS for Families n=52	Alcohol education booklet n=52	PT NR	-	↑ intentions to stop or reduce drinking* ↑ perceived susceptibility to alcohol-related health problems (likely to get sick if drunk)* **NS** resistance self-efficacy **NS** perceived prevalence of drinking among peers or adults	-
				10 weeks n=101 (97%)	-	↓ perceived prevalence of drinking among adults** **NS** perceived prevalence of drinking among peers ↑ perceived susceptibility to alcohol-related health problems (likely to become addicted by drinking often)* **NS** resistance self-efficacy	-
Werch et al., 1996b	RCT ++	STARS for Families n=68	No intervention n=70	3 months n=124 (90%)	-	**NS** drinking consequences **NS** intentions for alcohol use	-
Werch et al., 2000a; 2001	RCT +	STARS for Families Community n=107 Specialist n=174	Alcohol education booklet Community n=109 Specialist n=175	end of 6th grade n=569 (88%)	-	**NS** alcohol risk factor measures (influenceability, peer prevalence, expectancy beliefs, motivations to avoid)	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Werch et al., 2000a; 2001	RCT +	STARS for Families Community, n=97 Specialist, n=157	Alcohol education booklet Community, n=100 Specialist, n=161	end of 7th grade n=515 (79%)	-	**NS** influenceability **NS** peer prevalence ↓ expectancy beliefs (specialist schools only*) ↑ motivations to avoid alcohol use (specialist schools only**) ↓ total alcohol risk (specialist schools only*)	-
Werch et al., 2005a	RCT +	STARS for families, n=150 STARS Plus, n=149	Postcards only n=149	3 months n=433 (97%)	-	**NS** peer alcohol use ↓ peer alcohol susceptibility (STARS only*) ↓ alcohol incompatibility (STARS only*)	-
Werch et al., 2003b	RCT ++	Project SPORT Sport, n=152 Sport Plus, n=150 Sport Plus Parent, n=152	NA	3 months n=444 (98%)	-	↑ negative expectancy beliefs (Sport Plus Parent)* ↓ peer prevalence (control only*)	↑ self-control (Sport Plus Parent*)
Werch et al., 2005b	RCT ++	Project SPORT n=302	No intervention n=302	3 months n=584 (97%)	-	↑ negative expectancy beliefs* ↑ behavioural capability** ↑ perceived susceptibility* ↑ parental monitoring* ↑ parent/child communication* **NS** resistance self-efficacy **NS** value incompatibility ↓ intentions to drink in the future** ↓ pro alcohol attitudes* ↓ influenceability** **NS** expectancy beliefs **NS** subjective norms **NS** perceived peer prevalence	**NS** positive parent child relationship **NS** self-control

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Werch et al., 2005c	RCT +	Alcohol beverage tailored programme n=115	Alcohol education booklet n=117	PT n=201 (87%)	-	↓ influenceability for beer, wine, distilled spirits and malt liquor* ↓ perceived peer prevalence for wine, flavoured coolers, and fortified wine* ↑ perceived susceptibility for beer and wine consumption* ↑ perceived severity for beer, wine and distilled spirits*	-
Werch et al., 2008a	RCT +	Plan for Success (1) Planning, n=113; (2) planning + goal setting, n=113; (3) planning + career consultation, n=109	NA	PT n=335 (93%)	-	↓ intention to use alcohol** ↑ belief alcohol interferes with other behaviours**	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] Adjusted for baseline substance use; [b] 30-day heavy drinking, alcohol problems, alcohol use initiation declined over time in intervention and control groups ; [c] Adjusted for baseline alcohol use

Table 5.18. Brief behavioural and single session interventions: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up			
					Alcohol use	Heavy alcohol use	Other
Argentos, 1991	CBA -	Programme Kickoff n=280	No intervention n=70	PT n=NR	**NS** alcohol use	-	-
Dempster et al., 2006	NRCT -	Alcohol brief intervention n=133	No intervention n=49	1 month n=NR	-	**NS** binge drinking	**NS** number of units of alcohol consumed in a single session
Werch et al., 1996a	RCT +	STARS for Families n=52	Alcohol education booklet n=52	PT n=NR	**NS** alcohol quantity last month **NS** 30-day alcohol frequency **NS** recent alcohol use	**NS** heavy drinking	-

Study	Rating	Intervention	Comparator	Follow-up	Alcohol use	Heavy alcohol use	Other
Werch et al., 1996a	RCT +	STARS for Families n=52	Alcohol education booklet n=52	10 weeks n=101 (97%)	↓ alcohol quantity last month* ↓ 30-day alcohol frequency* **NS** recent alcohol use	**NS** heavy drinking	-
Werch et al., 1996b	RCT ++	STARS for Families n=68	No intervention n=70	3 months n=124 (90%)	**NS** 7-day use **NS** 30-day use	↓ 30-day heavy use*	-
Werch et al., 1998	RCT +	STARS for Families n=106	Alcohol education booklet n=105	PT n=187 (89%)	**NS** 30-day use **NS** 7-day use **NS** alcohol frequency **NS** alcohol quantity	**NS** 30-day heavy use **NS** heavy alcohol use	-
Werch et al., 2001; 2000a	RCT +	STARS for Families Community, n=107 Specialist, n=174	Alcohol education booklet Community, n=109 Specialist, n=175	end of 6th grade n=569 (88%)	↓ initiation (community schools only*) ↓ 7-day use (community schools only*) ↓ 30-day use (community schools only*)	↓ 30-day heavy use (community schools only**)	-
		STARS for Families Community, n=97 Specialist, n=157	Alcohol education booklet Community, n=100 Specialist, n=161	end of 7th grade n=515 (79%)	↓ initiation (commuter schools only*) **NS** 7-day use **NS** 30-day use	↓ 30-day heavy use (commuter schools only*)	-
Werch et al., 2005a	RCT +	STARS for families, n=150 STARS Plus, n=149	Postcards only n=149	3 months n=433 (97%)	**NS** 30-day quantity ↓ 30-day frequency[c] (STARS only*)	**NS** heavy alcohol use	↓ alcohol-related use problems*
Werch et al., 2003b	RCT ++	Project SPORT Sport, n=152 Sport Plus, n=150 Sport Plus Parent, n=152	NA	3 months n=444 (98%)	**NS** alcohol use measures[b]	-	-
Werch et al., 2005b	RCT ++	Project SPORT n=302	No intervention n=302	3 months n=584 (97%)	↓ 30-day frequency*** ↓ 30-day quantity*** ↓ length of alcohol use** ↓ stage of alcohol initiation***	↓ 3-day heavy use***	**NS** alcohol problems
Werch et al., 2005c	RCT +	Alcohol beverage tailored programme n=115	Alcohol education booklet n=117	PT n=201 (87%)	**NS** 30-day frequency **NS** 30-day quantity	**NS** 30-day heavy use	-

Study	Rating	Intervention	Comparator	Follow-up			
					Alcohol use	Heavy alcohol use	Other
Werch et al., 2008a	RCT +	Plan for Success (1) Planning, n=113; (2) planning + goal setting, n=113; (3) planning + career consultation, n=109	NA	PT n=335 (93%)	↓ length of alcohol use* **NS** 30-day alcohol frequency **NS** 30-alcohol use quantity	-	-
Werch et al., 2008b	RCT +	Brief image based messages n=182	Fitness flyers n=202	4 months n=NR (94%)	↓ alcohol use frequency*	-	↓ alcohol use problems*
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported [a] Adjusted for baseline substance use; [b] 30-day heavy drinking, alcohol problems, alcohol use initiation declined over time in intervention and control groups ; [c] Adjusted for baseline alcohol use							

Table 5.19. Brief behavioural and single session interventions: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Werch et al., 2000b	RCT +	STARS for Families n=NR	No intervention n=NR	6 months n=163 (92%)	-	↓ intentions to use alcohol in next 6 months (suburban and rural only*)	-
Werch et al., 2003a	RCT +	STARS for Families n=325	Alcohol education booklet n=325	1 year n=507 (78%)	-	**NS** influenceability **NS** peer prevalence **NS** expectancy beliefs ↓ intentions to use alcohol (commuter schools only**) ↑ motivations to avoid alcohol use (commuter schools only**) ↓ total alcohol risk (commuter schools only**)	-
Werch et al., 2005b	RCT ++	Project SPORT n=302	No intervention n=302	12 months n=514 (85%)	-	↑ alcohol protective factors** ↓ alcohol risk factors*	-
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported							

Table 5.20. Brief behavioural and single session interventions: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Werch et al., 1998	RCT +	STARS for Families n=106	Alcohol education booklet n=105	1 year n=147 (70%)	**NS** 7-day use **NS** 30-day use **NS** alcohol frequency	**NS** 30-day heavy use	**NS** alcohol quantity **NS** heavy alcohol use
Werch et al., 2000b	RCT +	STARS for Families n=NR	No intervention n=NR	6 months n=163 (92%)	**NS** 7-day use ↓ 30-day use*	↓ 30-day heavy use *	-
Werch et al., 2003a	RCT +	STARS for Families n=325	Alcohol education booklet n=325	1 year n=507 (78%)	**NS** lifetime alcohol use **NS** 30-day alcohol use **NS** length of drinking	**NS** 7-day alcohol use	-
Werch et al., 2005b	RCT ++	Project SPORT n=302	No intervention n=302	1 year n=514 (85%)	**NS** 30-day frequency **NS** 30-day quantity ↓ length of alcohol use* **NS** stage of alcohol initiation	**NS** 30-day heavy use	**NS** alcohol problems

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

5.5 Multicomponent school- and community-based programmes

5.5.1 Overview of evidence identified

Nine studies (Perry et al., 1996; Komro et al., 1999; 2001; 2008; Perry et al., 2002; Williams et al., 1995; Toomey et al., 1996; Johnson et al., 1990; Chou et al., 1998) were identified that examined two multicomponent, school- and community-based programmes: Project Northland and the Midwest Prevention Project. Both programmes were based in communities in the USA and combined comprehensive school-based curriculums, with community-based activities and parental involvement components. A variety of stakeholders were involved in delivery of both programmes.

The theoretical framework for the intervention was not reported for the Midwest Prevention project, but Project Northland was reported to be based on the theory of triadic influence, and Perry's planning model for adolescent health promotion. The sample size for both programmes exceeded 1,500 students and both programme primarily targeted students in the sixth to the eighth grade. A second phase of the Project Northland programme targeted students in 11th and 12th grade. Both studies were delivered over a three year period but follow-up results were only reported at the end of the programme and medium and long-term follow-up results were not available for either study.

5.5.2 Quality assessment

All nine studies identified for inclusion were based on an RCT design. On the whole the quality of the studies was generally judged to be of moderate quality. Only one study (Chou et al., 1998) was rated poor quality, and this was because there were differences between intervention and control participants at baseline and the study suffered from a high level of attrition with almost 60% of participants failing to provide complete data at all follow-ups. Of the studies rated moderate quality, details were lacking regarding the method of randomisation and the authors did not always sufficiently report on baseline differences between intervention and control students.

Table 5.21. Alcohol education: multicomponent school and community programmes

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Perry et al., 1996; Komro et al., 2001	RCT +	USA n=2,351 6th-8th grade	School, community, family	**Project Northland (Phase I):** Three year programme; parental involvement/educational curriculum, behavioural curricula, peer participation, community task force activities	NR	Peers, teachers, adult volunteers
Perry et al., 2002	RCT +	USA n=2953 11-12th grade	School, community, family	**Project Northland (Phase II):** interim curriculum (9th grade); classroom curriculum (11th grade), 11 postcards for parents, print media campaign, peer action teams, community action teams	NR	Teachers, Peers
Williams et al., 1995	RCT +	USA n=2,351 6th grade	School, community, family	**Project Northland (Slick Tracey Home Team):** 4 weekly sessions; activity story books, small group discussion, family fun night.	NR	Teachers, Peers
Toomey et al., 1996	RCT +	USA n=1,028 7th grade	School, community, family	**Project Northland (Amazing Alternatives!):** kickoff session for parent; 8-week peer led classroom curriculum; peer participation programme to create alcohol free alternative activities; home programme booklets mailed to parents; information for parents	NR	Teachers, Peers
Komro et al., 1999	RCT +	USA n=1,236 6th grade	School, community, family	**Project Northland:** peer leadership activities during Phase I	NR	Teachers, Peers
Komro et al., 2008	RCT +	USA N=4,259 6th grade	School, community, family	**Project Northland (Chicago):** Three year programme. See Perry et al., 1996 for details	Theory of triadic influence, Perry's planning model for adolescent health promotion	Teachers, peers
Johnson et al., 1990	RCT +	USA n=1,607 age NR	School, community	**Midwest Prevention Project (Kansas City):** 10 sessions; drug resistance skills, parent organisation programme, training for community leaders, mass media	NR	NR
Chou et al., 1998	RCT -	USA n=3,412 7th grade	School, community, family	**Midwest Prevention Project (Indianapolis):** see Johnson et al., 1990 for details	NR	Teachers

5.5.3 Findings

5.5.3.1 Short-term results (<6 months)

All nine studies (Perry et al., 1996; Komro et al., 1999, 2001, 2008; Perry et al., 2002; Williams et al., 1995; Toomey et al., 1996; Johnson et al., 1990; Chou et al., 1998) reported on the short-term effects of two long-term comprehensive multicomponent programmes.

Knowledge and understanding

None of the studies examined short-term intervention effects on knowledge.

Attitudes and values

Perry et al (1996) reported that students in the intervention district during Phase I of Project Northland had significantly lower scores on the peer influence scale at the end of the 8th grade compared to students in comparison districts. However, there were no significant differences between intervention and control communities on the self-efficacy or perceived access to alcohol scales. Among baseline non-users, students in the intervention districts had significantly lower scores at the end of 8th grade on the peer influence scale, and greater self-efficacy to refuse alcohol, relative to students in control districts. No difference was found between intervention and control baseline users. Perry et al (2002) reported that there were no differences in the trajectories of students' perceptions of peer influence to use alcohol or their perceived access to alcohol during phase two of Project Northland. During the interim phase when students were in ninth and tenth grade, students in intervention schools were significantly more likely to experience increased perceptions of peer influence to use alcohol and to decrease their self-efficacy to refuse alcohol. Komro et al (2008) examined a replication of Project Northland study among an urban, low-income population. Compared to the usual school curriculum, there were no effects of Project Northland on any of the measures of attitudes and values, including intentions, peer norms or self-efficacy.

Personal and social skills

None of the studies examined short-term intervention effects on personal and social skills

Health and social outcomes relating to alcohol use and sexual health

Perry et al (1996) reported that significant positive effects of Project Northland were found at the end of 8th grade (end of Phase one). Students in the intervention districts had significantly lower scores ($p<0.05$) on the tendency to use alcohol scale than students in control districts. In addition, nonusers of alcohol at baseline in the intervention communities reported lower scores than nonusers in control communities at the end of 8th grade ($p<0.01$), but not at the end of 6^{th} or 7^{th} grade. In addition for all students, the percentages who reported alcohol use in the past month and past week were significantly lower in the intervention group at the end of 8th grade. For baseline nonusers, intervention students had significantly lower monthly and weekly alcohol use at the end of the 8th grade. The percentage of students who reported past year alcohol use were also significantly lower among baseline nonusers in the intervention districts at the end of the 7th grade ($p<0.05$) and 8^{th} grades ($p<0.01$). Perry et al (2002) reported that students in the intervention schools were also

significantly less likely to increase their tendency to use alcohol and binge drinking during phase two of Project Northland. However, no differences were found on other measures, although intervention students were marginally less likely than control students to have increased their past month alcohol use during the 11th and 12th grades ($p>0.05$). During the interim phase (9th and 10th grades), students in the intervention schools were significantly more likely than control students to increase their alcohol use on all measures. Komro et al (1999) examined the effectiveness of two peer leadership components of the 7th grade Project Northland intervention, 'Amazing Alternatives!' programme. At the end of the 7th grade, students who were elected peer leaders had higher scores on the Alcohol Use Tendency Scale[5] than did those who had participated as volunteer peer leaders ($p<0.01$), students who did not participate as peer leaders ($p<0.05$) and (although not significant) students who participated as both elected and volunteer peer leaders ($p>0.05$). By the end of eighth grade no significant differences remained on the Alcohol Use Tendency Scale. Two studies examined the effects of Project Northland behavioural curricula. Williams and colleagues (1995; RCT +) found that at the end of the sixth grade the 'Slick Tracy Home Team Programme', had no significant effects on alcohol use after controlling for baseline differences between intervention and control students. Toomey et al (1996) found that the 'Amazing Alternatives! Home Programme' had no significant effects on any measure of alcohol use.

Johnson et al (1990) reported that the MPP had no significant effects on alcohol use at the 3-year follow-up when students were in ninth and tenth grade. Chou et al (1998) reported the programme showed a secondary prevention effect on decreasing alcohol use at 6 months after the intervention. The effect was also marginally significant for alcohol use at the 1.5-year follow-up with results of the logistic regression analysis indicating that the secondary prevention effect diminished over time.

5.5.3.2 Medium-term results (up to 12 months)

None of the included studies reported medium-term follow-up data.

5.5.3.3 Long-term results (>12 months)

None of the included studies reported long-term follow-up data.

5.5.4 Summary and evidence statements

Eight studies (Perry et al., 1996; Komro et al., 2001; Perry et al., 2002; Williams et al., 1995; Toomey et al., 1996; Komro et al., 2008; Johnson et al., 1990; Chou et al., 1998) were identified that examined two multicomponent, school- and community-based programmes: Project Northland and the Midwest Prevention Project (MPP). Project Northland was a two phase community trial designed to prevent alcohol use and alcohol related problems among young adolescents. Risk factors for alcohol use were targeted through school-, home- and community-based intervention, including parental involvement/education programmes, behavioural curricula, peer leadership programmes, and community-wide task forces activities. The MPP consisted of four intervention components: (1) a 10

[5] A summary of alcohol use and intentions to use alcohol based on occasions of alcohol use (lifetime, last year, and last month), intentions to use alcohol (when 21 years or older, next year, month, and week).

session school-based programme focused on drug resistance skills training, additional homework sessions encouraging involvement with parents; (2) a parent organisation programme for reviewing school prevention policies and parent training in parent-child communication skills; (3) training of community leaders in organising a drug abuse prevention taskforce; and (4) mass media coverage.

5.5.4.1 Knowledge and understanding

None of the studies examined intervention effects on knowledge or understanding.

5.5.4.2 Attitudes and values

During Phase I of Project Northland (Perry et al., 1996; Komro et al., 2001), although there was evidence of positive intervention effects on peer influence, the intervention had no impact on self-efficacy or perceived access to alcohol. In the interim phase of the project, students who participated in Project Northland were more likely than controls to experience increased perceptions of peer influence to use alcohol and to decrease their self-efficacy to refuse alcohol (Perry et al., 2002).

5.5.4.3 Personal and social skills

None of the studies examined intervention effects on personal and social skills.

5.5.4.4 Health and social outcomes relating to alcohol use and sexual health

Project Northland significantly reduced growth in binge drinking and tendency to use alcohol during Phase I and II of the programme (Perry et al., 1996; 2002; Komro et al., 2001), however, during the interim phase of the programme the growth in alcohol use was greater among intervention students than control students. The three-year MPP (Johnson et al., 1990; Chou et al., 1998) did not have significant effects on alcohol use in one cohort of ninth/tenth grade students, but a short-term secondary prevention effect was reported in a second cohort.

Evidence statement 5

5 (d) There is no evidence from eight RCTs[1] to determine the impact of multicomponent, school- and community-based programmes on knowledge, or personal and social skills.

5 (e) There is moderate evidence from three RCTs[2] to suggest that Project Northland, a long-term multicomponent, school- and community-based programme, has no effects on attitudes and values related to alcohol consumption.

5 (f) There is moderate evidence from two RCTs[3] to suggest that the Midwest Prevention Project has no effects on alcohol consumption and inconsistent evidence from five RCTs[4] to suggest that Project Northland may have mixed effects on alcohol consumption. Two RCTs[5] showed reductions in alcohol consumption in a rural population, particularly among younger adolescents, but replication of the programme among an urban sample[6] showed that the programme was not effective. Findings may only be partially applicable to the UK as studies were implemented in the USA and may not be generalisable beyond the populations studied.

[1] Perry et al., 1996; Komro et al., 2001 (both RCT +); Perry et al., 2002 (RCT +); Williams et al., 1995 (RCT +); Toomey et al., 1996 (RCT +); Komro et al., 2008 (RCT +); Johnson et al., 1990 (RCT +); Chou et al., 1998 (RCT -)

[2] Perry et al., 1996; Komro et al., 2001 (both RCT +); Perry et al., 2002 (RCT +); Komro et al., 2008 (RCT ++)

[3] Johnson et al., 1990 (RCT +); Chou et al., 1998 (RCT -)

[4] Perry et al., 1996; Komro et al., 2001 (both RCT +); Perry et al., 2002 (RCT +); Williams et al., 1995 (RCT +); Toomey et al., 1996 (RCT +); Komro et al., 2008 (RCT +)

[5] Perry et al., 1996; Komro et al., 2001 (both RCT +); Perry et al., 2002 (RCT +)

[6] Komro et al., 2008 (RCT ++)

Table 5.22. Multicomponent programmes: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Perry et al., 1996; Komro et al., 2001	RCT +	Project Northland (Phase 1) n=NR	Usual curriculum n=NR	up to end of 8th grade (81%)	-	↓ peer influence* **NS** self-efficacy **NS** perceived access to alcohol	-
Perry et al., 2002	RCT +	Project Northland (Phase 2) n=NR	Usual curriculum n=NR	up to end of 12th grade (85%)	-	**NS** peer influence **NS** self-efficacy **NS** perceived access to alcohol	-
Komro et al., 2008	RCT ++	Project Northland (Chicago) n=29 schools	Usual curriculum n=32 schools	up to end of 8th grade n=3,802 (95%)	-	**NS** alcohol intentions **NS** norms supportive of use **NS** perceived outcomes of supportive use **NS** resistance self-efficacy **NS** access to alcohol	**-**

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.23. Multicomponent programmes: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Perry et al., 1996; Komro et al., 2001	RCT +	Project Northland (Phase 1) n=NR	Usual curriculum n=NR	up to end of 8th grade (81%)	↓ weekly alcohol use* ↓ monthly weekly use*	-	↓ tendency to use alcohol*
Perry et al., 2002	RCT +	Project Northland (Phase 2) n=NR	Usual curriculum n=NR	up to end of 12th grade (85%)	**NS** growth rate: weekly use **NS** growth rate: monthly use	↓ growth rate: binge drinking*	↓ growth rate: tendency to use alcohol*
Williams et al., 1995	RCT +	Project Northland (Slick Tracey Home Team) n=NR	Usual curriculum n=NR	end of 6th grade n=2,201 (94%)	**NS** alcohol use	-	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	**Heavy alcohol use**	**Other**
Toomey et al., 1996	RCT +	Project Northland (Amazing Alternatives) n=521	No intervention n=507	up to end of 8th grade (83%)	**NS** alcohol use	-	-
Komro et al., 1999	RCT +	Project Northland Peer leadership (elected or voluntary) n=NR	Project Northland No peer leadership n=NR	end of 7th grade n=NR	-	-	↑ tendency to use alcohol (elected peer leaders*)
				end of 8th grade (78%)	-	-	**NS** tendency to use alcohol
Komro et al., 2008	RCT ++	Project Northland (Chicago) n=29 schools	Usual curriculum n=32 schools	up to end of 8th grade n=3,802 (95%)	**NS** alcohol use	-	-
Johnson et al., 1990	RCT +	MMP (Kansas City) n=NR	Community components only n=NR	PT (3 years) (84%)	**NS** alcohol use	-	-
Chou et al., 1998	RCT -	MMP (Indianapolis) n=1,904	Usual curriculum n=1,508	PT (6 months) NR	↓ alcohol use (baseline users***)	-	-
				PT (1.5 years) NR	↓ alcohol use (baseline users**)	-	-
				2.5 years NR	**NS** alcohol use	-	-
				3.5 years NR	**NS** alcohol use	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

5.6 Peer support and counselling programmes

5.6.1 Overview of evidence identified

Five studies (Colnes, 2001; Padget et al., 2005; Webster et al., 2002; Bremberg & Arborelius, 1994; Valentine et al., 1998) examined five peer support and counselling programmes for students. Three studies (Colnes, 2001; Padget et al., 2005; Webster et al., 2002) examined peer support programmes. Colnes (2001) examined the effects of a four-day residential training retreat for peer leaders and Padget et al (2005) examined the impact of peer leadership training on high school students who taught the Protecting You/Protecting Me (PY/PM) curriculum to elementary students[6]. Webster et al (2002) examined the effects of participation in a peer support programme for year 7 students, who were supported by peers in year 11. Two studies (Bremberg & Arborelius, 1994; Valentine et al., 1998) examined counselling programmes, both of which included individual and group counselling sessions.

Three studies were conducted in the USA, and one each in Australia and Sweden. All five programmes were school-based only and the provider for three peer support programmes (Colnes, 2001; Padget et al., 2005; Webster et al., 2002) was peers alone. The two counselling programmes (Bremberg & Arborelius, 1994; Valentine et al., 1998) were delivered by health counsellors or educational psychology students, respectively. Only one study (Bremberg & Arborelius, 1994) reported the theoretical framework for intervention and was based on multiple theories (coping behaviour theory, self-efficacy theory, and social modelling). The sample size recruited across the included studies ranged from 76 to 428 and four of the five studies targeted older adolescents. Follow-up ranged from immediate post-test to a maximum of 6 months.

5.6.2 Quality assessment

Of the five studies identified for inclusion, one study (Colnes, 2001) was based on an RCT design; two studies (Padget et al., 2005; Valentine et al., 1998) were NRCTs; and two studies (Bremberg & Arborelius, 1994; Webster et al., 2002) were based on CBA designs. The RCT by Colnes (2000) appeared to have been adequately conducted, but the sample size for the study was small and the reported method of randomisation was inadequate. The two NRCTs differed in quality. Adequate details of the study methodology were reported for the study by Padget et al (2005) and overall the study was rated moderate quality, but there were differences in ethnicity and baseline alcohol use between intervention and comparison groups in the study by Valentine et al (1998). In addition, no data was reported on attrition of subjects and few methodological details were reported and the study was rated poorly. Neither CBA study (Bremberg & Arborelius, 1994; Webster et al., 2002) was of high quality nor was sufficient detail reported to adequately assess the methodological quality. Both studies were consequently rated poorly.

[6] The impact of this programme on its elementary school participants is discussed in Jones et al (2009).

Table 5.24. Alcohol education: peer support and counselling programmes

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider(s)
Colnes, 2001	RCT +	USA n=76 mean 15.4 years	School	**Super Leaders:** Four day residential training; after school peer leadership programme and activities	Social skills training	Peers
Padget et al., 2005	NRCT +	USA n=401 High school	School	**PYPM**: One lesson per week for 8 weeks over 5 years; peer leader training	NR	Peers
Webster et al., 2002	CBA -	Australia n=428 mean 12 years	School	10-16 sessions (45 minutes each); peer support programme, confidence and individuality development	NR	Peers
Bremberg & Arborelius, 1994	CBA -	Sweden n=124 15-16 years	School	**It's Your Decision**: Six sessions; group discussions and individual counselling	Coping behaviour, self-efficacy theory, social modelling	Health counsellor (teacher, school social worker, or school nurse)
Valentine et al., 1998	NRCT -	USA n=336 mean 13; 15 years	School	**Urban Youth Connection**: Individual, paired or group counselling	NR	Educational psychology students

5.6.3 Findings

5.6.3.1 Short-term results (<6 months)

Knowledge and understanding

One study (Padget et al., 2005) examined the effects of a peer support prevention programme, which focused on reducing the dangers associated with drink driving. Students who taught the PY/PM programme to elementary school students demonstrated an increase in knowledge relating to the effects of alcohol ($p<0.001$) and the risks of high levels of alcohol use ($p<0.05$).

Attitudes and values

Two studies reported short-term intervention effects of two peer leadership programmes on attitudes and values. Colnes (2000) found that both intervention and control students had negative attitudes towards substance use at baseline and follow-up. There was no difference between intervention students who taught the PY/PM programme and controls (Padget et al., 2005) on any of the measures of attitudes and values including intentions or self-efficacy. At 4 months post baseline, intervention students who participated in the Its Your Decision counselling programme (Bremberg & Arborelius, 1994) reported a greater reduction in self attributed psychological problems related to alcohol ($p<0.05$). There was no difference in accidents related to alcohol, peer problems related to alcohol, parental problems related to alcohol or perceived lack of control of drinking.

Personal and social skills

Padget et al (2005) examined the effects of a peer support programme on the dangers of drinking and driving. There was no evidence that the programme affected changes in riding with impaired drivers or driving after drinking.

Health and social outcomes relating to alcohol use and sexual health

Two studies reported short-term intervention effects of two peer support programmes on alcohol use. Colnes (2000) reported that there was no significant change in frequency of alcohol use in either peer leaders who participated in the Super Leaders programme or the control students between baseline and 4-months follow-up. Means for both the intervention and control groups at pre and post test indicated that students in both groups were largely abstinent from alcohol at baseline and follow-up. Padget et al (2005) found that students who taught the PY/PM programme reported lower levels of binge drinking at post-test relative to control students ($p<0.05$). However, there was no significant difference in the number of students reporting recent alcohol use at post-test.

There were no short-term effects of the It's Your Decision counselling programme (Bremberg & Arborelius, 1994) on any measure of alcohol consumption (quantity, frequency, frequency of getting drunk) and Valentine et al (1998) found that there was no difference in use of different alcohol drinks in middle school students between intervention and comparison students. Among high school students, there was a greater proportion of users of liquor, beer, wine, and 'alcopops' in the intervention group than the control group.

5.6.3.2 Medium-term results (up to 12 months)

Knowledge and understanding

None of the included studies examined medium-term intervention effects on knowledge and understanding.

Attitudes and values

None of the included studies examined medium-term intervention effects on attitudes and values.

Personal and social skills

None of the included studies examined medium-term intervention effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

One study (Webster et al., 2002) reported on the medium-term effects of a peer support programme on alcohol use. Webster et al (2002) found that the programme had no effects on the alcohol use. Over 6 months of follow-up, participants in both intervention and comparison schools showed an increase in the enjoyment and use of alcohol and there was no difference in the pattern of change between groups.

5.6.3.3 Long-term results (>12 months)

None of the included studies examined the long-term intervention effects of peer and counselling support programmes.

5.6.4 Summary and evidence statements

Five studies (Colnes, 2001; Padget et al., 2005; Webster et al., 2002; Bremberg & Arborelius, 1994; Valentine et al., 1998) examined peer support and counselling programmes for students. Three studies (Colnes, 2001; Padget et al., 2005; Webster et al., 2002) examined peer leadership or support programmes and two studies (Bremberg & Arborelius, 1994; Valentine et al., 1998) examined counselling programmes, both of which included individual and group counselling sessions.

5.6.4.1 Knowledge and understanding

None of the studies examined intervention effects on knowledge or understanding.

5.6.4.2 Attitudes and values

Three studies (Colnes, 2001; Padget et al., 2005; Bremberg & Arborelius, 1994) examined short-term intervention effects on attitudes and values. For two peer leadership programmes there appeared to be modest impacts on attitudes to alcohol. One study of peer leadership training (Colnes, 2001) found that both intervention and control students maintained negative attitudes towards substance use, but a second study (Padget et al., 2005) found positive intervention effects among students who taught the PY/PM programme on attitudes about the effects of alcohol use and the risks of high levels of alcohol use. One study of a counselling programme found that the programme had a positive impact on the number of psychological problems that students' attributed to their alcohol use (Bremberg & Arborelius, 1994).

5.6.4.3 Personal and social skills

None of the studies examined intervention effects on personal and social skills.

5.6.4.4 Health and social outcomes relating to alcohol use and sexual health

Two studies (Bremberg & Arborelius, 1994; Valentine et al., 1998) reported on the short-term effects of in-school counselling programmes. Neither programme was shown to be consistently effective. In addition, one programme had potentially harmful effects on high school students' alcohol consumption. Three studies reported short-term data on the effectiveness of peer support programmes. Two of the programmes examined were shown to have no effects on the alcohol use of participants (Colnes, 2000; Webster et al., 2002). However, peer leaders who taught the PY/PM programme reported lower levels of binge drinking (Padget et al., 2005).

Evidence statement 6

There is inconsistent evidence from one RCT, two NRCTs and two CBA studies[1] to determine the effectiveness of counselling and peer support on attitudinal and behavioural outcomes related to alcohol use. Findings may only be partially applicable to the UK as studies were implemented in the USA and may not be generalisable beyond the populations studied.

[1] Colnes, 2001 (RCT +); Padget et al., 2005 (NRCT +); Webster et al., 2002 (CBA -); Bremberg & Arborelius, 1994 (CBA -); Valentine et al., 1998 (NRCT -)

Table 5.25. Peer support and counselling programmes: short-term programme effects on knowledge, attitudes and skills

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes	Skills
Colnes, 2001	RCT +	Super Leaders n=38	No intervention n=38	PT n=66 (87%)		**NS** attitudes	
Padget et al., 2005	NRCT +	PY/PM n=218	PAL only n=183	PT n=329 (82%)	↑ effects of alcohol*** ↑ risks of high levels of alcohol use* **NS** risks of low levels of alcohol use	**NS** future intentions **NS** self-efficacy **NS** sources of alcohol	**NS** riding with an impaired driver **NS** driving after drinking
Bremberg & Arborelius, 1994	CBA -	It's Your Decision n=65	No intervention n=59	up to 2 months 87%	-	**NS** problems perceived to be related to alcohol use	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.26. Peer support and counselling programmes: short-term programme effects on health and social outcomes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Colnes, 2001	RCT +	Super Leaders n=38	No intervention n=38	PT n=66 (87%)	**NS** frequency of alcohol use	-	-
Padget et al., 2005	NRCT +	PY/PM n=218	PAL only n=183	PT n=329 (82%)	**NS** recent alcohol use	↓ binge drinking*	-
Bremberg & Arborelius, 1994	CBA -	It's Your Decision n=65	No intervention n=59	up to 2 months 87%	**NS** alcohol consumption	**-**	**-**
Valentine et al., 1998	NRCT -	Urban Youth Connection n=187	No intervention n=149	PT NR	↓ 30-day beer use (high programme participation only) ↑ 30-day wine use (all students)	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 5.27. Peer support and counselling programmes: medium-term programme effects on health and social outcomes

Author	Study design	Intervention	Comparator	Follow-up	Outcomes		
					Alcohol use	Heavy alcohol use	Other
Webster et al., 2002	CBA -	Peer support n=235	Not reported n=193	up to 6 months n=326	**NS** alcohol use	-	-
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported							

5.7 Review of published economic evaluations

Two studies (Swisher et al., 2004; Pentz, 1998) were identified that met the criteria for inclusion in the review of published economic evaluations. Swisher et al (2004) assessed the cost-effectiveness of the standard Life Skills Training programme and infused Life Skills Training and Pentz (1998) assessed the costs, benefits and cost-effectiveness of the Midwestern Prevention Project.

5.7.1 Review of Swisher et al (2004)

5.7.1.1 Overview

Swisher et al (2004) assessed the cost-effectiveness of the standard Life Skills Training programme and infused Life Skills Training. The study was conducted alongside the cluster RCT reported on by Smith and colleagues (2004) (see Section 5.3). The aim of the economic evaluation was to compare the costs and effects of Infused Life Skill Training (I-LST) with those of Life Skill Training (LST).

5.7.1.2 Summary of effectiveness data

Details of the effectiveness of LST and I-LST (Smith et al., 2004) are discussed in Section 5.3. Briefly, the study examined the standard LST curriculum compared to an infused approach to the curriculum, which had no set number of lessons and was incorporated across subject areas. Nine middle schools were randomly assigned to three conditions: LST; I-LST; or control. The setting for the study was schools of lower socio economic status in rural communities in Pennsylvania, USA. Effectiveness data was not clearly presented in the economic study.

5.7.1.3 Summary of resource utilisation and cost data

The authors only included additional costs required to implement either I-LST or LST. Therefore the cost elements included in the analysis broadly covered the costs of teacher training, lesson development and programme time and, student and teacher materials. The authors did not report how the cost data were obtained or the year in which costs were expressed. Total cost elements and associated cost data are presented for the programme in Table 5.28.

Table 5.28. Cost elements (reproduced from Swisher et al., 2004)

Cost elements	Infused LST	Standard LST	Difference
7th grade			
Total 7th grade	*$ 51384.32*	*$ 32041.25*	*19343.07*
Total 7th grade by Student	*$ 129.11*	*$ 95.65*	*33.46*
8th grade			
Total 8th grade	*$ 46442.11*	*$ 20822.01*	*25620.10*
Total 8th grade by Student	*$ 116.69*	*$ 62.16*	*54.33*
Total both grade	**$ 97826.43**	**$ 52863.26**	**44963.18**
Total both grades by Student	**$ 245.80**	**$ 157.80**	**87.99**

5.7.1.4 Summary of cost-effectiveness data

The authors describe a CEA with calculations of incremental costs of the LST and I-LST programmes per year per student. After one year, the authors reported that the standard LST programme was more cost-effective than I-LST by $33.46 per student. In the second year, the authors reported that LST had no effects and cost $62.16 per student, but that whereas I-LST was more costly at $116.69 per student, it reduced smoking among females and was therefore more cost-effective. The authors undertook an analysis of the project costs of the programme over three years. In the third year, they projected that the cost per student for delivery of the programme over two school grades would be $91.65 for I-LST compared to $92.63 for LST. The 3-year total costs of the two programmes were estimated at $109,429.04 and $93,088.17, respectively.

5.7.1.5 Comments

The description of the interventions and their effects were not clearly reported. The description of resource use and unit costs of each alternative was adequately reported but not clearly tabulated. The authors refer indirectly to the use of marginal costs, considering the costs of both interventions as incremental compared to normal practice. No discount rate appears to have been applied although the authors refer to a time horizon. The authors report that the study design used is a cost-effectiveness analysis (CEA), however no incremental cost-effective ratios (ICERs) are expressed or reported and it is unclear how costs were related to outcomes (effects). What the authors call a sensitivity analysis is in fact a continuation model projecting the results of year 2 to year 3. Given the poor methodological and reporting quality of the study, the lack of clarity as to the effects described, the setting and the considerable attrition of participants in the original trial, the results of the study are unlikely to be generalisble to a UK context.

5.7.2 Review of Pentz (1998)

5.7.2.1 Overview

Pentz (1998) assessed the costs, benefits and cost-effectiveness of the Midwestern Prevention Project (MPP). Approximate costs, benefits, and cost-effectiveness were calculated from 5-year follow-up (6-year) outcome data and operational costs.

5.7.2.2 Summary of effectiveness data

As reported in the effectiveness review, the overall research design of the MPP included a quasi-experimental trial in Kansas City, Kansas and Kansas City, Missouri, followed by an experimental trial in Indianapolis. Pentz (1998) reported on the whole sample of students who received the MPP, which included students based in 107 junior or middle schools and 62 senior schools (approximately 26,000 adolescents entered the intervention each year). Follow-up was initially at 5 years but the text reports on the follow-up of a sub sample of 1,002 participants into adulthood. The programme described by Pentz (1998) consisted of five components: (1) mass media programming (31 programmes a year for the first 3 years); (2) a school programme (13 sessions in the sixth/seventh grade and 5 booster sessions the following year); (3) a parenting programme (education and coordination of parents with

school policy in years 2 and 3 and towards the end of middle school); (4) community organisation (community leader training, organisation, planning, and implementation of community prevention campaigns); and (5) local policy change in years 4 and 5[7].

The effects of the MPP were reported based on a random sample of 5,055 students from most of the Kansas City area. The author reported an accumulated 3-year net reduction of 9% in the incidence of monthly drunkenness, decreasing to approximately 2.5% by year 5. The effects on alcohol consumption appeared to be maintained into adulthood.

5.7.2.3 Summary of resource utilisation and cost data

Approximate costs for each prevention component of the MPP for each year of delivery are shown in Table 5.29.

Table 5.29. Approximate direct costs of the MPP by component (in thousands of dollars)

Prevention component	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Programme development	150	250	45	180	96	90
Training	44	88	118	162	176	176
Implementation	179	316	609	667	834	865
Institutionalisation	-	22	44	44	66	88
Programme subtotal	*373*	*676*	*816*	*1053*	*1166*	*1229*
Research/evaluation	246	470	565	776	879	925
Total (research + programme)	768	1146	1381	1829	2045	2144
Dollars per family (total)	**102**	**51**	**37**	**36**	**34**	**30**

However, the author estimated that costs of delivering the MPP as a "packaged product" would be less than those presented. Therefore, the yearly cost of the MPP was estimated at $31 per family (year of costs was not reported) in a large city of over 1 million, although start-up costs were estimated to be more than treble this figure. However, the author cautions that this may be a conservative estimate of cost as it does not take into account constant development costs and the "ownership" of the programme by the community, which may impose further change on the design and content of the intervention.

5.7.2.4 Summary of cost-effectiveness data

The results of the cost-benefit analysis (CBA) presented by the author show a $700 net saving per family per year resulting from a reduction in monthly drunkenness. Cost benefits ratios are also favourable (ratio to $1 spent on prevention to saving is $1:1.69). Costs and benefits were based on 26,000 new families being added per year to the prevention programme.

[7] This was an additional component not described in the study by Johnson and colleagues (1990) that was included in the review of effectiveness.

The authors also undertook a CEA. The MPP was compared to drug education "as usual", which was estimated to cost $6 per student. Usual drug education programmes were assumed to have no effects on alcohol or other substance use behaviours. Results of the CEA are shown in Table 5.30.

Table 5.30. Results from the cost-effectiveness analysis of the MPP

Variables		MPP	Traditional drug education	Extra cost (ΔC)	Extra effect (ΔE)
Average cost	C	$31	$6	$25	-
Reduction in monthly drunkenness	E	2.5%	0	-	2.5%
Incremental analysis					
ICER	ΔC/ ΔE	$25/2.5 = $10		-	-

Compared to "usual" drug education the ICER of the MPP was reported to be equal to the ratio of its incremental cost per incremental effects, equivalent to $10 per net reduction in the incidence of monthly drunkenness. The authors do not report whether discount rates were applied in the analyses.

5.7.2.5 Comments

The economic evaluation is based on effectiveness data presented in a conference abstract and was therefore not included in the review of effectiveness (Section 5). In addition, the authors made the assumption that "usual" drug education had little or no effect on alcohol use behaviours. However, given from the results presented that the intervention appears to be effective into adulthood, it is possible that the intervention may be exportable into a UK setting and the costs may represent value for money when compared to the benefits.

5.7.3 Summary and evidence statements

Two studies (Swisher et al., 2004; Pentz, 1998) were identified that met the criteria for inclusion in the review of published economic evaluations. Swisher et al (2004) assessed the cost-effectiveness of standard and infused LST, and Pentz (1998) assessed the costs, benefits and cost-effectiveness of the MPP. Evaluations of the effectiveness of these programmes were identified and included in Section 5.3.

The standard LST programme was found to be more cost effective than I-LST by $33.46 per student after 1 year of intervention delivery. In the second year, however, standard LST had no effects and the authors conclude that I-LST is more cost-effective. The 3-year total costs of the two programmes were estimated at $109,429.04 and $93,088.17, respectively.

The results of the cost-benefit analysis (CBA) of the MPP demonstrated a $700 net saving per family per year resulting from a reduction in the incidence of monthly drunkenness. Cost benefits ratios were also shown to be favourable (ratio to $1 spent on prevention to saving is $1:1.69). Compared to "usual" drug education the ICER of the MPP was reported to be equal to the ratio of its incremental cost per incremental effects, equivalent to $10 per net reduction in the incidence of monthly drunkenness.

Evidence statement 7

There is inconsistent evidence from two economic evaluation studies[1] to determine the cost-effectiveness of school-based interventions that aim to prevent or reduce alcohol use in young people under 18 years old. This evidence may be of limited applicability to a UK context because cost and benefit estimates were based on data from studies conducted in the USA.

[1] Swisher et al., 2004 (CEA -); Pentz, 1998 (CBA/CEA +)

6 Sex and relationships education

A total of 75 articles met the criteria for inclusion in the review of sex and relationships education programme. Nine articles were systematic reviews and meta-analyses, 65 articles reported on evaluations of sex and relationships education interventions, and one article was an economic evaluation study.

6.1 Systematic reviews and meta-analyses

Nine systematic reviews and meta-analyses were identified that examined the effectiveness of sex and relationships education interventions aimed at children aged 11-19 years, including abstinence and abstinence plus safer-sex programmes, safer-sex promotion and sexuality interventions.

6.1.1 Quality assessment

The reviews undertaken by Oakley et al (1995), Sales et al (2006) and Underhill et al (2007; 2008) were all rated 'SR ++'. These reviews were well conducted and included clearly reported methodology, which detailed a sufficiently rigorous search of the literature, and demonstrated how study quality was considered during analysis of the results. The quality of the meta-analysis by Franklin et al (1997) was judged to be adequate, but details around whether studies were similar enough to combine were poorly addressed by the authors and the article was rated 'SR +'. The review undertaken by Bennett and Assefi (2005) did not include a quality assessment of included studies, but the study was judged to be generally well-conducted and rated 'SR +'. Similarly, study quality was not reported by Robin et al (2004) or Pedlow and Carey (2003), but other aspects of the reviews were adequately covered and these were rated 'SR +'. The review undertaken by Kirby and colleagues (1994) was rated 'SR +'. The review addressed an appropriate and clearly focused question but did not assess quality of the included studies and the description of the literature search was not reported in sufficient detail to ascertain whether it was sufficiently rigorous.

6.1.2 Findings

Nine systematic reviews evaluated abstinence only and abstinence plus safer-sex promotion programmes (Underhill et al., 2007, 2008; Bennett & Assefi, 2005), safer-sex promotion (Oakley et al., 1995; Franklin et al., 2007; Kirby et al.,1994; Pedlow and Carey, 2003; Robin et al., 2004) and sexual behaviour-focused interventions (Sales et al., 2006). Findings from three reviews that examined abstinence-only and abstinence-plus programmes (Underhill et al., 2007, 2008; Bennett and Assefi, 2005) indicated that there is no evidence that these interventions cause harmful or adverse effects on relevant behavioural outcomes such as sexual activity. Underhill et al (2007) reported that abstinence-only programmes were ineffective at reducing sexual-risk behaviour, pregnancy and STI incidence and Bennett and Assefi (2005) suggested that any positive abstinence programme effects were only modest and short-term. Regarding abstinence-plus programmes, Bennett and Assefi (2005) reported that studies that included education about contraception significantly influenced knowledge and use of contraception. Underhill et al (2008) indicated that evidence for abstinence-plus programmes reducing HIV risk behaviours was limited, but that results consistently favoured abstinence-plus groups over controls for a range of behavioural outcomes including sexual activity, number of partners, sexual

initiation and condom use and significantly improved knowledge about AIDS/HIV. Additionally, Kirby et al (1994) concluded that there was insufficient evidence to draw conclusions about the effectiveness of abstinence-only programmes on sexual or contraceptive behaviours. The suggestion therefore is that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours. Oakley et al (1995) also found evidence that abstinence only education may have an adverse effect and actually increase sexual experimentation among students. For abstinence-plus programmes, which incorporate information on safer sex, there is evidence of positive effects on sexual-risk behaviours, and knowledge and use of contraceptives (Bennett & Assefi, 2005).

Franklin et al (1997) reported that pregnancy prevention interventions were more effective at impacting upon contraception use and pregnancy rates than on sexual activity and that contraception knowledge-building or distribution programmes were more effective than interventions such as abstinence programmes. Positive results of HIV prevention interventions were noted by Pedlow and Carey (2003), but effective programmes produced small effect sizes. Oakley et al (1995) reported that there is no evidence that providing young people with information or contraception results in increases in risky sexual behaviours and similarly Kirby et al (1994) reported finding no evidence that sexuality and AIDS education increases sexual activity. The implications are that evidence points towards safer-sex interventions having some limited effects for preventing unwanted behaviours, but that they do not appear to increase the risk of these behaviours occurring.

Four reviews (Kirby et al., 1994; Pedlow and Carey, 2003; Robin et al., 2004; Sales et al., 2006) identified characteristics of interventions that were effective. Evidence suggests that more effective studies were theoretically based with social cognitive theory the most successfully applied theory, (Kirby et al., 1994; Pedlow and Carey, 2003; Sales et al., 2006) and used trained adult educators (Robin et al., 2004; Sales et al., 2006), although it was recognised that trained peer providers could also be effective (Robin et al., 2004). Two reviews reported that successful interventions applied interactive strategies (Robin et al., 2004; Sales et al., 2006) and two highlighted the importance of including highly specific content focusing on reducing sexual risk behaviour such as skills about condom use or refusing sex (Kirby et al., 1994; Robin et al., 2004).

6.1.3 Summary and evidence statements

Nine systematic reviews evaluated abstinence only and abstinence plus safer-sex promotion programmes (Underhill et al., 2007, 2008; Bennett & Assefi, 2005), safer-sex promotion (Oakley et al., 1995; Franklin et al., 2007; Kirby et al.,1994; Pedlow and Carey, 2003; Robin et al., 2004) and sexual behaviour-focused interventions (Sales et al., 2006). Findings from three reviews that examined abstinence-only and abstinence-plus programmes (Underhill et al., 2007, 2008; Bennett and Assefi, 2005) indicated that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours. In addition, Oakley et al (1995) found evidence to suggest that abstinence only education may have an adverse effect and actually increase sexual experimentation among students. For programmes that incorporated information on safe sex and use of contraception, there was evidence from five reviews (Underhill et al., 2008; Pedlow & Carey, 2003; Franklin et al.,

1997; Kirby et al., 1994; Oakley et al., 1995) to suggest that interventions may have effects on preventing sexual risk behaviours, but that these effects tend to be modest. There was no evidence that sexuality and AIDS education increased sexual activity.

Evidence statement 8

8 (d) There is strong evidence from three systematic reviews[1] to suggest that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours.

8 (e) There is moderate evidence from five systematic reviews[2] to suggest that interventions incorporating information on safer sex and contraceptive use may have positive, but limited effects on preventing sexual risk behaviours. There is no evidence that such programmes increase the occurrence of sexual activity among young people.

8 (f) There is moderate evidence from four systematic reviews[3] to suggest that effective characteristics of sexual risk reduction interventions include: (1) a theoretical basis; (2) use of trained adult health educators as providers; and (3) provision of highly specific content focusing on sexual risk reduction.

[1] Underhill et al., 2007, 2008 (both SR ++); Bennett and Assefi, 2005 (SR +); Kirby et al., 1994 (SR +); Oakley et al., 1995 (SR ++)

[2] Pedlow & Carey, 2003 (SR +); Franklin et al., 1997 (SR +); Kirby et al., 1994 (SR +); Oakley et al., 1995 (SR ++); Underhill et al., 2008

[3] Kirby et al., 1994 (SR +); Pedlow and Carey, 2003 (SR +); Robin et al., 2004 (SR +); Sales et al., 2006 (SR ++)

Table 6.1. Sex and relationships education: systematic reviews and meta-analyses

Author (Year)	Design	Inclusion/exclusion	Number of studies	Findings
Franklin et al., 1997	SR +	Studies with a primary focus on the primary prevention of adolescent pregnancy	32 studies	Programmes had a greater effect on contraceptive use and pregnancy rates, than on sexual activity. Contraceptive knowledge building programmes and contraceptive distribution programmes are more effective than other sex education programmes (e.g. abstinence-only programmes).
Bennett & Assefi, 2005	SR +	School-based programmes reporting intervention impact on sexual and contraceptive behaviour. USA only.	16 studies	Some abstinence-only and abstinence-plus programmes can change sexual behaviours, however effects relatively modest and only lasted short-term. No evidence that abstinence-plus programmes increased sexual activity. Programmes that offered contraceptive education significantly influenced students' knowledge and use of contraception.
Kirby et al., 1994	SR +	School-based interventions, impact on sexual or contraceptive behaviours measured	16 studies	Insufficient evidence to determine if school-based abstinence-only programmes delay the onset of intercourse or affect other sexual or contraceptive behaviours. Two curriculums that specified delaying the onset of sexual intercourse as a clear goal - Postponing Sexual Involvement and Reducing the Risk - delayed the initiation of sex. Postponing Sexual Involvement significantly reduced the frequency of intercourse. Only two of the eight programmes (AIDS Prevention for Adolescents in School and an untitled curriculum by Schinke et al) included significantly increased contraceptive use among all experienced youths, but two additional programmes (Postponing Sexual Involvement and Reducing the Risk) increased contraceptive use among specific groups of students.
Oakley et al., 1995	SR ++	Sexual health interventions for young people aged 0-19 years	65 studies; 48 school-based	No evidence that providing practical information and contraception leads to sexual risk taking behaviour, but there is evidence that chastity education may encourage sexual experimentation.
Underhill et al., 2007	SR ++	Abstinence-only interventions with HIV prevention as stated goal	8 studies	No evidence that abstinence-only programs can effectively encourage abstinent behaviour; although programs did not appear to cause harm. Overall, programmes were ineffective for preventing or decreasing sexual activity.
Underhill et al., 2008	SR ++	Abstinence-plus programs designed to influence behaviour change on at least one outcome measure related to HIV transmission	37 studies	No evidence that abstinence-plus programmes increase HIV risk among youth participants in high-income countries and multiple evaluations found that the programmes can decrease HIV risk. No conclusive evidence that abstinence-plus programmes can reduce STI incidence and limited evidence that abstinence-plus programmes can reduce pregnancy incidence; however, direction of effects consistently favoured abstinence-plus programs. Programmes had mixed effects on sexual behaviour

Author (Year)	Design	Inclusion/exclusion	Number of studies	Findings
Sales et al., 2006	SR ++	School, community or clinic based interventions or interventions developed for special populations	39 studies; 13 school-based	Successful school-based interventions appeared to be theoretically based, implemented by trained teachers or health educators, and include a variety of skills and knowledge building didactic and interactive activities.
Pedlow & Carey, 2003	SR +	HIV risk reduction interventions targeting teenagers	22 studies	HIV risk reduction interventions have been shown to be effective but are associated with small effect sizes. Most effective studies emphasised a theoretical framework, most often Social Cognitive Theory. Interventions with multiple sessions or long doses have been no more successful than those with shorter doses.
Robin et al., 2004	SR +	Behavioural interventions targeting HIV, STD, and pregnancy for young people aged 13 years or younger	24 studies; 9 school-based	Programmes that produced positive effects: (1) used trained adult facilitators, and two other programmes with positive effects also used trained peer facilitators; (2) included content that was specific to reducing sexual risk behaviour such as refusal of unwanted sex and condom-use skills; and (3) commonly employed interactive and participatory educational strategies.

6.2 UK-based studies

6.2.1 Overview of evidence identified

Twelve UK studies, evaluating seven programmes, were identified that could be defined as predominantly sex and relationships education. Typically these programmes focused on areas of sexual health including contraception, sexually transmitted infections, sexual health services and relationships. Seven studies (Henderson et al., 2007; Mellanby et al., 1995; 2001; Stephenson et al., 2004; 2008; Tucker et al., 2007; Wight et al., 2002) reported on evaluations of three comprehensive school-based programmes, A PAUSE, RIPPLE and SHARE (Sexual Health and Relationships: Safe, Happy and Responsible). Two studies (Mellanby et al., 1995; 2001) examined the A PAUSE sex education programme. Mellanby et al (2001) conducted a follow-on study of the original controlled, repeat cross-sectional study by Mellanby et al (1995). The follow-on study (Mellanby et al., 2001) compared the effects of the peer-led elements of the programme to adult delivery of the same material. The RIPPLE study (Stephenson et al., 2004; 2008) examined the effectiveness of a peer-led sex education programme compared to teacher-led SRE. Three studies (Wight et al., 2002; Henderson et al., 2007; Tucker et al., 2007) examined the effectiveness of the SHARE programme. Two studies (Wight et al., 2002; Henderson et al., 2007) examined the medium- to long-term effects of the programme in the same sample of studies and Tucker et al (2007) undertook a replication study of the programme. Two studies (Gillies et al., 1990; Bellingham et al., 1993) reported on evaluations of the Streetwize UK AIDS education comic and Denman et al (1995) examined a theatre in education programme. Two studies (Graham et al., 2002; Magnusson et al., 2004) examined single lessons focusing on emergency contraception and contraceptive services, respectively. The majority of studies took place within normal school hours while one evaluation of the Streetwize programme (Bellingham and Gillies, 1993) was set within youth training centres (YTCs) that catered for young people who had just left school.

For 11 studies, no detail of the theory that the programme was based on was provided. The theoretical basis for the A PAUSE programme (Mellanby et al., 1995) was applied social learning theory. Teachers were the programme provider for three programmes (an emergency contraception education programme [Graham et al., 2002]; SHARE [Henderson et al., 2007; Tucker et al., 2007; Wight et al., 2002]) and one evaluation of the Streetwize programme (Gillies et al., 1990), with centre trainers providing the intervention in the second evaluation (Bellingham and Gillies, 1993).

Table 6.2. Sex and relationships education: UK studies

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Gillies et al., 1990	CBA -	School	n=284 students, 14 years	**Streetwize UK**: HIV comic, containing 'real life' stories about HIV transmission, quizzes, information and useful contact numbers; accompanied by teachers guide and suggestions for role play and peer group approaches	Not reported	Teachers
Bellingham & Gillies, 1993	RCT +	Youth Training Centres	n=337, 16-19 years	**Streetwize comic:** one session in youth training centres; information about HIV, AIDS, body fluids and transmission, sex and risk, sexual relationships, and social and sexual behaviour and attitudes.	Not reported	Other: trainers
Denman et al., 1995	CBA -	School	n=807 students; 13-14 years	**Theatre in HIV and AIDS education:** 30 minute play and 1.5 hour workshop; HIV/AIDS prevention	Not reported	External: theatre group
Graham et al., 2002	RCT ++	School	n=3,234 year 10 students	One two-hour lesson for pupils; in-service teacher training about emergency contraception	Not reported	Teachers
Magnusson et al., 2004	NRCT -	School	n=589 students, 13-14 years	One lesson promotion of contraceptive services; location, opening hours, service provided and confidentiality policy.	Not reported	Health professional
Mellanby et al., 1995	NRCT +	School	n=6,573 students; 15-16 years	**A PAUSE Program:** 25-30 one-hour lessons over three years; puberty, contraception, reproductive health, assertiveness training, and negotiation in relationships.	Not reported	Doctor, Teacher, Peer led
Mellanby et al., 2001	CBA +	School	n=1,675 year 9 students	**A PAUSE Program:** 10 sessions; puberty, contraception, reproductive health, assertiveness training, and negotiation in relationships.	Social learning theory	Other: teacher and nurse; peers
Stephenson et al., 2004; 2008	RCT ++	School	n=8,766 year 9 students, mean 13.7 years	**RIPPLE:** Three one-hour sessions; relationships, STIs, condoms, contraception, sexual health services and sexual communication	Not reported	Peer led
Wight et al., 2002	RCT ++	School	n=7,616 students, 13-15 years	**SHARE (Sexual Health and Relationships: Safe, Happy and Responsible):** 20 sessions over two years (10 in year 9, 10 in year 10) aimed at reducing unsafe sexual behaviour and unwanted pregnancy and improving the quality of relationships	Not reported	Teachers

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Henderson et al., 2007	RCT ++	School	n=4,215 female students, 13-15 years	**SHARE (Sexual Health and Relationships: Safe, Happy and Responsible):** 20 sessions over 2 years (10 in year 9, 10 in year 10) aimed at reducing unsafe sexual behaviour and unwanted pregnancy and improving the quality of relationships	Not reported	Teachers
Tucker et al., 2007	CBA -	School	n=4,324 students, median 14.5 years	**SHARE (Sexual Health and Relationships: Safe, Happy and Responsible):** Revised teaching materials, multidisciplinary staff training, planned multidisciplinary classroom delivery by teachers and nurses, and access to sexual health services at drop-in centres for pupils.	Not reported	Teachers

The RIPPLE programme (Stephenson et al., 2004; 2008) was led by peers and an intervention based on a single lesson about contraceptive services (Magnusson et al., 2004) was provided by external health professionals, while the A PAUSE programme (Mellanby et al., 1995; 2001) involved doctor-, nurse-, teacher- and peer-led sessions.

The studies varied greatly in the number of participants recruited, from 284 to 7,616, with seven of the evaluations (Graham et al., 2002; Henderson et al., 2007; Mellanby et al., 2004; Mellanby et al., 2001; Stephenson et al., 2004; 2008; Tucker et al., 2007) involving more than 1,500 participants. Six studies (Graham et al., 2002; Henderson et al., 2007; Stephenson et al., 2004; 2008; Tucker et al., 2007 and Wight et al., 2002) discussed the use of power calculations to ensure that an appropriate sample size required to detect a significant effect was selected.

Eleven studies (Denman et al., 1995; Graham et al., 2002; Magnusson et al., 2004; Henderson et al., 2007; Tucker et al., 2007; Wight et al., 2002; Gillies et al., 1990 Stephenson 2004; 2008; Mellanby et al., 1995; 2001) evaluated programmes that targeted adolescents aged between 13 and 15 years. A second evaluation of the Streetwize comic programme was set in youth training centres (YTCs) (Bellingham and Gillies, 1993) and involved older adolescents aged 16-19 years.

Length of follow-up varied greatly across studies, from immediate post-test to over four years. Evaluation of the Theatre in HIV and AIDS education programme (Denman et al., 1995), the Streetwize UK comic (Gillies et al., 1990; Bellingham & Gillies, 1993) and an intervention based on a single lesson on emergency contraception (Magnusson et al., 2004) were based on immediate post-test or short-term follow-up only. Effects of two interventions, the A PAUSE programme (Mellanby et al., 1995; 2001) and an intervention based on a single lesson on emergency contraception (Graham et al., 2002) were examined over the medium-term. Evaluation of the A PAUSE programme was based on follow-up at both immediate post-test (Mellanby et al., 2001) and 1-year (Mellanby et al., 1995). Evaluation of the RIPPLE and SHARE programmes included both medium- and long-term follow-up, at 6-, 12- and 18-months (Stephenson et al., 2004; Tucker et al., 2007), and over four years after intervention (Henderson et al., 2007; Stephenson et al., 2008). Two medium-term evaluations of SHARE (Tucker et al., 2007) and the A PAUSE programme (Mellanby et al., 1995) were based on cross-sectional surveys.

6.2.2 Quality assessment

Of the 12 studies, six (Bellingham and Gillies, 1993; Graham et al., 2002; Henderson et al., 2007; Stephenson et al., 2004; 2008; Wight et al., 2002) were RCTs; two studies were based on an NRCT design (Magnusson et al., 2004; Mellanby et al., 1995) and five studies were CBA studies (Denman et al., 1995; Gillies et al., 1990; Mellanby et al., 2001; Tucker et al., 2007). All RCT and NRCTs were based on cluster randomisation conducted at the organisational level (school: Graham et al., 2002; Henderson et al., 2007; Magnusson et al., 2004; Mellanby et al., 1995; Stephenson et al., 2004; 2008; Wight et al., 2002; training centre: Bellingham & Gillies, 1993). For one study (Magnusson et al., 2004) it was not possible to determine the unit of analysis, but for six RCTs the unit of analysis was not matched to unit of randomisation. Five studies including the emergency contraception education programme (Graham et al., 2002), RIPPLE (Stephenson et al., 2004; 2008) and two evaluations of

the SHARE programme (Henderson et al., 2007; Wight et al., 2002) were rated good quality (++ rating). Graham et al (2002) and Stephenson et al (2004; 2008) provided details of randomisation, using computer generated methods so were rated good quality (++) on this criteria, whereas all other RCTs did not report details about their methods of randomisation, making it impossible to judge whether selection bias had been adequately minimised. Outcomes were generally well reported, but did not always include behavioural outcomes (Denman et al., 1995; Gillies et al., 1990; Mellanby et al., 2001). The analysis undertaken was also well reported in general although effect sizes or significance values were not able to be determined in one study (Denman et al., 1995). One RCT (Stephenson et al., 2004) reported intention to treat analysis. One study, an NRCT (Magnusson et al., 2004), was rated poor quality (- rating) because of poor analyses, short-term follow-up and a lack of details regarding the method of allocation to intervention and control groups.

6.2.3 Findings

6.2.3.1 Short-term results (<6 months)

Five studies (Bellingham and Gillies, 1993; Denman et al., 1995; Gillies et al., 1990; Magnusson et al., 2004; Mellanby et al., 2001) evaluated short-term outcomes for four interventions: the Streetwize UK comic; a Theatre in HIV and AIDS education programme; an intervention based on a single lesson about contraceptive services; and the A PAUSE programme.

Knowledge and understanding

Four studies (Bellingham and Gillies, 1993; Denman et al., 1995; Gillies et al., 1990; Mellanby et al., 2001) examined short-term knowledge outcomes with generally positive results. Three studies (Bellingham and Gillies, 1993; Denman et al., 1995; Gillies et al., 1990) examined the impact of two programmes (Streetwize comic; Theatre in HIV and AIDS) on knowledge relating to HIV and AIDS. A study of a theatre in HIV and AIDS production (Denman et al., 1995), and two studies of the Streetwize comic intervention, one with young people attending YTCs (Bellingham and Gillies, 1993) and a second with school pupils (Gillies et al., 1990), reported positive intervention effects on HIV and AIDS knowledge (both $p<0.001$). The peer-led version of the A PAUSE Programme (Mellanby et al., 2001) was found to have had a lesser impact on knowledge related to STIs in comparison to the adult-led version ($p<0.01$).

Attitudes and values

All five studies evaluated outcomes relating to attitudes and results indicated that programmes were less effective at influencing participants' attitudes than knowledge. One evaluation of the Streetwize comic with young people attending YTCs (Bellingham and Gillies, 1993) measured behavioural intentions relating to contraception and reported no significant differences between the intervention and comparison groups. This evaluation of the Streetwize comic programme also found that the intervention did not influence attitudes to HIV and AIDS, although a second study of the Streetwize comic with school pupils (Gillies et al., 1990) reported that the programme positively affected attitudes to HIV prevention through only having one partner ($p<0.01$). Denman et al (1995) reported on ten measures of attitude, but only found significant positive programme effects for three outcomes relating

to risk perceptions of AIDS ($p<0.001$); children with HIV ($p<0.05$) and condom use showing people care for each other ($p<0.001$) and not for attitudes about condoms reducing the risk of HIV, condom responsibility or confidence in using condoms. An intervention based on a single lesson about contraceptive services (Magnusson et al., 2004) positively affected student's perceptions of contraception and health clinic availability ($p<0.001$). Short-term evaluation of the A PAUSE Programme (Mellanby et al., 2001), a peer- and adult-led sex education programme for Year 9 pupils, indicated positive effects of the programme on participants' beliefs about males and females who have sex, and perceptions of sexual prevalence amongst peers in the peer-led arm of the programme ($p<0.01$) in comparison to the adult-led group. However, the programme had a less of an influence on attitudes towards the benefits of having sex, with no difference between the peer- and adult-led groups in their perceptions in the beneficial effects of sex.

Personal and social skills

Two studies (Bellingham and Gillies, 1993; Mellanby et al., 2001) reported on short-term outcomes relating to skills including communication and assertiveness for the Streetwize UK comic and A PAUSE programme, respectively. Bellingham and Gillies (1993) reported that the Streetwize UK comic had no significant effects on HIV communication among young people attending YTCs. Evaluation of the A PAUSE programme (Mellanby et al., 2001) revealed programme effects on assertiveness among females ($p<0.05$), but not males. However, there were no differences in assertiveness skills between students in the peer- and adult-led versions of the programme.

Health and social outcomes relating to alcohol use and sexual health

Two studies (Magnusson et al., 2004, Bellingham and Gillies, 1993) reported short-term health outcomes for the intervention based on a single lesson about contraceptive services and an evaluation of the Streetwize UK comic with young people attending YTCs, respectively. Both studies reported that the interventions examined had no significant effects on condom or contraception use at last sex (Bellingham and Gillies, 1993) or in general (Magnusson et al., 2004). Bellingham and Gillies (1993) also reported that Streetwize UK comic had no effect on the participants' number of sexual partners.

6.2.3.2 Medium-term results (up to 12 months)

Five studies (Graham et al., 2002; Mellanby et al., 1995; Stephenson et al., 2004; Tucker et al., 2007; Wight et al., 2002) reported medium-term follow-up data for four interventions including a teacher-led intervention about emergency contraception (Graham et al., 2002) and three comprehensive sex education programmes, RIPPLE (Stephenson et al., 2004), SHARE (Wight et al., 2002; Tucker et al., 2007) and A PAUSE (Mellanby et al., 1995). Evaluation of the A PAUSE programme (Mellanby et al., 1995) and one study of the SHARE programme (Tucker et al., 2007) utilised a repeated cross-sectional design and followed up different cohorts of students at each survey point.

Knowledge and understanding

All five studies reported on knowledge outcomes. A teacher-led intervention about emergency contraception (Graham et al., 2002) was effective at increasing knowledge about emergency

contraception, six months after delivery ($p<0.01$). The effects of the peer-led RIPPLE programme (Stephenson et al., 2004) were examined with regard to the programme's effects on students' knowledge of methods to prevent STIs, local sexual health services and of the emergency contraceptive pill. There were no significant effects of the programme on student's knowledge of emergency contraception or local health services, but compared to students who received teacher-led sex education, there was an increase in knowledge of methods to prevent STIs among intervention females, but not males. An evaluation of the effects of the RIPPLE programme on the peer-leaders themselves (Strange et al., 2002) found that they gained knowledge on emergency contraception ($p<0.05$), as well as improving their awareness of STI prevention ($p<0.001$). Two evaluations of the SHARE sex education programme found that the programme had significant and positive effects on knowledge about sexual health ($p<0.01$; Wight et al., 2002) and STIs ($p<0.001$; Tucker et al., 2007). The A PAUSE Programme (Mellanby et al., 1995) had a strong positive effect on the accuracy of participants' perceptions about sexual activity amongst their peers ($p<0.001$).

Attitudes and values

Four studies (Graham et al., 2002; Mellanby et al., 1995; Stephenson et al., 2004; Tucker et al., 2007) examined medium-term intervention effects on attitudes and values for four interventions: a teacher-led intervention about emergency contraception (Graham et al., 2002), and three sex education programmes RIPPLE (Stephenson et al., 2004), SHARE (Tucker et al., 2007) and A PAUSE (Mellanby et al., 1995). Graham et al (2002) reported that there were no effects of a teacher-led intervention about emergency contraception on behavioural intentions to use emergency contraception and Stephenson et al (2004) found no significant differences between students who participated in the peer-led RIPPLE programme and control students in terms of their intentions about sex or condom use. In addition, there were no effects of the RIPPLE programme on perceptions about condom or contraceptive availability, or on peer leaders' attitudes about condoms or sex (Strange et al., 2002), although providers did gain more positive attitudes about homosexual relationships. The evaluation of the SHARE programme (Tucker et al., 2007) found positive effects on many attitudes to condom use including those concerning price ($p<0.05$); sexual enjoyment ($p<0.001$); embarrassment ($p<0.001$) and their ability to prevent AIDS ($p<0.001$); and STIs ($p<0.01$). Tucker et al (2007) also reported that the SHARE programme had positive effects on behavioural intentions to discuss condoms with a partner ($p<0.05$), intentions to own condoms ($p<0.001$), and on confidence in condom acquisition and use ($p<0.001$). There were no significant effects on of the A PAUSE programme (Mellanby et al., 1995) on students' beliefs towards sex.

Personal and social skills

One study (Stephenson et al., 2004), of the RIPPLE sex education programme, examined participants' confidence in discussing contraception or sex with a partner, but found no significant intervention effects. The RIPPLE programme was reported to have a large and positive effect upon peer-leaders' confidence to deliver sex education lessons to peers (Strange et al., 2002).

Health and social outcomes relating to alcohol use and sexual health

Three studies (Graham et al., 2002; Mellanby et al., 1995; Wight et al., 2002) of a teacher-led intervention about emergency contraception and the A PAUSE and SHARE sex education programmes, respectively, examined medium-term programme effects on outcomes related to sexual health. Graham et al (2002) found that a teacher-led intervention on emergency contraception had no effects on emergency contraception use or sexual experience. Wight et al (2002) reported that the SHARE sex education programme had no effects on condom use overall or at first sex, or on contraception or condom use at last sex. Participation in SHARE (Wight et al., 2002) did not significantly influence the number of unwanted pregnancies, or feelings of regret or pressure at first sex, although a small positive programme effect on regret at first sex with most recent partner ($p<0.05$) was reported for males. Tucker et al (2007) found that, based on a cross-sectional survey of students who participated in the SHARE programme in 2003 compared to control students, there were no effects of the programme on the number of students who reported having sex. One study of the A PAUSE programme, based on cross-sectional follow-up (Mellanby et al., 1995), indicated a positive effect of the programme on whether participants had ever had sex (OR 1.45; 95% CI 1.13, 1.87).

6.2.3.3 Long-term results (>12 months)

Three studies (Henderson et al., 2007; Stephenson et al., 2004; 2008), which evaluated two comprehensive sex education programmes, SHARE and RIPPLE, respectively, reported long-term follow-up data. Follow-up ranged from 18 months to over four years.

Knowledge and understanding

Only the RIPPLE programme was examined in terms of its impact on outcomes related to knowledge. At 18-months follow-up (Stephenson et al., 2004), the programme had positive effects on participants' knowledge relating to STIs ($p<0.001$), although this effect was only apparent for males. This was in contrast to the 6-month follow-up, where a positive effect had been seen for females ($p<0.01$) but not males. As at 6-month follow-up, there were no long-term effects of the peer-led RIPPLE programme on knowledge about emergency contraception or local sexual health services, at 18 months (Stephenson et al., 2004) or four years (Stephenson et al., 2008).

Attitudes and values

Only the RIPPLE programme was examined in terms of its impact on outcomes related to attitudes and values. At 18-months follow-up (Stephenson et al., 2004), there were no significant effects of the RIPPLE programme on students' attitudes or beliefs towards sex, or on perceptions concerning the availability of contraception (Stephenson et al., 2004).

Personal and social skills

One study (Stephenson et al., 2004) reported on long-term skills outcomes for the RIPPLE sex education programme. At 18-month follow-up, (Stephenson et al (2004) reported that the programme had positively affected confidence in condom use amongst females ($p<0.001$) but not males. However, at 18 month follow-up, RIPPLE (Stephenson et al., 2004) also had a negative effect on girls'

confidence in refusing sex ($p<0.05$). There was no effect of the RIPPLE programme on quality of relationships or confidence in discussing sex or contraception.

Health and social outcomes relating to alcohol use and sexual health

Both the RIPPLE and SHARE sex education programmes were evaluated in terms of their long-term effects on outcomes related to sexual health (Stephenson et al., 2004; 2008; Henderson et al., 2007). The results generally indicated that these programmes were not consistently effective at improving health outcomes relating to sexual activity, conceptions and contraception in the longer term.

At the 18-month follow-up (Stephenson et al., 2004), females who received the peer-led RIPPLE programme were significantly less likely to report having sex by age 16 years compared to females in the control group ($p<0.001$). There was no difference between intervention and control males. Based on a 4-year evaluation of the RIPPLE programme, at age 18 there was no difference in the proportion of males or females who had had sex (Stephenson et al., 2008).

Based on long-term follow-up at 18-months and four years (Stephenson et al., 2004; 2008), respectively, there appeared to be no effects of the RIPPLE on contraception use or STI diagnosis. The long-term effect of the programme on unintended pregnancies was less clear. At 18 months follow-up (Stephenson et al., 2004), the programme was found to have had no effect on unintended pregnancies, but at the four-year follow-up (Stephenson et al., 2008), fewer pregnancies were reported amongst intervention students compared to control students (OR 0.62; 95% CI: 0.42, 0.91). There were no effects of the RIPPLE programme on abortion or birth rates (Stephenson et al., 2008). Long-term evaluation of the SHARE programme (Henderson et al., 2007) found that at four and a half year follow-up, there were no programme effects on termination and conception rates.

6.2.4 Summary and evidence statements

The 12 UK studies that were identified included three brief HIV prevention interventions (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990), two interventions based on a single lesson about emergency contraception (Graham et al., 2002) and contraceptive services (Magnusson et al., 2004), and seven studies evaluating three comprehensive SRE programmes: A PAUSE (Mellanby et al., 1995; 2001); RIPPLE (Stephenson et al., 2004; 2008); and SHARE (Henderson et al., 2007; Tucker et al., 2007; Wight et al., 2002).

6.2.4.1 Knowledge and understanding

Two studies (Tucker et al., 2007, Wight et al., 2002) that evaluated SHARE reported positive effects of the programme on knowledge about STIs (Tucker et al., 2007) and sexual health (Wight et al., 2002). The peer-led RIPPLE programme had non-significant effects on knowledge relating to emergency contraception and sexual health services, but had positive effects on students' medium- and long-term knowledge of STIs for females and males, respectively (Stephenson et al., 2004). The adult-led version of the A PAUSE programme was found to have had a greater impact on students' knowledge of STIs than the peer-led version of the programme (Mellanby et al., 2001). Three studies (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990), including one of a theatre in AIDS/HIV education programme (Denman et al., 1995) and two evaluations of the Streetwize UK

comic (Bellingham and Gillies, 1993; Gillies et al., 1990) reported beneficial short-term intervention effects on knowledge of HIV and AIDS. Graham et al (2002) reported positive effects of a teacher-led intervention about emergency contraception on knowledge of contraception and intrauterine contraceptive devices.

6.2.4.2 Attitudes and values

The effects of three comprehensive SRE programmes on attitudes were mixed. Compared to teacher-led SRE, the peer-led RIPPLE programme (Stephenson et al., 2004; 2008) was found to have had no effects on attitudes about using condoms or sex at medium- or long-term follow-up. However, positive programme effects of the SHARE programme (Tucker et al., 2007) were found on attitudes concerning condom use and preventing STIs. Both evaluations of the A PAUSE programme (Mellanby et al., 1995; 2001) indicated positive short- and medium-term effects of the programme on perceptions around sexual activity amongst peers. Mellanby et al (1995) found no effects of the programme on beliefs about sexual intercourse, but Mellanby et al (2001) reported that relative to the adult-led version of the programme, the peer-led version had positive on students' short-term attitudes towards the beneficial effects of sex. Results relating to confidence using condoms were mixed. Positive medium-term effects of the peer-led RIPPLE programme (Stephenson et al., 2004) were reported for females but not males, and there were no significant effects of the programme on whether students had discussed contraception with a partner at short- or long-term follow-up. Tucker et al (2007) reported positive programme effects of the SHARE programme on self-efficacy to use condoms, but not on condom acquisition.

Two brief HIV interventions, the Streetwize UK comic and a Theatre in HIV and AIDS education programme, had limited effects on short-term attitudes towards HIV and contraception. Gillies et al (1990) reported a positive effect on attitudes towards having one partner to prevent HIV among school pupils who received the Streetwize UK comic, but among young people in YTCs, Bellingham and Gilles (1993) found no effect of the comic on attitudes about HIV or intentions towards condom use. Denman et al. (1995) also examined attitudes concerning HIV and condoms and reported mainly non-significant findings. There were no significant effects of a teacher-led intervention (Graham et al., 2002) on emergency contraception on intentions to use emergency contraception, but an intervention based on a single lesson about contraceptive services (Magnusson et al., 2004) found that the intervention had a positive effect on perceptions of contraception and health clinic availability.

6.2.4.3 Personal and social skills

Results for skills outcomes were limited with few studies reporting on these outcomes. Two studies (Stephenson et al., 2004; Mellanby et al., 2001) of the RIPPLE and A PAUSE programmes, respectively, evaluated effects on personal and social skills. Stephenson et al (2004) found no medium-term intervention effects of RIPPLE on relationship quality and although Mellanby et al (2001) found no effect of the A PAUSE programme on assertiveness in boys, there was a positive short-term effect of the programme on assertiveness in girls. Bellingham and Gillies (1990) reported no effects of the Streetwize UK comic on short-term communication about HIV.

6.2.4.4 Health and social outcomes relating to alcohol use and sexual health

Few of the studies found significant programme effects on health outcomes related to sexual health. All three of the SRE programmes, A PAUSE (Mellanby et al., 1995), RIPPLE (Stephenson et al., 2008) and SHARE (Tucker et al., 2007), were evaluated in terms of their effects on sexual initiation. There were positive medium- and long-term effects of the A PAUSE (Mellanby et al., 1995) and RIPPLE (Stephenson et al., 2004) programmes on the number of students who reported ever having had sex, although for RIPPLE this effects was only apparent among females at the 18-month follow-up. Tucker et al (2007) found no effect of SHARE on the number of students who reported having had sex. There were no effects of either the RIPPLE (Stephenson et al., 2004; 2008) or SHARE (Wight et al., 2002) programmes on use of condoms or other forms of contraception. There were no medium-term effects of the SHARE (Wight et al., 2002) or RIPPLE (Stephenson et al., 2004) programmes on rates of unintended pregnancies, however, Stephenson et al (2008) found that at age 20, students who participated in the peer-led RIPPLE programme were less likely to have been pregnant. However, only 49% of the original sample was followed up at age 20. There were no long-term effects of the RIPPLE (Stephenson et al., 2008) or SHARE (Henderson et al., 2007) programmes on termination rates.

Bellingham and Gillies (1993) found no effects of the Streetwize UK comic on students' number of sexual partners or condom use at last sex, among young people attending YTCs. In addition, there were no effects of two interventions based on a single lesson about emergency contraception (Graham et al., 2002) and contraceptive services (Magnusson et al., 2004), respectively, on contraception use at follow up. The teacher-led intervention about emergency contraception (Graham et al., 2002) also had no effects on sexual experience.

Evidence statement 9

9 (f) There is moderate evidence from two RCTs and two CBA studies[1] to suggest that comprehensive sex education programmes may be effective at increasing students' knowledge about STIs in the short- to long-term. In addition, there is weak evidence from one RCT and two CBA studies[2] to suggest that brief interventions focusing on HIV prevention, such as Theatre in Education or a comic-based intervention, may have short-term positive effects on knowledge about HIV/AIDs. This evidence is directly applicable as these studies were conducted in the UK.

9 (g) Overall, there is inconsistent evidence from two RCTs and two CBA studies[3] to determine the effects of comprehensive sex education programmes on attitudes and values relating to sexual health. However, there is weak evidence from one CBA study[4] to suggest that a two-year sex education programme aimed at reducing unsafe sexual behaviour and unwanted pregnancy (SHARE) may have positive effects on long-term attitudes and intentions regarding condoms. There is moderate evidence from two RCTs, one NRCT and two CBA studies[5] to suggest that brief or single session interventions focusing on HIV prevention or contraceptives and contraceptive services may have a limited impact on students' attitudes and values. This evidence is directly applicable as the study was conducted in the UK.

9 (h) There is inconsistent evidence from two RCTs and one CBA study[6] to determine the effects of UK-based SRE approaches on personal and social skills.

9 (i) There is moderate evidence from one RCT and one NRCT[7] to suggest that comprehensive SRE programmes, that include peer-led sessions such as RIPPLE and A PAUSE, may delay sexual initiation, but strong evidence from three RCTs and one NRCT[8] to suggest that SRE programmes and single session interventions focusing on contraceptives and contraceptive services may have no impacts on condom or contraceptive use. This evidence is directly applicable as the studies were conducted in the UK.

9 (j) There is mixed evidence from three RCTs[9] on the effects of comprehensive SRE programmes on outcomes relating to pregnancy. There is moderate evidence from one RCT[10] of the peer-led RIPPLE programme to suggest that this programme may reduce teenage pregnancy, but not abortion, rates in the long-term and strong evidence from one RCT[11] of the teacher-led SHARE programme to suggest that this programme has no long-term effects on conceptions or terminations. This evidence is directly applicable as the studies were conducted in the UK.

[1] Mellanby et al., 2001 (CBA +); Stephenson et al., 2004 (RCT ++); Tucker et al., 2007 (CBA -); Wight et al., 2002 (RCT ++)

[2] Denman et al., 1995 (CBA -); Bellingham and Gillies, 1993 (RCT +); Gillies et al., 1990 (CBA -)

[3] Mellanby et al., 1995 (NRCT +); Mellanby et al., 2001 (CBA +); Stephenson et al., 2004; 2008 (RCT ++); Tucker et al., 2007 (CBA -)

[4] Tucker et al., 2007 (CBA -)

[5] Bellingham and Gillies, 1993 (RCT +); Denman et al., 1995 (CBA -); Gillies et al., 1990 (CBA -); Graham et al., 2002 (RCT ++); Magnusson et al., 2004 (NRCT -)

[6] Bellingham and Gillies, 1993 (RCT +); Mellanby et al., 2001 (CBA +); Stephenson et al., 2004 (RCT ++)

[7] Mellanby et al., 1995 (NRCT +); Stephenson et al., 2004 (RCT ++)

[8] Stephenson et al., 2004; 2008 (both RCT ++); Wight et al., 2002 (RCT ++); Graham et al., 2002 (RCT ++); Magnusson et al., 2004 (NRCT -)

[9] Henderson et al., 2007 (RCT ++); Stephenson et al., 2004; 2008 (both RCT ++); Wight et al., 2002 (RCT ++)

[10] Stephenson et al., 2008 (RCT ++)

[11] Henderson et al., 2007 (RCT ++)

Table 6.3. UK SRE studies: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Bellingham & Gillies, 1993	RCT +	Streetwize comic n=173	No intervention n=164	2 weeks n=241 (72%)	↑ HIV/AIDS***	**NS** HIV/AIDS **NS** condom intentions	**NS** HIV communication with partner
Gillies et al., 1990	CBA -	Streetwize UK n=122	No intervention n=162	2 weeks n=227 (80%)	↑ HIV/AIDS***	↑ HIV prevention through having one partner**	-
Denman et al., 1995	CBA -	Theatre in HIV and AIDS education n=276	Did not take part in the performance or workshop n=531	PT (1 day) n=680 (84%)	↑ HIV/AIDS***	↑ everybody is at risk from AIDS*** ↑ other perceptions of the risk of AIDS **NS** attitudes towards condom use	-
Magnusson et al., 2004	NRCT -	Contraceptive services n=NR	Normal sex education n=NR	up to 6 months n=512 (87%)	-	↑ contraception availability and clinic location***	-
Mellanby et al., 2001	CBA +	A PAUSE Peer-led n=1,064	A PAUSE Adult-led n=611	PT (1 week) n=1,320 (79%)	↓ STDs***	↑ perceived sex prevalence*** ↓ beneficial effects of sex* ↑ stereotypes about females having sex** ↓ stereotypes about males having sex**	↑ assertiveness (females)* **NS** assertiveness (males)

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.4. UK SRE studies: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Bellingham & Gillies, 1993	RCT +	Streetwize UK comic n=173	No intervention n=164	2 weeks n=241 (72%)	-	**NS** number of partners	**NS** condom use at last sex	-	-
Magnusson et al., 2004	NRCT -	Contraceptive services n=NR	Normal sex education n=NR	~ 6 months n=512 (87%)	-	-	**NS** contraception use	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.5. UK SRE studies: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Graham et al., 2002	RCT ++	Emergency contraception n=1,552	Teachers did not receive training N=1,682	6 months n=2,632 (81%)	↑ emergency contraception** ↑ intrauterine device*	**NS** intention to use emergency contraception	-
Mellanby et al., 1995	NRCT +	A PAUSE n=1,175	Normal education n=5,398	1 year[a] NA	-	**NS** beliefs about sexual intercourse ↑ perceived sex prevalence***	-
Stephenson et al., 2004	RCT ++	RIPPLE n=4,516	Teacher-led SRE 4,050	6 months n=7,770 (88%)	↑ methods to prevent STIs (girls only**) **NS** emergency contraception **NS** local sexual health services	**NS** availability of condoms or contraceptives **NS** condom use **NS** sex	**NS** confidence in discussing contraception or sex with partner
Tucker et al., 2007	CBA -	SHARE n=2,760	Non-SHARE programs n=1,564	1 year[a] NA	↑STIs***	↑ condoms: embarrassment***; reduce sexual enjoyment***; to discuss condoms with partner*; prevent AIDS***; condom use prevents STIs**; price*; intention to own*** ↑ belief in planning to protect from STIs* ↑self-efficacy condom use*** **NS** self-efficacy condom acquisition***	-
Wight et al., 2002	RCT ++	SHARE n=3,616	Normal sex education n=6,000	6 months n=5,854 (87%)	↑ sexual health**	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a]cross-sectional follow-up survey

Table 6.6. UK SRE studies: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Graham et al., 2002	RCT ++	Emergency contraception n=1,552	Teachers did not receive training N=1,682	6 months n=2,632 (81%)	**NS** sexual experience	-	**NS** use of emergency contraception	-	-
Mellanby et al., 1995	NRCT +	A PAUSE n=1,175	Normal education n=5,398	1 year[a] NA	↓ ever had sex*	-	-	-	-
Tucker et al., 2007	CBA -	SHARE n=2,760	Non-SHARE programs n=1,564	1 year[a] NA	**NS** reported sex	-	-	-	-
Wight et al., 2002	RCT ++	SHARE n=3,616	Normal sex education n=6,000	6 months n=5,854 (87%)	**NS** regret at first sex **NS** pressure at first sex ↓ regret at first sex with most recent partner (males only*)	-	**NS** condom use: mean score; first sex; last sex **NS** contraception at last sex	-	**NS** unwanted pregnancies

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] Based on cross-sectional follow-up survey

Table 6.7. UK SRE studies: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Stephenson et al., 2004	RCT ++	RIPPLE n=4,516	Teacher-led SRE n=4,050	18 months n=6,656 (76%)	↑ STIs (boys only***) **NS** emergency contraception **NS** local sexual health services	**NS** availability of condoms or contraceptives **NS** condom use **NS** sex	↑ confidence condom use (girls only**) ↓ sex refusal-efficacy (girls only*) **NS** confidence in discussing contraception or sex with partner **NS** quality of relationship
Stephenson et al., 2008	RCT ++	RIPPLE n=4,516	Teacher-led SRE n=4,050	4 years n=4,310 (49%)	**NS** emergency contraception **NS** sexual health services	**NS**	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.8. UK SRE studies: long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Stephenson et al., 2004	RCT ++	RIPPLE n=4,516	Teacher-led SRE n=4,050	18 months n=6,656 (76%)	↓ ever had sex (girls only***) **NS** same sex experience	-	**NS** contraception use at last sex	-	**NS** unintended pregnancies
Stephenson et al., 2008	RCT ++	RIPPLE n=4,516	Teacher-led SRE n=4,050	4 years n=4,310 (49%)	**NS** ever had sex **NS** regret or pressure at first or last sex	-	**NS** use of contraception **NS** unprotected first sex	**NS** STI diagnosis	↓ pregnancies **NS** abortion rates **NS** birth rates
Henderson et al., 2007	RCT ++	SHARE n=2,080	Normal sex education n=2,135	4.5 years N=4196 (99.5%)	-	-	-	-	**NS** termination and conception rates

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

6.3 Abstinence-only programmes

6.3.1 Overview of evidence identified

Ten articles (Blake et al., 2001; Borawski et al., 2005; Christopher & Roosa, 1990; Denny et al., 1999; 2002; 2006; Donnelly et al., 2001; Jorgensen et al., 1993; Roosa & Christopher, 1990; Trenholm et al., 2008) were identified that evaluated eight programmes defined as abstinence only programmes across nine studies. These programmes encouraged and promoted abstinence as the best and only way to prevent pregnancy, HIV and other STIs. All nine studies were conducted in the USA and were delivered within schools during normal lesson hours. Additionally, one study reported on a replication of the Success Express Programme (Roosa and Christopher, 1990), which was offered in schools and community centres. In addition, Project Taking Charge (Jorgensen et al., 1993) included three evening sessions for parents.

Four programmes were teacher-led (For Keeps [Borawski et al., 2005]; Sex Can Wait [Denny et al., 1999; Denny and Young, 2006]; Project Taking Charge [Jorgensen et al., 1993] and Project C.A.R.E. [Donnelly et al., 2001]) and one programme, Managing the Pressures before Marriage (MPM; Blake et al., 2001), was peer-led. Three studies did not report details of the providers for three programmes (Success Express Programme [Christopher and Roosa, 1990; Roosa and Christopher, 1990] and My Choice, My Future!/Recapturing the Vision (MCMF/RTV) [Trenholm et al., 2008]). For five programmes no theoretical base was reported (For Keeps; Success Express Programme; Sex Can Wait; Project Taking Charge; MCMF, RTV). Project C.A.R.E (Donnelly et al., 2001) applied social learning theory and one programme, MPM (Blake et al., 2001) applied social learning and social cognitive theories.

Where reported, sample size varied greatly amongst the included studies from 91 to 1,715 students. One study evaluating Sex Can Wait (Denny et al., 1999) did not describe the number of students, instead reporting that the sample consisted of students from 15 schools. No authors reported whether their study was sufficiently powered to detect an intervention effect. However, two studies discussed that the small sample size of sexually inexperienced students (Borawski et al., 2005) and high non-participation in the programme (Trenholm et al., 2008) might have reduced power.

Five programmes targeted adolescents between the ages of 11 to 14 years (MPM; For Keeps; Success Express Programme; Project C.A.R.E.; MCMF/ RTV). Additionally, the Sex Can Wait programme (Denny et al., 1999; 2002; Denny & Young, 2006) targeted students in middle (aged 11-14 years) and high school (aged 14-18 years). Project Taking Charge (Jorgensen et al., 1993), also targeted older adolescents aged over 14 years. The length of follow-up varied between studies. Evaluation of three programmes (Success Express Programme; Project C.A.R.E; MPM) and one evaluation of the Sex Can Wait programme (Denny et al., 1999) was based on immediate post-test only. Evaluation of one programme, Project Taking Charge (Jorgensen et al., 1993) was based on follow-up at six months and evaluation of the three-year MCMF and RTV programmes took place between 42 and 78 months after baseline data was collected. A second evaluation of Sex Can Wait (Denny and Young, 2006) followed up participants at 18 months.

Table 6.9. Sex and relationships education: abstinence-only programmes

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Blake et al., 2001	RCT +	School	USA n=351 8th grade students	**Managing the Pressures before Marriage (MPM):** five one-hour sessions plus homework aiming to increase parent-child communication about sex	Skills based	Peer led
Borawski et al., 2005	NRCT +	School	USA n=1,096 students, 12-13 years	**For Keeps:** five 40-minute sessions emphasising the benefits of abstinence and consequences of early sexual activity; how condoms and contraception does not protect against the emotional consequences of sex; the need for development of resistance skills	Not reported	Teachers
Christopher & Roosa, 1990	NRCT -	School	USA n=320 students, mean age 12.8 years	**Success Express:** 6 sessions designed to teach behaviours, attitudes and skills consistent with abstinence; graduation ceremony	Not reported	NR
Roosa & Christopher, 1990	NRCT -	School + community	USA n=339 students, mean age 13 years	**Success Express**: six sessions over six weeks focusing on self-esteem and family values, growth and development that occur during puberty, media and peer pressures, assertiveness training, and goal-setting skills.	No reported	NR
Denny et al., 1999, 2002	NRCT -	School	USA Students from 15 middle and high schools	**Sex Can Wait:** 5 weeks curriculum on self-esteem, reproductive anatomy, physiology, changes associated with puberty, values and decision making skills; development and enhancement of communication skills; and goal setting and life planning	Not reported	Teachers
Denny & Young, 2006	NRCT -	School	USA Middle school n=698 students High school n=337 students	**Sex Can Wait:** Five weeks, 24 lessons on self-esteem, reproductive anatomy, physiology, changes associated with puberty, values and decision making skills; development and enhancement of communication skills; and goal setting and life planning	Not reported	Teachers
Donnelly et al., 2001	NRCT -	School	USA n=839 students, 6th-8th grade	**Project C.A.R.E./Sex Can Wait**: 23 sessions over 1 year to promote abstinence until marriage; Goal setting, decision making, communication skills, self esteem enhancement	Social learning theory	Teachers
Jorgensen et al, 1993	NRCT +	School	USA n=91 students, mean age 14.4 years	**Project Taking Charge**: 6 weeks abstinence promotion with classroom and parental components	Not reported	Teachers
Trenholm et al., 2008	RCT -	School	USA n=448 Middle School students	**My Choice, My Future! (MCMF)** 52 lessons over three years; abstinence education	Not reported	Not reported

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Trenholm et al., 2008	RCT -	School	USA n=480 middle school students	**ReCapturing the Vision (RCV):** One year daily class; abstinence education		NR

6.3.2 Quality assessment

Of the nine studies, two were RCTs (Trenholm et al., 2008; Blake et al., 2001) and seven were NRCTs (Borawski et al., 2005; Christopher and Roosa, 1990; Denny et al., 1999; Denny and Young, 2006; Donnelly et al., 2001; Jorgensen et al., 1993; Roosa and Christopher, 1990). The RCT by Trenholm et al (2008) was based on individual randomisation of students and Blake et al (2001) randomised at the level of the classroom taking into consideration the probability of type I errors. The study by Blake et al (2001) did not include a 'no intervention' control; rather they compared the effects of the MPM curriculum with and without five homework assignments. Of the two RCT, one study was rated moderate for quality (Blake et al., 2001; RCT +) and one study was rated poor (Trenholm et al., 2008; RCT –). Neither RCT provided details of the method of randomisation so it was difficult to judge whether selection bias was minimised, although both studies stated that random methods were applied. Blake et al (2001) reported outcomes to be reliable, and outcomes and analysis were reported to a high standard. Trenholm et al (2008) did not report on reliability of outcomes and it was not always possible to determine which programme (MCMF or RCV) outcomes were attributable to. Follow up was inadequate in Blake et al (2001) at one week and was unclear and variable in Trenholm et al (2008) at between 42 and 78 months from baseline. Neither study provided the initial sample size so it was impossible to determine attrition rates.

Five of the NRCTs were rated poor (NRCT -) for quality (Christopher and Roosa, 1990; Denny et al., 1990; Denny and Young, 2006; Donnelly et al., 2001; Roosa and Christopher, 1990) and two were rated moderate (NRCT +) for quality (Borawski et al., 2005; Jorgensen et al., 1993). Follow up times were generally inadequate (Borawski et al., 2005; Christopher and Roosa, 1990; Denny et al., 1999; Donnelly et al., 2001; Roosa and Christopher, 1990) and in one study with long-term outcomes (Denny and Young, 2006) attrition was very high at 50%. Attrition was a concern in two other studies, being either high (Christopher and Roosa, 1990) or not calculable due to post-test numbers only being presented (Denny et al., 1999). Analysis and outcomes were reasonably reported across studies except in three studies (Christopher and Roosa, 1990; Donnelly et al., 2001; Roosa and Christopher, 1990) with inadequate reporting of significance levels or effect sizes. Methodology was generally well reported, but lacked detail in three studies (Donnelly et al., 2001; Jorgensen et al., 1993; Roosa and Christopher, 1990).

6.3.3 Findings

6.3.3.1 Short-term results (<6 months)

Seven studies (Blake et al., 2001; Borawski et al., 2005; Christopher and Roosa, 1990; Denny et al., 1999; Denny and Young, 2006; Donnelly et al., 2001; Roosa and Christopher, 1990) reported short-term data for five programmes: MPM; For Keeps; Sex Can Wait, Project C.A.R.E., MPM and the Success Express Programme.

Knowledge and understanding

Four studies (Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny and Young, 2006) examined short-term impacts on knowledge. One study (Blake et al., 2001) that examined MPM and

two studies of Sex Can Wait (Denny et al., 1999; Denny and Young, 2006) reported that there were no intervention effects on knowledge about abstinence or the curriculum. One study (Borawski et al., 2005) of the For Keeps programme reported significant positive effects on knowledge about HIV and STDs ($p<0.001$).

Attitudes and values

All seven studies that evaluated short-term outcomes reported on attitudes and values. Denny et al (1999) reported significant, positive effects of the Sex Can Wait curriculum on attitudes towards abstention ($p<0.01$) among high school students but not among middle school students. However, high school students reported a corresponding increase in hopelessness. Five studies (Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny & Young, 2006; Roosa & Christopher, 1990) examined behavioural intentions and beliefs regarding sex and abstinence. There was no difference in beliefs supporting delayed sex between MPM only students and students who received the enhanced MPM (Blake et al., 2001), however, students who received the enhanced curriculum were less likely to report intentions to have sex before finishing high school ($p<0.01$). Students who participated in For Keeps (Borawski et al., 2005) were more likely than control students to report a belief in abstinence until marriage ($p<0.001$) and until older ($p<0.01$), and were less likely to report intentions to have sex in the next three months ($p<0.05$) or the next year ($p<0.01$). However, For Keeps participants also reported fewer intentions than control students to use condoms in the future ($p<0.001$). Two studies of the Sex Can Wait programme (Denny et al., 1999; Denny and Young, 2006) found significant, positive effects of the Sex Can Wait curriculum on intentions to remain abstinent among high school students (both $p<0.001$), but not middle school students. There was no difference in the pre-marital sexual beliefs or sexual behaviours of intervention and control participants in the replication study of the Success Express programme (Roosa & Christopher, 1990). Three studies (Donnelly et al., 2001; Christopher & Roosa, 1990; Roosa & Christopher, 1990) examined programme effects on self-esteem, for the Project CARE and Success Express programmes, respectively, finding no effects on this measure.

Blake et al (2001) also examined the effects of the enhanced MPM on refusal efficacy, finding significant positive effects of the enhanced programme compared to the MPM only curriculum on sexual ($p<0.01$) and substance use ($p<0.001$) refusal efficacy. There were no significant effects of the Sex Can Wait programme (Denny et al., 1999; Denny and Young, 2006) on decision making. Additionally one study (Borawski et al., 2005) examined the short-term impact of the For Keeps programme on condom use self-efficacy and sexual impulse control but found no significant differences between intervention and control groups.

Personal and social skills

Four studies (Blake et al., 2001; Christopher and Roosa, 1990; Roosa and Christopher, 1990; Donnelly et al., 2001) reported mainly non-significant short-term outcomes relating to student-family communications for three programmes (Success Express; MPM; Project C.A.R.E). Parent-child communication about sex ($p<0.05$) and school ($p<0.001$) was significantly higher among students who received the enhanced MPM relative to the curriculum only version of the programme (Blake et

al., 2001). No significant programme effects on family communication were reported in either study evaluating the Success Express programme (Christopher and Roosa, 1990; Roosa & Christopher, 1990) and there were no differences in family support between intervention and control students who participated in Project C.A.R.E (Donnelly et al., 2001).

Health and social outcomes relating to alcohol use and sexual health

Short-term outcomes related to sexual health were reported by six of the seven studies. The purpose of one study (Donnelly et al., 2001) was to examine the effects of an abstinence-only programme, Project CARE, on substance use outcomes and therefore only reported health outcomes relating to substance use.

Four studies (Christopher and Roosa, 1990; Denny et al., 1999; Denny and Young, 2006; Jorgensen et al., 1993) of three programmes, Success Express Programme; Sex Can Wait; Project Taking Charge, reported outcomes relating to initiation of sex and presented mixed findings. One study (Christopher and Roosa, 1990) that evaluated the Success Express programme found that intervention students reported more lifetime sexual experience than control students ($p<0.05$), an outcome found to be non-significant in a second evaluation of this programme (Roosa and Christopher, 1990). Both evaluations of Sex Can Wait (Denny et al., 1999; Denny & Young, 2006) found no effect of the programme on sexual initiation among middle school students. However, among high school students a positive effect of the intervention on whether students had ever been sexually activity was found (both $p<0.001$). The same pattern of results was apparent for the impact of Sex Can Wait on past month sexual activity, with non-significant results for middle school students but significant and positive outcomes for high school students (both $p<0.01$). Two studies (Blake et al., 2001; Borawski et al., 2005) of the MPM and For Keeps programmes, respectively, examined intervention effects on recent sexual activity finding no significant effects of either intervention. Borawski et al (2005), however, found significant positive effects of the For Keeps programme on frequency of sex ($p<0.05$), having two or more partners ($p<0.01$) and multiple episodes of sex ($p<0.05$).

Donnelly et al (2001) reported that Project C.A.R.E, an abstinence only intervention based on Sex Can Wait, had no effects on alcohol use or substance use, except for use of crack or methamphetamines for which negative effects were demonstrated ($p<0.05$). One further study (Blake et al., 2001) of MPM examined alcohol related outcomes and reported a small, but significant positive effect of the enhanced curriculum compared to MPM only, on lifetime ($p\leq0.05$) and recent ($p\leq0.05$) alcohol use.

6.3.3.2 Medium-term results (up to 12 months)

One study (Jorgensen et al., 1993), which examined the effects of Project Taking Charge reported medium-term follow-up results.

Knowledge and understanding

Jorgensen et al (1993) reported that Project Taking Charge had positive effects on knowledge of sexual development ($p<0.05$) and sexually anatomy ($p<0.001$), along with knowledge about STIs

(p<0.05). No medium-term programme effects were found for knowledge about pregnancy complications.

Attitudes and values

There were no effects of Project Taking Charge (Jorgensen et al., 1993) on the following measures related to attitudes and values: sexual values, attitudes or intentions and educational aspirations.

Personal and social skills

There were no effects of Project Taking Charge (Jorgensen et al., 1993) on participants' self-esteem or communication with parents.

Health and social outcomes relating to alcohol use and sexual health

Jorgensen et al (1993) examined whether participation in Project Taking Charge was associated with delays in the initiation of sex intercourse. Among participants who were sexually inexperienced at baseline, intervention students were less likely than control students to report the initiation of sexual activity at the 6-month follow-up (p=0.05). However, the authors caution that the sample size for analysis was small (n=50) and that the results should be interpreted with caution.

6.3.3.3 Long-term results (>12 months)

Two studies (Denny and Young, 2006; Trenholm et al., 2008), reporting on evaluations of three programmes (Sex Can Wait, MCMF and RTV), reported long-term follow-up data. Trenholm et al (2008) described follow-up at 42-78 months past baseline, equivalent to six months to three and a half years post-test for participants who took part in the three year programme.

Knowledge and understanding

There were positive long-term effects on knowledge reported in both studies (Denny and Young, 2006; Trenholm et al., 2008). Middle and high school students who participated in Sex Can Wait (Denny and Young, 2006) demonstrated significantly better knowledge of topics covered in the curriculum than controls (p<0.001), an outcome that had been non-significant at previous post-test evaluations (Denny et al., 1999; Denny and Young, 2006). Outcomes for knowledge about sexually transmitted infections (p<0.001) and the risks of having unprotected sex (p<0.01) were significantly greater amongst students in MCMF (Trenholm et al., 2008) than controls. However, there were no significant differences in knowledge for RTV students and controls.

Attitudes and values

Denny and Young (2006) reported on the long-term effects of Sex Can Wait on students' attitudes and found no significant programme effects on middle school students' intentions to remain abstinent. For high school students however, intervention students remained significantly more likely to demonstrate favourable intentions (p<0.05) as they had done at post-test.

Personal and social skills

None of the studies examined long-term programme effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Both studies reported long-term intervention effects on sexual behaviours. At the 18-month follow-up, middle school students who participated in Sex Can Wait (Denny and Young, 2006) were significantly less likely have initiated sexual activity ($p<0.05$) and were less likely to report sexual intercourse in the last 30 days ($p<0.001$), compared to control students. For high school students however there were no significant differences between intervention and control students on either of these measures (Denny & Young, 2006). This is in contrast to the immediate post-test results reported in both Sex Can Wait evaluations which showed positive behavioural outcomes for high school, but not middle school, students. No significant effects on student abstinence at six months to three and a half years were reported following MCMF or RTV (Trenholm et al., 2008) and neither of these interventions demonstrated any effects on pregnancy rates or condom use.

6.3.4 Summary and evidence statements

The nine studies evaluating abstinence only programmes were similar in population, including mainly younger adolescents aged 12-14 years. Three studies (Denny et al., 1999; Denny and Young, 2006; Jorgensen et al., 1993) included older populations of adolescents (aged >14 years)

6.3.4.1 Knowledge and understanding

Knowledge outcomes were reported in six studies (Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny and Young, 2006; Jorgensen et al., 1993; Trenholm et al., 2008). The most commonly reported knowledge outcome was concerning knowledge of STIs, for which two studies (Borawski et al., 2005; Jorgensen et al., 1993) reported positive short- and medium-term programme effects, respectively. A third study, Trenholm et al (2008), evaluated two programmes and found that only MCMF and not RTV affected participants' long-term STI knowledge. Neither study evaluating Sex Can Wait (Denny et al., 1999; Denny and Young, 2006) found short-term differences between programme and control high and middle school students on knowledge of topics covered in the curriculum, but Denny and Young (2006) reported positive long-term effects amongst high school students only. There was no difference in knowledge relating to abstinence among students who received an enhanced version of the MPM compared to those who received the curriculum only version of the programme (Blake et al., 2001).

6.3.4.2 Attitudes and values

Eight studies examined attitudes and values, and abstinence-only programmes were generally found to have had a positive effect on participants' beliefs and attitudes towards abstinence. Seven studies (Blake et al., 2001; Borawski et al., 2005; Christopher and Roosa, 1990; Denny et al., 1999; Denny and Young, 2006; Jorgensen et al., 1993; Roosa and Christopher, 1990) reported on attitudes towards abstinence or around age of first sex and found mostly positive programme effects. The Success Express programme (Christopher and Roosa, 1990; Roosa and Christopher, 1990) reported mainly non-significant programme effects on attitudes. Borawski et al (2005) reported finding positive effects of For Keeps on intentions to remain abstinent until marriage, until older and in the next three months and both evaluations of Sex Can Wait found positive programme effects on abstinence

intentions for high school, but not middle school students. Jorgensen et al (1993) however reported no effect of Project Taking Charge on intentions to have sex. No programmes reported an adverse programme effect on attitudes towards abstinence or intentions to have sex.

6.3.4.3 Personal and social skills

Eight studies (Blake et al., 2001; Borawski et al., 2005; Christopher and Roosa, 1990; Denny et al., 1999; Denny and Young, 2006; Donnelly et al., 2001; Jorgensen et al., 1993; Roosa and Christopher, 1990) examined outcomes relating to personal and social skills and generally reported no significant differences between intervention and control participants at follow-up. Just one study (Blake et al., 2001) found positive programme effects for skills outcomes: reporting students who had received the MPM programme had more favourable results for parent-child communication outcomes. Results from the other studies indicated that abstinence-only programmes did not affect communication.

6.3.4.4 Health and social outcomes relating to alcohol use and sexual health

Eight studies (Christopher & Roosa, 1990; Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny & Young, 2006; Jorgensen et al., 1993; Roosa & Christopher, 1990; Trenholm et al., 2008) examined effects on health outcomes related to sexual health and two studies (Blake et al., 2001; Donnelly et al., 2001) examined effects on health outcomes related to substance use. These studies demonstrated that abstinence-only programmes generally had no significant effects on the initiation of sexual activity, with the exception of the Sex Can Wait programme (Denny et al., 1999; Denny & Young, 2006). Two studies of Sex Can Wait (Denny et al., 1999; Denny and Young, 2006) reported positive short-term programme effects on whether high school, but not middle school students, reported sexual intercourse, ever or in the last 30 days. However at long-term follow-up, 18-months after intervention, Denny and Young (2006) found positive programme effects for middle school, but not high school students, on these measures. Jorgensen et al (1993) reported a positive impact of Project Taking Charge on the initiation of sexual activity, but as the sample size for the analyses was small the results are unlikely to be generalisable beyond the study. Based on short-term follow-up, Blake et al (2001) found no differences in sexual behaviour among students who received an enhanced version of the MPM programme compared to the curriculum only version. Borawski et al (2005) also reported a lack of programme effects of the For Keeps on recent sexual intercourse at short-term follow-up, but noted reductions in the frequency of sexual intercourse, number of sexual partners and multiple episodes of sex. Only one abstinence-only programme, Success Express (Christopher and Roosa, 1990), had a negative effect on health outcomes. Intervention students reported greater lifetime sexual experience than controls. However, in a replication study of this programme (Roosa & Christopher, 1990) there was no difference between intervention and control students on this measure. No significant long-differences differences between programme and control participants were reported for number of pregnancies following the MCMF and RTV programmes (Trenholm et al., 2008). Two studies (Borawski et al., 2005; Trenholm et al., 2008) reported outcomes relating to contraception and reported that abstinence programme participants were no more or less likely to use contraception than controls.

Two studies (Donnelly et al., 2001; Blake et al., 2001) examined the effects of abstinence only programmes and alcohol and other substance use. There was no impact of the Project CARE intervention (Donnelly et al., 2001), but students who received the enhanced version of the MPM programme reported less lifetime and recent alcohol use than students who received the curriculum only version of the programme.

Evidence statement 10

10 (e) There is moderate evidence from one RCT and two NRCTs[1] to suggest that abstinence only programmes may have positive short- to long-term effects on knowledge relating to STIs. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

10 (f) There is weak evidence from four NRCTs[2] to suggest that abstinence only programmes may have short-term positive effects on attitudes and intentions towards sexual activity. There is weak evidence from one NRCT[3] to judge the impact of abstinence programs on long-term intentions. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

10 (g) There is moderate evidence from four NRCTs and two RCTs[4] to suggest that abstinence only programmes may have no impact on the initiation of sexual behaviours or the maintenance of sexual abstinence. In addition, there is moderate evidence from one RCT and three NRCTs[5] to suggest that abstinence only programmes may have no impact on or increase sexual activity. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

10 (h) There is weak evidence from one RCT[6] to suggest that abstinence only education programmes may have no impact on long-term pregnancy rates and contraception use. This evidence may only be partially applicable because the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

[1] Borawski et al., 2005 (NRCT +); Jorgensen et al, 1993 (NRCT +); Trenholm et al., 2008 (RCT -)

[2] Borawski et al., 2005 (NRCT +); Denny et al., 1999 (NRCT -); Denny and Young, 2006 (NRCT -); Roosa and Christopher, 1990 (NRCT -)

[3] Denny et al., 2006 (NRCT -)

[4] Blake et al., 2001 (RCT +); Borawski et al., 2005 (NRCT +); Denny et al., 1999 (NRCT -); Jorgensen et al, 1993 (NRCT +); Roosa and Christopher, 1990 (NRCT -); Trenholm et al., 2008 (RCT -)

[5] Blake et al., 2001 (RCT +); Borawski et al., 2005 (NRCT +); Denny et al., 1999 (NRCT -); Denny and Young, 2006 (NRCT -)

[6] Trenholm et al., 2008 (RCT -)

Table 6.10. Abstinence-only programmes: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Blake et al., 2001	RCT +	MPM curriculum + homework n=190	MPM curriculum only n=161	1 week	**NS** abstinence	↓ belief that should expect sex if had sex before* ↓ belief would have sex before finishing high school** ↑ sexual refusal efficacy** ↑ substance use refusal efficacy***	↑ frequency of parent-child communication ↑ parent-child communication about prevention strategies** ↑ parent-child communication about consequences of sex* ↑ parent-child communication about school*** **NS** parent-child communication about puberty and sexual expectations
Borawski et al., 2005	NRCT +	For Keeps n=1,096	NR n=973	16-25 weeks (66%)	↑ HIV/STDs***	↑ belief in abstinence until older ** ↑ belief in abstinence until marriage*** ↓ intentions to have sex, next 3 months* ↓ intentions to have sex, next year** ↓ intentions to use condoms*** **NS** condom-use efficacy **NS** sexual impulse control	-
Christopher and Roosa, 1990	NRCT -	Success Express n=191	No intervention n=129	PT	-	**NS** perceived: best age for first sex; age expected for first sex; best age for marriage; lifetime or friends lifetime sexual involvement **NS** self-esteem	**NS** family communication
Denny et al., 1999	NRCT -	Sex Can Wait Middle school, n=287	Regular curriculum n=320	PT	**NS** curriculum	**NS** attitudes **NS** hopelessness **NS** abstinence intentions **NS** self-efficacy **NS** decision making	-
		Sex Can Wait High school, n=195	Regular curriculum n=92	PT	**NS** curriculum	↑ attitudes** ↑ hopelessness** ↑ abstinence intentions*** **NS** self-efficacy **NS** decision making	**-**

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Denny and Young, 2006	NRCT -	Sex Can Wait Middle school, n=326	n=372	PT (87%)	**NS** curriculum	**NS** abstinence intentions **NS** hopelessness **NS** self efficacy **NS** decision making	-
Denny and Young, 2006	NRCT -	Sex Can Wait High school, n=226	n=111	PT (85%),	**NS** curriculum	↑ beliefs about abstinence** ↑ intention to remain abstinent*** **NS** self efficacy **NS** decision making	-
Donnelly et al., 2001	NRCT -	Project C.A.R.E. n=413	Regular education n=426	PT	-	**NS** self-esteem	**NS** social support from families
Roosa and Christopher, 1990	NRCT -	Success Express n=339	No intervention n=129	PT	-	↑ expected age to have first sex* **NS** pre-marital sex beliefs **NS** attitude to abstinence **NS** self-esteem	**NS** family communication
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported							

Table 6.11. Abstinence-only programmes: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	Conceptions	Substance Use
Blake et al., 2001	RCT +	MPM curriculum + homework n=190	MPM curriculum only n=161	1 week	**NS** sexual intercourse, ever	**NS** recent sexual intercourse	-	-	↓ lifetime alcohol use* ↓ recent alcohol use
Borawski et al., 2005	NRCT +	For Keeps n=1,096	NR n=973	16-25 weeks (66%)	-	**NS** recent sexual intercourse ↓ frequency of sexual intercourse* ↓ 2+ sexual partners** ↓ multiple episodes of sex*	**NS** consistent condom use	-	-

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	**Frequency/ Number of partners**	**Contraceptive use**	**Conceptions**	**Substance Use**
Christopher & Roosa, 1990	NRCT -	Success Express n=191	No intervention n=129	PT	↑ lifetime sexual behaviour*	-	-	-	-
Roosa & Christopher, 1990	NRCT -	Success Express n=339	No intervention n=129	PT	**NS** lifetime sexual behaviour	-	-	-	-
Denny et al., 1999	NRCT -	Sex Can Wait Middle school, n=287	Regular curriculum n=320	PT	**NS** sexual intercourse, ever	**NS** sexual intercourse, last 30 days	-	-	-
		Sex Can Wait High school, n=195	Regular curriculum n=92	PT	↓ sexual intercourse, ever***	↓ sexual intercourse, last 30 days**	-	-	-
Denny & Young, 2006	NRCT -	Sex Can Wait n=326 (Middle School)	n=372	PT (87%)	**NS** sexual intercourse, ever	**NS** sexual intercourse, last 30 days	-	-	-
		Sex Can Wait n=226 (High School)	n=111	PT (85%)	↓ sexual intercourse, ever***	↓ sexual intercourse, last 30 days**	-	-	-
Donnelly et al., 2001	NRCT -	Project C.A.R.E. n=413	Regular education n=426	PT	-	-	-	-	↓ crack; methamphetamines use* **NS** alcohol; tobacco; cannabis; inhalants; crack; heroin use

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.12. Abstinence-only programmes: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Jorgensen et al, 1993	NRCT +	Project Taking Charge n=52	No intervention n=39	6 months NR	↑ sexual development* ↑ STDs* ↑ sexual anatomy*** **NS** pregnancy complications	**NS** sexual values **NS** sexual attitudes and intentions **NS** educational aspirations **NS** self-esteem	**NS** parent-child sex or vocational communication
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported							

Table 6.13. Abstinence-only programmes: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	Conceptions	Substance Use
Jorgensen et al, 1993	NRCT +	Project Taking Charge n=52	No intervention n=39	6 months NR	↓ sexual initiation*[a]	-	-	-	
*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported [a] Based on small sample (n=50)									

Table 6.14. Abstinence-only programmes: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Denny and Young, 2006	NRCT -	Sex Can Wait Middle school, n=326	n=372	18 months (34%)	**NS** curriculum	**NS** abstinence intentions **NS** hopelessness **NS** decision making **NS** self efficacy	-
		Sex Can Wait High school, n=226	n=111	18 months (72%)	↑ curriculum***	**NS** beliefs about abstinence ↑ intention to remain abstinent* **NS** decision making **NS** self efficacy	-
Trenholm et al., 2008	RCT -	My Choice, My Future! n=286 (FU)	No sex education n=162	42-78 months	↑ STDs*** ↑ unprotected sex risks**	-	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Trenholm et al., 2008	RCT -	ReCapturing the Vision n=275	No sex education n=205	42-78 months	**NS** STDs **NS** unprotected sex risks	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.15. Abstinence-only programmes: long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	Conceptions	Substance Use
Denny and Young, 2006	NRCT -	Sex Can Wait n=326 (Middle School)	n=372	18 months (34%)	↓ sexual intercourse, ever*	↓ sexual intercourse, last 30 days***	-	-	-
Denny and Young, 2006	NRCT -	Sex Can Wait n=226 (High School)	n=111	18 months (72%)	**NS** sexual intercourse, ever	**NS** sexual activity, last 30 days	-	-	-
Trenholm et al., 2008	RCT -	My Choice, My Future! n=286	No sex education n=162	42-78 months (82%)	**NS** abstinence	-	**NS** condom use	**NS** pregnancies	-
		ReCapturing the Vision n=275	No sex education n=205	42-78 months (82%)	**NS** abstinence	-	**NS** condom use	**NS** pregnancies	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

6.4 Abstinence-plus programmes

6.4.1 Overview of evidence identified

A total of 24 articles were identified that reported on the evaluation of 15 abstinence plus programmes across 18 studies. Abstinence plus programmes were defined as those that reported an emphasis on abstinence as the safest way to avoid HIV/STI infection and pregnancy, but also promoted safer sex through the use of contraceptives. Four articles (Coyle et al., 1999; 2001; Basen-Enquist et al., 2001; Kirby et al., 2004) reported on evaluations of the Safer Choices programme across the same sample of students and were grouped as a single study (Coyle et al., 1999). Three articles (Aten et al., 2002; Siegel et al., 1998; 2001) reported on evaluations of the Rochester AIDS Prevention Project for Youth, although both evaluations appeared to report on largely the same sample of students an additional school was included in the study reported on by Siegel et al (2001) and Aten et al (2002).

All 24 studies were conducted in North America, in the USA (n=22) and Canada (n=2). All 15 programmes were primarily delivered in school during scheduled lesson time. Two programmes, Safer Choices (Coyle et al., 1999) and the Youth AIDS Prevention Project (YAPP; Levy et al., 1995), combined school-based curriculums with activities for parents, and two programmes, a sex education programme based on Health Belief Model and Social learning Theory (HBM-SLT; Eisen et al., 1990) and Focus on Kids (Stanton et al., 2006), were designed to be delivered in schools or in the community. Five programmes were solely taught by teachers (an AIDS prevention programme [Walter & Vaughan, 1993]; HBM-SLT curriculum [Eisen et al., 1990], Positive Prevention [LaChausse, 2006], Reducing the Risk [Kirby et al., 1991] and Safer Choices [Coyle et al., 1999; 2001]) or peers (Protection Express [Caron et al., 2004]). Four programmes, Be Proud! Be Responsible! (BPBR; Borawski et al., 2009), a modified version of Reducing the Risk (Zimmerman et al., 2008), the Rochester AIDS Prevention Project for Youth (RAPP; Siegel et al., 1998; 2001), and Skills for Healthy Relationships (Wright, 1998), were taught by teachers in combination with other providers including adult educators, peers and school nurses. Four programmes, Draw the Line/Respect the Line (Coyle et al., 2004), Focus on Kids (Stanton et al., 2005), Postponing Sexual Involvement (Aarons et al., 2000), and YAPP (Levy et al., 1995), were taught by external health educators and for two programmes, Teen Incentives (Smith, 1994) and an STI prevention curriculum (Boyer & Shafer, 1997), it was not clear who the provider was.

The theoretical base for the curriculum or programme was not reported for three programmes: an STI prevention programme (Boyer & Shafer, 1997), Teen Incentives (Smith, 1994), and an AIDS prevention programme (Walter & Vaughan, 1993). Eight programmes (Be Proud! Be Responsible!, Safer Choices, Draw the Line/Respect the Line, Health Belief Model and Social learning Theory curriculum, Reducing the Risk, Positive Prevention, Focus on Kids, and Skills for Healthy Relationships) were based on a combination of theories. The theories applied most often were social cognitive theory (n=7 programmes), social learning theory and the theory of reasoned action (both n=3 programmes).

Table 6.16. Sex and relationships education: abstinence-plus programmes

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Aarons et al., 2000	RCT +	USA n=522 students; mean 12.8 years	School	**Postponing Sexual Involvement:** Eight lessons over two month in 7th grade and booster sessions in 8th grade; reproductive health, postponing sexual involvement peer-led curriculum, voluntary booster sessions covering a range of health issues.	Social cognitive theory	Peer led and health professional
Borawski et al., 2009	RCT +	USA n=1,357 students; mean 15 years	School	**Be Proud! Be Responsible**: Six, 50-minute modules, booster session; abstinence promotion, information and skill building about safer sex practices.	Social cognitive theory, theory of reasoned action, theory of planned behaviour	Predominantly, health education teachers, but in three pairs of schools, approximately a quarter of the classes were taught by school nurses
Boyer & Shafer, 1997	NRCT -	USA n=695 students; mean 14.4 years (range 13-17 years)	School	Three sessions over three days on STI prevention; didactic knowledge and skills building sessions	Not reported	Not reported
Caron et al., 2004	NRCT +	Canada n=945 junior high school students; n=477 senior high school students	School	**Protection Express**: HIV/STI prevention; Peer training programme for senior high school students, developed educational presentation on one of five topics: postponing sexual intercourse, communication and assertiveness in relationships, equality in relationships, conditions to a healthy relationship, and condom use. Peer presentations subsequently presented to junior students	Social cognitive theory	Peer led
Coyle et al., 1999; 2001	RCT +	USA n=4,310 9th grade students	School, family	**Safer Choices**: 20 sessions over 2 school years (10 sessions per year); HIV/STI and pregnancy prevention curriculum, role playing, role model stories, parent newsletters, homework assignments, school-community linkages	Social cognitive theory, social influence theory	Teachers
Coyle et al., 2004	RCT +	USA n=2,829 students; mean 11.5 years	School	**Draw the Line/Respect the Line:** 20 sessions**;** HIV/AIDS and pregnancy prevention, limit setting and refusal skills	Social cognitive theory, social inoculation theory	Teachers
Eisen et al., 1990; 1992	RCT +	USA n=1,444 students; 13-19 years	School or community	8-12 hour sex education programme based on Health Belief Model and Social learning Theory; information, discussion of emotions, decision-making, and personal responsibility.	Health belief model, social learning theory	Teachers

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Hubbard et al., 1998	NRCT +	USA n=532 students; grades 9-12	School	**Reducing the Risk:** Sixteen lesson sexuality curriculum; skill development, setting behavioural goals, activities to personalise information on the risks of unprotected sex, support for personal values and groups norms against unprotected intercourse.	Social learning theory, social influence theory	Teachers
Kirby et al., 1991	NRCT +	USA n=1,033 students; mean 15.3 years	School	**Reducing the Risk:** 15 classes over one school year; abstinence and safer sex promotion; promotion of parent/child discussions.	Social learning theory, social inoculation theory, cognitive behaviour theory	Teachers
LaChausse, 2006	RCT -	USA n=353 9th grade students	School	**Positive Prevention**: Six lessons, 45 minutes each; interactive activities regarding HIV/STIs, risks or early sexual involvement, resisting social pressures for sexual involvement.	Social learning theory, cognitive behavioural theory	Teachers
Levy et al., 1995; Weeks et al 1995	RCT +	USA n=2,392 7th grade students	School, family	**Youth AIDS Prevention Project**: 10 sessions in 7th grade (1 day/2 weeks) and 5 additional sessions (over 1 week) in 8th grade; HIV/AIDS, pregnancy and STI prevention, decision-making skills and resistance/negotiation skills, homework assignment, orientation meeting for parents.	Social cognitive theory	Master's level health educators
Siegel et al., 1998	NRCT +	USA n=3,696 students; mean 13 years (middle school students); mean 17 years (high school students)	School	**Rochester AIDS Prevention Project for Youth:** 12 sessions for middle school students (in 7th grade), 12 sessions for high school students (10th, 11th or 12th grade); Curriculum emphasised self-esteem and decision-making, discussion and skills-based activities on sexuality, STIs, pregnancy and HIV/AIDS.	Theory of reasoned action	Teacher, Adult Health Educator or Peer led
Siegel et al., 2001; Aten et al., 2002	NRCT +	USA n=4,001 students; mean 13 years (middle school students); mean 17 years (high school students)	School	**Rochester AIDS Prevention Project for Youth**: See Siegel et al., 1998 for intervention details	Theory of reasoned action	Teacher, Adult Health Educator or Peer led
Smith, 1994	RCT -	USA n=120 students; mean 15.1 years	School	**Teen Incentives Program**: Once weekly sessions for eight weeks; interpersonal skills training, career mentorship, role playing, writing and acting out skits	Not reported	Not reported

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Stanton et al., 2006	RCT +	USA n=1,131 students; 12-16 years	School or community	**Focus on Kids**: Eight sessions, 1½ hours each, 1-2 day community; decision-making, goal setting, communication, negotiating, consensual relationships, and information regarding abstinence, safer sex, drugs, alcohol and drug selling.	Social cognitive theory, protection motivation theory	Sex education specialists
Walter & Vaughan, 1993	NRCT +	USA n=1,201 students; mean 15.7 years	School	Six session AIDS prevention programme; facts about AIDS transmission and prevention, correcting misrepresentations regarding AIDS risk behaviours, negotiation skills associated with delaying sex and condom use, knowledge and skills around obtaining and using condoms.	Not reported	Teachers
Wright 1998	NRCT +	Canada n=4,512 students; 13-16 years	School	**Skills for Healthy Relationships**: Twenty hours of skills building activities (31 activities); knowledge acquisition, skills development, motivational supports, attitudes development.	Theory of reasoned action, theory of planned behaviour, self-efficacy theory	Teachers, Peer leaders
Zimmerman et al., 2008	RCT +	USA n=1,944 students; 13-16 years	School	**Reducing the Risk:** 16-17 sessions; modified RTR curriculum to include videos with music, peer facilitation, role playing, games and prizes	Not reported	Teacher, Peer led

The overall number of students recruited to participate in the included studies ranged from 120 students to over 4,500 students. Evaluation of six programmes (Reducing the Risk, Youth AID Prevention Project, Draw the Line/Respect the Line, RAPP, Safer Choices and Skills for Healthy Relationships) was based on a sample size of more than 1,500 students. Power calculations or mention of sample size needed to detect significant effect was only discussed in four studies (Caron et al., 2004; Coyle et al 2004; LaChausse, 2006; Walter & Vaughan, 1993).

The programmes examined in the included studies targeted a range of age groups and school year levels. Three programmes, Draw the Line/Respect the Line, Postponing Sexual Involvement and YAPP, targeted students aged between 11 and 13 years. Six programmes (RAPP, Focus on Kids, Protection Express, Skills for Healthy Relationships, an unnamed STI prevention programme and the HBM-SLT curriculum) targeted students across a range of ages, from approximately 12-13 years up to age 16-17, and six programmes (Safer Choices, Positive Prevention, Teen Incentives Programme, Be Proud! Be Responsible!, an unnamed AIDS prevention programme, Reducing the Risk) targeted older adolescents (>14 years).

Programmes were evaluated over a range of follow-up periods. Three studies (Boyer & Shafer, 1997; Smith, 1994; Levy et al., 1995) reported immediate post-test results only, and the majority of studies reported follow-up periods of less than 12 months. Evaluations of three programmes, Reducing the Risk (Hubbard et al., 1998; Kirby et al., 1991), Skills for Healthy Relationships (Wright, 1998) and Safer Choices (Coyle et al., 2001), were based on long-term follow-up greater than 12 months, at 18-, 24- and 31-months respectively.

6.4.2 Quality assessment

Of the 18 studies identified, ten were RCTs and eight were NRCTs. Nine RCTs (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 1999; 2004; Eisen et al., 1990; LaChausse, 2006; Levy et al., 1995; Stanton et al., 2006; Zimmerman et al., 2008) were based on cluster randomisation and one study involved individual randomisation of students (Smith, 1994). Cluster randomisation was conducted at school district (Levy et al., 1995), school (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 1999; 2004; Zimmerman et al., 2008) and classroom level (Eisen et al., 1990; LaChausse, 2006; Stanton et al., 2006). For five of the cluster RCTs (Aarons et al., 2000; Eisen et al., 1990; LaChausse, 2006; Levy et al., 1995; Stanton et al., 2006) the unit of analysis was not matched to the unit of randomisation or authors did not report methods for adjusting for intraclass correlations. Study quality was rated moderate (+ rating) across the majority of the studies and only one study, an RCT, was rated poor (- rating). Although all of the RCTs were reported as randomised, no further details were reported about the method of randomisation, with the exception of Borawski et al (2009), so it was not possible to judge whether selection bias had been adequately minimised. Borawski et al (2009) reported using a two-stage, double-blinded randomisation procedure, and was rated good quality (++ rating) on this particular design aspect. Details on outcomes were generally well reported across the included RCTs and NRCTs. Outcomes measures were reported to be reliable in seven RCTs (Borawski et al., 2009; Coyle et al., 1999; 2004; Eisen et al., 1990; LaChausse, 2006; Stanton et al., 2006; Zimmerman et al., 2008) and three NRCTs (Boyer & Schaffer, 1997; Caron et al., 2004; Wright,

1998), and relevant outcomes were judged to have been reported across all studies. The quality of the analyses conducted was also generally good, but only one RCT (Stanton et al., 2006) reported that an intention-to-treat analysis had been undertaken. The majority of studies based their analysis on students who had completed both baseline and follow-up surveys. One study, RCT (Smith, 1994), was rated poor quality (- rating) because the reporting quality of the study was poor and it was difficult to interpret the statistical results presented.

6.4.3 Findings

6.4.3.1 Short-term results (<6 months)

Eleven studies (Aarons et al., 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; Eisen et al., 1990; Levy et al., 1995; Siegel et al., 1998; Smith, 1994; Stanton et al., 2006; Walter & Vaughan, 1993; Wright, 1998) reported short-term data on the effects of 11 programmes: a postponing sexual involvement curriculum, BPBR, an STI/HIV prevention curriculum, Safer Choices, HBM-SLT curriculum, YAPP, RAPP, Teen Incentives, Focus on Kids, an AIDS-preventive curriculum, and Skills for Healthy Relationships.

Knowledge and understanding

Nine studies (Aarons et al., 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; Eisen et al., 1990; LaChausse, 2006; Siegel et al., 1998; Walter & Vaughan, 1993; Wright, 1998) examined short-term intervention effects on sexual health knowledge, five of which reported positive effects. Aarons et al (2006) found that the Postponing Sexual Involvement curriculum was only effective at increasing contraceptive knowledge among male intervention students, and had no short-term effects on knowledge related to reproductive sexual services among males or females.

Attitudes and values

Ten studies (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 1999; Eisen et al., 1990; Levy et al., 1995; LaChausse, 2006; Siegel et al., 1998; Stanton et al., 2006; Walter & Vaughan, 1993; Wright, 1998) examined short-term intervention effects on attitudes and values.

Six studies (Aarons et al., 2006; Borawski et al., 2009; Levy et al., 1995; Siegel et al., 1998; Stanton et al., 2006; Wright, 1998) reported on changes in behavioural intentions. Four studies (Aarons et al., 2006; Borawski et al., 2009; Levy et al., 1995; Stanton et al., 2006) found no intervention effects on behavioural intentions, including intentions to have sex and intentions for condom use, for four programmes (a postponing sexual involvement curriculum, BPBR, YAPP and Focus on Kids). Female students who received the Postponing Sexual Involvement curriculum (Aarons et al., 2000) reported greater intentions to not have sex in the next six months, compared to control students at the end of seventh grade. However, less than six months later at the beginning of eighth grade, there was no difference in intentions between male or female intervention students and controls. Although Levy et al (1995) found that students in the intervention and control groups did not differ in their intentions to have sex or use condoms; intervention students were more likely to consider using condoms with foam if they planned on being sexually active in the next 12 months. For students who participated in

the RAPP (Siegel et al., 1998), only high school intervention students demonstrated significantly greater behavioural intentions than control students. In the study by Wright (1998), there were significantly higher levels of intentions to engage in preventive behaviours in the intervention group compared to the control group ($p<0.0001$).

Seven studies (Aarons et al., 2006; Borawski et al., 2009; Coyle et al., 1999; Eisen et al., 1990; LaChausse, 2006; Walter & Vaughan, 1993; Wright, 1998) examined impact on attitudes and beliefs related to sexual behaviour. There were no significant differences between female intervention students who received the Postponing Sexual Involvement curriculum (Aarons et al., 2006) and control students on attitudes toward delayed initiation of sex or delayed childbearing, but among males, intervention students reported more positive attitudes towards delayed childbearing, but not delayed sex, at the end of seventh grade and the beginning of eighth grade. Males and females who participated in Be Proud! Be Responsible! (Borawski et al., 2009) reported significantly higher condom use prevention beliefs, but there were no intervention effects on other beliefs related to condom use, whether condom use was hedonistic, and towards abstinence. Coyle et al (1999) reported short-term intervention effects of the Safer Choices programme on students' attitudes toward condom use, but there were no intervention effects on attitudes about sex. Intervention students expressed more positive attitudes toward condom use and decreased barriers toward condom use, higher self-efficacy for condom use, and higher levels of risk perception than control students. Eisen et al (1990) found that there was no difference in health beliefs between intervention and control students following delivery of a curriculum based on the Health Belief Model and Social Learning Theory. At the 1-month post-test, there were no effects of the Positive Prevention curriculum (LaChausse, 2006) on attitudes towards abstention, or self-efficacy for abstinence or condom use. Walter and Vaughan (1993) found significant improvements on four of five belief outcomes for students who received a special AIDS-preventive curriculum compared to controls: perceived susceptibility of acquiring AIDS ($p<0.01$); perceived benefits and barriers for engaging in AIDS preventive behaviour ($p<0.01$ and $p<0.05$, respectively); and perceptions about the commonness of involvement in AIDS prevention ($p<0.01$). There was no difference in participants' perceptions about the acceptability of involvement of AIDS preventive behaviour but significant improvements were found among intervention students on the measure of self-efficacy, which assessed participants' degree of certainty regarding their ability to success fully perform AIDS-preventive actions ($p<0.01$). Intervention group students who received the Skills for Healthy Relationships curriculum (Wright, 1998) reported significantly more positive attitudes towards homosexuals and people living with AIDS/HIV than control group students at the end of the programme ($p<0.0001$).

Personal and social skills

Three studies (Borawski et al., 2009; Boyer & Shafer, 1997; Wright, 1998) examined short-term intervention effects on personal and social skills related to sexual risk behaviours. Borawski et al (2009) reported a significant difference between male intervention who participated in BPBR, and control students on the following efficacy outcomes: impulse control, condom negotiation skills, and condom technical skills. A knowledge-and cognitive-behavioural skills-building intervention to prevent

STIs (Boyer & Shafer, 1997) had a significant short-term impact on sexual risk prevention skills ($p < 0.05$) and substance use prevention skills ($p < 0.001$). Intervention group students who participated in Skills for Healthy Relationships (Wright, 1998) reported higher levels of prevention skills[8] than the control group ($p < 0.0001$).

Health and social outcomes relating to alcohol use and sexual health

Six studies reported short-term programme effects on the initiation of sexual involvement. Of these, five studies (Borawski et al., 2009; Coyle et al., 1999; Eisen et al., 1990; Walter & Vaughan, 1993; Wright, 1998) found no intervention effects for the following five programmes: BPBR; Safer Choices; HBM-SLT curriculum; an AIDS-preventive curriculum, Skills for Healthy Relationships. Aarons et al (2000) evaluated an intervention that included reproductive health classes, health risk screening and the Postponing Sexual Involvement curriculum. At the end of the seventh grade, female (but not male) students had significantly higher virginity rates than control students. However, less than six months later at the beginning of eighth grade, there was no difference in virginity rates between intervention and control students of either gender.

Intervention effects on frequency of sexual intercourse and/or number of partners were examined in seven studies (Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; Levy et al., 1995; Smith, 1994; Stanton et al., 2006; Walter & Vaughan, 1993). Four studies (Borawski et al., 2009; Coyle et al., 1999; Levy et al., 1995; Stanton et al., 2006) reported no intervention effects on frequency of sexual intercourse. Smith (1994) reported that students who participated in the Teen Incentives programme decreased their sexual activity (absolute and relative frequency) compared to control students who received written materials on contraception and decision-making. Boyer and Shafer (1997) found no effects of an STI/HIV prevention curriculum on number of sexual partners but Walter and Vaughan (1993) found that an AIDS-preventive curriculum had short-term effects (up to 3 months) on sexual risk behaviours. Compared to control students, students who participated in the curriculum in 9th or 11th grade reported less involvement in sexual intercourse with high-risk sexual partners ($p < 0.05$) and were more likely to be sexually monogamous ($p < 0.05$).

Eight studies (Aarons et al., 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; Levy et al., 1995; Smith, 1994; Stanton et al., 2006; Walter & Vaughan, 1993) examined intervention effects on contraceptive use; four studies (Borawski et al., 2009; Boyer & Shafer, 1997; Levy et al., 1995; Stanton et al., 2006) found no intervention effects for the following programmes: BPBR, an STI/HIV prevention curriculum, and Focus on Kids. Aarons et al (2000) found that female intervention students who participated in a two-year curriculum reported greater use of contraception at the end of the programme compared to control students, both at the post-test at the end of seventh grade and at the beginning of eighth grade. Among sexually experienced students, those who participated in Safer Choices (Coyle et al., 1999) reported fewer acts of sexual intercourse without a condom in the past 3 months compared to the control group (mean difference [SE] 0.50 [0.31]; $p=0.03$) and were more likely to have used condoms or protection against pregnancy at last intercourse (condoms: OR 1.91;

[8] Communication and behavioural skills relevant to prevention

95% CI 1.13, 3.21; other contraception: OR 1.62; 95% CI 1.05, 2.50). Two other studies reported intervention effects on contraceptive use. Smith (1994) reported that students who participated in the Teen Incentives programme increased their use of contraceptives relative to control students ($p<0.05$) and students who participated in an AIDS-preventive curriculum (Walter and Vaughan, 1993) were more likely to use condoms ($p<0.05$) than control students.

Coyle et al (1999) also found that there was no difference between students who received Safer Choices and control students in their use of alcohol and other drugs before sex in the past 3 months, and whether they had been tested for HIV or other STIs. Walter and Vaughan (1993) reported that participation in an AIDS-preventive curriculum was associated with a favourable trend for STI incidence, but the difference between intervention and control students did not reach significance.

6.4.3.2 Medium-term results (up to 12 months)

Eleven studies (Aarons et al., 2000; Borawski et al., 2009; Caron et al., 2004; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Stanton et al., 2006; Wright, 1998; Zimmerman et al., 2008) reported medium-term follow-up data for 11 programmes: Postponing Sexual Involvement, Be Proud! Be Responsible!, Protection Express, Draw the Line/Respect the Line, HBM-SLT curriculum, Reducing the Risk (standard and modified), Positive Prevention, RAPP, Focus on Kids, and Skills for Healthy Relationship.

Knowledge and understanding

Eight studies (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 2004; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Wright, 1998; Zimmerman et al., 2008) examined medium-term programme effects on knowledge. Five studies (Borawski et al., 2009; Coyle et al., 2004; Kirby et al., 1991; Siegel et al., 2001; Wright, 1998) reported that significant increases in knowledge were sustained among intervention students at medium-term follow-up for five programmes: BPBR, Draw the Line/Respect the Line, Reducing the Risk, RAPP, and Skills for Healthy Relationships. Aarons et al (2000) found programme effects on knowledge related to contraceptives among males intervention students only. Furthermore, there were no programme effects on knowledge related to reproductive health services among either gender. Two studies (LaChausse, 2006; Zimmerman et al., 2008) reported no medium-term intervention effects on knowledge.

Attitudes and values

Nine studies (Aarons et al., 2000; Caron et al., 2004; Coyle et al., 2004; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Stanton et al., 2006; Wright, 1998; Zimmerman et al., 2008) examined medium-term programme effects on attitudes.

Six studies (Aarons et al., 2000; Caron et al., 2004; Siegel et al., 2001; Stanton et al., 2006; Wright, 1998) examined programme impact on behavioural intentions. There were no medium-term effects of the Postponing Sexual Involvement curriculum (Aarons et al., 2000) on intentions to not have sex in the next six months among females and among males, intentions to not have sex were significantly lower among intervention students (OR 0.32; 95% CI 0.13, 0.80). Junior high students who participated in Protection Express were more likely than control students to report intentions to remain

abstinent and to use condoms (both p<0.001). However, among senior high students who participated in the programme as peer leaders there were no intervention effects on behavioural intentions. Among middle school who participated in RAPP (Siegel et al., 2001), intervention students reported safer behavioural intentions regarding sexual behaviour and substance use than controls (females, p<0.05; males, p<0.01), but there was no difference among high school students who received the programme. Stanton et al (2006) found no differences in intentions to engage in sex among students who participated in Focus on Kids and control students who received an environmental health intervention. Compared to the control group, students who participated in the Skills for Healthy Relationships programme (Wright, 1998) reported significantly higher levels of intentions to engage in preventive behaviours in the intervention group.

Nine studies (Aarons et al., 2000; Caron et al., 2004; Coyle et al., 2004; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Stanton et al., 2006; Zimmerman et al., 2008) examined medium-term intervention effects on attitudes, beliefs and/or self-efficacy. Following delivery of booster sessions in the eighth grade, there were no medium-term effects of the Postponing Sexual Involvement curriculum on attitudes to delaying sex or childbearing, or self-efficacy to refuse sex. Caron et al (2004) reported that the Protection Express curriculum had positive effects on junior high intervention students' attitudes to abstinence, and role beliefs and perceived self-efficacy for abstention and condom use. Senior high students, who acted as peer leaders, also reported changes in attitudes and beliefs in relation to abstinence and condom use after participation in the programme relative to the control group. Coyle et al (2004) found that boys who received the Draw the Line/Respect the Line programme had more positive attitudes toward not having sex than control students (p<0.01), however two studies (LaChausse, 2006; Zimmerman et al., 2008) reported no programme effects on attitudes towards delaying sexual involvement for Positive Prevention and Reducing the Risk, respectively. Students who participated in Skills for Healthy Relationships (Wright, 1998) reported significantly more positive attitudes towards homosexuals and people living with AIDS/HIV than control group students. Of three studies (Coyle et al., 2004; Kirby et al., 1991; Zimmerman et al., 2008) that examined students' perceptions or beliefs toward peer norms for sexual involvement, significant positive programme effects were reported in two studies (Coyle et al., 2004; Kirby et al., 1991) for Draw the Line/Respect the Line and the original evaluation of Reducing the Risk, respectively, but not for a modified version of Reducing the Risk (Zimmerman et al., 2008). Coyle et al (2004) also found that male students who participated in Draw the Line/Respect the Line had stronger sexual limits (p<0.01), and were less likely to place themselves in situations that could lead to sexual behaviours (p<0.001), than control students. Four studies (LaChausse, 2006; Siegel et al., 2001; Stanton et al., 2006; Zimmerman et al., 2008) examined intervention effects on self-efficacy. LaChausse (2006) reported that there were no significant differences between intervention and control students in self-efficacy to abstain from sexual intercourse, but that intervention students reported a higher self-efficacy to use condoms (mean [SD]: 7.41 [0.90] vs. 6.74 [1.26]; p=0.001). In the study by Siegel et al (2001), compared to control students, self-efficacy was significantly higher among middle school and high school female students who participated in the RAPP (p<0.05 and p<0.01, respectively). Stanton et al (2006) reported higher perceptions of self efficacy and response efficacy regarding abstinence

among participants in Focus on Kids compared to control students. Intervention students also demonstrated significantly higher perceptions of self efficacy to use condoms. Zimmerman et al (2008) found no significant differences between intervention and control students on three measures of self-efficacy (refusal, condom and situational).

Personal and social skills

Two studies (Kirby et al., 1991; Wright, 1998) examined medium-term programme effects on personal and social skills related to sexual risk reduction. Kirby et al (1991) found that the Reducing the Risk curriculum impacted on student's communication with their parents at 6-months; intervention participants and their parents were more likely than control students to have ever discussed abstinence ($p<0.01$) and contraception ($p<0.01$). However, there was no difference between group in their level of communication with their parents about pregnancy and STIs. Students who participated in the Skills for Healthy Relationships curriculum (Wright, 1998) reported higher levels of prevention skills compared to the control group.

Health and social outcomes relating to alcohol use and sexual health

Nine studies examined medium-term programme effects on initiation of sexual intercourse. Four studies (Borawski et al., 2009; Caron et al., 2004; Kirby et al., 1991; Wright, 1998) found that there were no medium-term effects of the following curriculums on initiation of sexual intercourse: BPBR, Protection Express, Reducing the Risk and Skills for Healthy Relationships. Aarons et al (2000) reported that, at the end of 8th grade, female students who had participated in the Postponing Sexual Involvement curriculum had significantly higher virginity rates than control students (OR 1.88; 95% CI 1.02, 3.47). Coyle et al (2004) found that young men, but not young women, who received the Draw the Line/Respect the Line curriculum were significantly less likely than control students to report ever having sex, at the end of 9th grade (age 14-15 years) one year after receiving the intervention. At 6-months follow-up, students who received the Positive Prevention curriculum (LaChausse, 2006) were also significantly less likely to have had sex compared to control students (OR 0.19, 95% CI 0.07, 0.51) Based on a composite measure of initiation or onset of sexual experience, Siegel et al (2001) found that rates of initiation were lower among middle school females who received the RAPP curriculum in the medium-term than among control groups ($p<0.01$). Zimmerman et al (2008) found that when combined, participants who received the traditional or modified version of Reducing the Risk were significantly less like to have initiated sexual activity at the end of 10th grade (age 15-16 years; one year after intervention) than control participants ($p<0.05$).

Programme effects on frequency of sexual intercourse and/or number of partners were examined in six studies (Borawski et al., 2009; Coyle et al., 2004; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Stanton et al., 2006). These studies found that none of the programmes examined (BPBR, Draw the Line/Respect the Line, Reducing the Risk, Positive Prevention, RAPP and Focus on Kids) had any effect on these outcomes at the medium-term follow-up.

Nine studies (Aarons et al., 2000; Borawski et al., 2009; Caron et al., 2004; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Stanton et al., 2006; Zimmerman et al., 2008)

examined medium-term programme effects on contraceptive use, of which seven studies (Borawski et al., 2009; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Stanton et al., 2006; Zimmerman et al., 2008) found no effects for the following programmes: BPBR, Draw the Line/Respect the Line, HBM-SLT curriculum, Reducing the Risk (standard and modified), Positive Prevention, and Focus on Kids. Aarons et al (2000) found that female, but not male, intervention students who received the Postponing Sexual Involvement curriculum, in addition to health risk screening and reproductive health classes reported greater use of contraception at the end of eighth grade compared to control students. Caron et al (2004) reported that at 9-months follow-up, senior high intervention students who acted as peers were more likely than control students to report using a condom consistently with their regular or occasional sexual partner ($p<0.01$). However, junior high intervention and control students did not differ with respect to condom use.

Two studies (Eisen et al., 1990; Kirby et al., 1991) examined the medium-term effects of a HLM-SLT curriculum and Reducing the Risk, respectively, on pregnancy. Neither study identified significant programme effects on this outcome.

6.4.3.3 Long-term results (>12 months)

Four studies (Coyle et al., 2001; Kirby et al., 1991; Hubbard et al., 1998; Wright, 1998) reported long-term follow-up data for three programmes: Safer Choices, Reducing the Risk and Skills for Healthy Relationships.

Knowledge and understanding

Three studies (Coyle et al., 2001; Kirby et al., 1991; Wright, 1998) examined long-term programme effects on sexual health knowledge. After 31-months follow-up, Coyle et al (2001) reported that effects on knowledge of HIV and STDs remained significantly higher for intervention students who participated in Safer Choices compared to control students (mean difference [SE] HIV 0.11 [0.02]; STIs 0.09 [0.02]; both $p=0.00$). Kirby et al (1991) and Wright (1998) also reported sustained long-term increases in knowledge among students exposed to abstinence plus programmes compared to controls.

Attitudes and values

At 31-months follow-up, Coyle et al (2001) found that Safer Choices students expressed significantly more positive attitudes than comparison students about condoms (mean difference [SE] 0.07 [0.02]; $p=.01$) and reported significantly fewer barriers to condom use (mean difference [SE] -0.11 [0.04]; $p=0.01$), greater self-efficacy for condom use (mean difference [SE] 0.11 [0.03]; $p=0.00$) and perceived HIV and STD risks to be higher (mean difference [SE] HIV 0.11 [0.05]; $p<0.05$; STIs 0.09 [0.04]; $p<0.05$). However, there was no difference between intervention and control students on the following measures: attitudes about sex; normative beliefs about condoms; self efficacy for refusing sex; and self efficacy for communication. Despite medium-term effects on beliefs about the sexual involvement of peers, at 18-months follow-up (Kirby et al., 1999) there was no difference between intervention students who participated in Reducing the Risk and control students on this outcome. Wright (1998) reported that both short- and medium-term effects on attitudes and intentions were

maintained at the end of 11th grade. Intervention group students reported significantly more positive attitudes towards homosexuals and people living with AIDS/HIV than control group students, and significantly higher levels of intentions to engage in preventive behaviours in the intervention group compared to the control group.

Personal and social skills

Despite a short-term impact on communication with parents (Coyle et al., 1999), there were no long-term effects of the Safer Choices curriculum (Coyle et al., 2001) on students' level of communication with their parents. Kirby et al (1991) found that medium-term effects on parental communication were sustained long-term for abstinence ($p<0.05$) but not for contraception. As at previous follow-ups (Kirby et al., 1991), there was no difference between Reducing the Risk and control students in communication with parents about pregnancy and STDs, or in intentions to use skills for avoiding unprotected intercourse. Wright (1998) found that short- and medium-term intervention effects on prevention skills were sustained at the long-term follow-up among students who participated in the Skills for Healthy Relationship programme, compared to controls. However, there was no difference in self-esteem between intervention and control students.

Health and social outcomes relating to alcohol use and sexual health

Two studies (Kirby et al., 1991; Hubbard et al., 1998) demonstrated that the Reducing the Risk curriculum was partially effective at reducing the age of initiation over the long-term. At 18-months, Kirby et al (1991) found that fewer students in the intervention group had initiated intercourse compared to the control group (29% vs. 38%; $p<0.05$). However, the results of the logistic regression analysis of the proportions initiating intercourse did not reach significance ($p=0.13$). In a replication of the Reducing the Risk curriculum, Hubbard et al (1998) also found that fewer intervention students than control students were sexually active at 18-months follow-up (28% vs. 43%; $p<0.05$). However, this study experienced large losses to follow-up (only 36% of students were followed up) and consequently students followed up at 18 months were unlikely to be representative of the baseline sample. For the other programmes with long-term follow-up, Safer Choices and Skills for Healthy Relationships, there were no intervention effects on initiation of sexual intercourse.

Kirby et al (1991) examined the long-term effects of the Reducing the Risk curriculum on frequency of sexual intercourse, finding that there were no statistically significant differences between the intervention and control group. Kirby et al (1991) also found that there was no long-term effects of the Reducing the Risk curriculum on contraceptive use or pregnancy. Hubbard et al (1998) reported that the curriculum had a long-term impact on use of contraception by new initiates, but as previously stated the results of this study were confounded by large losses to follow-up. There appeared to be long-term effects of the Safer Choices curriculum at long-term follow-up. At 31 months, compared to control students, intervention students reported fewer acts of sexual intercourse without a condom in the last 3 months (mean difference [SE] 0.63 [0.23]; $p=0.05$) and fewer sexual partners without a condom in the last 3 months (mean difference [SE] 0.73 [0.14]; $p=0.02$). Intervention students were also significantly more likely to have used condoms (OR 1.68; 95% CI 1.02, 2.76) or other pregnancy prevention methods at last intercourse (OR 1.76; 95% CI 1.01, 30.7).

6.4.4 Summary and evidence statements

A total of 18 studies were identified that evaluated 15 sex and relationships education programmes based on an abstinence-plus approach. Abstinence plus programmes were defined as those that reported an emphasis on abstinence as the safest way to avoid HIV/STI infection and pregnancy, but also promoted safer sex through the use of contraceptives. All 15 programmes were developed and evaluated in North America; 13 programmes were developed in the USA and two programmes were developed in Canada. Two programmes, Safer Choices and YAPP, incorporated activities for parents and one programme, Protection Express, was exclusively peer-led. The programmes identified tended to target older adolescents (>14 years) or students across a range of ages, from the age of 13 upwards.

6.4.4.1 Knowledge and understanding

Thirteen studies (Aarons et al 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; 2001; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 1998; 2001; Walter & Vaughan, 1993; Wright, 1998; Zimmerman et al., 2008) examined intervention effects on sexual health knowledge. These studies found that abstinence-plus programmes were generally effective in improving sexual health knowledge in the short- and medium-term. In addition, three studies (Coyle et al., 2001; Kirby et al., 1991; Wright, 1998) examined long-term programme effects on knowledge for three programmes, Safer Choices, Reducing the Risk and Skills for Healthy Relationships. All three studies reported sustained long-term increases in knowledge among students exposed to abstinence plus programmes compared to controls.

6.4.4.2 Attitudes and values

Fourteen studies (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 1999; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Levy et al., 1995; Siegel et al., 1998; 2001; Stanton et al., 2006; Walter & Vaughan, 1993; Wright, 1998; Zimmerman et al., 2008) examined short- and medium-term intervention effects on attitudes and values. The results of these studies demonstrated that intervention effects on behavioural intentions, attitudes to sexual behaviour, and self-efficacy were inconsistent and there was no clear indication of the direction of effects. In addition, some programmes, such as Draw the Line/Respect the Line, had differing effects on male and female students. Two studies (Coyle et al., 2001; Wright, 1998) examined long-term effects on attitudes and values for Safer Choices, Reducing the Risk and Skills for Healthy Relationships, respectively. Safer Choices had long-term positive effects on students' attitudes to and self-efficacy for condom use, but did not impact attitudes or self-efficacy related to sex. Wright (1998) found that positive effects of the Skills for Healthy Relationships programme on attitudes and intentions related to HIV prevention were sustained long-term.

6.4.4.3 Personal and social skills

Six studies (Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; 2001; Kirby et al., 1991; Wright, 1998) examined intervention effects on personal and social skills related to sexual risk behaviours for five programmes that incorporated skills building activities (BPBR, an STI/HIV

prevention curriculum, Safer Choices, Reducing the Risk and Skills for Healthy Relationships). All five programmes had some positive short- or medium-term effects on skills relating to sexual risk prevention. Two studies (Kirby et al., 1991; Coyle et al., 1999; 2001) examined effects on communication with parents for Reducing the Risk and Safer Choices, respectively. Despite a short-term impact on communication with parents (Coyle et al., 1999), there were no long-term effects of the Safer Choices curriculum (Coyle et al., 2001) on students' level of communication with their parents. There were mixed effects of Reducing the Risk on communication, there were medium- to long-term positive effects on students' communication with their parents about abstinence, but positive medium-term effects on communication about contraception were not sustained. There was no difference between Reducing the Risk and control students in communication with parents about pregnancy and STDs, or in intentions to use skills for avoiding unprotected intercourse in the long-term.

6.4.4.4 Health and social outcomes relating to alcohol use and sexual health

All 18 studies examined intervention effects on a range of health outcome measures relating to sexual health. Across these studies there was no indication of short-term programme effects on the initiation of sexual involvement and at the medium-term follow-up, programme effects were largely inconsistent with four studies (Borawski et al., 2009; Caron et al., 2004; Kirby et al., 1991; Wright, 1998) reporting no programme effects on initiation of sexual intercourse. There was some evidence of a positive impact for five studies (Aarons et al., 2000; Coyle et al., 2004; LaChausse, 2006; Siegel et al., 2001; Zimmerman et al., 2008), although for three studies (Aaron et al., 2000; Coyle et al., 2004; Siegel et al., 2001) there were contrasting outcomes among intervention males and females. Two studies (Kirby et al., 1991; Hubbard et al., 1998) demonstrated that the Reducing the Risk curriculum was partially effective at reducing the age of initiation over the long-term, but methodological limitations of the study by Hubbard et al (1998) and lack of statistical significance in logistic regression analyses in the study by Kirby et al (1991) limited the interpretation of this finding. For two further programmes with long-term follow-up, Safer Choices (Coyle et al., 2001) and Skills for Healthy Relationships (Wright, 1998), there were no intervention effects on initiation of sexual intercourse. Programme effects on frequency of sexual intercourse and number of sexual partners were found to be inconsistent or non-existent in the short-, medium- and long-term across 11 studies (Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; 2004; Levy et al., 1995; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 2001; Smith, 1994; Stanton et al., 2006; Walter & Vaughan, 1993).

Short- and medium-term intervention effects on contraceptive use were found to be inconsistent across 14 studies (Aarons et al., 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Caron et al., 2004; Coyle et al., 1999; 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Levy et al., 1995; Stanton et al., 2006; Smith, 1994; Walter & Vaughan, 1993; Zimmerman et al., 2008). Of these studies, six studies (Aarons et al., 2000; Caron et al., 2004; Coyle et al., 1999; Smith, 1994; Walter & Vaughan, 1993) reported short- to medium-term effects on condom use, with increased use of condoms and contraceptives among intervention students relative to controls. Kirby et al (1991) reported that there was no long-term effects of the Reducing the Risk curriculum on contraceptive use,

but in a replication study of Reducing the Risk, Hubbard et al (1998) reported that the curriculum had a long-term impact on use of contraception by new initiates. However, the results of this study were confounded by large losses to follow-up. There appeared to be long-term effects of the Safer Choices curriculum on contraceptive use. At long-term follow-up, compared to control students, intervention students reported fewer acts of sexual intercourse without a condom and fewer sexual partners without a condom in the last 3 months. Intervention students were also significantly more likely to have used condoms or other pregnancy prevention methods at last intercourse, than controls

Two studies (Eisen et al., 1990; Kirby et al., 1991) examined the medium- to long-term effects of a HLM-SLT curriculum and Reducing the Risk, respectively, on pregnancy. Neither study identified significant programme effects on this outcome.

Evidence statement 11

11 (f) There is moderate evidence from three RCTs and three NRCTs[1] to suggest that programmes that emphasise abstinence but that also promote safer sex, may produce short- to long-term term improvements in sexual health-related knowledge. This evidence may only be partially applicable because as these studies were conducted in the USA and may not be generalisable beyond the populations studied. In addition, the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

11 (g) There is inconsistent evidence from four RCTs and four NRCTs[2] to determine the effects of abstinence-plus programmes on attitudes, behavioural intentions and self-efficacy relating to sexual behaviour.

11 (h) There is inconsistent evidence from one RCT and two NRCTs[3] to determine the long-term effects of abstinence-plus programmes on communication with parents. There is moderate evidence from one RCT and one NRCT[4] to suggest abstinence-plus programmes that incorporate skills building activities may have positive, short and medium- to long-term effects on skills relevant to prevention. This evidence may only be partially applicable because as these studies were conducted in the USA and may not be generalisable beyond the populations studied. In addition, the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

11 (i) There is moderate evidence from five RCTs and five NRCTs[5] to suggest that abstinence-plus programmes may not have a consistent short-, medium- or long-term impact on the initiation of sexual activity or the maintenance of abstinence. In addition, there is moderate evidence from four RCTs and two NRCTs[6] to suggest that abstinence plus programmes may not have an impact on frequency of sexual activity and risky sexual behaviours. This evidence may only be partially applicable because as these studies were conducted in the USA and may not be generalisable beyond the populations studied. In addition, the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

11 (j) There is moderate evidence from six RCTs and three NRCTs[7] to suggest that abstinence-plus programmes may not have a consistent impact on condom and other contraceptive use, and moderate evidence from one RCT and one NRCT[8] to suggest that abstinence-plus programmes have no medium- to long-term impact on pregnancy rates. This evidence may only be partially applicable because as these studies were conducted in the USA and may not be generalisable beyond the populations studied. In addition, the programme's emphasis on abstinence is of limited relevance to PSHE delivery in secondary schools focusing on SRE and alcohol education.

[1] Borawski et al., 2009 (RCT +); Coyle et al., 2001 (RCT +); Coyle et al., 2004 (RCT +); Kirby et al., 1991 (NRCT +); Siegel et al., 2001 (NRCT +); Wright 1998 (NRCT +)

[2] Borawski et al., 2009 (RCT +); Caron et al., 2004 (NRCT +); Coyle et al., 2004 (RCT +); Kirby et al., 1991 (NRCT +); LaChausse, 2006 (RCT +); Siegel et al., 2001 (NRCT +); Wright, 1998 (NRCT +); Zimmerman et al., 2008 (RCT +)

[3] Coyle et al., 2001 (RCT +); Hubbard et al., 1998 (NRCT +); Kirby et al., 1991 (NRCT +)

[4] Borawski et al., 2009 (RCT +); Wright, 1998 (NRCT +)

[5] Borawski et al., 2009 (RCT +); Caron et al., 2004 (NRCT +); Coyle et al., 2001 (RCT +); Coyle et al., 2004 (RCT +); Hubbard et al., 1998 (NRCT +); Kirby et al., 1991 (NRCT +); LaChausse, 2006 (RCT +); Siegel et al., 2001 (NRCT +); Wright 1998 (NRCT +); Zimmerman et al., 2008 (RCT +)

[6] Borawski et al., 2009 (RCT +); Coyle et al., 2004 (RCT +); Kirby et al., 1991 (NRCT +); LaChausse, 2006 (RCT +); Siegel et al., 2001 (NRCT +); Stanton et al., 2006 (RCT +)

[7] Caron et al., 2004 (NRCT +); Coyle et al., 2001 (RCT +); Coyle et al., 2004 (RCT +); Eisen et al., 1990 (RCT +); Kirby et al., 1991 (NRCT +); Hubbard et al., 1998 (NRCT +); LaChausse, 2006 (RCT +); Stanton et al., 2006 (RCT +); Zimmerman et al., 2008 (RCT +)

[8] Eisen et al., 1990 (RCT +); Kirby et al., 1991 (NRCT +)

Table 6.17. Abstinence-plus programmes: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Aarons et al., 2000	RCT +	Postponing Sexual Involvement n=262	No intervention n=260	PT	↑ contraception (males only*) **NS** reproductive health services	↓ intentions to not have sex (females only*) ↑ self-efficacy to refuse sex (females only*) **NS** attitudes: delayed sex ↑ attitudes: delayed childbearing (boys only*)	**NS** parent or boy/girlfriend communication
				<6 months	↑ contraception (males only*) **NS** reproductive health services	**NS** intentions to not have sex **NS** self-efficacy to refuse sex **NS** attitudes: delayed sex ↑ attitudes: delayed childbearing (boys only*)	**NS** parent or boy/girlfriend communication
Borawski et al., 2009	RCT +	BPBR n=631	Usual curriculum n=726	PT	↑ STIs*** ↑ condoms***	↑ beliefs: condom use prevention** **NS** beliefs: condom use **NS** beliefs condom use hedonistic **NS** beliefs: abstinence **NS** intentions to have sex ↑ intentions to use a condom*	↑ condom technical skills*** ↑ impulse control** ↑condom negotiation skills**
				4-months (97%)	↑ STIs** ↑ condoms***	**NS** beliefs: condom use prevention ↑ beliefs: condom use **NS** beliefs condom use hedonistic **NS** beliefs: abstinence ↓ intentions to have sex* **NS** intentions to use a condom **NS** perceived peer beliefs: sex/condom use	↑ condom negotiation skills** ↑ condom technical skills** **NS** impulse control
Boyer & Shafer, 1997	NRCT +	STI/HIV prevention n=210	Didactic education n=303	PT n=513 (74%)	↑ STIs*	-	↑ sexual risk prevention skills* ↑ substance use prevention skills***

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Coyle et al., 1999; Coyle et al., 2001	RCT +	Safer Choices n=NR	Knowledge-based HIV prevention curriculum n=NR	End of first year n=3,677 (85%)	↑ HIV*** ↑ other STIs***	↑ condom positive attitudes* ↓ condom use barriers*** ↑ risk perception HIV***/other STIs* ↑ self-efficacy: condom use*** **NS** attitudes about sex **NS** self-efficacy: refusing sex **NS** self-efficacy: communication	↑parent communication*
Eisen et al., 1990	RCT +	HBM-SLT curriculum N=722	Community-based programmes N=722	PT N=1,328 (92%)	↑ sexual knowledge*	**NS** health beliefs	-
LaChausse, 2006	RCT +	Positive Prevention N=216	Usual curriculum N=137	1 month	**NS** HIV infection and AIDS	**NS** attitudes towards abstention **NS** self-efficacy: abstinence **NS** self-efficacy: condoms	-
Levy et al., 1995; Weeks et al., 1995	RCT +	YAPP N=1,459	Basic AIDS education N=933	PT N=1,669 (70%)	-	↑ consider using condoms with foam*** **NS** intentions to have sex **NS** intentions to use condoms	-
Siegel et al., 1998	NRCT +	RAPP n=2,437 (1,402 health educator; 1,035 peer educator)	Usual curriculum n=1,259	PT N=2758 (75%)	↑ knowledge[a]**	↑ behavioural intentions (high school only; females*/males**)	

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Stanton et al., 2006	RCT +	Focus on Kids N=870	Environmental health intervention N=261	3 months N=898 (79%)	-	**NS** abstinence: self-efficacy, response efficacy, response costs; extrinsic/intrinsic rewards; severity; vulnerability **NS** intentions to be abstinent **NS** condoms: self-efficacy, response efficacy, extrinsic/intrinsic rewards; severity; vulnerability ↓ response costs* **NS** intentions to be use condoms	-
Walter & Vaughan, 1993	RCT +	AIDS-preventive curriculum n= 667	No intervention n= 534	3 months	↑ AIDS transmission and prevention***	↑perceived susceptibility of acquiring AIDS** ↑perceived benefits for engaging in AIDS preventive behaviour** ↓ perceived barriers for engaging in AIDS preventive behaviour* ↑ perceptions about the commonness of involvement in AIDS prevention** ↑ self-efficacy to perform AIDS-preventive actions**	-
Wright 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	PT	↑ HIV/AIDS***	↑ positive attitudes towards homosexuals and people living with AIDS/HIV*** ↑ intentions to engage in preventive behaviours***	↑ prevention skills*** ↓ self-esteem**

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] Significance not reported

Table 6.18. Abstinence-plus programmes: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Aarons et al., 2000	RCT +	Postponing Sexual Involvement n=262	No intervention n=260	PT n=503[a]	↑ virginity (females only)*	-	↑ used contraceptives/ condoms last time had sex (female only)*	-	-
				<6 months n=564[a]	**NS** virginity	-	↑ used contraceptives/ condoms last time had sex (female only)*	-	-
Borawski et al., 2009	RCT +	BPBR N=631	Usual curriculum N=726	PT, 4 months	**NS** ever had intercourse	**NS** frequency	**NS** frequency of unprotected intercourse	-	-
Boyer & Shafer, 1997	NRCT +	STI/HIV prevention N=210	Didactic education N=303	PT n=513 (74%)	-	**NS** number of sexual partners	**NS** condom use	-	-
Coyle et al., 1999; Coyle et al., 2001	RCT +	Safer Choices n=NR	Normal education n=NR	End of first year n=3,677 (85%)	**NS**	↓ without a condom (past 3 months)* **NS** number of times had intercourse (past 3 months)	↑ condom use at first intercourse* ↑ condom use at last intercourse*	**NS** tested for HIV/STI	-
Eisen et al., 1990; Eisen et al., 1992	RCT +	HBM-SLT curriculum N=722	Community-based programmes N=722	PT N=1,328 (92%)	**NS** abstinence maintenance	-	-	-	-
Levy et al., 1995; Weeks et al., 1995	RCT +	YAPP N=1,459	Basic AIDS education N=933	PT N=1,669 (70%)	-	**NS** sex in last 30 days	↑ condoms with foam** **NS** engaged in protective behaviours	-	-
Smith, 1994	RCT -	Teen Incentives N=60	Written materials N=60	PT N=95 (79%)	-	↓ frequency*	↑ contraception*	-	-

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Stanton et al., 2006	RCT +	Focus on Kids N=870	Environmental health intervention N=261	3 months	-	**NS** rates of sexual intercourse (past 6 months)	**NS** condom use	-	-
Walter & Vaughan, 1993	RCT +	AIDS-preventive curriculum n= 667	No intervention n= 534	3 months	**NS** abstinence	↓ involvement in sexual intercourse with high-risk partners* ↑ sexual monogamy*	↑ condom use*	**NS** STI incidence	-
Wright 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	PT	**NS** sexual experience	-	-	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] follow-up based on cross-sectional samples

Table 6.19. Abstinence-plus programmes: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Aarons et al., 2000	RCT +	Postponing Sexual Involvement n=262	No intervention n=260	12-months n=510	↑ contraceptives (males only*) **NS** reproductive health services	**NS** intentions to not have sex **NS** self-efficacy to refuse sex **NS** attitudes: delayed sex **NS** attitudes: delayed childbearing	**NS** parent or boy/girlfriend communication
Borawski et al., 2009	RCT +	BPBR n=631	Usual curriculum n=726	12-months (92%)	↑ STIs*** ↑ condoms*	**NS** beliefs: condom use prevention; condom use; condom use hedonistic; abstinence **NS** intentions to have sex or use a condom **NS** perceived peer beliefs: sex/condom use	↑ condom negotiation skills (male only**) **NS** impulse control **NS** condom negotiation skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Caron et al., 2004	NRCT +	Protection Express n=369 junior high	Usual curriculum n=329 junior high	9-months (70%)	-	Postponing sexual intercourse: ↑ intentions*** ↑ attitudes*** ↑ role beliefs*** ↑ perceived self-efficacy*** ↑ anticipated regret **NS** perceived behavioural control **NS** personal normative beliefs Condom use: ↑ intentions*** ↑ role beliefs*** **NS** attitudes **NS** behavioural control **NS** personal normative beliefs **NS** perceived self-efficacy **NS** anticipated regret	-
Caron et al., 2004	NRCT +	Protection Express n=147 senior high	Usual curriculum n=159 senior high	9-months (70%)	-	Postponing sexual intercourse: **NS** intentions ↑ attitudes*** ↑ behaviour control (direct only)*** ↑ personal normative beliefs** ↑ role beliefs*** ↑ perceived self-efficacy*** Condom use: **NS** intentions **NS** attitudes ↑ behaviour control (indirect only)*** **NS** personal normative beliefs **NS** anticipated regret **NS** role beliefs ↑ perceived self-efficacy***	-
Coyle et al., 2004	RCT +	Draw the Line/Respect the Line N=NR	Usual curriculum N=NR	Until end of ninth grade	↑ HIV and condoms (boys only***)	↑ attitudes favouring reasons for not having sex (boys only**) ↓ peer normative beliefs favouring sex (boys only**) ↑ sexual limits (boys only**) ↓ situations that could lead to sexual behaviour (males only***)	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Kirby et al., 1991	NRCT +	Reducing the Risk n= 586	Usual curriculum n= 447	6 months NR	↑ contraceptive knowledge***	↓ belief that peers are having sex**	↑ communication with parents: abstinence** ↑ communication with parents: contraception** **NS** communication with parents: pregnancy **NS** communication with parents: STIs
LaChausse, 2006	RCT +	Positive Prevention N=216	Usual curriculum N=137	6 months	**NS** HIV infection and AIDS	**NS** Attitudes toward sexual abstention **NS** self-efficacy for abstention ↑ self-efficacy to use condoms***	-
Siegel et al., 2001; Aten et al., 2002	NRCT +	RAPP n=1,404 health educator; 1,020 peer educator; 313 regular health educator	Usual curriculum n= 1264	Mean duration 41.2 weeks	↑ knowledge[a] (middle school only: females***/males**)	↑ sex self-efficacy (females only; middle school*/high school**) ↑ 'preferable' behavioural intentions (middle school only: females*/males**)	-
Stanton et al., 2006	RCT +	Focus on Kids N=870	Environmental health intervention N=261	6 months N=938 (83%);	-	↑ self efficacy to abstain** ↑ response efficacy for abstinence* **NS** abstinence: response costs; extrinsic/intrinsic rewards; severity; vulnerability **NS** intentions to be abstinent ↑ self efficacy to use condoms* **NS** condoms: response efficacy, extrinsic/intrinsic rewards; severity; vulnerability; response costs **NS** intentions to be use condoms	-

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Stanton et al., 2006	RCT +	Focus on Kids N=870	Environmental health intervention N=261	9 months N=904 (80%)	-	**NS** abstinence: self-efficacy, response efficacy, response costs; extrinsic/intrinsic rewards; severity; vulnerability **NS** intentions to be abstinent **NS** condoms: self-efficacy, response efficacy, extrinsic/intrinsic rewards; severity; vulnerability; response costs **NS** intentions to be use condoms	-
Wright 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	Grade 10	↑ HIV/AIDS***	↑ positive attitudes towards homosexuals and people living with AIDS/HIV*** ↑ intentions to engage in preventive behaviours***	↑ prevention skills**
Zimmerman et al., 2008	RCT +	Reducing the Risk Standard, n=NR Modified, n=NR	Standard curriculum N=NR	End of 10th grade (52%)	**NS**	**NS** peer sexual activity, attitudes about waiting to have sex, self-efficacy, response to sexual pressure	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] human reproduction, decision making, communication with others concerning sexual matters, HIV/AIDS and other STIs, high risk behaviours and other sexuality items

Table 6.20. Abstinence-plus programmes: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Aarons et al., 2000	RCT +	Postponing Sexual Involvement n=262	No intervention n=260	1-year n=510[a]	↑ virginity (females only)*	-	↑ used contraceptives /condom last time had sex (female only)*	-	-
Borawski et al., 2009	RCT +	BPBR N=631	Usual curriculum N=726	12 months	**NS** ever had intercourse	**NS** frequency	**NS** frequency of unprotected intercourse	-	-
Caron et al., 2004	NRCT +	Protection Express n=369 junior high, n=147 senior high	Usual curriculum n=329 junior high, n=159 senior high	9-months (70%)	**NS** postponing sex	-	↑ condom use (senior high only**)	-	-
Coyle et al., 2004	RCT +	Draw the Line/Respect the Line N=NR	Usual curriculum N=NR	Until end of ninth grade	↓ Ever had sex (boys only**)	**NS** Had sex in the last 12 months **NS** occasions of sexual intercourse **NS** number of sexual partners	**NS** condom use	-	-
Eisen et al., 1990; Eisen et al., 1992	RCT +	HBM-SLT curriculum N=722	Community-based programmes N=722	12 months N=888 (62%)	-	-	**NS** contraceptive use at first intercourse **NS** use of effective method at most recent intercourse[b] **NS** contraceptive efficiency[b]	-	**NS** pregnancy
Kirby et al., 1991	NRCT +	Reducing the Risk n= 586	Usual curriculum n= 447	6 months NR	**NS** initiated intercourse	**NS** frequency	**NS** contraceptive practice **NS** unprotected intercourse	-	**NS** pregnancy

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
LaChausse, 2006	RCT +	Positive Prevention N=216	Usual curriculum N=137	6 months N=287 (81%)	↓ ever had sexual intercourse*	**NS** frequency	**NS** frequency of condom use	-	-
Siegel et al., 2001; Aten et al., 2002	NRCT +	RAPP n=1,404 health educator; 1,020 peer educator; 313 regular health educator	Usual curriculum n= 1264	Mean duration 41.2 weeks	↓ initiation/ onset sexual experience (middle school females only**)	**NS** risky sexual behaviour	-	-	-
Stanton et al., 2006	RCT +	Focus on Kids N=870	Environmental health intervention N=261	6 and 9 months	-	**NS** rates of sexual intercourse (past 6 months)	**NS** condom use	-	-
Wright 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	All follow-ups	**NS** sexual experience	-	-	-	-
Zimmerman et al., 2008	RCT +	Reducing the Risk Standard, n=NR Modified, n=NR	Standard curriculum N=NR	End of 10th grade N=1,424	↓ initiation of sexual activity*	-	**NS** frequency of condom use **NS** condom use at last sex	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] follow-up based on cross-sectional samples; [b] sexually inexperienced at baseline

Table 6.21. Abstinence-plus programmes: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Coyle et al., 1999; Coyle et al., 2001	RCT +	Safer Choices n=NR	Knowledge-based HIV prevention curriculum n=NR	31 months n=3,058 (71%)	↑ HIV*** ↑ other STIs***	↑ condom positive attitudes** ↓ condom use barriers** ↑ risk perception HIV*/other STIs* ↑ self-efficacy for condom use*** **NS** attitudes about sex; **NS** normative beliefs about condoms **NS** self efficacy: refusing sex **NS** self efficacy: communication	**NS** communication with parents
Hubbard et al., 1998	NRCT +	Reducing the Risk N=267	Usual curriculum N=265	18 months n=212 (36%)	-	-	↑ communication with parents: contraception* ↑ communication with parents: protection from HIV/STIs* **NS** communication with parents: pregnancy **NS** communication with parents: abstinence
Kirby et al., 1991	NRCT +	Reducing the Risk n= 586	Usual curriculum n= 447	18 months N=758 (73%)	↑ contraceptive knowledge***	**NS** belief that peers are having sex	↑ communication with parents: abstinence* **NS** communication with parents: contraception **NS** communication with parents: pregnancy **NS** communication with parents: STIs
Wright 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	Grade 11	↑ HIV/AIDS***	↑ positive attitudes towards homosexuals and people living with AIDS/HIV*** ↑ intentions to engage in preventive behaviours**	↑ prevention skills*

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.22. Abstinence-plus programmes: Long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Coyle et al., 2001	RCT +	Safer Choices n=NR	Normal education n=NR	31 months n=3,058 (71%)	**NS**	↓ without a condom (past 3 months)*	↑ condom use at last intercourse* ↑ use of protection at last intercourse*	**NS** tested for HIV/STI	-
Kirby et al., 1991	NRCT +	Reducing the Risk n= 586	Usual curriculum n= 447	18 months N=758 (73%)	↓ initiated intercourse* (NB: NS on log regressions)	**NS** frequency	**NS** contraceptive practice **NS** unprotected intercourse	-	**NS** pregnancy
Hubbard et al., 1998	NRCT +	Reducing the Risk N=267	Usual curriculum N=265	18 months n=212 (36%)	↓ initiation of sexual activity*	-	↑ use of contraception by new initiates*	-	-
Wright, 1998	NRCT +	Skills for Health Relationships N=2606	Usual curriculum N=1906	Grade 11 (73%; 79%)	**NS** sexual experience	-	-	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

6.5 HIV and sexual risk-reduction programmes

6.5.1 Overview of evidence identified

A total of 11 studies reported on school-based HIV prevention and sexual risk-reduction programmes. Studies were defined by their specific focus on HIV prevention and HIV risk-behaviour, sexual risk-behaviour or a combination of both.

Of the 11 studies, six were conducted in North America (Coyle et al., 2006, Fisher et al., 2002, Lemieux et al., 2008, Mitchell-DiCenso et al., 1997, Roberto et al., 2007, Workman et al., 1996) and the remaining five studies were conducted in European countries, including Italy (Borgia et al., 2005), Spain (Traeen, 2003), Norway (Kvalem et al., 1996), Sweden (Larsson et al., 2006), and the Netherlands (Schaalma et al., 1996). All programmes were delivered in school time however one programme (Roberto et al., 2007) also included six computer-based activities to be completed outside of school time. Two programmes were delivered solely by teachers (Safe sex and pregnancy prevention [Traeen, 2003]; AIDS/STI prevention curriculum [Schaalma et al., 1996]). A further two were delivered in combination with teachers; with one also using peer educators (HIV prevention curriculum [Fisher et al., 2002]) and another also using public health nurses and community professionals (McMasters Teen Programme [Mitchell-DiCenso et al., 1997]). Three programmes solely used peer educators (an AIDS and sexuality education programme [Kvalem et al., 1996]; Students Working Against AIDS Together [SWAAT; Lemieux et al., 2008]; and a programme based on social learning theory [Borgia et al., 2005]). One programme used health educators to deliver the intervention (All4You [Coyle et al., 2006]), one used undergraduate psychology students (CBT HIV prevention [Workman et al., 1996]), one used nurses/midwives and medical students (contraception programme [Larsson et al., 2006]) and one study was delivered using the internet (computer-based education [Roberto et al., 2007]).

The theoretical base was not reported for the contraception programme (Larsson et al., 2006). Five programmes were underpinned by a single theoretical base (SLT programme, HIV prevention education, McMasters Teen Programme, Computer-based education, CBT HIV prevention). However, five others used a combination of theories (All4You, Safe sex and pregnancy prevention, AIDS and sexuality education, SWAAT, AIDS/STI prevention curriculum). Overall social learning theory was the most commonly used theory in HIV/sexual risk-reduction programmes (n=5 programmes). Theory of planned behaviour (n=2 programmes), the information-motivation-behavioural skills (IMB) model (n=2 programmes) and the cognitive behavioural model (n=2 programmes) were also applied more often than others.

Table 6.23. Sex and relationships education: HIV and sexual risk-reduction programmes

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Borgia et al., 2005	RCT +	Italy n=1,697 students, median 18 years (high school)	School	5 sessions over 10 hours the aim was to increase knowledge of HIV, address social influences and group norms, improve decision making, communication and negotiation skills and related self-efficacy, place risks related to specific contexts and behaviour in proper dimension and abolish prejudice and stigma towards persons with AIDS.	Social learning theory	Peer educators
Coyle et al., 2006	RCT ++	USA n=988 students, 14-18 years	School	**All4you!**: 14 sessions over 26 hours with 9 delivered in classrooms and 5 delivered in visits to volunteer sites. Programme included skills based HIV/STD and pregnancy prevention curriculum; service-learning activities involving visits to volunteer sites.	Social development theory, social cognitive theory, theory of planned behaviour, theory of reasoned action	Health educators
Fisher et al., 2002	NRCT ++	USA n=1,577 students, mean age 14.8 years	School	Combined peer plus curriculum HIV prevention intervention delivered in 5 lessons.	Information-motivation-behavioural skills (IMB) model	Teachers and peer educators
Kvalem et al., 1996	RCT -	Norway n=2,088 high school students, range 16-20 years	School	AIDS and sexuality education programme focussing on STI and pregnancy prevention delivered in 10-14 hours over a two day period.	Cognitive social learning theory, social influence theory	Peer educators
Larsson et al., 2006	NRCT +	Sweden n=461 students, mean age 17.25 years	School	Educational programme aimed to improve knowledge of, attitudes towards and practices relating to condom and emergency hormonal contraceptive use. The multi-component programme included one 20-minute lesson about the emergency contraceptive pill (nurse/midwife); one session of three 40-minute lessons by educators from the Love Emergency (medical students) within one month after the first lesson focused on attitudes and values towards different contraceptive methods, including rehearsal of condom skills; VIP card for free condoms; telephone number to access individual counselling from nurse/midwife.	Not reported	Nurse/midwife and medical students

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Lemieux et al., 2008	CBA -	USA n=422 students, mean age 16 years	School	**Students Working Against Aids Together**: Music-based HIV prevention intervention. Main components were the creation, recording and distribution of HIV prevention themed music and promotional materials; in-class presentations. Programme took place over five months, four months preparation to create a CD and a month of CD distribution.	Information-motivation-behavioural skills model, natural opinion leader model	Peer educators
Mitchell-DiCenso et al., 1997	RCT +	USA n=2,309 students, mean age 12.6 years (intervention group)	School	**McMasters Teen Programme**: curriculum-based programme aimed at providing skills training. Ten one hour sessions included accurate information about reproductive system and adolescent development; relationship strategies; emotional communication skills; sexual problem solving skills.	Cognitive behavioural model	Teachers, public health nurses, community professionals
Roberto et al., 2007	RCT +	USA n=402 students, 10th grade, mean age 15.5 years	School	Computer-based HIV prevention/sexual health programme based on an extended parallel process model. Delivered over 7 weeks and included six computer-based activities completed outside class time.	Extended parallel process model	Computer-based (via internet)
Schaalma et al., 1996	RCT +	Netherlands n=3,142 students, 9th and 10th grade	School	AIDS/STI prevention curriculum. Key components of the study focused on Knowledge about AIDS, STDs, transmission, prevention, and risk perception; attitudes toward safe sex in general and condom use; values, social influences, and communication skills regarding the prevention of AIDS and STDs; self-efficacy beliefs regarding negotiating skills and practicing condom use.	Social cognitive theory, communication theories, fear arousing communication, risk perception, social comparison, social/psychological inoculation theories	Teachers
Traeen, 2003	RCT +	Norway n=1,183 students, age 16-17 years	School	Safe sex and unwanted pregnancy reduction programme focusing on social skills and life skills plus knowledge based.	Social constructionism, social learning theory and sexual script theory.	Teachers

Author	Study design and rating	Baseline population	Setting	Programme components	Theoretical base	Provider
Workman et al., 1996	RCT -	USA n=60 students, mean age 15 years	School	Cognitive-behavioural HIV/AIDS prevention intervention focusing on sexual risk-reduction delivered over 12 weeks with 30 minutes per week. Key components focused on sexual-social values clarification, sexual-social decision making, reproductive-sexual anatomy and physiology, contraceptives, STDs, AIDS myths and facts, and sexual assertiveness and communication skills.	Cognitive-behavioural theory	Undergraduate psychology students

The overall number of students recruited to participate in the included studies ranged from 60 students to 3,142 students. Overall, five programmes (SLT programme, HIV prevention curriculum, AIDS and sexuality education, McMasters Teen Programme, AIDS/STI prevention curriculum) were based on samples greater than 1,500 students. The use of power calculations or an appropriate sample size to detect a significant effect was discussed in only 3 studies (Borgia et al., 2005, Traeen, 2003, Larsson et al., 2006) with two studies recognising the limitations of their samples (Borgia et al., 2005; Traeen, 2003). A further two studies provided enough information to determine that sample size was appropriate (Fisher et al., 2002, Mitchell-DiCenso et al., 1997). One study had a very small sample which was insufficiently powered (Workman et al., 1996). However, five studies did not provide sufficient information to determine whether the sample size was appropriate. (Coyle et al., 2006; Kvalem et al., 1996; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996).

The included studies focused on different ages and school years. One programme (McMasters Teen Programme) targeted young people 12-14 years with a mean age of 12.6 years. Two studies included a wide age range of students from age 13-14 years to 18-19 years (HIV prevention curriculum, All4you). A further two studies focused on older adolescents ranging between 16-20 years (AIDS and sexuality education, contraception programme) and two other studies focused on one age group/grade (aged 18 years; SLT programme, 15-16 years; Computer-based education).

Follow up times varied amongst programme evaluations. Two studies (Roberto et al., 2007; Workman et al., 1996) reported immediate post-test results only and three (Borgia et al., 2005; Lemieux et al., 2008; Schaalma et al., 1996) reported a short follow-up time of 5 months or less. Three studies (Fisher et al., 2002; Kvalem et al., 1996; Larsson et al., 2006) reported maximum follow-up times of 12 months and three studies (Coyle et al., 2006; Mitchell-DiCenso et al., 1997; Traeen, 2003) reported follow-up times greater than 12 months at 18 months (Coyle et al., 2006; Traeen, 2003) and 4 years (Mitchell-DiCenso et al., 1997).

6.5.2 Quality Assessment

Of the 11 included studies, eight were RCTs, two were NRCT and one was based on a CBA study design. Of the eight RCTs, seven (Borgia et al., 2005; Coyle et al., 2006; Kvalem et al., 1996; Mitchell-DiCenso et al., 1997; Roberto et al., 2007, Schaalma et al., 1996, Traeen, 2003) were based on cluster randomisation and one study used individual student randomisation (Workman et al., 1996). Cluster randomisation was conducted at school level in six studies (Borgia et al., 2005; Coyle et al., 2006; Mitchell-DiCenso et al., 1997; Roberto et al., 2007; Schaalma et al., 1996; Traeen, 2003) and at classroom level in one study (Kvalem et al., 1996). The unit of analysis in three of the RCTs (Borgia et al., 2005; Kvalem et al., 1996; Traeen, 2003) did not match the unit of allocation nor was any adjustment reported in the studies. The majority of studies were rated as moderate quality (+ rating). One RCT (Coyle et al., 2006) was rated good quality (++ rating) presenting a high quality matched study design and providing thorough details of the methodology and results. Only one study reported intention to treat analysis (Fisher et al., 2002) and this NRCT was rated good quality. However, three studies were rated as poor quality (- rating). Methodological data were limited in some studies and results were not always reported fully. Outcome measures were reported to be reliable in seven RCTs

(Borgia et al., 2005; Coyle et al., 2006; Mitchell-DiCenso et al., 1997; Roberto et al., 2007; Schaalma et al., 1996; Traeen, 2003; Workman et al., 1996), in one NRCT (Fisher et al., 2002), and in one CBA study (Lemieux et al., 2008). Relevant outcomes were reported across all included studies.

6.5.3 Findings

6.5.3.1 Short-term results (<6 months)

Six studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996; Workman et al., 1996) reported short-term outcomes on six programmes: a social learning theory-based (SLT) programme, an HIV prevention curriculum, SWAAT, a computer-based education programme, AIDS/STI prevention curriculum, a cognitive behavioural therapy-based (CBT) HIV prevention intervention.

Knowledge and understanding

Five studies (Borgia et al., 2005; Fisher et al., 2002; Roberto et al., 2007; Schaalma et al., 1996; Workman et al., 1996) reported short-term results related to sexual health and HIV knowledge and understanding. All five programmes reported significant improvements in knowledge relating to, for example, pregnancy, AIDS and prevention behaviours. One exception was in the peer educator delivery intervention (Fisher et al., 2002) which showed non-significant results compared to the teacher and combined methods of delivery.

Attitudes and values

Five studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996) reported short-term results of their programme on participants' attitudes and values.

Behavioural intention data (e.g. condom use) were reported by four studies (Fisher et al., 2002; Lemieux et al., 2008; Schaalma et al., 1996). Only one study (Schaalma et al., 1996) showed an increase in condom use intentions and students receiving the combined programme within the HIV prevention curriculum (Fisher et al., 2002) reported intentions to engage in HIV prevention behaviour that were significantly higher than the control group ($p<0.05$).

Five studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996) reported on attitudes and values relating to sexual behaviour. No significant short-term effects for attitudes towards condom use or social normative views of condom use were seen in those receiving SWAAT intervention (Lemieux et al., 2008). Intervention students receiving the SLT HIV prevention programme (Borgia et al., 2005) showed increases in attitudes and risk perceptions. Schaalma et al (1996) reported that students receiving an AIDS/STI prevention curriculum demonstrated significant increases in positive attitude and self-efficacy beliefs in addition to increased perceptions of subjective norms, peer behaviour, and risk appraisal. Roberto et al (2007) reported non-significant results relating to condom self-efficacy and refusal self-efficacy. Intervention students also expressed increased attitudes towards waiting to have sex and expressed significantly increased levels of situational self-efficacy. However, the intervention group also demonstrated

reduced perception of their own susceptibility to HIV/STIs. Fisher et al (2002) reported short-term results from a computer-based education programme on HIV prevention attitudes and norms stratified by intervention group (classroom, combined, peer) and sexual experience at baseline. Findings showed mixed effects on different groups.

Personal and social skills

Five studies (Borgia et al., 2005; Fisher et al., 2002; Roberto et al., 2007; Workman et al., 1996) explored short-term intervention effects on personal and social skills related to sexual behaviour and relationships. Two HIV focused studies (Borgia et al., 2005; Lemieux et al., 2008) reported significant increases in prevention skills[9]. A HIV prevention curriculum (Fisher et al., 2002) found significant increased in behavioural skills [10] in both their sexually inexperienced ($p<0.01$) and sexually experienced ($p<0.05$) intervention students exposed to a combined classroom and peer-based programme. However the intervention groups using either classroom only or peer only interventions showed no significant differences to the control group. Intervention students in one computer-based HIV and sexual health education programme (Roberto et al., 2007) reported significantly higher levels of condom negotiation skills compared to the control group ($p<0.05$). Workman and colleagues (1996) found no impact of their cognitive behavioural therapy-based HIV prevention intervention on their intervention students when examining: sexual decision-making, sexual assertiveness, level of comfort discussing AIDS preventative behaviour skills.

Health and social outcomes relating to alcohol use and sexual health

Five studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996) reported short-term health and social outcomes related to sexual health and alcohol use behaviours. Of these, two studies (Borgia et al., 2005; Schaalma et al., 1996) reported no significant effects on health outcomes in the following programmes: social learning theory-based HIV programme; AIDS/STI prevention curriculum. Roberto et al (2007) reported that students in the experimental group were significantly less likely to initiate sexual activity between pre-test and post-test compared to the control group ($p<0.01$). No studies examined short-term programme effects on conceptions.

Three studies examined the programme effects on frequency and/or number of sexual partners (Borgia et al., 2005; Roberto et al., 2007; Schaalma et al., 1996). All three studies reported no programme effects. Short-term effects on contraceptive use were reported by five studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Schaalma et al., 1996). Two studies (Borgia et al., 2005; Schaalma et al., 1996) found no intervention effects on frequency or consistent use of condoms in the past two or three months in students receiving either a social learning theory-based HIV programme or an AIDS/STI prevention programme. One study (Roberto et al., 2007) found no effects on condom use at last sexual intercourse in those students receiving a

[9] Communication and negotiation skills; Borgia et al., 2007. Self-efficacy to perform prevention behaviours; Lemieux et al., 2008.

[10] Abstinence and condom acquisition and use.

computer-based HIV education programme. Intervention students receiving the SWAAT curriculum (Lemieux et al., 2008) reported significant improvements in condom use behaviours in the preceding three months ($p<0.05$). Compared to the control students receiving their usual curriculum, sexually active students receiving the combined classroom/peer HIV intervention and those receiving the peer only HIV intervention reported significant increases in condom use in the past three months ($p<0.05$) (Fisher et al., 2002). Lemieux and colleagues (2008) also found short-term programme effects relating to uptake of testing for sexually transmitted infections in the experimental group receiving the SWAAT intervention.

6.5.3.2 Medium-term results (up to 12 months)

Seven studies (Coyle et al., 2006; Fisher et al., 2002; Kvalem et al., 1996; Larsson et al., 2006; Mitchell-DiCenso et al., 1997; Traeen, 2003; Workman et al., 1996) examined medium-term effects from seven programmes: All4you!, an HIV prevention curriculum, an AIDS/STI prevention programme, a contraception programme, McMaster's Teen Programme, a safe sex and pregnancy prevention programme, and a CBT HIV prevention programme.

Knowledge and understanding

Two studies (Coyle et al., 2006; Larsson et al., 2006) reported the medium-term impact of their programme on knowledge and understanding. Coyle and colleagues (2006) reported two medium-term follow up periods, one at 6 months and one at 12 months. At the six month follow-up a significant increase in HIV and condom knowledge ($p<0.05$) was found in the intervention group compared to the control group. However, this was not significant at 12 month follow-up. Non-significant results were also reported for general condom knowledge at both 6 and 12 month follow-up. Knowledge of emergency hormonal contraception (EHC) was examined at a 12 month follow-up of students receiving a contraception education programme. Students in the intervention group showed significant increases ($p<0.01$) in knowledge of EHC use at 72 hours after unprotected sex. However, no significant improvements were found in knowledge of EHC use on the first day after intercourse or of the side effects relating to EHC.

Attitudes and values

Two studies (Coyle et al., 2006; Larsson et al., 2006) examined medium-term programme effects on attitudes and values. Coyle and colleagues (2006) reported that students participating in the All4You! programme showed no significant difference in behavioural intentions relating to condom use at both 6 and 12 months compared to the control group. Furthermore, attitudes and beliefs regarding condom use for pregnancy prevention and for sexual intercourse generally were significantly higher in the control group receiving their usual curriculum than in the intervention group. Although, there was no significant difference at the 12 month follow-up for these beliefs, the control group did show a significantly higher ($p<0.05$) increase in condom self-efficacy to get and use condoms compared to the intervention group at 12 month follow-up. A number of non-significant effects on attitudes and beliefs were reported at both 6 and 12 month follow-up as follows: attitudes towards condoms generally; condoms for STI prevention; perceptions of number of sexually active peers and peers

using condoms; perceptions of peer beliefs regarding condom use; optimism; fatalism; community orientation; connectedness to caring adult outside family circle; and self-efficacy to abstain. Larsson and colleagues (2006) found that attitudes and values of participants in a contraception programme remained relatively unchanged when observed at 12 month follow-up with the exception of a significant decrease in the view that EHC is a kind of abortion ($p<0.05$) and an increase in condom self-efficacy to buy condoms ($p<0.05$). Non-significant changes in contraceptive attitudes and values were observed in the following cases: attitude towards using EHC; feeling embarrassed to buy condoms; view that condoms are a man's responsibility; that contraceptives will be influenced by EHC; that an EHC increase would increase the risk of unprotected sex; could imagine discussing condoms; could imagine using condoms if they had a new partner; would recommend EHC to a friend.

Personal and social skills

No studies reported medium-term programme effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Seven studies (Coyle et al., 2006; Fisher et al., 2002; Kvalem et al., 1996; Larsson et al., 2006; Mitchell-DiCenso et al., 1997; Traeen, 2003; Workman et al., 1996) examined medium-term effects from seven programmes. Three studies (Coyle et al., 2006; Kvalem et al., 1996; Mitchell-DiCenso et al., 1997) found no significant medium-term programme effects on initiation of sexual intercourse at either 6 (Coyle et al., 2006) or 12 month follow-up for the following programmes: All4you!; AIDS/STI education; McMaster's Teen Programme. Participants in the All4you! (Coyle et al., 2006) programme showed a significantly lower frequency of sexual intercourse in the intervention group compared to the control group receiving their usual curriculum. However, this was no longer significant at 12 month follow-up. There was no significant difference seen for number of unprotected partners (steady and non-steady) in the past three month or number of previous partners. Workman and colleagues (1996) also reported no significant effects on HIV prevention behaviours in students receiving the CBT HIV prevention programme.

Medium-term programme effects on contraception were reported in five studies (Coyle et al., 2006; Fisher et al., 2002; Kvalem et al., 1996; Larsson et al., 2006; Traeen, 2003). One study (Kvalem et al., 1996) reported no significant effects on condom use. Students participating in the All4you! programme (Coyle et al., 2006) showed significant decreases in unprotected sex (overall ($p<0.01$) and with non-steady partners ($p<0.05$)) in the past 3 months and in condom use at last sexual intercourse ($p<0.01$). However, no effects were sees at 12 month follow-up for these aspects or for frequency of unprotected sex with steady partners or effective pregnancy prevention behaviour at last sexual intercourse. At six months follow-up Kvalem et al (1996) found significantly increased levels of condom use in the intervention group compared to the control ($p<0.001$). However, these were not sustained at 12 month follow-up. Students participating in the contraception programme showed increased condom use at 12 months follow-up ($p<0.05$) and showed no significant differences in lifetime use of EHC compared to the control group. Fisher and colleagues (2002) reported mixed results from their intervention groups with significant increases in condom use seen in the classroom intervention group ($p<0.01$) and no significant differences seen in the peer and combined

peer/classroom intervention groups compared to the control. Students exposed to the safe sex and pregnancy prevention intervention (Traeen, 2003) who were sexually inexperienced at baseline showed significant increases in use of condoms ($p<0.05$) and oral/hormonal contraceptives ($p<0.05$) at first sex. However, no significant differences were seen in other methods of contraception at first sex or in the use of condoms or oral/hormonal contraception at most recent sex. Increases were sees in interrupted intercourse at both first sex and most recent sex ($p<0.05$) compared to controls.

One study (Coyle et al., 2006) examined the medium-term programme effects on health outcomes relating to sexually transmitted infection and alcohol and drug use. Findings in both the six month follow-up and the 12 month follow-up showed no significant programme effects on the number of HIV or STI tests taken or the use of drugs/alcohol prior to sexual intercourse in the past three months. Two studies also (Coyle et al., 2006; Mitchell-DiCenso et al 1997) reported no significant programme effects on pregnancy rates compared to control groups.

6.5.3.3 Long-term results (>12 months)

Three studies (Coyle et al., 2006; Mitchell-DiCenso et al 1997; Traeen, 2003) examined long-term programme effects for three interventions: All4you!, McMaster's Teen Programme, and a safe sex and pregnancy prevention programme.

Knowledge and understanding

Programme effects on knowledge and understanding were examined by one study (Coyle et al., 2006). Students participating in the intervention showed significant increases in HIV and condom knowledge ($p<0.05$) as well as general condom knowledge ($p<0.05$) compared to the control group receiving the usual curriculum.

Personal and social skills

One study (Coyle et al., 2006) reported on behavioural intention and attitudes and values relating to condom use and peers and self-efficacy at 18 months follow-up. However, no significant effects were shown in the intervention group at this time.

Health and social outcomes relating to alcohol use and sexual health

Three studies (Coyle et al., 2006; Mitchell-DiCenso et al 1997; Traeen, 2003) examined long-term health outcomes relating to sexual health and alcohol. Two studies (Coyle et al., 2006; Mitchell-DiCenso et al 1997) reported programme effects on initiation at first intercourse and similar to the medium-term results no significant effects were found. One study (Coyle et al., 2006) reported on frequency and number of sexual partners at 18 months follow-up and similar to medium-term effects there were no significant positive effects on number of unprotected partners or past number of sexual partners. In addition, there was a significant negative effect on number of unprotected non-steady sexual partners ($p<0.05$) in the intervention group compared to the control. Three studies (Coyle et al., 2006; Mitchell-DiCenso et al 1997; Traeen, 2003) reported long-term effects on contraception use

6.5.4 Summary and evidence statements

Overall, 11 studies (Borgia et al., 2005; Coyle et al., 2006; Fisher et al., 2002; Kvalem et al., 1996; Larsson et al., 2006; Lemieux et al., 2008; Mitchell-DiCenso et al., 1997; Roberto et al., 2007; Schaalma et al., 1996; Traeen, 2003; Workman et al., 1996) were identified that examined HIV and sexual risk-reduction programmes.

6.5.4.1 Knowledge and understanding

Knowledge outcomes were reported by seven studies (Borgia et al., 2005; Coyle et al., 2006; Fisher et al., 2002; Larsson et al., 2006; Roberto et al., 2007; Schaalma et al., 1996; Workman et al., 1996). General HIV or sexual health knowledge was reported most frequently. However, only two studies (Coyle et al., 2006; Larsson et al., 2006) explored medium- or long-term knowledge outcomes and they focused on knowledge of HIV and condom use or the emergency hormonal contraceptive (EHC) pill. Medium-term effects were inconsistent with evidence of increased knowledge of EHC use on the third day after unprotected sex. No effect on HIV and condom knowledge was seen at 12 months follow-up, yet there was a positive effect at 18 months. Both studies included older adolescents in their sample (Coyle et al., 2006: 14-18 years; Larsson et al., 2006: mean 17.25 years).

6.5.4.2 Attitudes and values

Outcomes relating to attitudes were reported by seven studies (Borgia et al., 2005; Coyle et al., 2006; Fisher et al., 2002; Lemieux et al., 2008; Larsson et al., 2006; Roberto et al., 2007; Schaalma et al., 1996). A wide variety of outcomes were reported across studies and often specific outcomes were only reported within one study, thus preventing comparison. Condom self-efficacy, perception of social norms and condom use/prevention intentions were the outcomes most commonly reported across studies. Lemieux et al (2008) and Roberto et al (2007) reported no programme effects on condom self-efficacy. Whereas Coyle et al (2006) reported no programme effects for condom self-efficacy at six and 18 months follow-up and a reduction at 12 months follow-up. Perceptions of social norms increased in both the classroom (sexually experienced at baseline) and combined groups (sexually inexperienced at baseline) receiving a HIV prevention curriculum but not in the other groups. Lemieux et al (2008) reported no programme effects on views relating to social normative support. Schaalma et al (1996) found an increase in positive perceptions of subjective norms at 4-8 weeks follow-up. A significant improvement in condom use/prevention intentions was seen in Schaalma et al (1996). However, four studies (Fisher et al., 2002; Lemieux et al., 2008; Coyle et al., 2006; Larsson et al., 2006) reported primarily no effect on condom use or prevention intentions.

6.5.4.3 Personal and social skills

Short-term programme effects on personal and social skills were reported by five studies (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Workman et al., 1996). Findings were predominantly positive and indicated programme effects overall on prevention or behavioural skills in two studies (Borgia et al., 2005; Lemieux et al., 2008). Participants receiving the combined programme in the HIV prevention curriculum showed an increase in behavioural skills. Participants in

the computer-based educational programme reported an increase in condom negotiation skills. Only one study (Workman et al., 1996) reported no effects on any personal or social skills.

6.5.4.4 Health and social outcomes relating to alcohol use and sexual health

Eleven studies reported health outcomes from HIV and sexual risk-reduction programmes. Impact on sexual initiation was explored in four studies (Roberto et al., 2007; Coyle et al., 2006; Kvalem et al., 1996; Mitchell-DiCenso et al., 1997) and only short or medium-term outcomes were reported. One study (Roberto et al., 2007) reported positive results on age at sexual initiation. All other studies showed no programme effects. Furthermore, three studies (Borgia et al., 2005; Roberto et al., 2007; Schaalma et al., 1996) reported no impact on the rate of sexual activity and four studies (Borgia et al., 2005; Coyle et al., 2006; Roberto et al., 2007; Schaalma et al., 1996) showed no effect on the number of sexual partners participants reported. One study (Borgia et al., 2005) split analysis by whether participants were sexually active at baseline or not, whereas it was not clear if this was the case in others. Five studies (Fisher et al., 2002; Lemieux et al., 2008; Coyle et al., 2006; Kvalem et al., 1996; Larsson et al., 2006) showed positive short-term programme effects on condom use and one study (Traeen, 2003) showed programme effects on protected intercourse. The long-term programme effects were limited and one study (Borgia et al., 2005) showed no short-term programme effects on condom use. However, the mean age of the study population was 18 years which may have had an influence on the results if relationship status was not accounted for in an older adolescent population. One study (Mitchell-DiCenso et al., 1997) targeting a younger cohort reported only long-term effects on condom use, with positive increase in condom use among males at 2 years follow-up. Limited outcomes were presented on HIV/STI testing, alcohol or drug use and pregnancy. One study (Lemieux et al., 2008) reported a significant increase in HIV testing, however all other outcomes showed no difference compared to the control groups.

Evidence statement 12

12 (g) There is moderate evidence from five RCTs, two NRCTs and one CBA study[1] to suggest that HIV and sexual risk-reduction programmes can improve sexual health and HIV knowledge in the short-, medium-and long-term. This evidence may be only partially applicable to the UK as five of the studies were conducted in the USA, one in Italy and one in the Netherlands and may not be generalisable beyond the populations studied.

12 (h) There is mixed evidence from four RCTs and one NRCT[2] that examined the effects of HIV and sexual risk-reduction programmes on young people's (≥14 years) attitudes and values towards sexual health and alcohol. This evidence may be only partially applicable to the UK as studies were carried out in the USA, Italy and the Netherlands and may not be generalisable beyond the populations studied.

12 (i) There is moderate evidence from two RCTs, one NRCT and one CBA study[3] to suggest that HIV and sexual risk-reduction programmes may improve personal and social skills including behavioural prevention skills and condom negotiation skills in the short-term. There was no evidence to determine the effects of HIV and sexual risk-reduction on personal and social skills in the medium- to long-term. This evidence may be only partially applicable to the UK as

studies were carried out in the USA and Italy and may not be generalisable beyond the populations studied.

12 (j) There is moderate evidence from seven RCTs[4] to suggest that HIV and sexual risk-reduction programmes may have no effects on sexual initiation, frequency of sexual activity or number of sexual partners. This evidence may be only partially applicable to the UK as studies were carried out in the USA, Norway, Italy and Netherlands and may not be generalisable beyond the populations studied.

12 (k) There is strong evidence from three RCTs, two NRCTs and one CBA study[6] to suggest that HIV and sexual risk-reduction programmes can increase condom use or protected intercourse in the short- to medium-term. However, there was moderate evidence from two RCTs[7] to suggest that the long-term effects of HIV and sexual risk-reduction programmes on contraceptive use may be limited. This evidence may be only partially applicable to the UK as studies were carried out in the USA, Norway, and Sweden and may not be generalisable beyond the populations studied.

12 (l) There is moderate evidence from two RCTs[8] to suggest that HIV and sexual risk-reduction programmes have no medium- to long-term effect on sexually transmitted infections, alcohol and drug use or on conceptions. As both studies were implemented in the USA findings may be only partially applicable to the UK and may not be generalisable beyond the populations studied.

[1] Borgia et al., 2005 (RCT +); Coyle et al., 2006 (RCT ++); Fisher et al., 2002 (NRCT ++); Larsson et al., 2006 (NRCT +); Lemieux et al., 2008 (CBA -); Roberto et al., 2007 (RCT +); Schaalma et al., 1996 (RCT +); Workman et al., 1996 (RCT -)

[2] Borgia et al., 2005 (RCT +); Coyle et al., 2006 (RCT ++); Fisher et al., 2002 (NRCT ++); Roberto et al., 2007 (RCT +); Schaalma et al., 1996 (RCT +)

[3] Borgia et al., 2005 (RCT +); Fisher et al., 2002 (NRCT ++); Lemieux et al., 2008 (CBA -); Roberto et al., 2007 (RCT +)

[4] Borgia et al., 2005 (RCT +); Coyle et al., 2006 (RCT ++); Kvalem et al., 1996 (RCT -); Mitchell-DiCenso et al., 1997 (RCT +); Roberto et al., 2007 (RCT +); Schaalma et al., 1996 (RCT +); Workman et al., 1996 (RCT -)

[5] Coyle et al., 2006 (RCT ++); Kvalem et al., 1996 (RCT -); Mitchell-DiCenso et al., 1997 (RCT +)

[6] Borgia et al., 2005 (RCT +); Coyle et al., 2006 (RCT ++); Roberto et al., 2007 (RCT +); Schaalma et al., 1996 (RCT +)

[7] Coyle et al., 2006 (RCT ++); Fisher et al., 2002 (NRCT ++); Lemieux et al., 2008 (CBA -); Kvalem et al., 1996 (RCT -); Larsson et al., 2006 (NRCT +); Traeen, 2003 (RCT +)

[8] Coyle et al., 2006 (RCT ++); Traeen, 2003 (RCT +)

[9] Coyle et al., 2006 (RCT ++); Mitchell-DiCenso et al., 1997 (RCT +)

Table 6.24. HIV and sexual risk-reduction programmes: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Personal/social skills
Borgia et al., 2005[3]	RCT +	Peer-led n=613	Teacher-led n=682	5 months	↑Knowledge	↑ Attitudes, risk-perception	↑Prevention skills
Fisher et al., 2002	NRCT ++	HIV prevention curriculum Classroom, n=310 Peer, n=381 Combined, n=296	Usual curriculum n=589	3 months	*Sexually inexperienced:* ↑ HIV prevention information (classroom***, combined*** only) *Sexually experienced:* ↑ HIV prevention information (classroom***, combined***, peer**)	*Sexually inexperienced:* ↑ attitudes (classroom**, combined** only) ↑ norms (combined only*) ↑intentions (combined only*) *Sexually experienced:* ↑ attitudes (peer**, combined** only ↑ norms (classroom only*) **NS** intentions	*Sexually inexperienced:* ↑ behavioural skills (combined only**) *Sexually experienced:* ↑ behavioural skills (combined only*)
Lemieux et al., 2008	CBA -	SWAAT n=NR	No intervention n=NR	3 months	-	**NS** condom use[a] **NS** social normative support for condom use[a] **NS** intention to use condoms	↑HIV prevention behavioural skills*
Roberto et al., 2007	RCT +	Computer-based education n=181	No intervention n=221	PT	↑ knowledge***	↑attitude towards waiting* **NS** condom self-efficacy, refusal self-efficacy ↑ situational self-efficacy* ↓susceptibility**	↑condom negotiation*
Schaalma et al., 1996	RCT +	AIDS/STI prevention curriculum n=NR	Usual curriculum n=NR	4-8 weeks	↑knowledge***	↑ risk appraisal** ↑positive attitudes*** ↑ positive perceptions of subjective norms** ↑ positive perceptions of peer behaviour* ↑ self-efficacy beliefs* ↑ condom use intentions**	-
Workman et al., 1996	RCT -	CBT HIV prevention n=30	Womanhood development n=30	PT (1 week)	↑ HIV knowledge**	-	**NS** sexual decision-making **NS** sexual assertiveness **NS** level of comfort discussing AIDS preventative behaviour

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] Authors claimed the programme provided protective measures as significant decreases were seen in controls

Table 6.25. HIV and sexual risk-reduction programmes: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Borgia et al., 2005[3]	RCT +	Peer-led n=613	Teacher-led n=682	5 months	-	**NS** number of partners, past 3 months[a]	**NS** frequency of condom use, past 3 months	-	-
Fisher et al., 2002	NRCT ++	HIV prevention curriculum, classroom n=310 Peer n=381 Combined n=296	Usual curriculum n=589	3 months	-	-	↑ condom use, past 3 months[a] (combined*, peer* only)	-	-
Lemieux et al., 2008	CBA -	SWAAT n=NR	No intervention n=NR	3 months	-	-	↑Condom use, past 3 months*	↑ HIV testing**	-
Roberto et al., 2007	RCT +	Computer-based education n=181	No intervention n=221	PT	↓ initiation of sexual activity**	**NS** number of partners	**NS** condoms use at last intercourse	-	-
Schaalma et al., 1996	RCT +	AIDS/STI prevention curriculum n=NR	Usual curriculum n=NR	4-8 weeks	-	**NS** sexual risk index[b]	**-**	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] sexually experienced at baseline; [b] score ranging from 0 (no sexual intercourse) to 3 (inconsistently using condoms with two or more sex partners)

Table 6.26. HIV and sexual risk-reduction programmes: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Personal/social Skills
Coyle et al., 2006	RCT ++	All4you! n=597	Usual curriculum n=391	6 months (73%)	↑ HIV & condoms* **NS** condoms	**NS** condoms generally **NS** condoms for STI protection ↓ condoms for pregnancy protection* ↓ condoms for intercourse* **NS** normative beliefs **NS** condom use intentions **NS** condom self-efficacy **NS** self-efficacy to abstain	-
				12 months (62%)	**NS** HIV & condoms **NS** condoms	**NS** attitudes and beliefs regarding condoms **NS** normative beliefs **NS** condom use intentions ↓ condom self-efficacy* **NS** self-efficacy to abstain	-
Larsson et al., 2006	NRCT +	Contraception programme n=282	No intervention n=179	12 months n=367 (94%)	↑EHC on 3rd day** **NS** EHC on 1st day **NS** EHC side effects	↓ EHC is a kind of abortion* ↑could imagine buying condoms* **NS** other attitudes towards EHC and condoms	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
EHC emergency hormonal contraception

Table 6.27. HIV and sexual risk-reduction programmes: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Coyle et al., 2006	RCT ++	All4you! n=597	Usual curriculum n=391	6 months (73%)	**NS** sexual initiation	**NS** Number of unprotected partners[a] ↓ frequency of sexual intercourse[a]* **NS** number of unprotected steady/non-steady partners[a] **NS** number of previous sexual partners	↓ frequency of unprotected intercourse[a] ↓ frequency of unprotected intercourse[a] (steady partner only*) ↑ condom use[b] **NS** effective pregnancy prevention[b]	**NS** number of HIV tests **NS** number of tests for STIs	**NS** pregnancy since baseline

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	**Frequency/ Number of partners**	**Contraceptive use**	**STIs**	**Conceptions**
Coyle et al., 2006	RCT ++	All4you! n=597	Usual curriculum n=391	12 months (62%)	**NS** sexual initiation	**NS** Number of unprotected partners[a] **NS** Frequency of intercourse[a] **NS** number of unprotected steady/non-steady partners[a] **NS** number of sexual partners previous	**NS** Frequency of unprotected intercourse[a] **NS** Frequency of unprotected intercourse[a] (steady partner, non-steady partner) **NS** condom use[b] **NS** effective pregnancy prevention[b]	**NS** number of HIV tests **NS** number of tests for STIs	**NS** pregnancy since baseline
Fisher et al., 2002	NRCT ++	HIV prevention Classroom, n=310 Peer, n=381 Combined, n=296	Usual curriculum n=589	12 months	-	-	↑ condom use, past year (classroom only[c]**)	-	-
Kvalem et al., 1996	RCT -	AIDS and sexuality education n=284	No intervention n=801	6 months (76%)	-	-	↑ condom use***	-	-
				12 months (69%)	**NS** initiation of first intercourse	-	**NS** condom use	-	-
Larsson et al., 2006	NRCT +	Contraception programme n=282	No intervention n=179	12 months	-	-	↑ condom use* **NS** used EHC, ever	-	-
Mitchell-DiCenso et al., 1997	RCT +	McMasters Teen Programme n=2,309	Usual curriculum n=1,666	12 months	**NS** initiation of first intercourse	-	-	-	**NS** first pregnancy

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Traeen, 2003	RCT +	Safe sex and pregnancy prevention n=416	No intervention n=197	6-7 months (69%)	-	-	*At first intercourse[c]:* **NS** some contraception at first sex, no contraception, condoms before orgasm, emergency contraception [b]↑ interrupted at first sex, condoms, hormonal/oral contraception *At most recent sex[c]:* **NS** some contraception, no contraception, condoms before orgasm, condoms, hormonal/oral contraception, emergency contraception. ↑ interrupted	-	-
Workman et al., 1996	RCT -	CBT HIV prevention n=30	Womanhood development n=30	PT (1 week)	-	**NS** AIDS preventative behaviours	-	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] in past 3 months; [b] at last intercourse; [c] sexually experienced at baseline

Table 6.28. HIV and sexual risk-reduction programmes: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Coyle et al., 2006	RCT ++	All4you! n=597	Usual curriculum n=391	18 months	↑ HIV & condoms* ↑ condoms*	**NS** attitudes and beliefs regarding condoms **NS** normative beliefs **NS** condom use intentions **NS c**ondom self-efficacy **NS** self-efficacy to abstain	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.29. HIV and sexual risk-reduction programmes: long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Coyle et al., 2006	RCT ++	All4you! n=597	Usual curriculum n=391	18 months	**NS** sexual initiation among those inexperience at baseline	**NS** Number of unprotected partners[a] **NS** Frequency of intercourse[a] **NS** Number unprotected steady partners[a] ↑ Number unprotected non-steady partners[a]* **NS** number of previous sexual partners	**NS** Frequency of unprotected intercourse[a] **NS** Frequency of unprotected intercourse[a] (steady partner/non-steady) **NS** condom use[b] **NS** effective pregnancy prevention[b]	**NS** number of HIV tests **NS** number of tests for STIs	**NS** pregnancy since baseline
Traeen, 2003	RCT +	Safe sex and pregnancy prevention n=416	No intervention n=197	1-2 years (56%)	-	-	**NS** contraceptive use at first sex[c]	-	-
Mitchell-DiCenso et al., 1997	RCT +	McMasters Teen Programme n=2,309	Usual curriculum n=1,666	2-4 years	**NS** initiation of first intercourse	-	↑ always condom use in males, 2 years	-	**NS** first pregnancy

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] past 3 months; [b] last intercourse; [c] sexually inexperienced at baseline, [c] sexually experienced at baseline.

6.6 Other school-based approaches

6.6.1 Overview of evidence identified

A total of included seven studies were identified that reported on six different programme approaches relating to sexual health. Two studies examined school-based clinic programmes (Stout et al., 1996; Teitler, 1997), two studies (Somers et al., 2001; 2006) reported findings from one programme using baby simulators (Baby Think it Over), and three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) examined the effects of combined community and school-based programmes. School-based clinic studies were included where the evaluation examined a health clinic located directly within the school grounds. Stout et al (1996) examined school-based clinic programmes at three pairs of schools (sites A, B and C), which had a centre that had been operating for five school months at the time of the baseline survey. All three centres had varying operating budgets, staffing levels and qualifications, and constraints on their practice, but all three faced the constraint of not being able to prescribe or dispense contraception. Teitler (1997) evaluated the impact of nine school-based health resource centres where students could receive reproductive health information, condoms and general health referrals. Vincent et al (2004) examined the long-term effects of the School/Community Programme for Sexual Risk Reduction Among Teens, which was originally conducted in a rural county in South Carolina. Two studies (Lewis et al., 1999; Paine-Andrews et al., 1999) reported on the replication of this programme in three Kansas communities (Franklin County, Geary County and one neighbourhood in Wichita). Paine-Andrews et al (1999) examined the effects of all three community partnerships, and Lewis et al (1999) examined the effects of the initiative in Geary County only. All three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) examined the effects of the programme at the county level by comparing outcomes in intervention and non-intervention communities.

All studies were conducted in North America. Two studies (Stout et al., 1996; Teitler, 1997) were carried out in schools and consisted of two school based clinics (Stout et al., 1996; Teitler, 1997) neither of which reported a theoretical base. A further three studies evaluated complex interventions conducted out in schools and the community (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004), two studies (Lewis et al., 1999; Vincent et al., 2004) did not report a theoretical base for the intervention, but the intervention in the third study (Paine-Andrews et al., 1999) was underpinned by theory of change theory. The Baby Think it Over programme was carried out in both school and the home (Somers et al., 2001; 2006) with no theoretical base in the initial study but with cognitive development theory underpinning the second study.

Table 6.30. Sex and relationship education: other school-based approaches

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Stout et al., 1996	CBA -	School	USA n=1870 – site A n=778 – site B n=1,651, site C	School health promotion clinics; open 16-40 hours per week	Not reported	Clinic staff in school
Teitler 1997	CBA -	School	USA n=945 (at FU) students, mean 16 years	Drop in centres at school providing information, condoms and health referrals	Not reported	Health professionals and graduate interns
Lewis et al., 1999	ITS -	School + community	USA n=NR, 9th-12th grade students	**Reducing the Risk**: K-12th Grade Curriculum; increased access to health services and contraceptives; media efforts to increase awareness; peer education and support; supervised activities; programs in the faith community; community lineages	Not reported	Teachers
Paine-Andrews et al., 1999	CBA -	School + community	USA Participant details NR	Pregnancy prevention programme over five years; Enhanced sexuality education for teachers and parents; comprehensive, age-appropriate sexuality education from K-12; increased access to health services; collaboration with school administrators; use of mass media; increased awareness and involvement of the entire community in teenage pregnancy prevention, peer support and education; alternative activities for young people; and involvement of the faith community.	Theory of change	Various not described
Somers et al., 2001	CBA -	School + home	USA 100 students, mean age years: intervention17.1; control 16.4	**Baby Think It Over**: 48 hours at home and school; computerised infant simulator	Not reported	NA
Somers et al., 2006	NRCT -	School + home	USA 230 students, mean age years: intervention 15.8; control 16.6	**Baby Think It Over**: Two nights and three days; computerised infant simulator	Cognitive development	NA
Vincent et al., 2004	ITS -	School + community	USA n=NR	Abstinence and contraception promotion interventions from K-12 grades in one county	Not reported	Health educators

One study examined three school health promotion clinics (Stout et al., 1996) where services were delivered by clinic staff. A second school-based clinic (Teitler, 1997) provided information, referrals and condoms to students was delivered by health professionals and graduate interns. The Baby Think it Over Programme was primarily delivered by the baby simulators used by young people over a period of 2-3 days. External professionals (i.e. health educators) were used to deliver the abstinence and safe sex programmes (Vincent et al., 2004). Reducing the Risk programme was the only intervention delivered by teachers. Further, the community-based pregnancy prevention programme (Paine-Andrews et al., 1999) used a variety of people to deliver the intervention however details for this were unclear.

The number of students recruited into the programmes ranged from 100 students to 1,870 students. However, the number of participants was not reported in three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004). Only one study (Stout et al., 1996) was based on a sample of more than 1,500 participants and as this study employed three different clinic sites as intervention sites only two of the three sites had intervention groups over 1,500. Appropriate sample size to power the analysis conducted was only discussed in one case (Teitler, 1997) and authors concluded that the sample was too small to capture small or medium size effects.

Programmes targeted a range of age groups. Two studies did not clearly record the age group of their participating students (Paine-Andrews et al., 1999; Vincent et al., 2004). Reducing the Risk and both clinic-based interventions targeted students aged 14-18 years in grades 9-12 (Stout et al., 1996) and Teitler (1997) reported a mean age of 16 years for participants. The participants in the first Baby think it Over programme (Somers et al., 2001) had a mean age of 17.1 years whereas the second cohort (Somers et al., 2006) were younger with a mean age of 15.8 years. Interventions duration varied by programme with Baby Think It Over (Somers et al., 2001; 2006) carried out over 48-36 hours, curriculum-based programmes took place regularly over several years (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) and school-based clinics open to students throughout the school week and available over a two year period (Stout et al., 1996; Teitler, 1997).

Programmes reported a range of follow-up times. One study (Somers et al., 2006) reported immediate post-test results only and one other (Somers et al., 2001) reported follow-up results at less than six months. Two studies (Lewis et al., 1999; Stout et al., 1996) reported long-term follow-up between 2-3 years. One study (Vincent et al., 2004) explored data relating to girls aged 14-17 years in one county receiving abstinence and safe sex education over a 20 year period. A further two other studies (Paine-Andrews et al., 1999; Teitler, 1997) did not report a clear follow-up time.

6.6.2 Quality assessment

Of the seven studies included, one (Somers et al., 2006) was a NRCT. Four studies (Paine-Andrews et al., 1999; Somers et al., 2001; Stout et al., 1996; Teitler, 1997) were CBA studies and two studies (Vincent et al., 2004; Lewis et al., 1999) were based on an interrupted time series. Study quality was rated poor across all seven studies (- rating). The Baby Think it Over programme (Somers et al., 2006) was based on varied follow-up times for participants, it was not clear how bias was minimised and contamination may have been significant in this study. Limited details on the intervention and the

reliability of the measures used were provided. The four CBA studies (Paine-Andrews et al., 1999; Somers et al., 2001; Stout et al., 1996; Teitler, 1997) were all rated poor quality. Studies were judged to have provided limited details of their methodology, intervention, and participants in both the intervention and control groups. Follow-up times were also generally too short to be classed as meaningful in some studies, although outcome measures were deemed appropriate overall. The two interrupted time series studies (Lewis et al., 1999; Vincent et al., 2004) were not well reported in terms of the methodology used for the time series. Neither study reported a clearly defined point in time over which the intervention occurred, other than the year of intervention, nor was it clear if the intervention occurred independently of other changes over time.

6.6.3 Findings

6.6.3.1 Short-term results (<6 months)

Two studies (Somers et al., 2001; 2006) reported short-term programme effects for the Baby Think It Over, infant simulator programme.

Knowledge and understanding

None of the studies identified examined short-term programme effects on knowledge and understanding.

Attitudes and values

Two studies (Somers et al., 2001; 2006) using the Baby think it over programme reported short-term effects on participants' attitudes and values. Non-significant effects on behavioural intentions regarding safe sex and child bearing were reported in both studies. The programme also had no effect on attitudes towards pre-marital sex, child rearing, pregnancy, or future orientation. However, Somers et al (2006) did report a decrease in the intervention students' views regarding other people's acceptance of teenage pregnancy ($p \leq 0.05$).

Personal and social skills

None of the studies identified examined short-term programme effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Two studies (Somers et al., 2001; 2006) of the Baby Think It Over programme examined short-term health outcomes on participants. There no effects of the intervention on age of first sex, frequency of sex or contraceptive use.

6.6.3.2 Medium-term results (up to 12 months)

None of the studies identified examined medium-term programme effects.

6.6.3.3 Long-term results (>12 months)

Five studies (Stout et al., 1996; Teitler, 1997; Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) examined long-term effects intervention effects for two school-based health centres and three school- and community-based programmes, respectively.

Knowledge and understanding

None of the studies identified examined medium-term programme effects on knowledge and understanding.

Attitudes and values

Stout et al (1996) examined the effects of school-based health centres across three pairs of school sites defined as sites A, B and C. At one site, site B, there was a decrease in positive views towards abstention before marriage relative to the comparison site ($p<0.05$), but at a second site, site C, an increase in the number of people favouring abstention before marriage was reported relative to the comparison site ($p<0.05$). Interviews with staff at site C indicated that they placed a great emphasis on encouraging abstinence, a factor which is likely to have influenced outcomes at this site. At the third site, site A, there was no difference between the intervention and comparison sites in reproductive health attitudes.

Personal and social skills

Stout et al (1996) reported that there were no significant programme effects of health clinics on participants' sexuality dialogue with parents, at any of the three intervention sites, compared to comparison sites.

Health and social outcomes relating to alcohol use and sexual health

Three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) reported long-term programme effects for two multicomponent community- and school-based intervention programme approaches. Vincent et al (2004) examined the long-term effects of the School/Community programme in a rural county in South Carolina, by comparing 20 years of pregnancy rates among girls aged 14-17 in the intervention county with three comparison counties. Based on three approaches to the analyses, the authors found that: (1) overall, there was a general downturn in teen pregnancy rates across the entire state between 1981 and 2000; (2) in the intervention county rates fell from 54.8 to 32.1 pregnancies per 1,000 females; and (3) the intervention county started higher and ended lower than the comparison communities. From this the authors concluded that the intervention had had a positive effect on teenage pregnancies in the intervention county. Paine-Andrews et al (1999) examined the effects of the replication of the School/Community programme on estimated pregnancy rates and birth rates across three communities in Kansas, USA. Overall, although estimated pregnancy rates decreased among females aged 14-17 in two intervention communities (Franklin County and Geary County), there was no significant difference in pregnancy rates between the intervention and comparison communities. Changes in birth rates were mixed in two intervention communities in Wichita, and overall there was no significant difference between intervention and control communities on this measure. Lewis et al (1999) examined the effects of the school/community partnership approach in Geary County in more detail. In the intervention community the estimated pregnancy rate for 14-17 year olds decreased between 1991 and 1996 (the partnership approach was introduced in 1993), in comparison to an increase in comparison communities. However, based on an average of the estimated pregnancy rate for the three years

before and during the intervention, the relative decrease seen in the intervention community was not found to be significant.

Two studies examined the long-term effects of two school-based health centres. Teitler (1997) reported on the evaluation of the health resource centres programme which was implemented in nine schools in Philadelphia, USA. There were no significant effects of the health resource centres on initiation of sex, sex in the past month or condom use. However, the authors reported that the direction of the effect was in favour of the health centres on all of these measures. Stout et al (1996) examined the effects of school-based health centres across three study sites. At study site A, relative to the control school, students who used the health centre reported a reduction in contraceptive use ($p<0.05$) and there was no difference in reproductive health outcomes. At site B, relative to the control site, clinic participants reported an increase in contraception use at first sex and an increase in contraception initiation in the first six months of initiating sex. However, no other programme effects were observed. Clinic participants at site C reported a decrease in sexual activity relative to participants at the control site ($p<0.05$), but among sexually active students there were no changes in contraceptive behaviour. The authors note that the emphasis on abstinence at this site might have contributed to the reduction in sexual activity.

6.6.4 Summary and evidence statements

A total of included seven studies were identified that reported on six programmes relating to other school-based approaches to sex and relationships education

6.6.4.1 Knowledge and understanding

No studies in this category reported on knowledge outcomes.

6.6.4.2 Attitudes and values

Three studies (Stout et al., 1996; Somers et al., 2001; 2006) that reported on school-based health clinics and an infant simulation intervention, respectively, reported few effects on attitudes. There were inconsistent effects on reproductive attitudes across three school health clinic sites (Stout et al., 1996), which appeared to be largely due to the different operational goals of the sites studied. Findings from the Baby Think It Over programme (Somers et al., 2001; 2006) indicated no effects of the intervention on attitudes and values towards child bearing or safe sex.

6.6.4.3 Personal and social skills

Only one study (Stout et al., 1996), which examined three school-based health clinics, reported programme effects on personal and social skills. Stout et al (1996) examined the impact of participation in school-based health clinics on sexuality communication between students and parents, but they proved to have no effect on this outcome.

6.6.4.4 Health and social outcomes relating to alcohol use and sexual health

There were no effects of the Baby Think it Over infant simulation programme on any of the sexual behaviour measures examined (Somers et al., 2001; 2006). Three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) that examined a school and community partnership

approach to tackling teenage pregnancy, generally found that although there were reductions in pregnancy rates among 14-17 year olds at the intervention sites, these reductions were not found to be significant compared to non-intervention sites. However, one study (Vincent et al., 2004) that examined pregnancy rates over 20 years concluded that the intervention had had a positive effect on teenage pregnancies. Two studies (Stout et al., 1996; Teitler, 1997), which examined the long-term effects of school-based health centres, found that these programmes did not have consistent effects on participant's sexual behaviour.

Evidence statement 13

13 (e) There is inconsistent evidence from one NRCT and two CBAs[1] to determine the effects of school-based clinics or an infant simulation intervention on knowledge, attitudes, values and personal and social skills.

13 (f) There is weak evidence from one NRCT and one CBA study[2] to suggest that infant simulation programmes have no effect on health outcomes related to sexual health. This evidence may be only partially applicable to the UK as studies were carried out in the USA and may not be generalisable beyond the populations studied.

13 (g) There is weak evidence from two CBA studies and one ITS[3] to suggest that a comprehensive school- and community-based approach to teenage pregnancy may produce modest reductions in teenage pregnancy rates. This evidence may be only partially applicable to the UK as studies were carried out in the USA and may not be generalisable beyond the populations studied.

13 (h) There is inconsistent evidence from two CBAs[4] to determine the effects of school-based clinics on health outcomes related to sexual health.

[1] Stout et al., 1996 (CBA -); Somers et al., 2001 (CBA -); Somers et al., 2006 (NRCT -)

[2] Somers et al., 2001 (CBA -); Somers et al., 2006 (NRCT -);

[3] Lewis et al., 1999 (Interrupted time series -); Paine-Andrews et al., 1999 (CBA -); Vincent et al., 2004 (CBA -)

[4] Stout et al., 1996 (CBA -); Teitler, 1997 (CBA -)

Table 6.31. Other school-based SRE approaches: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Somers et al., 2001	CBA -	Baby Think It Over n=84	No intervention n=16	6-10 weeks n=NR	-	**NS** contraceptive/sexual attitudes **NS** pre-marital sex **NS** pregnancy **NS** child bearing **NS** child rearing	-
Somers et al., 2006	NRCT -	Baby Think It Over n=113	No intervention n=117	PT n=NR	-	↓ Perception of others' acceptance about teen pregnancy* **NS** realism about child rearing **NS** future orientation **NS** sex and chid bearing intentions **NS** pre-marital sex	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.32. Other school-based SRE approaches: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Somers et al., 2001	CBA -	Baby Think It Over n=84	No intervention n=16	6-10 weeks n=NR	-	**NS** sexual behaviours	-	-	-
Somers et al., 2006	NRCT -	Baby Think It Over n=113	No intervention n=117	PT n=NR	**NS** age first had sex	**NS** frequency of sex; oral sex	**NS** contraception use	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.33. Other school-based SRE approaches: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Skills
Stout et al., 1996	CBA -	Site A n=739	Site A n=1131	2 years n=NR	-	**NS** reproductive health attitudes	**NS** sexuality dialog with parents
		Site B n=354	Site B n=424		-	↓ abstention before marriage*	**NS** sexuality dialog with parents
		Site C n=1126	Site C n=525		-	↑ abstention before marriage*	**NS** sexuality dialog with parents

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 6.34. Other school-based SRE approaches: long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	Frequency/ Number of partners	Contraceptive use	STIs	Conceptions
Lewis et al., 1999	ITS -	Multicomponent school and community intervention n=1 site	Non-intervention matched counties n=NR	3 years n=NR	-	-	-	-	**NS** pregnancy rates
Paine-Andrews et al., 1999	CBA -	Multicomponent school and community intervention n=4 sites	Non-intervention matched counties n=4 sites	NR	-	-	-	-	**NS** pregnancy rates **NS** birth rates
Vincent et al., 2004	ITS -	Multicomponent school and community intervention n=1 site	Non-intervention counties n=3 sites	20 years NA	-	-	-	-	↓ pregnancy rates[NS]
Stout et al., 1996	CBA -	Site A n=739	Site A n=1131	2 years n=NR	-	**NS** sexual activity	↓ contraception use*	↓ binge drinking*	**NS** emotional health **NS** health service utilisation

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes				
					Age of initiation	**Frequency/ Number of partners**	**Contraceptive use**	**STIs**	**Conceptions**
Stout et al., 1996	CBA -	Site B n=354	Site B n=424	2 years n=NR	-	**NS** sexual activity	↑ contraception use at first sex* ↑ initiation of contraception within first 6 months of sex*	-	-
Stout et al., 1996	CBA -	Site C n=1126	Site C n=525	2 years n=NR	-	↓ sexual activity*	**NS** contraception use	-	-
Teitler 1997	CBA -	Students in schools with Health Resource Centres n=348 (at FU)	Students in schools without Health Resource Centres n=597 (at FU)	NR n=945	**NS** initiation of sex	**NS** past month sex	**NS** condom use at last sex; in last month	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

6.7 Review of published economic evaluations

One study (Wang et al., 2000) was identified that met the criteria for inclusion in the review of published economic evaluations. Wang et al (2000) evaluated the cost-effectiveness and cost benefit of Safer Choices, an abstinence-plus programmes.

6.7.1 Review of Wang et al (2000)

6.7.1.1 Overview

The aim of the study by Wang et al (2000) was to evaluate the cost-effectiveness and cost benefits of Safer Choices, an abstinence-plus sex and relationships education programme, compared to a standard, information-based curriculum.

6.7.1.2 Summary of effectiveness data

Effectiveness estimates were drawn from an evaluation of the Safer Choices programme by Coyle et al (1999). The economic evaluation was based on 7-month follow-up data and a sample of 3677 ninth-grade students who had completed both the baseline and follow-up surveys. At the 7-month follow-up, the authors reported that a significant increase in condom and contraceptive use at last intercourse was found (both $p<0.05$); 67% of intervention students compared to 52% of the control group reported using condoms at last intercourse, and 68% of intervention students reported using contraception at last intercourse compared to 57% of the control group.

6.7.1.3 Summary of resource utilisation and cost data

The authors adapted the Bernoulli model to translate increases in condom use into cases of HIV and other STDs (Chlamydia, gonorrhoea, and pelvic inflammatory disease [PID]) averted. The model estimated the probability of HIV infection based on four variables: number of sexual partners, number of sexual contacts with each partner, HIV prevalence, and probability of transmission. In addition, a pregnancy model was developed to translate increases in contraceptive use into cases of pregnancy averted. Full details of the variables used in the model were reported in the article. To examine the cost-benefit of Safer Choices, cases of HIV, other STIs and pregnancies averted were translated into medical and social costs averted. Cost data for the base-case analysis were based on the private sector perspective, but the use of the both public and private sector costs were explored in sensitivity analyses. Medical costs for HIV, Chlamydia, gonorrhoea, PID and pregnancy were drawn from previously published studies or estimated by the authors. For societal costs related to HIV infection and pregnancy the authors used estimates drawn from previously published studies and assumptions made by the authors. Social costs including lost productivity for HIV infection, and costs relating to earning-related outcomes, public assistance, and other consequences for childbearing.

A retrospective cost analysis was conducted to estimate intervention costs which consisted of programme costs and the costs of condoms and oral contraceptives. Direct programme costs included teacher training, teaching, lesson materials and site coordination as shown in Table 36. The costs of developing and evaluating the programme were excluded. The costs of condoms and oral contraceptives were estimated as the product of the number of condoms or oral contraceptives used

within 1-year among intervention students and their sexual partners and the wholesale price of condoms or oral contraceptives. The total costs to implement the programme were estimated at $102,852 (1994 US$) and the costs of condoms and oral contraceptives were estimated at $2,391, resulting in total intervention costs of $105,243.

Table 6.35. Programme implementation costs, Safer Choices

Component	Total cost, $ (1994)
Teacher training	29,183.10
Teaching	16,400.00
Peer facilitators	25,436.80
Site coordinator training	1,640.00
Site coordination	23,616.00
Curriculum packages	3,904.00
Implementation materials	490.00
Activity kits	590.000
Photocopies for students	430.35
Photocopies for teachers	11.59
Videos	1150.00
Total	**102,851.84**

6.7.1.4 Summary of cost-effectiveness data

Overall, 0.12 cases of HIV, 24.30 cases of Chlamydia, 2.77 cases of gonorrhoea, 5.86 cases of PID and 18.50 cases of pregnancy were estimated to have been averted over a 1-year time horizon. The total costs averted were calculated at $279,519 ($139,806 medical costs and $139,713 social costs). Overall, the net benefit of the programme was $174,276 and the benefit-cost ratio was 2.65, indicating that for every $1 spent on the programme, $2.65 were saved in medical and societal costs.

The authors reported that the results were not cost-saving in two scenarios: (1) low probability of HIV or STD transmission, low percentage of students using contraceptives, high contraceptive failure rate, low medical costs, and low prevalence or incidence rate; and (2) low probability of HIV or STD transmission, low percentage of students using contraceptives, high contraceptive failure rate, low medical costs, and low condom use per act.

6.7.1.5 Comments

The economic evaluation answered a well-defined question, evaluating the cost-effectiveness and cost benefits of a school-based abstinence-plus programme relative to a standard, information-based HIV curriculum. Data on the impact of the programme on condom use were drawn from an RCT and translated into cases of health outcomes averted using an analytic model. The authors developed a static model with a 1-year time horizon, and so did not incorporate population-level transmission dynamics. The authors made several assumptions regarding the data used in the model, but the robustness of the results were examined in a multivariate sensitivity analysis. Costs were considered from a medical and societal perspective and the authors appeared to have considered all the important costs and consequences of the two perspectives adopted. However, the conclusions of the

analysis were not based on an overall index or ratio of costs to effects. In addition, the use of a static model and short time horizon means that the true benefits of the intervention may have been considerably underestimated. The generalisbility of the study to a UK context is unclear as the data used in the evaluation is based on studies conducted in the USA, and other US population estimates. However, the authors state that the methods and data used were conservative and it is possible that the intervention may be cost saving in a UK context.

6.7.2 Summary and evidence statements

One study (Wang et al., 2000) was identified that met the criteria for inclusion in the review of published economic evaluations. Wang et al (2000) evaluated the cost-effectiveness and cost benefits of a school-based sex and relationships education programme, Safer Choices. Evaluations of the effectiveness of this programme were identified and are included in Section 6.2.

Overall the net benefit of the Safer Choices programmes was $174,276 and the benefit-cost ratio was 2.65, indicating that for every $1 spent on the programme, $2.65 were saved in medical and societal costs.

Evidence statement 14

There is moderate evidence from one economic evaluation study[1] to suggest that a sex and relationships education programme, Safer Choices, may be cost-effective and cost saving. This evidence may be of limited applicability to a UK context because cost and benefit estimates were based on data from studies conducted in the USA.

[1] Wang et al., 2000 (CEA +)

6.36. Sex and relationships education: summary of economic evaluation studies

Study details	Research question	Methods of estimation for costs and benefits	Results	Confounders, potential sources of bias and other comments
Wang et al (2000) Country/currency: US$ (1994) CEA +	Research question: To evaluate the cost-effectiveness and cost benefit of Safer Choices Population: High school students and their sexual partners Intervention: Safer Choices, a school based education programme designed to prevent HIV, other STDs, and pregnancy. Perspective: Medical and societal	The authors adapted the Bernoulli model to translate increases in condom use into cases of HIV and other STDs (Chlamydia, gonorrhoea, and pelvic inflammatory disease) averted. Pregnancy model was developed to translate increases in contraceptive use into cases of pregnancy averted, and cases of adverse health outcomes averted were translated into medical and social costs averted. A retrospective cost analysis was conducted to estimate intervention costs which consisted of programme costs and the costs of condoms and oral contraceptives.	Total intervention costs were estimated at $105,243 and 0.12 cases of HIV, 24.30 cases of Chlamydia, 2.77 cases of gonorrhoea, 5.86 cases of PID and 18.50 cases of pregnancy were estimated to have been averted over a 1-year time horizon. The total costs averted were calculated at $279,519 ($139,806 medical costs and $139,713 social costs). In the cost-benefit analysis, the net benefit was $174,276 and the benefit-cost ratio was 2.65. Results were not cost-saving in two scenarios, when the following variable estimates were used: low probability of HIV or STD transmission, low percentage of students using contraceptives, high contraceptive failure rate, low medical costs, and low prevalence or incidence rate/low condom use per act.	Intervention effectiveness based on 7-month outcome data. Model did not incorporate population-level transmission dynamics Short time horizon No ratio of cost to benefits presented. Study limited by some of the assumptions made, e.g. all relationships were of a heterosexual nature and that the sexual partners of intervention students were from a pool outside of the intervention group.

7 General health education programmes

No systematic reviews or meta-analyses were identified for inclusion in the review of general health education programmes, and in addition no economic evaluation studies were identified. Nine articles that reported on evaluations of general health education programmes were identified. Studies were defined as general health education if they focused on a broad range of health behaviours, but incorporated as a minimum, a focus on both alcohol use and sexual health.

7.1 General health education programmes

7.1.1 Overview of evidence identified

Overall, nine studies (Bond et al., 2004; Flay et al., 2004; Harrington et al., 2001; O'Donnell et al., 1999; 2002; Moberg & Piper, 1990; McNeal et al., 2004; Patton et al., 2006; Piper et al., 2000) reported on the evaluation of six general health education programmes that reported relevant alcohol and sexual education outcomes. Two studies (O'Donnell et al., 1999; 2002) examined the effectiveness of the Reach for Health (RFH) curriculum, and the effects of the inclusion of an additional community youth service (CYS) component. Although both studies appeared to be based on the same sample of students from two middle schools, O'Donnell et al (2002) reported on a subsample of students who met eligibility criteria and dropped the 'no intervention' control group from the analyses. Two studies (Harrington et al., 2001; McNeal et al., 2004) examined the All Stars intervention programme, which was designed to reduce substance use, sexual behaviour and violence. McNeal et al (2004) extended the analyses presented in the study by Harrington et al (2001) by breaking down the composite substance use measure into separate types of drugs (cigarettes, cannabis, alcohol and inhalants). Bond et al (2004) and Patton et al (2006) examined the Gatehouse Project, a 2-year programme which was designed to improve emotional wellbeing and reduce health risk behaviours. The study by Bond et al (2004) was based on longitudinal follow-up of students who received the programme in year 8 and annually thereafter until the end of Year 10. Patton et al (2006) surveyed subsequent cross-sectional samples of year 8 students over five years. The two remaining studies examined the Healthy for Life health promotion programme (Piper et al., 2000), which targeted poor nutrition and eating patterns, tobacco, alcohol and cannabis use, and Flay et al (2004) examined the effects of a social development curriculum, with and without additional community components, delivered as part of the Aban Aya project.

Table 7.1. General health education programmes

Author	Study design and rating	Setting	Baseline population	Programme components	Theory	Provider
Bond et al., 2004	RCT ++	School	Australia n=2,678 13-14 years	**Gatehouse Project:** Multi-component study focusing on emotional well-being and risk behaviours carried out in 40 hours over 10 weeks. Addressing risk and protective factors and delivered in year 8	Not reported	Teachers and other staff members
Flay et al., 2004	RCT ++	School + community	USA n=644 10-12 years	**Aban Aya**: Three years, 16- 21 lessons per year; building cognitive behavioural skill, school + community intervention (SCI) and social development curriculum (SCD) groups. SCI = SDC + parental support, community development, school climate	Behavioural change theories	University-based health educators
Harrington et al., 2001	RCT +	School	USA n=2,289 students, mode 12 years	**All Stars**: 1 year; 14 entire class, four small group and four one on one sessions; debates, games and general discussion	Not reported	Teachers; External (specialists, All Star facilitators)
McNeal et al., 2004	RCT +	School	USA n=2,289 students, 11-13 years	**All Stars**: 22 sessions; substance use, sex and violence prevention	Social learning theory	Teachers; External (specialists, All Star facilitators)
Moberg & Piper, 1990	CBA +	School	USA n=197 students 12-14 years	**Project Model Health:** 32 hour programme delivered throughout the semester focusing on a range of health outcomes including reduction in drink driving and risk-taking attitudes.	Social learning theories	Teams of college-age instructors
O'Donnell et al., 1999; 2002	RCT +	School, community	USA n=1,157 students in 12-14 years	**Reach for Health curriculum + Community Youth Service programme**: 40 lessons and three hours per week community placements; curriculum focused on health risks related to substance use, sexual health, violence, STI, and unintended pregnancy.	Health belief model; social learning theory	Teachers
Patton et al., 2006	RCT +	School	Australia n=2,546 students, 13-14 years	**Gatehouse Project**: Three year programme including a 10 week problem solving curriculum in 8th grade	Not reported	Teachers and other staff members
Piper et al., 2000	RCT -	School, community	USA n=2,483 students, 11-14 years	**The Healthy for Life Programme**: containing a peer, family and community component and focusing general health behaviours including alcohol use.	Social influences model	Teachers and peer leaders

Five of the six programmes were conducted in North America and the remaining study (the Gateway Project; Bond et al., 2004; Patton et al., 2006) was carried out in Australia. All six programmes were primarily delivered in schools with four solely school-based and two using combined school and community elements. Aban Aya (Flay et al., 2004) focused on building cognitive behavioural skills and consisted of two intervention groups; one using social development curriculum and one using the social development curriculum in conjunction with parental support and community development. Founded on social learning theory, the All Stars programme (Harrington et al., 2001; McNeal et al., 2004) employed a curriculum-based approach to prevent substance use, sex and violence. Project Model Health (Moberg & Piper, 1990) was curriculum-based and reported a range of health outcomes including drink driving and risk-taking attitudes. Founded on health belief models and social learning theory, the Reach for Health (RFH) curriculum (O'Donnell et al., 1999; 2002) with a community youth service (CYS) programme employed primarily school-based educational sessions along with community placements. Gatehouse Project (Bond et al., 2004; Patton et al., 2006) was a multi-component programme carried out solely in schools focusing on emotional well-being and risk behaviours. The social learning theories-based programme Health for Life (Piper et al., 2000) focused on general health but had an alcohol prevention and sexual behaviour aspect and contained a peer, family and community element.

The RFH curriculum (O'Donnell et al., 1999; 2002) used only teachers to deliver the intervention. A further three studies (All Stars [Harrington et al., 2001; McNeal et al., 2004]; Gatehouse Project [Bond et al., 2004; Patton et al., 2006]; and the Healthy for Life programme [Piper et al., 2000]) supported teacher delivery with specialist facilitators, other staff members and peer leaders respectively. Two other studies, of the Aban Aya project (Flay et al., 2004) and Project Model Health (Moberg & Piper, 1990) were not provided by teachers but used university-based educators and teams of college-age educators, respectively, to deliver the programmes. Age and grade of participating students varied slightly in students receiving general health interventions. However, all studies reported participating students between ages 11-14 years.

Sample sizes varied across programmes from 197 students to 2,676 students. Evaluation of three programmes (All Stars [Harrington et al., 2001; McNeal et al., 2004]; Gatehouse Project [Patton et al., 2006; Bond et al., 2004]; and the Healthy for Life programme [Piper et al., 2000]) was based on a sample size greater than 1,500 students. Power calculations were reported in five of the nine studies (Harrington et al., 2001; McNeal et al., 2004; Patton et al., 2006; Bond et al., 2004; Piper et al., 2000). Studies were sufficiently powered in all five studies, however, one study recognised that some subsamples were smaller than desired and could have reduced the power and thus the precision of the estimates (Piper et al., 2000). Evaluations took place over differing follow-up periods. Evaluation of Project Model Health was based on follow-up at 20 months (Moberg & Piper, 1990). O'Donnell et al (1999; 2002) reported post-test results along with findings at two years for the Reach for Health Curriculum. The Gatehouse Project (Bond et al., 2004) was evaluated at one and two years follow-up. The study of the Healthy for Life Programme (Piper et al., 2000) followed-up students until 10th grade and follow up of participants in All Stars was conducted at one year post intervention. The second

study of the Gateway Project (Patton et al., 2006) consisted of three cross-sectional studies, conducted at 2-year intervals.

7.1.2 Quality assessment

Of the nine studies, eight were RCTs and one was a CBA study. Six RCTs (Flay et al., 2004; O'Donnell et al., 1999; 2002; Patton et al., 2006; Bond et al., 2004; Piper et al., 2000) were based on cluster randomisation and two studies (All Stars [Harrington et al., 2001; McNeal et al., 2004]) were based on individual randomisation. Cluster randomisation was carried out at school district (Gatehouse Project [Bond et al., 2004]), school (Aban Aya [Flay et al., 2004]; Gatehouse Project [Patton et al., 2006]; The Healthy for Life Programme [Piper et al., 2000]) and classroom (RFH + CYS [O'Donnell et al., 1999; 2002]) level. In three of the cluster RCTs the unit of randomisation did not match the unit of analysis. However, in all three cases (Flay et al., 2004; Bond et al., 2004; Piper et al., 2000) the analyses were adjusted for the intraclass correlations, with one study reporting an intention to treat analysis (ITT) (Bond et al., 2004). All but three of the RCTs were rated moderate (+ rating) for quality. Two RCT studies (Bond et al., 2004; Flay et al., 2004) were rated good quality (++ rating), as methods of randomisation were clear and appropriate, and design and outcome measures were clearly reported and reliable. One RCT (Piper et al., 2000) was rated poor quality (- rating) as the method of randomisation used was subject to bias. Although assignment to the intervention and control groups was random, schools allocated to the intervention arm chose which version of the curriculum to deliver. One CBA study (Moberg & Piper, 1990) was also rated as moderate quality. Attrition rates were unclear in this study. The reliability of outcome measures was not reported for one programme (RFH +CYS [O'Donnell et al., 1999; 2002]) and another did not report full details of outcomes (Harrington et al., 2001). However, outcome measures were judged to be relevant and reliable in all other studies. Follow-up times were deemed to be meaningful across all included studies.

7.1.3 Findings

7.1.3.1 Short-term results (<6 months)

Three studies (O'Donnell et al., 1999; Bond et al., 2004; Patton et al., 2006) reporting on two programmes, the RHS curriculum + CYS programme and the Gateway Project, respectively, reported immediate post-test programme effects.

Knowledge and understanding

None of the identified studies examined short-term intervention effects on knowledge and understanding.

Attitudes and values

Bond et al (2004) examined the effects of the Gateway Project on self-reported anxiety/depressive symptoms, finding that the intervention had no impact on this outcome.

Personal and social skills

Bond et al (2004) also examined the effects of the Gateway Project on student's social relationships in terms of their availability of attachments and conflictual relationships. There were no effects of the intervention on either of these measures.

Health and social outcomes relating to alcohol use and sexual health

Short-term programme effects of the RFH + CYS programme (O'Donnell et al., 1999) showed no effect of the RFH curriculum only, compared to a no intervention control, on sexual activity or an index of sexual behaviour[11]. However, students who received the RFH curriculum and participated in CYS activities were less likely to report recent sexual activity ($p<0.05$) and reported lower scores on the sexual behaviour index ($p<0.05$), than control students. Two studies (Bond et al., 2004; Patton et al., 2006) examined the short-term impact of the Gateway Project. At the end of the 2-year intervention programme, both studies found that the intervention had no effects on alcohol or other substance use, and Patton et al (2006) also found no intervention effects on early initiation of sexual activity. At the end of the one-year All Stars programme there were no differences between intervention and control students in terms of their sexual activity. However, compared to both the teacher condition and control, specialist intervention students showed a higher mean level of substance use ($p<0.05$) (Harrington et al., 2001).

7.1.3.2 Medium-term results (up to 12 months)

Five studies (Harrington et al., 2001; McNeal et al., 2004; Bond et al., 2004; Piper et al., 2000; Moberg & Piper, 1990) reported medium-term programme effects for four programmes: All Stars; The Healthy for Life Programme; Gatehouse Project; Project Model Health.

Knowledge and understanding

One study (Moberg & Piper, 1990) examined programme effects relating to participants' knowledge of health. However, no effects were shown at one year follow-up.

Attitudes and values

Three studies (Bond et al., 2004; Moberg & Piper, 1990; Piper et al., 2000) examined short-term intervention effects on attitudes and values. Bond et al (2004) reported that there were no effects of the Gatehouse Project on self-reported anxiety/depressive symptoms. Moberg and Piper (1990) found significant effects of the Project Model Health programme; intervention students reported more positive attitudes towards sex[12] and reported fewer intentions to use substances, compared to control students. There were no intervention effects on self-esteem. Piper et al (2000) reported that participants receiving the intensive, 1-year version of the Healthy for Life Programme were less likely

[11] Four category index, scored as follows: (1) no lifetime experience with intercourse; (2) past but no recent intercourse; (3) recent, always protected intercourse (both condoms and contraceptive use); and (4) recent, unprotected intercourse.

[12] Belief that students should postpone the onset of sexual intercourse; students who are sexually active should use contraception.

to perceive high rates of substance use among their peers (p<0.001). Students who received the 3-year, age appropriate version of the programme did no differ from control students on this measure.

Personal and social skills

None of the included studies examined medium-term intervention effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Four studies (Harrington et al., 2001; McNeal et al., 2004; Bond et al., 2004; Moberg & Piper, 1990; Piper et al., 2000) examined medium-term effects on health outcomes relating to sexual health and alcohol for three general health programmes (All Stars; The Healthy for Life Programme; Gatehouse Project). There were no effects of the All Stars programme (McNeal et al., 2004) on sexual activity in the past month, but students who received the teacher-led version of the intervention showed a decrease in their use of alcohol in the past month, compared to controls (p<0.05). There was no impact of the intensive version of Healthy for Life programme on past month sexual intercourse, but students receiving the age appropriate intervention were more likely than control students to report having had sexual intercourse in the past month (p<0.05). At one year follow-up, students who received the age-appropriate version of the Healthy for Life Programme (Piper et al., 2000) were also more likely than control students to have used alcohol in the past month (p<0.05). There was no difference between intervention students who received the intensive version of the programme and control students on this measure. There were no medium-term effects of the Gatehouse project (Bond et al., 2004) on alcohol use measures, including any drinking and binge drinking. Findings from the evaluation of Project Model Health (Moberg & Piper, 1990) revealed no effects of the programme on past month alcohol use or alcohol use frequency. However, at the 1-year follow-up, students who participated in Project Model Health were less likely to report they had been sexually active in the past month, compared to controls (Moberg and Piper, 1990).

7.1.3.3 Long-term results (>12 months)

Five studies (Piper et al., 2000; Flay et al., 2004; O'Donnell et al., 1999; 2002; Patton et al., 2006) reported long-term findings for five programmes: The Healthy for Life Programme; Gatehouse Project; Aban Aya; Project Model Health; RFH + CYS programme.

Knowledge and understanding

None of the included studies examined long-term programme effects on knowledge and understanding.

Attitudes and values

At follow-up in 10th grade, there was no difference between intervention students who participated in the Healthy for Life programme and control students in their perceptions of peer substance use.

Personal and social skills

None of the included studies examined long-term programme effects on personal and social skills.

Health and social outcomes relating to alcohol use and sexual health

Five studies (Piper et al., 2000; Flay et al., 2004; O'Donnell et al., 2002; Patton et al., 2006) reported long-term finding on health outcomes for five programmes: The Healthy for Life Programme; Gatehouse Project; Aban Aya; RFH + CYS programme.

Two studies (Patton et al., 2006; O'Donnell et al., 2002) reporting on two programmes (Gatehouse Project; RFH + CYS programme) examined programme effects on sexual initiation. There were effects of the Gatehouse Project (Patton et al., 2006) on early sexual initiation. Results from a cross-sectional survey of year 8 students taken two years after intervention showed that students in intervention schools were less likely to report early initiation of sexual intercourse (OR 0.55 95% CI: 0.37,0.83). At the 2-year follow-up, students who received the RFH + CYS programme (O'Donnell et al., 2002) were less likely to report sexual initiation after receiving either one year (OR 0.49; 95% CI: 0.25, 0.99) or two years (OR 0.32; 95% CI: 0.25, 0.99) of the combined programme, compared to students who received the RFH curriculum only. Students in the combined programme arm were also less likely to report recent sexual activity after one (OR 0.48; 95% CI: 0.24, 0.96) or two (OR 0.39; 95% CI: 0.20, 0.76) years of the programme. Piper et al (2000) found no change in past month sexual activity in 10th grade students who had received either the intensive or age appropriate version of Healthy for Life, despite finding a negative treatment effect on this measure at the ninth grade follow-up. Findings from the Aban Aya programme (Flay et al., 2004) at three years follow-up showed a decrease in sexual activity among males in the Social/Community Intervention (SCI) group ($p<0.05$) and an increase in condom use ($p<0.05$), but not in the Social Development Curriculum (SDC). A reduction in substance use was also seen among males in both intervention groups ($p=0.05$) and students in the SCI group also showed decreases in provoking behaviours and school delinquency ($p<0.05$). No significant programme effects were found for females on any of these measures. No programme effects on substance use were present at any cross-sectional observation periods in the Gatehouse Project (Patton et al., 2006). Students who participated in the Health for Life programme (Piper et al., 2000) reported increases in past month alcohol use in both the age appropriate and intensive intervention groups ($p<0.05$), in addition to an increase in the overall substance use scale for those students receiving the age appropriate intervention ($p<0.05$).

7.1.4 Summary and evidence statements

A total of nine studies (Bond et al., 2004; Flay et al., 2004; Harrington et al., 2001; O'Donnell et al., 1999; 2002; Moberg & Piper, 1990; McNeal et al., 2004; Patton et al., 2006; Piper et al., 2000) were identified that examined sex and relationship or alcohol education within a general health education programme.

7.1.4.1 Knowledge and understanding

Only one study (Moberg & Piper, 1990) examined programme effects on knowledge however results showed no difference between the intervention and control groups.

7.1.4.2 Attitudes and values

Two studies (Moberg & Piper, 1990; Piper et al., 2000) detailed the impact of their programmes on participants' attitudes and values. Findings from Project Model Health (Moberg & Piper, 1990) showed that at one year follow-up intervention students displayed improved health attitudes towards postponing sex and using contraceptives in addition to a positive reduction in their attitudes and intentions towards alcohol and other drugs. Piper et al (2000) found a medium-term impact on students' perceptions of peer attitudes towards alcohol and other drugs in those receiving the intensive condition of the Healthy for Life programme. However, by two years follow-up there was no effect.

7.1.4.3 Personal and social skills

No studies reported on programme effects on personal and social skills.

7.1.4.4 Health and social outcomes relating to alcohol use and sexual health

Nine studies (Bond et al., 2004; Flay et al., 2004; Harrington et al., 2001; O'Donnell et al., 1999; 2002; Moberg & Piper, 1990; McNeal et al., 2004; Patton et al., 2006; Piper et al., 2000) examined health outcomes relating to sex and relationship or alcohol education from general health education programmes. Only two programmes, the RFH curriculum (O'Donnell et al., 1999; 2002) and the Gatehouse Project (Patton et al., 2006), explored the intervention impact on age of sexual initiation. One programme (O'Donnell et al., 1999; 2002) incorporating a community element showed positive results at medium and long-term follow-up. Two programmes, the RFH curriculum (O'Donnell et al., 1999; 2002) and the Aban Aya project (Flay et al., 2004), incorporated a community element into their programme design and both reported a positive impact on sexual behaviour in their intervention groups exposed to the community element. The All Stars programme showed inconsistent results across two studies (Harrington et al., 2001; McNeal et al., 2004) and also produced an increase in substance use in the specialist condition. The Healthy for Life Programme (Piper et al., 2000) also produced long-term increases in alcohol use at two years follow-up. The Gatehouse Project (Bond et al., 2004; Patton et al., 2006) showed no programme effects for any health outcomes.

Evidence statement 15

15 (d) There is inconsistent evidence from one RCT and one CBA study[1] to determine the effect of general health education programmes on knowledge, attitudes and values relating to sexual health and alcohol use.

15 (e) There is moderate evidence from three RCTs[2] to suggest that general health education programmes incorporating an intensive community intervention element in conjunction with a curriculum base may have a positive effect on sexual behaviour and substance use. The evidence may only be partially applicable to the UK as programmes were implemented in the USA and focused primarily on black and minority ethnic groups. As such their generalisbility may be limited to the populations studied.

15 (f) There is moderate evidence from five RCTs[3] to suggest that curriculum-based, general health education programmes have no impact on, and in some cases may have a negative impact

on, sexual behaviours and alcohol use. Studies were based on two programmes conducted in the USA and Australia and therefore the evidence may not be generalisable beyond the populations studied.

[1] Moberg & Piper, 1990 (CBA +); Piper et al., 2000 (RCT -)

[2] Flay et al., 2004 (RCT ++); O'Donnell et al., 1999, 2002 (both RCT +)

[3] Harrington et al., 2001 (RCT +); McNeal et al., 2004 (RCT +); Piper et al., 2000 (RCT -); Bond et al., 2004 (RCT ++); Patton et al., 2006 (RCT +)

7.1.5 Summary tables

Table 7.2. General health education: short-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Personal/social skills
Bond et al., 2004	RCT ++	Gateway Project n=1,335	No intervention n=1,342	PT (>90%)	-	**NS** depressive symptoms	**NS** social relations

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 7.3. General health education: short-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Sexual Health			Alcohol use
					Age of initiation	Frequency/ Number of partners	Contraceptive use	
Bond et al., 2004	RCT ++	Gateway Project n=1,335	No intervention n=1,342	PT (>90%)	-	-	-	**NS** any drinking **NS** regular use **NS** binge drinking
Harrington et al., 2001	RCT +	All Stars Specialist condition, n=269 Teacher condition, n=287	n=739	PT (1 year)	-	**NS** sexual activity	-	↑ past month substance use (specialist condition only*)
O'Donnell et al., 1999	RCT +	Reach for Health, n=222[a] Reach for Health + CYS, n=255[a]	No intervention n=584[a]	PT n=1,061 (92%)	-	↓ recent sex (RHS + CYS only*) ↓ sexual risk behaviour index (RHS + CYS only*)	-	-
Patton et al., 2006	RCT +	Gateway Project n=1,158	No intervention n=1,428	PT n=NA[c]	**NS** early initiation	-	-	**NS** substance use

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] only students who completed both baseline and follow-up surveys; [b] based on eligible sample at 10th grade; [c] follow-up based on cross-sectional surveys

Table 7.4. General health education: medium-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Personal/social skills
Bond et al., 2004	RCT ++	Gateway Project n=1,335	No intervention n=1,342	1 year (>90%)	-	**NS** depressive symptoms	**NS** social relations
Moberg & Piper, 1990	CBA +	Project Model Health n=115	No intervention n=82	1 year	**NS** health knowledge	↑ sexual attitudes to postpone sex and use contraception* ↓ substance use and intent index* **NS** self-esteem	-
Piper et al., 2000	RCT -	Healthy for Life Age appropriate, n=827 Intensive, n=758	No intervention n=898	9th grade	-	↓ perceptions of peer substance use (intensive condition only***)	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 7.5. General health education: medium-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Sexual health outcomes			Alcohol use
					Age of initiation	Frequency/ Number of partners	Contraceptive use	
Bond et al., 2004	RCT ++	Gatehouse Project n=1,335	No intervention control n=1,343	1 year (>90%)	-	-	-	**NS** Any drinking **NS** Regular drinker **NS** Binge drinking
McNeal et al., 2004	RCT +	All Stars Specialist condition, n=NR Teacher condition, n=NR	Normal health education n=NR	1 year n=1822 (72%)	-	**NS** past month sexual activity	-	↓ past month alcohol use (Teacher condition only*)
Moberg & Piper, 1990	CBA +	Project Model Health n=115	No intervention n=82	1 year (74%)	-	↓ sexual activity, past month**	-	**NS** alcohol use, past month **NS** alcohol use, quantity/frequency

Study	Rating	Intervention	Comparator	Follow-up	Sexual health outcomes			Alcohol use
					Age of initiation	Frequency/ Number of partners	Contraceptive use	
Piper et al., 2000	RCT -	Healthy for Life Age appropriate, n=827 Intensive, n=758	No intervention n=898	9th grade (80%)	-	↑ sexual intercourse, past month (age appropriate only***)	-	↑ alcohol use, past month (intensive condition only*)

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 7.6. General health education: long-term programme effects on knowledge, attitudes and skills

Study	Rating	Intervention	Comparator	Follow-up	Outcomes		
					Knowledge	Attitudes and values	Personal/social skills
Piper et al., 2000	RCT -	Healthy for Life Age appropriate, n=827 Intensive, n=758	No intervention n=898	10th grade (68%)	-	**NS** perceptions of peer substance use	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported

Table 7.7. General health education: long-term programme effects on health and social outcomes

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes relating to sexual health			Alcohol use
					Age of initiation	Frequency/ Number of partners	Contraceptive use	
Patton et al., 2006	RCT +	Gateway Project n=966[a]	No intervention n=1,497[a]	2 years NA[a]	↓ early initiation	-	-	**NS** substance use
Flay et al., 2004	RCT ++	Aban Aya Social development curriculum, n=204	Health Enhancement Curriculum n=184	3 years	-	**NS** recent sex	**NS** condom use	↓ substance use (boys only*)
		Aban Aya School/ community, n=185			-	↓ recent sex (boys only*)	↑ condom use (boys only*)	↓ substance use (boys only*)

Study	Rating	Intervention	Comparator	Follow-up	Health outcomes relating to sexual health			Alcohol use
					Age of initiation	Frequency/ Number of partners	Contraceptive use	
Piper et al., 2000	RCT -	Healthy for Life Age appropriate, n=827 Intensive, n=758	No intervention n=898	10th grade (68%)	-	**NS** sexual intercourse, past month	-	↑ alcohol use, past month*
O'Donnell et al., 2002	RCT +	RFH + CYS (1 or 2 programme years) n=NR	RFH curriculum only (1 or 2 programme years) n=NR	2 years n=195 (77%[b])	↓ sexual initiation (1-year CYS*; 2-year CYS**)	↓ recent sex (1-year CYS*;2-year CYS**)	-	-

*p≤0.05; **p≤0.01; ***p≤0.001; ↑ increase relative to comparator; ↓ decrease relative to comparator; **NS** not significant; - outcome not reported
[a] follow-up based on cross-sectional surveys

8 Discussion

8.1 Alcohol and drug education programmes

A total of 119 articles met the criteria for inclusion in the review of alcohol and drug education programmes. Fourteen articles were systematic reviews and meta-analyses, 103 articles reported on the evaluation of an alcohol or substance use education programme, and two articles were economic evaluation studies. Of the 103 articles, 74 reported on evaluations of classroom-based programmes; 20 of which were alcohol specific, and 54 of which focused on substance use including alcohol. Also identified were 15 articles that reported on evaluations of brief or single session interventions, nine articles reporting on two multicomponent school- and community-based programmes and five articles reporting on evaluations of peer support and/or counselling programmes.

8.1.1 Systematic reviews and meta-analyses

A total of 14 systematic reviews and meta-analyses were identified for inclusion. The majority of the reviews identified examined the effectiveness of programmes targeting substance use including alcohol, and only three reviews (Foxcroft et al., 2002; Loveland-Cherry, 2003; Spoth et al., 2008) focused specifically on the prevention of alcohol use. Foxcroft et al (2002) found that there was no consistent evidence to determine which programmes were effective over the short to medium-term, but highlighted three programmes which were effective over the longer term. These included the family-based, Strengthening Families programme, and two school-based programmes, Botvin's LST and a culturally-focused curriculum for Native American students. Spoth et al (2008) highlighted promising evidence from six additional programmes, Keepin it REAL, the Midwest Prevention Project, Project Northland, Healthy School and Drugs, Project ALERT, and SHAHRP. Two reviews (Cuijpers, 2002; Gottfredson and Wilson, 2003) identified evidence to suggest that peer leaders strengthened the effects of school-based interventions, although Gottfredson and Wilson (2003) found that any beneficial effects of peer involvement were lost when they were combined with teacher-led activities. White et al (2004) did not find any evidence to suggest that any particular agency or external contributor was more effective than another.

8.1.2 Classroom-based programmes

A total of 74 articles were identified for inclusion that reported on evaluations of classroom-based programmes. Overall, 20 articles were identified for inclusion that reported on the evaluation of 12 alcohol education programmes across 15 studies and 54 articles were identified that examined 22 classroom-based substance use (including alcohol) prevention programmes across 34 studies.

Of the 15 studies identified for inclusion that examined alcohol education programmes, nine studies were RCTs, three were NRCTs and three were CBA studies. The 12 alcohol education programmes were primarily classroom-based curriculums, but two programmes incorporated additional materials and activities for parents. The programmes identified targeted students across a range of age groups; eight programmes targeted students aged 14 or younger and four programmes were targeted at older

adolescents. Across eight studies (Bagnall, 1990; McBride et al., 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Newman et al., 1992; Shope et al., 1996a) that examined intervention effects on knowledge related to alcohol use there were indications that alcohol-specific education programmes generally increased alcohol or curriculum knowledge over the short-term. However, effects on medium- and long-term knowledge acquisition were weaker. Eight studies (Bagnall, 1990; Baumann, 2006; McBride et al., 2004; Morgenstern et al., 2009; Newton et al., 2009; Schnepf, 2002; Vogl et al., 2009; Wilhelmsen et al., 1994) examined young people's alcohol-related attitudes and values, finding non-significant programme effects across the majority of programmes. However, the SHAHRP programme (McBride et al., 2004), which was based on a harm reduction approach, had positive short- and long-term effects on students' alcohol-related attitudes. Short-term increases in safer alcohol-related attitudes were also reported by Wilhelmsen et al (1994) who examined a highly-role specific programme compared to a less-role specific alcohol programme. Few studies examined intervention effects on personal and social skills. Intervention impacts on a range of alcohol-related measures were examined across the included studies. The SHAHRP programme (McBride et al., 2004) appeared to have the most consistent effects on short-term alcohol use, and additionally had effects on hazardous/harmful drinking. Medium- to long-term effects on alcohol consumption were found to be limited. Studies were either methodologically poor, as in the case of the AAPT programme, or reported conflicting or diminished effects. For example, 17-months after delivery of the SHAHRP programme (McBride et al., 2004) the positive short-term effects appeared to be declining. Although intervention effects favoured SHAHRP, differences between intervention and control students in terms of their alcohol consumption and other measures of alcohol use including harmful/hazardous drinking were no longer significant. There were no long-term effects of a longer term version of the AMPS programme (Shope et al., 1996a) on alcohol consumption, but there did appear to be intervention effects on alcohol misuse.

Of the 34 studies, which examined 22 classroom-based substance use (including alcohol) prevention programmes, 23 were based on RCT designs, seven were NRCTs and four were CBA studies. Although all of the programmes were primarily classroom-based, five programmes combined school components with family- and/or community-based components. Two studies (Perry et al., 2003; Spoth et al., 2002, 2005, 2008) combined two originally school-based only programmes (DARE and LST, respectively) with components targeting parents. The majority of programmes targeted students aged 14 or younger. Four studies (Botvin et al., 1990a; Botvin et al., 2001a; Shope et al., 1996b; Cuijpers et al., 2001), including evaluations of LST, AMPS, DARE, and the Healthy School and Drugs Project, respectively, examined programme effects on alcohol-related knowledge. Overall both short and medium-term increases in alcohol knowledge were reported but these were not sustained long-term. Twenty-one studies reported outcomes relating to alcohol or substance use attitudes and behavioural intentions. There were inconsistent effects on attitudes towards alcohol use and peer norms, but eight studies (Botvin et al., 1995b; 1997; 2001a; Caplan et al., 1992; Eisen et al., 2002; Lennox & Cecchini, 2008; Perry et al., 2003; Hecht et al., 2003), which examined behavioural intentions indicated generally positive programme effects on intentions to drink or get drunk. Intervention effects on personal and social skills were examined across a small number of programmes but found to be

inconsistent. Four programmes, the Positive Youth Development Programme, the Unplugged programme a revised version of Project Alert, and the Healthy School and Drug Project had positive short-term programme effects on alcohol use. However, the findings of the Positive Youth Development Programme (Caplan et al., 1992) were limited by the poor quality of the study. Positive longer term effects were demonstrated for two programmes, Keepin It REAL (Hecht et al., 2003) and Be Under Your Own Influence/All Stars (Slater et al., 2006), which combined school and media intervention components. The strongest evidence of effectiveness came from a series of studies which examined Botvin's LST (Botvin et al., 1990a; 1990b; 1995b; 1997; 2001a; Fraguela et al., 2003). Two studies (Botvin et al., 1997; 2001a) found positive short- and medium-term effects on drinking frequency and binge-drinking, and these were sustained long-term (Botvin et al., 1995b; 2001a). However, replication of the programme by other research groups suggests that there may be issues with the transferability of LST to other settings (Fraguela et al., 2003; Smith et al., 2004; Spoth et al., 2005; 2008).

8.1.3 Brief behavioural or single session interventions

A total of 15 articles were identified that reported on evaluations of seven brief or single session intervention approaches across 13 studies. Of the 13 studies, 11 studies were RCTs, one was an NRCT and one was a CBA study. All 13 studies were primarily school-based but six studies examined interventions which incorporated materials targeting parents. A range of providers were utilised including school nurses, physicians, teachers, fitness professionals, consultants, trained research staff and motivational speakers. Two studies were based on mailed intervention materials and therefore did not involve a provider in the delivery.

None of the studies examined intervention effects on knowledge or understanding but 11 studies (Argentos, 1991; Dempster et al., 2006; Werch et al., 1996a; 1996b; 2000a; 2003b; 2005a; 2005b; 2005c; 2008a) examined intervention effects on students' attitudes and values. Across these studies, there was an indication of positive intervention effects in the short-term, resulting in increases in negative views of alcohol and/or its consequences and a decrease in alcohol-related expectancies. Brief behavioural or single session intervention approaches appeared to have inconsistent short- and medium-term effects on student's intentions to drink. Few studies examined intervention effects on personal and social skills, and for two studies (Werch et al., 2003b; 2005b) that impacts on self-control and parent-child relationships intervention effects were mixed. Eight studies (Werch et al., 1996a; 1996b; 1998; 2000a; 2000b; 2003b; 2005a; 2005b) that examined STARS for Families and Project SPORT, two brief intervention approaches based on nurse consultations, indicated mixed, but generally positive effects of this programme approach on alcohol consumption and heavy drinking in the short- to medium-term. An alcohol tailored beverage programme (Werch et al., 2005c) and a brief intervention founded on the Behaviour-Image Model (Werch et al., 2008a) had inconsistent effects on alcohol use, and two further programmes, a single session on the dangers of binge drinking (Dempster et al., 2006), and the one week Programme "Kickoff" (Argentos, 1991), had no effects on alcohol use.

8.1.4 Multicomponent school- and community-based programmes

Nine studies (Perry et al., 1996; Komro et al., 1999; 2001; 2008; Perry et al., 2002; Williams et al., 1995; Toomey et al., 1996; Johnson et al., 1990; Chou et al., 1998) were identified that examined two multicomponent, school- and community-based programmes: Project Northland and the Midwest Prevention Project. Both programmes were based in communities in the USA and combined comprehensive school-based curriculums, with community-based activities and parental involvement components. All nine studies identified for inclusion were based on an RCT design.

None of the studies examined intervention effects on knowledge or understanding, or personal and social skills. There no were effects of Project Northland on attitudes and values and neither of the studies of the MPP examined intervention effects on these outcomes. Project Northland significantly reduced growth in binge drinking and tendency to use alcohol during Phase I and II of the programme (Perry et al., 1996; 2002; Komro et al., 2001), however, during the interim phase of the programme the growth in alcohol use was greater among intervention students than control students. The three-year MPP (Johnson et al., 1990; Chou et al., 1998) did not have significant effects on alcohol use in one cohort of ninth/tenth grade students, but a short-term secondary prevention effect was reported in a second cohort.

8.1.5 Peer support and counselling programmes

Five studies examined five peer support and counselling programmes. Of the five studies identified for inclusion, one study was based on an RCT design; two studies were NRCTs; and two studies were based on CBA designs. All five programmes were school-based only and the provider for three peer support programmes (Colnes, 2001; Padget et al., 2005; Webster et al., 2002) was peers alone. The two counselling programmes (Bremberg & Arborelius, 1994; Valentine et al., 1998) were delivered by health counsellors or educational psychology students, respectively.

None of the studies examined intervention effects on knowledge or understanding, or personal and social skills. Three studies (Colnes, 2001; Padget et al., 2005; Bremberg & Arborelius, 1994) examined short-term intervention effects on attitudes and values. For two peer leadership programmes there appeared to be modest impacts on attitudes to alcohol and one study of a counselling programme found that the programme had a positive impact on the number of psychological problems that students' attributed to their alcohol use (Bremberg & Arborelius, 1994). Neither of the counselling programmes (Bremberg & Arborelius, 1994; Valentine et al., 1998) was shown to be effective in reducing alcohol consumption, and one programme (Valentine et al., 1998) had potentially harmful effects on high school students' alcohol consumption. There were inconsistent effects of peer support programmes on alcohol use.

8.1.6 Review of published economic evaluations

Two studies (Swisher et al., 2004; Pentz, 1998) were identified that met the criteria for inclusion in the review of published economic evaluations. Swisher et al (2004) assessed the cost-effectiveness of standard and infused LST, and Pentz (1998) assessed the costs, benefits and cost-effectiveness of the MPP. The standard LST programme was found to be more cost effective than I-LST by $33.46

per student after 1 year of intervention delivery. In the second year, however, standard LST had no effects and the authors concluded that I-LST was more cost-effective. The 3-year total costs of the two programmes were estimated at $109,429.04 and $93,088.17, respectively. The results of the cost-benefit analysis (CBA) of the MPP demonstrated a $700 net saving per family per year resulting from a reduction in the incidence of monthly drunkenness. Cost benefits ratios were also shown to be favourable (ratio to $1 spent on prevention to saving is $1:1.69). Compared to "usual" drug education the ICER of the MPP was reported to be equal to the ratio of its incremental cost per incremental effects, equivalent to $10 per net reduction in the incidence of monthly drunkenness.

8.2 Sex and relationships education

A total of 75 articles met the criteria for inclusion in the review of sex and relationships education programme. Nine articles were systematic reviews and meta-analyses, 65 articles reported on evaluations of sex and relationships education interventions, and one article was an economic evaluation study.

8.2.1 Systematic reviews and meta-analyses

Nine systematic reviews evaluated abstinence only and abstinence plus safer-sex promotion programmes (Underhill et al., 2007, 2008; Bennett & Assefi, 2005), safer-sex promotion (Oakley et al., 1995; Franklin et al., 2007; Kirby et al.,1994; Pedlow and Carey, 2003; Robin et al., 2004) and sexuality-focused interventions (Sales et al., 2006). Findings from three reviews that examined abstinence-only and abstinence-plus programmes (Underhill et al., 2007, 2008; Bennett and Assefi, 2005) indicated that abstinence-only programmes have limited effects or are ineffective for preventing or reducing sexual risk behaviours. In addition, Oakley et al (1995) found evidence to suggest that abstinence only education may have an adverse effect and actually increase sexual experimentation among students. For programmes that incorporated information on safe sex and use of contraception, there was evidence from five reviews (Underhill et al., 2008; Pedlow & Carey, 2003; Franklin et al., 1997; Kirby et al., 1994; Oakley et al., 1995) to suggest that interventions may have effects on preventing sexual risk behaviours, but that these effects tend to be modest. There was no evidence that sexuality and AIDS education increased sexual activity.

8.2.2 UK-based studies

Twelve UK studies, evaluating seven programmes, were identified that could be defined as predominantly sex and relationships education. Of the 12 studies, six were RCTs, two studies were based on an NRCT design, and five were CBA studies. Seven studies (Henderson et al., 2007; Mellanby et al., 1995; 2001; Stephenson et al., 2004; 2008; Tucker et al., 2007; Wight et al., 2002) reported on evaluations of three comprehensive school-based programmes, A PAUSE, RIPPLE and SHARE, respectively. Two studies (Gillies et al., 1990; Bellingham et al., 1993) reported on evaluations of the Streetwize UK, AIDS education comic, Denman et al (1995) examined a theatre in education programme and two studies (Graham et al., 2002; Magnusson et al., 2004) examined single lessons on emergency contraception and contraceptive services, respectively.

Across four studies (Tucker et al., 2007, Wight et al., 2002; Stephenson et al., 2004; Mellanby et al., 2001) that examined three comprehensive school-based programmes, there were indications that these programmes had significant effects on knowledge about STIs. Three studies (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990) that examined a theatre in AIDS/HIV education programme and the Streetwize UK comic, respectively, had positive impacts on knowledge about HIV, and a teacher-led intervention about emergency contraception (Graham et al., 2002) increased knowledge relating to contraception. The effects of three comprehensive SRE programmes on attitudes were mixed. There were inconsistent or no effects of the peer-led RIPPLE programme and A PAUSE, but there were positive programme effects of the SHARE programme (Tucker et al., 2007) on attitudes concerning condom use and STI prevention, on self-efficacy to use condoms. Other intervention approaches focusing on HIV prevention (Denman et al., 1995; Bellingham and Gillies, 1993; Gillies et al., 1990) and emergency contraception (Graham et al., 2002) had limited impacts on attitudes and values. Results for skills outcomes were limited with few studies reporting on these outcomes. In addition, few of the studies found significant programme effects on health outcomes related to sexual health. There were positive medium- and long-term effects of the A PAUSE (Mellanby et al., 1995) and RIPPLE (Stephenson et al., 2004) programmes on the number of students who reported ever having had sex, although for RIPPLE this effect was only apparent among females at the 18-month follow-up. There were no effects of either the RIPPLE (Stephenson et al., 2004; 2008) or SHARE (Wight et al., 2002) programmes on use of condoms or other forms of contraception. There was mixed evidence on the effects of these programmes on pregnancy. There were no medium-term effects of the SHARE (Wight et al., 2002) or RIPPLE (Stephenson et al., 2004) programmes on rates of unintended pregnancies, however, Stephenson et al (2008) found that at age 20, students who participated in the peer-led RIPPLE programme were less likely to have been pregnant. There were no long-term effects of the RIPPLE (Stephenson et al., 2008) or SHARE (Henderson et al., 2006) programmes on abortion rates. Other intervention approaches focusing on HIV prevention (Denman et al., 1995; Bellingham and Gillies, 1993), and single lessons about emergency contraception (Graham et al., 2002) and contraceptive services (Magnusson et al., 2004), respectively, had no impact on sexual behaviours.

8.2.3 Abstinence-only programmes

Ten articles were identified that evaluated eight programmes defined as abstinence-only programmes across nine studies. These programmes encouraged and promoted abstinence as the best and only way to prevent pregnancy, HIV and other STIs. Of the nine studies, two were RCTs and seven were NRCTs. Four programmes were teacher-led and one was peer-led. The provider for three programmes was not reported. Abstinence-only programmes were generally targeted at students younger than 14 years, with the exception of the Sex Can Wait programme, which consists of upper elementary, middle and high school components.

Knowledge outcomes were reported in six studies (Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny and Young, 2006; Jorgensen et al., 1993; Trenholm et al., 2008) and overall abstinence-only programmes appeared to be effective at increasing knowledge related to STIs in the

short- to medium-term. Evidence was lacking on the longer term effects on knowledge. Eight studies examined effects on attitudes and values, and abstinence-only programmes were generally found to have had a positive effect on participants' beliefs and attitudes towards abstinence, and no programmes reported an adverse programme effect on attitudes towards abstinence or intentions to have sex. Results from the studies that examined intervention effects on parent-child communication indicated that abstinence-only programmes did not affect communication. Eight studies (Christopher & Roosa, 1990; Blake et al., 2001; Borawski et al., 2005; Denny et al., 1999; Denny & Young, 2006; Jorgensen et al., 1993; Roosa & Christopher, 1990; Trenholm et al., 2008) demonstrated that abstinence-only programmes had non-significant or inconsistent effects on the initiation of sexual activity. Two studies (Borawski et al., 2005; Trenholm et al., 2008) reported outcomes relating to contraception and no impact on contraception use. One abstinence-only programme, Success Express (Christopher and Roosa, 1990), had a negative effect; at follow-up intervention students reported greater lifetime sexual experience than controls. However, in a replication study of this programme (Roosa & Christopher, 1990) there was no difference between intervention and control students on this measure.

8.2.4 Abstinence-plus programmes

A total of 24 articles were identified that reported on the evaluation of 15 abstinence plus programmes across 18 studies. Abstinence plus programmes were defined as those that reported an emphasis on abstinence as the safest way to avoid HIV/STI infection and pregnancy, but also promoted safer sex through the use of contraceptives. Of the 18 studies identified, ten were RCTs and eight were NRCTs. Two programmes, Safer Choices and YAPP, incorporated activities for parents and one programme, Protection Express, was exclusively peer-led. The programmes identified tended to target older adolescents (>14 years) or students across a range of ages, from the age of 13 years and upwards.

Fourteen studies (Aarons et al 2000; Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; 2001; 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Siegel et al., 1998; 2001; Walter & Vaughan, 1993; Wright, 1998; Zimmerman et al., 2008) examined intervention effects on sexual health knowledge, finding that abstinence-plus programmes were generally effective in improving sexual health knowledge in the short- and medium-term. In addition, three studies (Coyle et al., 2001; Kirby et al., 1991; Wright, 1998) reported sustained long-term increases in knowledge among students exposed to abstinence plus programmes compared to controls. The results of 14 studies (Aarons et al., 2000; Borawski et al., 2009; Coyle et al., 1999; Coyle et al., 2004; Eisen et al., 1990; Kirby et al., 1991; LaChausse, 2006; Levy et al., 1995; Siegel et al., 1998; 2001; Stanton et al., 2006; Walter & Vaughan, 1993; Wright, 1998; Zimmerman et al., 2008) demonstrated that intervention effects on behavioural intentions, attitudes to sexual behaviour, and self-efficacy were inconsistent and there was no clear indication of the direction of effects. In addition, some programmes, such as Draw the Line/Respect the Line, had differing effects on male and female students. Across five programmes that incorporated skills building activities (Borawski et al., 2009; Boyer & Shafer, 1997; Coyle et al., 1999; 2001; Kirby et al., 1991; Wright, 1998) there were positive short- to medium-term effects on skills relating to sexual risk prevention. There was no indication of short-term intervention

effects on the initiation of sexual involvement and at the medium-term follow-up, programme effects were largely inconsistent with four studies (Borawski et al., 2009; Caron et al., 2004; Kirby et al., 1991; Wright, 1998) reporting no effects on initiation of sexual intercourse. In addition, intervention effects on frequency of sexual intercourse, number of sexual partners and contraceptive use were found to be inconsistent or non-existent in the short-, medium- and long-term. Two studies (Eisen et al., 1990; Kirby et al., 1991) examined the medium- to long-term effects of a HLM-SLT curriculum and Reducing the Risk, respectively, on pregnancy. Neither study identified significant programme effects on this outcome.

8.2.5 HIV and sexual risk-reduction programmes

Overall, 11 studies were identified that examined HIV and sexual risk-reduction programmes. Studies were defined by their specific focus on HIV prevention and HIV risk-behaviour, sexual risk-behaviour or a combination of both. Of the 11 included studies, eight were RCTs, two were NRCT and one was based on a CBA study design. All programmes were delivered in school time however one programme included six computer-based activities to be completed outside of school time. The included studies focused on different ages and school years. One programme targeted students aged 12-14 years, but in general, programmes were targeted at older adolescents.

Seven studies (Borgia et al., 2005; Coyle et al., 2006; Fisher et al., 2002; Larsson et al., 2006; Roberto et al., 2007; Schaalma et al., 1996; Workman et al., 1996) examined intervention effects on general HIV and sexual health knowledge, finding significant effects on knowledge over the short-term. Two studies (Coyle et al., 2006; Larsson et al., 2006), which explored medium- to long-term effects on knowledge of HIV and contraception reported significant effects. Outcomes relating to attitudes were reported by seven studies (Borgia et al., 2005; Coyle et al., 2006; Fisher et al., 2002; Lemieux et al., 2008; Larsson et al., 2006; Roberto et al., 2007; Schaalma et al., 1996). Condom self-efficacy, perception of social norms and condom use/prevention intentions were the outcomes most commonly reported across these studies but intervention effects were found to be inconsistent with no clear direction of effect. Short-term programme effects on personal and social skills were predominantly positive and included positive programme effects on behavioural prevention skills and condom negotiation skills (Borgia et al., 2005; Fisher et al., 2002; Lemieux et al., 2008; Roberto et al., 2007; Workman et al., 1996). However, none of the included studies examined medium- to long-term impacts on skills. Intervention impacts on sexual initiation were explored in four studies (Roberto et al., 2007; Coyle et al., 2006; Kvalem et al., 1996; Mitchell-DiCenso et al., 1997), which overall indicated inconsistent effects on this outcome. Further studies indicated no impact on sexual activity or the numbers of sexual partners. Six studies (Fisher et al., 2002; Lemieux et al., 2008; Coyle et al., 2006; Kvalem et al., 1996; Larsson et al., 2006; Traeen, 2003) showed positive short-term programme effects on condom use and protected intercourse, but longer term programme effects on contraception use appeared to be limited. Limited outcomes were presented on HIV/STI testing, alcohol or drug use and pregnancy.

8.2.6 Other school-based approaches

Seven studies were identified that reported on six different programme approaches relating to sexual health; one was a NRCT, five were CBA studies and one study was based on an interrupted time series design. Two studies examined school-based clinic programmes (Stout et al., 1996; Teitler, 1997), two studies (Somers et al., 2001; 2006) reported findings from one programme using baby simulators (Baby Think it Over), and three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) examined the effects of combined community and school-based programmes.

None of the studies examined intervention effects on knowledge or understanding. Three studies (Stout et al., 1996; Somers et al., 2001; 2006), which examined school-based health clinics and an infant simulation intervention, respectively, reported inconsistent effects on attitudes towards sexual health and only one study examined programme effects on personal and social skills. There were no effects of the Baby Think it Over infant simulation programme on any of the sexual behaviour measures examined (Somers et al., 2001; 2006). Three studies (Lewis et al., 1999; Paine-Andrews et al., 1999; Vincent et al., 2004) that examined a school and community partnership approach to tackling teenage pregnancy, generally found that although there were reductions in pregnancy rates among 14-17 year olds at the intervention sites, these reductions were not found to be significant compared to non-intervention sites. However, one study (Vincent et al., 2004) that examined pregnancy rates over 20 years concluded that the intervention had had a positive effect on teenage pregnancies. Two studies (Stout et al., 1996; Teitler, 1997), which examined the long-term effects of school-based health centres, found that these programmes did not have consistent effects on participant's sexual behaviour.

8.2.7 Review of published economic evaluations

One study (Wang et al., 2000) was identified that met the criteria for inclusion in the review of published economic evaluations. Wang et al (2000) evaluated the cost-effectiveness and cost benefits of a school-based sex and relationships education programme, Safer Choices. Overall the net benefit of the Safer Choices programmes was $174,276 and the benefit-cost ratio was 2.65, indicating that for every $1 spent on the programme, $2.65 were saved in medical and societal costs. The generalisbility of the study to a UK context was unclear as the data used in the evaluation was based on studies conducted in the USA, and utilised other US population estimates. However, the authors state that the methods and data used were conservative and it is possible that the intervention may be cost saving in a UK context.

8.3 General health education programmes

8.3.1 Systematic reviews and meta-analyses

No systematic reviews or meta-analyses were identified for inclusion in the review of general health education programmes.

8.3.2 General health education programmes

Overall, nine studies reported on the evaluation of six general health education programmes that reported relevant alcohol and sexual education outcomes. Of the nine studies, eight were RCTs and one was a CBA study. All six programmes were primarily delivered in schools. Four programmes were solely school-based and two programmes incorporated both school and community elements. All six programmes targeted young adolescents aged less than 14 years.

One study (Moberg & Piper, 1990) examined programme effects on knowledge, finding no significant effects of Project Model Health on curriculum-specific knowledge. However, there were positive medium-term effects of this programme on attitudes towards postponing sex and using contraceptives, and attitudes and intentions towards alcohol and other drugs. Piper et al (2000) found a medium-term impact on students' perceptions of peer attitudes towards alcohol and other drugs in those receiving the intensive condition of the Healthy for Life Programme. However, there was no longer term effect of this programme. None of the studies examined intervention effects on personal and social skills. Two programmes, the RFH curriculum (O'Donnell et al., 1999; 2002) and the Aban Aya project (Flay et al., 2004), which incorporated community components, had positive effects on sexual behaviour in the medium- to long-term. Four school-based programmes (Bond et al., 2004; Harrington et al., 2001; McNeal et al., 2004; Patton et al., 2006; Piper et al., 2000) had either no effect or harmful effects on sexual behaviours and alcohol use.

8.3.3 Review of published economic evaluations

No published economic evaluation studies were identified for inclusion in the review of general health education programmes.

8.4 Strengths and limitations

The review of the effectiveness and cost-effectiveness of PSHE in secondary schools focusing on SRE and alcohol education was based on a comprehensive and systematic literature review. Over 11,000 titles and abstracts were screened for inclusion for the review, and over 900 full text articles were reviewed. In addition, the review has been conducted using a standardised and transparent approach, adhering to protocols for the development of NICE public health guidance.

8.4.1 Quality of the included studies

The studies identified for inclusion in the review were based on a range of study designs, with over half of the studies based on an RCT design. The study quality was variable across the included studies and overall one third of the included studies were rated poor quality. Approximately one tenth of studies achieved a good rating (++), with the remainder rated moderate quality (~60%). The vast majority of studies did not describe the source population or source area from which study participants were drawn, and therefore it was not possible to determine the eligibility of the selected populations or area included. Few studies reported how selection bias was minimised. Across the RCTs identified for inclusion the authors reported little more than that randomisation had been undertaken. The actual methods of randomisation and whether allocation had been adequately concealed was rarely reported. For studies that were based on non-random assignment it was also

rarely reported how confounding and bias were minimised or how individuals or clusters were allocated to intervention or control arms. In addition, only two studies, both RCTs, reported whether investigators were blind to intervention and comparison groups. It was difficult to judge whether contamination was acceptably low across the included studies as few studies discussed whether contamination had or was likely to have occurred. For studies that randomised at the classroom or individual level there was the possibility that contamination occurred within schools, but for studies that randomised at the school level the possibility of contamination was minimised. Attrition rates varied across studies and some studies failed to account for all participants at study conclusion. Outcome measures were reported to be reliable in around two thirds of studies, which a proportion of studies reporting inter- or intra-rater reliability scores. Follow-up time varied greatly across the included studies from immediate post-test to over four years of follow-up. Around two-thirds of studies reported what was judged to be a follow-up time of adequate length. A variety of approaches were taken to the analysis of results. Few studies reported that an intention to treat analysis had been undertaken and few authors discussed whether the studies were adequately powered. Analytical methods appeared to be appropriate in the majority of studies, but estimates of effect size were not reported or calculable in some studies. Overall, the reporting quality of the studies was lacking meaning that the criteria on the study quality checklist were often noted as not reported.

8.4.2 Applicability

As highlighted in previous reviews conducted by the lead author and colleagues (Jones et al., 2007; 2009), there is a lack of prevention initiatives originating from the UK, particularly in the field of alcohol education. UK-based evaluations of a range of intervention approaches to SRE were identified for inclusion in the review and this provides applicable evidence from which to generate recommendations for practice and policy in England. However, the research literature on both SRE and alcohol education continues to be dominated by programmes from the USA, which may have a limited generalisbility to the UK context, because of their emphasis on abstinence.

8.4.3 How and why programmes worked

Due to the short timescales over which the review was conducted and the volume of evidence identified, it was beyond the scope of the review to undertake a full examination of how and why programmes that demonstrated effectiveness worked. However, the systematic reviews identified for inclusion the review highlighted characteristics of interventions that were effective.

For SRE programmes, more effective studies were theoretically based with social cognitive theory the most successfully applied theory (Kirby et al., 1994; Pedlow and Carey, 2003; Sales et al., 2006) and used trained adult educators (Robin et al., 2004; Sales et al., 2006), although it was recognised that trained peer providers could also be effective (Robin et al., 2004). Two reviews reported that successful interventions applied interactive strategies (Robin et al., 2004; Sales et al., 2006) and two highlighted the importance of including highly specific content focusing on reducing sexual risk behaviour such as skills about condom use or refusing sex (Kirby et al., 1994; Robin et al., 2004).

For alcohol education programmes, interactive programmes targeting alcohol have been found to be more effective than non-interactive programmes (Tobler et al., 2000; Cuijpers, 2002). Cuijpers (2002) proposed further quality criteria suggesting that programmes should be based on the social influence model and focus on normative education, commitment not to use substances, and intentions not to use. In addition, Cuijpers (2002) reported that life-skills training and/or the use of peer leaders strengthened the effects of school-based interventions.

8.5 Research recommendations

The review has identified a number of gaps in the evidence and future research should aim to address the following key research recommendations:

- There needs to be further evaluation of the effectiveness and cost-effectiveness of PSHE approaches in secondary school focusing on alcohol education, which are currently being delivered or planned in the UK;
- Full economic evaluation studies are required of PSHE approaches focusing on both SRE and alcohol education that consider both the costs and consequences of implementing these types of interventions and programmes.
- Future research should consider the relationship between alcohol use and sexual health.

Improvements in study design and the quality of reporting are required with respect to all types of studies and the following are recommendations to improve the methodology of future studies:

- Improved reporting of methods is required, particularly with regard to methods for the allocation of participants and clusters (e.g. methods of randomisation), allocation concealment, procedures for blinding, and follow-up of participants. Reporting standards could be improved by following guidelines on reporting, such as the CONSORT statement for RCTs and TREND statement for non-randomised studies.
- Standardisation of outcomes is required. Across the included studies a range of attitudinal and behavioural measures were reported and consequently it was not possible to synthesise outcomes across studies. Also when considering which outcomes to incorporate, there needs to be a consideration of the age and level maturity of the sample targeted (e.g. with regard to studies of SRE programmes consideration should be given to the relationship status of participants).
- Some studies were conducted with inadequate sample sizes, and future research studies should be sufficiently powered to detect intervention effects.
- Future research studies should incorporate an adequate length of follow-up.

9 Conclusions

9.1 Alcohol and drug education programmes

The evidence suggests that classroom-based programmes, regardless of whether the focus is on alcohol alone or as one of a number of substances, may have beneficial effects on alcohol-related knowledge, particularly in the short- to medium-term. Programme effects on attitudes and values were mixed and inconsistent across a range of intervention approaches and the evidence was insufficient to draw conclusions about the impact of these programmes on personal and social skills. Overall, the findings of the review of alcohol and drug education programmes highlight that there is a lack of clear, medium- to long-term evidence for the effectiveness of school-based alcohol education programmes on health and social outcomes relating to alcohol use. In addition, the applicability to a UK context of those programmes that have demonstrated effectiveness, such as LST, STARS for Families and Project SPORT, is limited. There is lack of evidence on which to draw conclusions about the cost-effectiveness of alcohol and drug education programmes. Further good quality UK-based research of promising or novel intervention approaches, including assessment of cost-effectiveness, is required in order to improve the evidence base on which to make UK-based policy and practice recommendations for PSHE focusing on alcohol education.

9.2 Sex and relationships education programmes

There were consistently positive programme effects on acquisition of sexual health knowledge, across the SRE education programmes that examined this outcome, regardless of whether the programme emphasised abstinence or not. A range of outcomes were reported with regards to attitudes and values and programme effects were mixed or inconsistent across these measures. It was therefore not possible to draw unequivocal conclusions about the impact of SRE programmes on attitudes and values relating to sexual health. The evidence suggests that while abstinence-only programmes have no effects on health and social outcomes related to sexual health, programmes that incorporate information on safer sex and contraceptive use may have positive, but limited effects on the prevention of sexual risk behaviours, in particular limited effects on contraceptive use. Although the applicability of some of these programmes to a UK context is limited, these conclusions are supported by the evidence drawn from studies conducted in the UK. There is lack of evidence on which to draw conclusions about the cost-effectiveness of SRE programmes. Further good quality UK-based research of promising or novel intervention approaches, including assessment of cost-effectiveness, is required in order to add to the evidence base on which to make UK-based policy and practice recommendations for PSHE focusing on SRE.

9.3 General health education programmes

There was a lack of evidence on which to draw clear conclusions about the effects of the general health education programmes on knowledge, and attitudes and values relating to alcohol use and sexual health. The evidence suggests that general health education programmes, which incorporate an intensive community intervention element in conjunction with a curriculum base may have a positive effect on sexual behaviour and substance use. There were no effects, or in some cases

harmful effects on sexual health and alcohol use outcomes for curriculum-based, general health education programmes. In addition, the applicability of these programmes to a UK context was limited.

10 References

Bellis M, Hughes K, Calafat A, et al. (2008). Sexual uses of alcohol and drugs and the associated health risks: a cross sectional study of young people in nine European cities. BMC Public Health, 8(1):155.

Choquet M, Manfredi R (1992). Sexual intercourse, contraception, and risk taking behaviour among unselected French adolescents aged 11-20 years. Journal of Adolescent Health 13: 623-630.

Department for Children Schools and Families (2008) Review of sex and relationship Education (SRE) in Schools. London, Department for Children Schools and Families.

Department for Education and Employment. (2000) Sex and relationship education guidance. London, Department for Education and Employment.

Department for Education and Skills (2005) National Healthy Schools Status, a guide for schools. London, Department for Education and Skills.

Department for Education and Skills (2006) Teenage Pregnancy: Accelerating the Strategy to 2010. London, Department for Education and Skills.

Department for Education and Skills (2007) Improving Access to Sexual Health Services for Young People in Further Education Setting. London, Department for Education and Skills.

Department of Health (2007) Safe. Sensible. Social. The next steps in the National Alcohol Strategy. London: Department of Health.

Department of Health. (2009) Health profiles for England 2008. London, Department of Health.

Dye C, Upchurch DM (2006). Moderating effects of gender on alcohol use. Implications for condom use at first intercourse. Journal of School Health, 76 (3):111-116.

Emmerson (2008) National Mapping of On-site Sexual Health Services in Education Settings. Sex Education Forum.

Emmerson (2007) SRE and young people in further education: A review of provision and practice in England. Pastoral Care in Education, 25 (3):39-48.

Health Protection Agency (2009). Selected STI diagnoses and diagnosis rates from GUM clinics in the UK: 2004-2008. London, Health Protection Agency.

Hibell B, Andersson B, Bjarnasson T et al. (2004). The 2003 ESPAD report: alcohol and other drug use among students in 35 countries. Stockholm: Swedish Council for Information on Alcohol and Other Drugs.

Jones L, Bates G, Downing J, Sumnall H, Bellis MA (2009) A review of the effectiveness and cost-effectiveness of personal, social and health education in primary schools focusing on sex and relationship education for young people aged 5 to 11 years. Liverpool John Moores University

Kim-Godwin YS, Clements C, Bullers S et al. (2007). Sexual behaviors and drinking patterns among middle school and high school students in southeastern North Carolina. Journal of School Nursing 23 (4):214-221.

Lowry R, Holtzman D, Trueman BI, et al. (1994). Substance use and HIV related sexual behaviours among US high school students: are they related? Am J Public Health, 84: 1116-20.

MacDonald A (2009) Independent review of the proposal to make Personal, Social, Health and Economic (PSHE) education statutory. London, Department for Children, Schools and Families.

Miller JW, Naimi TS, Brewer R, Everett Jones S. (2007). Binge drinking and associated health risk behaviours among high school students. Pediatrics, 119: 76-85.

Prime Minister's Strategy Unit (2007) Alcohol Harm Reduction Strategy. London, Strategy Unit.

Qualifications and Curriculum Authority (2007) The National Curriculum 2007. London, Qualifications and Curriculum Authority.

Ramisetty-Mikler S, Caetano R, Goebert D, Nishimura S. (2004). Ethic variation in drinking, drug use, and sexual behaviour among adolescents in Hawaii. J School Health, 74: 16-22.

Robertson JA, Plant MA (1988). Alcohol, sex and risks of HIV. Drug Alcohol Dependence, 22: 75-78.

Appendix 1. References to included studies

Aarons SJ, Jenkins RR, Raine TR, et al (2000) Postponing sexual intercourse among urban junior high school students - A randomized controlled evaluation. Journal of Adolescent Health 27(4):236-247.

Argentos, M. S. (1991). The evaluation of a drug and alcohol prevention program in a secondary school setting. Dissertation Abstracts International 52 (4-B).

Assefi NP, Bennett SE (2005) School-based teenage pregnancy prevention programs: a systematic review of randomized controlled trials. Journal of Adolescent Health 36(1):72-81.

Aten MJ, Siegel DM, Enaharo M, Auinger P (2002) Keeping middle school students abstinent: Outcomes of a primary prevention intervention. Journal of Adolescent Health 31(1):70-78.

Bagnall, G. (1990). Alcohol education for 13 year olds--does it work? Results from a controlled evaluation. British Journal of Addiction 85 (1): 89-96.

Basen-Engquist K, Coyle KK, Parcel GS, et al (2001) Schoolwide effects of a multicomponent HIV, STD, and pregnancy prevention program for high school students. Health Education & Behavior 28(2):166-85.

Battistich V, Dean BJ, Gosselink CA, Zavela KJ (2004) Say yes first: follow up of a five-year rural drug prevention program. Journal of Drug Education 34(1):73-88.

Baumann BD (2006) Alcohol use and dating violence: A high-school prevention model, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 66.

Bell RM, Ellickson PL, Harrison ER (1993) Do drug prevention effects persist into high school? How project ALERT did with ninth graders.[see comment]. Preventive Medicine 22(4):463-83.

Bellingham K, Gillies P (1993) Evaluation of an AIDS education programme for young adults, in Journal of Epidemiology and Community Health, pp 134-8.

Bennett, G. T. (1995). An exploration of patterns of drug use and of the effectiveness of a substance abuse prevention program according to adolescents' level of academic achievement. Dissertation Abstracts International Section A: Humanities and Social Sciences 55 (10-A).

Blake SM, Simkin L, Ledsky R, et al (2001) Effects of a parent-child communications intervention on young adolescents' risk for early onset of sexual intercourse. Family Planning Perspectives 33(2):52-61.

Bond, L., Patton, G., Glover, S. et al. (2004). The Gatehouse Project: can a multilevel school intervention affect emotional wellbeing and health risk behaviours? Journal of Epidemiology and Community Health 58 (12): 997-1003.

Borawski EA, Trapl ES, Adams-Tufts K, et al (2009) Taking be proud! Be responsible! To the suburbs: A replication study. Perspectives on Sexual and Reproductive Health 41:12-22.

Borawski EA, Trapl ES, Lovegreen LD, et al (2005) Effectiveness of abstinence-only intervention in middle school teens. American Journal of Health Behavior 29(5):423-34.

Borgia P, Marinacci C, Perucci CA, Schifano P (2005) Is peer education the best approach for HIV prevention in schools? Findings from a randomized controlled trial. Journal of Adolescent Health 36(6):508-516.

Botvin GJ, Baker E, Dusenbury L, et al (1990) Preventing Adolescent Drug Abuse through a Multimodal Cognitive- Behavioral Approach: Results of a 3-Year Study. Journal of Consulting and Clinical Psychology 58(4):437-46.

Botvin GJ, Baker E, Dusenbury L, et al (1995a) Long-term follow-up results of a randomized drug abuse prevention trial in a white middle-class population. Journal of the American Medical Association 273(14):1106-1112.

Botvin GJ, Baker E, Filazzola AD, Botvin EM (1990) A cognitive-behavioral approach to substance abuse prevention: One-year follow-up. Addictive Behaviors 15(1):47-63.

Botvin GJ, Griffin KW, Diaz T, Ifill-Williams M (2001) Preventing binge drinking during early adolescence: one- and two-year follow-up of a school-based preventive intervention. Psychology of Addictive Behaviors 15(4):360-5.

Botvin GJ, Griffin KW, Diaz T, et al. (2001a). Drug abuse prevention among minority adolescents: posttest and one-year follow-up of a school-based preventive intervention. Prevention Science 2 (1): 1-13.

Botvin GJ, Griffin KW, Diaz T, et al. (2001b). Preventing binge drinking during early adolescence: one- and two-year follow-up of a school-based preventive intervention. Psychology of Addictive Behaviors 15 (4): 360-365.

Botvin GJ, Schinke SP, Epstein JA, et al. (1995b). Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority adolescents: Two-year follow-up results. Psychology of Addictive Behaviors 9 (3): 183-194.

Boyer CB, Shafer MA, Tschann J (1997) Evaluation of a Knowledge- and Cognitive-Behavioral Skills-Building Intervention to Prevent STDs and HIV Infection in High School Students. Adolescence 32(125):25-42.

Bremberg S, Arborelius E. (1994). Effects on adolescent alcohol consumption of a school based student-centred health counselling programme. Scandinavian Journal of Social Medicine 22 (2): 113-119.

Brewer LC (1991). Social skills training as a deterrent to entry level drug experimentation among 15-year-old adolescents. Unpublished PhD dissertation, University of Pennsylvania.

Caplan M, Weissberg RP, Grober JS, et al. (1992). Social competence promotion with inner-city and suburban young adolescents: Effects on social adjustment and alcohol use. Journal of Consulting and Clinical Psychology 60 (1): 56-63.

Caron F, Godin G, Otis J, Lambert LD (2004) Evaluation of a theoretically based AIDS/STD peer education program on postponing sexual intercourse and on condom use among adolescents attending high school. Health Education Research 19(2):185-197.

Chou CP, Montgomery S, Pentz MA, et al. (1998). Effects of a community-based prevention program on decreasing drug use in high-risk adolescents. American Journal of Public Health 88 (6): 944-948.

Christopher FS, Roosa MW (1990) An evaluation of an adolescent pregnancy prevention program: Is "Just Say No" enough? Family Relations 39(1):68-72.

Clayton RR, Cattarello AM, Johnstone BM (1996) The effectiveness of drug abuse resistance education (project DARE): 5- year follow-up results. Preventive Medicine 25(3):307-318.

Clayton RR, Cattarello A, Day L, Walden KP (1991). Persuasive communication and drug prevention: An evaluation of the DARE program. In: Donohew, L., Sypher, H. E., and Bukoski, W. J. (ed) Persuasive communication and drug abuse prevention, pp 295-313. Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Coggans N, Cheyne B, McKellar S (2003). The Life Skills Training Drug Education Programme: a review of research.

Colnes RM (2001). The effectiveness of a school-based substance use prevention program. Dissertation Abstracts International: Section B: The Sciences and Engineering 61 (8-B): pp-

Coyle K, Basen EK, Kirby D, et al (1999) Short-Term Impact of Safer Choices: A Multicomponent, School-Based HIV, Other STD, and Pregnancy Prevention Program. Journal of School Health 69(5):181-88.

Coyle K, Basen-Engquist K, Kirby D, et al (2001) Safer choices: Reducing teen pregnancy, HIV, and STDs. Public Health Reports 116(SUPPL. 1):82-93.

Coyle KK, Kirby DB, Maran BV, Gomez CA (2004) Draw the line/respect the line: a randomized trial of a middle school intervention to reduce sexual risk behaviors. American Journal of Public Health 94(5):843-852.

Coyle KK, Kirby DB, Robin LE, et al (2006) All4You! A randomized trial of an HIV, other STDs, and pregnancy prevention intervention for alternative school students. AIDS Education & Prevention 18(3):187-203.

Robin L, Dittus P, Whitaker D, et al (2004) Behavioral interventions to reduce incidence of HIV, STD, and pregnancy among adolescents: a decade in review. Journal of Adolescent Health 34(1):3-26.

Cuijpers P, Jonkers R, de Weerdt I, de Jong A (2002) The effects of drug abuse prevention at school: the 'Healthy School and Drugs' project. Addiction 97(1):67-73.

Dedobbeleer N, Desjardins S (2001) Outcomes of an ecological and participatory approach to prevent alcohol and other drug "abuse" among multiethnic adolescents. Substance Use & Misuse 36(13):1959-91.

Dempster M, Newell G, Cowan G, Marley J (2006) Facing up to binge drinking: reducing binge drinking in adolescent males. British Dental Journal 201(9):587-90; discussion 578.

Denman S, Pearson J, Moody D, The effects of drug abuse prevention at school: the 'Healthy School and Drugs' project (1995) Theatre in education on HIV and AIDS: a controlled study of school children's knowledge and attitudes. Health Education Journal 54(1):3-17.

Denny G, Young M (2006) An evaluation of an abstinence-only sex education curriculum: an 18-month follow-up. Journal of School Health 76(8):414-22.

Denny G, Young M, Rausch S, Spear C (2002) An evaluation of an abstinence education curriculum series: sex can wait. American Journal of Health Behavior 26(5):366-77.

Denny G, Young M, Spear CE (1999) An evaluation of the "sex can wait" abstinence education curriculum series. American Journal of Health Behavior 23(2):134-144.

Dent CW, Sussman S, Stacy AW (2001) Project Towards No Drug Abuse: generalizability to a general high school sample.[erratum appears in Prev Med. 2005 Jun;36(6):539-40]. Preventive Medicine 32(6):514-20.

Donnelly J, Ferraro H, Eadie C (2001) Effects of a health and relationship education program on drug behaviors. North American Journal of Psychology 3(3):453-462.

Dukes RL, Stein JA, Ullman JB (1997). Long-term impact of Drug Abuse Resistance Education (D. A. R. E.): Results of a 6-year follow-up. Evaluation Review 21 (4): 483-500.

Dukes RL, Ullman JB, Stein JA (1996). Three-year follow-up of Drug Abuse Resistance Education (D.A.R.E.). Evaluation Review 20 (1): 49-66.

Dusenbury L, Falco M, Lake A (1997). A review of the evaluation of 47 drug abuse prevention curricula available nationally. Journal of School Health 67 (4): 127-132.

Eisen M, Zellman GL, Massett HA, Murray DM (2002) Evaluating the Lions-Quest "Skills for Adolescence" drug education program: First-year behavior outcomes. Addictive Behaviors 27(4):619-632.

Eisen M, Zellman GL, McAlister AL (1990) Evaluating the impact of a theory-based sexuality and contraceptive education program. Family Planning Perspectives 22(6):261-271.

Eisen M, Zellman GL, McAlister AL (1992) A Health Belief Model-Social Learning Theory approach to adolescents' fertility control: findings from a controlled field trial. Health Education Quarterly 19(2):249-62.

Ellickson PL, Bell RM (1990) Drug prevention in junior high: A multi-site longitudinal test. Science 247(4948):1299-1305.

Ellickson PL, McCaffrey DF, Ghosh-Dastidar B, Longshore DL (2003) New Inroads in Preventing Adolescent Drug Use: Results from a Large-Scale Trial of Project ALERT in Middle Schools. American Journal of Public Health 93(11):1830-1836.

Ennett ST, Rosenbaum DP, Flewelling RL, et al. (1994). Long-term evaluation of drug abuse resistance education. Addictive Behaviors 19 (2): 113-125.

Fearnow-Kenney MD, Wyrick DL., Jackson-Newsom J, et al. (2003). Initial indicators of effectiveness for a high school drug prevention program. American Journal of Health Education 34 (2): 66-71.

Fisher JD, Bryan AD, Fisher WA, Misovich SJ (2002) Information-motivation-behavioral skills model-based HIV risk behavior change intervention for inner-city high school youth. Health Psychology 21(2):177-86.

Flay BR, Graumlich S, Segawa E, et al (2004) Effects of 2 Prevention Programs on High-Risk Behaviors among African American Youth: A Randomized Trial. Archives of Pediatrics and Adolescent Medicine 158(4):377-384.

Fraguela JAG, Martin AL, Trinanes ER (2003). Drug abuse prevention in the school: Four-year follow-up of a programme. Psychology in Spain

Franklin C, Grant D, Corcoran J, et al (1997) Effectiveness of Prevention Programs for Adolescent Pregnancy: A Meta- Analysis. Journal of Marriage and the Family 59(3):551-67.

Gillies PA, Stork A, Bretman M (1990) Streetwize UK: a controlled trial of an AIDS education comic. Health Education Research 5(Mar 90):27-33.

Gosin M, Marsiglia, FF, Hecht ML. (2003). keepin' it R.E.A.L.: A drug resistance curriculum tailored to the strengths and needs of pre-adolescents of the southwest. (84 refs.). Journal of Drug Education 33 (2): 119-142.

Gottfredson DC, Wilson DB (2003) Characteristics of effective school-based substance abuse prevention. Prevention Science 4:27-38.

Graham A, Moore L, Sharp D, Diamond I (2002) Improving teenagers' knowledge of emergency contraception: cluster randomised controlled trial of a teacher led intervention. BMJ 324(7347):1179.

Graham JW, Johnson CA, Hansen WB, et al. (1990). Drug use prevention programs, gender, and ethnicity: evaluation of three seventh-grade Project SMART cohorts. Preventive Medicine 19 (3): 305-313.

Griffin KW, Botvin GJ, Nichols TR, Doyle MM (2003) Effectiveness of a universal drug abuse prevention approach for youth at high risk for substance use initiation. Preventive Medicine 36(1):1-7.

Harmon MA (1993). Reducing the risk of drug involvement among early adolescents. Evaluation Review 17 (2): 221-239.

Harrington NG, Giles SM, Hoyle RH, et al (2001) Evaluation of the All Stars character education and problem behavior prevention program: effects on mediator and outcome variables for middle school students. Health Education & Behavior 28(5):533-548.

Hecht ML, Marsiglia FF, Elek E, et al. (2003). Culturally grounded substance use prevention: an evaluation of the keepin' it R.E.A.L. curriculum. Prevention Science 4 (4): 233-248.

Henderson M, Wight D, Raab GM, et al (2007) Impact of a Theoretically Based Sex Education Programme (SHARE) Delivered By Teachers On NHS Registered Conceptions And Terminations: Final Results Of Cluster Randomised Trial. BMJ 334(7585):133-136.

Hubbard BM, Giese ML, Rainey J (1998) A Replication Study of Reducing the Risk, a Theory-Based Sexuality Curriculum for Adolescents. Journal of School Health 68(6):243-47.

Johnson CA., Pentz MA., Weber MD, et al. (1990). Relative effectiveness of comprehensive community programming for drug abuse prevention with high-risk and low-risk adolescents. Journal of Consulting & Clinical Psychology 58 (4): 447-456.

Jorgensen SR, Potts V, Camp B (1993) Project Taking Charge: Six-month follow-up of a pregnancy prevention program for early adolescents. Family Relations 42(4):401-06.

Kirby D, Barth RP, Leland N, Fetro JV (1991) Reducing the risk: Impact of a new curriculum on sexual risk-taking. Family Planning Perspectives 23(6):253-263.

Kirby D, Short L, Collins J, et al (1994) School-based programs to reduce sexual risk behaviors: a review of effectiveness. Public Health Reports 109(3):339-60.

Kirby DB, Baumler E, Coyle KK, et al (2004) The "Safer Choices" intervention: Its impact on the sexual behaviors of different subgroups of high school students. Journal of Adolescent Health 35(6):442-452.

Klitzner M, Gruenewald PJ, Bamberger E, et al. (1994). A quasi-experimental evaluation of Students Against Driving Drunk. American Journal of Drug & Alcohol Abuse 20 (1): 57-74.

Komro KA, Perry CL, Veblen-Mortenson S, et al (2008) Outcomes from a randomized controlled trial of a multi-component alcohol use preventive intervention for urban youth: project northland Chicago. Addiction 103(4):606-18.

Komro KA, Perry CL., Williams CL. et al. (2001). How did Project Northland reduce alcohol use among young adolescents? Analysis of mediating variables. Health Education Research 16 (1): 59-70.

Kreft IG (1998). An illustration of item homogeneity scaling and multilevel analysis techniques in the evaluation of drug prevention programs. Evaluation Review 22 (1): 46-77.

Kulis S, Nieri T, Yabiku S, et al (2007) Promoting reduced and discontinued substance use among adolescent substance users: Effectiveness of a universal prevention program. Prevention science 8:35-49.

Kulis S, Marsiglia FF, Elek E, et al. (2005). Mexican/Mexican American adolescents and keepin' it REAL: an evidence-based substance use prevention program. Children & Schools 27 (3): 133-145.

Kvalem IL, Sundet JM, Rivo KI, et al (1996) The effect of sex education on adolescents' use of condoms: applying the Solomon four-group design. Health Education Quarterly 23(1):34-47.

LaChausse RG (2006) Evaluation of the Positive Prevention HIV/STD curriculum. American Journal of Health Education 37(4):203-210.

Larsson M, Eurenius K, Westerling R, Tyden T (2006) Evaluation of a sexual education intervention among Swedish high school students. Scandinavian Journal of Public Health 34(2):124-131.

Lemieux AF, Fisher JD, Pratto F (2008) A Music-Based HIV Prevention Intervention for Urban Adolescents. Health Psychology 27(3):349-357.

Lennox RD, Cecchini MA (2008) The NARCONON drug education curriculum for high school students: a non-randomized, controlled prevention trial. Substance Abuse Treatment, Prevention, & Policy 3:8.

Levy SR, Perhats C, Weeks K, et al (1995) Impact of a School-Based AIDS Prevention Program on Risk and Protective Behavior for Newly Sexually Active Students. Journal of School Health 65(4):145-51.

Lewis RK, Paine-Andrews A, Fisher J, et al (1999) Reducing the risk for adolescent pregnancy: evaluation of a school/community partnership in a Midwestern military community. Family & Community Health 22(2):16-31.

Loveland-Cherry CJ (2005) Alcohol, children, and adolescents. Annual Review of Nursing Research 23:135-77.

Lynam DR., Milich R, Zimmerman R, et al. (1999). Project Dare: No Effects at 10-Year Follow-up. Journal of Consulting & Clinical Psychology 67 (4): 590-593.

Magnusson J, Kendall S, Oakley L, Townsend J (2004) Promoting contraceptive services to teenagers. Community Practitioner 77(10):381-384.

McBride N, Farringdon F, Midford R, et al (2003) Early unsupervised drinking--reducing the risks. The School Health and Alcohol Harm Reduction Project. Drug & Alcohol Review 22(3):263-76.

McBride N, Farringdon F, Midford R, et al (2004) Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). Addiction 99(3):278-91.

McBride N, Midford R, Farringdon F, Phillips M (2000) Early result from a school alcohol harm minimization study: The school health and alcohol harm reduction project. Addiction 95(7):1021-1042.

McNeal RB, Jr., Hansen WB, Harrington NG, Giles SM (2004) How All Stars works: an examination of program effects of mediating variables. Health Education & Behavior 31(2):165-180.

Mellanby AR, Newcombe RG, Rees J, Tripp JH (2001) A comparative study of peer-led and adult-led school sex education. Health Education Research 16(4):481-92.

Mellanby AR, Phelps FA, Crichton NJ, Tripp JH (1995) School sex education: an experimental programme with educational and medical benefit. BMJ 311(7002):414-7.

Mitchell-DiCenso A, Thomas BH, Devlin MC, Goldsmith CH, et al (1997) Evaluation of an educational program to prevent adolescent pregnancy. Health Education and Behavior 24(3):300-12.

Moberg DP, Piper DL (1990). An outcome evaluation of Project Model Health: a middle school health promotion program. Health Education Quarterly 17 (1): 37-51.

Newton NC, Vogl LE, Teesson M, Andrews G (2009) CLIMATE Schools: alcohol module: cross-validation of a school-based prevention programme for alcohol misuse. Australian & New Zealand Journal of Psychiatry 43(3):201-7.

Oakley A, Fullerton D, Holland J, et al (1995) Sexual health education interventions for young people: a methodological review. BMJ 310:158-162.

O'Donnell L, Stueve A, Doval AS, et al (1999) The effectiveness of the Reach for Health Community Youth Service learning program in reducing early and unprotected sex among urban middle school students. American Journal of Public Health 89(2):176-182.

O'Donnell L, Stueve A, O'Donnell C, et al (2002) Long-term reductions in sexual initiation and sexual activity among urban middle schoolers in the reach for health service learning program. Journal of Adolescent Health 31(1):93-100.

Padget A, Bell ML, Shamblen SR, Ringwalt C (2005) Effects on high school students of teaching a cross-age alcohol prevention program. Journal of Drug Education 35(3):201-216.

Paine-Andrews A, Harris KJ, Fisher JL, et al (1999) Effects of a replication of a multicomponent model for preventing adolescent pregnancy in three Kansas communities. Family Planning Perspectives 31(4):182-189.

Palmer RF, Graham JW, White EL, et al. (1998). Applying multilevel analytic strategies in adolescent substance use prevention research. Preventive Medicine 27 (3): 328-336.

Patton GC, Bond L, Carlin JB, et al (2006) Promoting social inclusion in schools: A group-randomized trial of effects on student health risk behavior and well-being. American Journal of Public Health 96(9):1582-1587.

Pedlow CT, Carey MP (2003) HIV sexual risk-reduction interventions for youth: A review and methodological critique of randomized controlled trials. Behavior Modification 27(2):135-190.

Perry CL, Komro KA, Veblen-Mortenson S, et al (2003) A randomized controlled trial of the middle and junior high school D.A.R.E. and D.A.R.E. Plus programs. Archives of Pediatrics and Adolescent Medicine 157(2):178-184.

Perry CL, Williams CL, Veblen-Mortenson S, et al. (1996). Project Northland: outcomes of a communitywide alcohol use prevention program during early adolescence. American Journal of Public Health 86 (7): 956-965.

Piper DL, Moberg DP, King MJ (2000) The Healthy for Life project: behavioral outcomes. Journal of Primary Prevention 21(1):47-73.

Ringwalt C, Ennett ST, Holt KD (1991). An outcome evaluation of project DARE (Drug Abuse Resistance Education). Health Education Research 6 (3): 327-337.

Roberto AJ, Zimmerman RS, Carlyle KE, Abner EL (2007) A computer-based approach to preventing pregnancy, STD, and HIV in rural adolescents. Journal of Health Communication 12(1):53-76.

Roosa MW, Christopher FS (1990) Evaluation of an Abstinence-Only Adolescent Pregnancy Prevention Program: A Replication. Family Relations 39(4):363-67.

Rosenbaum DP, Hanson GS (1998). Assessing the effects of school-based drug education: A six-year multilevel analysis of project DARE. (60 refs.). Journal of Research in Crime and Delinquency 35 (4): 381-412.

Rosenbaum DP, Flewelling RL, Bailey SL, et al. (1994). Cops in the classroom: A longitudinal evaluation of drug abuse resistance education (DARE). Journal of Research in Crime and Delinquency 31 (1): 3-31.

Sales JM, Milhausen RR, DiClemente RJ (2006) A decade in review: Building on the experiences of past adolescent STI/HIV interventions to optimise future prevention efforts. Sexually Transmitted Infections 82(6):431-436.

Schaalma HP, Kok G, Bosker RJ, et al (1996) Planned development and evaluation of AIDS/STD education for secondary school students in The Netherlands: short-term effects. Health Education Quarterly 23(4):469-87.

Schnepf CM (2002) Comparing the effects of a peer- and a teacher-implemented alcohol education program for urban adolescents, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 63.

Shope JT, Copeland LA, Marcoux BC, Kamp ME (1996) Effectiveness of a school-based substance abuse prevention program. Journal of Drug Education 26(4):323-37.

Shope JT, Copeland LA, Maharg R, Dielman TE (1996) Effectiveness of a high school alcohol misuse prevention program. Alcoholism: Clinical and Experimental Research 20(5):791-798.

Shope JT, Copeland LA, Kamp ME, et al. (1998). Twelfth grade follow-up of the effectiveness of a middle school-based substance abuse prevention program. Journal of Drug Education 28 (3): 185-197.

Shope JT, Kloska DD, Dielman TE, et al. (1994). Longitudinal evaluation of an enhanced alcohol misuse prevention study (AMPS) curriculum for grades six-eight. Journal of School Health 64 (4): 160-166.

Shortt AL, Hutchinson DM, Chapman R, Toumbourou JW (2007) Family, school, peer and individual influences on early adolescent alcohol use: first-year impact of the Resilient Families programme. Drug & Alcohol Review 26(6):625-34.

Siegel DM, Aten MJ, Enaharo M (2001) Long-term effects of a middle school- and high school-based human immunodeficiency virus sexual risk prevention intervention. Archives of Pediatrics & Adolescent Medicine 155(10):1117-26.

Siegel DM, Aten MJ, Roghmann KJ, Enaharo M (1998) Early effects of a school-based human immunodeficiency virus infection and sexual risk prevention intervention. Archives of Pediatrics and Adolescent Medicine 152(10):961-970.

Simons-Morton B, Haynie D, Saylor K, et al. (2005). The effects of the Going Places program on early adolescent substance use and antisocial behavior. Prevention Science 6 (3): 187-197.

Slater MD, Kelly KJ, Edwards RW, et al (2006) Combining in-school and community-based media efforts: Reducing marijuana and alcohol uptake among younger adolescents. Health Education Research 21(1):157-167.

Smit F, Cuijpers P, Lemmers L, et al (2003) Same prevention, different effects? Effect modification in an alcohol misuse prevention project among high-school juniors. Drugs: Education, Prevention and Policy 10:185-193.

Smith EA, Swisher JD, Vicary JR, et al (2004) Evaluation of Life Skills Training and infused-Life Skills Training in a rural setting: outcomes at two years. Journal of Alcohol and Drug Education 48(1):20.

Smith MA (1994) Teen Incentives Program: evaluation of a health promotion model for adolescent pregnancy prevention. Journal of Health Education 25(1):24-9.

Snow DL, Tebes JK, Arthur MW, Tapasak RC (1992) Two-year follow-up of a social-cognitive intervention to prevent substance use. Journal of Drug Education 22(2):101-14.

Snow DL, Tebes JK, Ayers TS (1997). Impact of two social-cognitive interventions to prevent adolescent substance use: Test of an amenability to treatment model. Journal of Drug Education 27 (1): 1-17.

Somers CL (2006) Teenage Pregnancy Prevention and Adolescents' Sexual Outcomes: An Experiential Approach. American Secondary Education 34(2):21-24.

Somers CL, Gleason JH, Johnson SA, Fahlman MM (2001) Adolescents' and Teachers' Perceptions of a Teen Pregnancy Prevention Program. American Secondary Education 29(3):51-66.

Spoth RL, Randall GK, Trudeau L, et al (2008) Substance use outcomes 51/2 years past baseline for partnership-based, family-school preventive intervention. Drug and Alcohol Dependence 96(1-2):57-68.

Spoth RL, Redmond C, Trudeau L, Shin C (2002) Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs. Psychology of Addictive Behaviors 16(2):129-34.

Stanton B, Harris C, Cottrell L, Li X, et al (2006) Trial of an urban adolescent sexual risk-reduction intervention for rural youth: a promising but imperfect fit. The Journal of Adolescent Health 38(1):e25-55.e36.

Stephenson J, Strange V, Allen E, et al (2008) The long-term effects of a peer-led sex education programme (RIPPLE): A cluster randomised trial in schools in England. PLoS Medicine 5(11):1579-1590.

Stephenson JM, Strange V, Forrest S, et al (2004) Pupil-led sex education in England (RIPPLE study): Cluster-randomised intervention trial. Lancet 364(9431):338-346.

Stout JW, White LC, Alexander T (1996) Oregon School-Based Health Centers: A Follow-Up Report. Portland: Oregon State Department of Human Resources.

Sun W, Skara S, Sun P, et al. (2006). Project Towards No Drug Abuse: Long-term substance use outcomes evaluation. Preventive Medicine 42 (3): 188-192.

Sussman S, Dent CW, Stacy AW, et al. (1998). One-year outcomes of Project Towards No Drug Abuse. Preventive Medicine 27 (4): 632-642.

Sussman S, Sun P, McCuller WJ, et al. (2003). Project Towards No Drug Abuse: Two-year outcomes of a trial that compares health educator delivery to self-instruction. (27 refs.). Preventive Medicine 37 (2): 155-162.

Teitler JO (1997) Does condom availability make a difference? An evaluation of Philadelphia's health resource centers. Family Planning Perspectives 29(3):123-127.

Tobler NS, Stratton HH (1997) Effectiveness of school-based drug prevention programs: A meta-analysis of the research. Journal of Primary Prevention 18(1):71-128.

Tobler NS. (1993). Meta-analysis of adolescent drug prevention programs. Dissertation Abstracts International 55 (11).

Tobler NS, Roona MR, Ochshorn P, et al. (2000). School-based adolescent drug prevention programs: 1998 Meta-analysis. Journal of Primary Prevention 20 (4): 275-336.

Toomey TL (1996). An Alcohol Primary Prevention Program for Parents of 7th Graders: The Amazing Alternatives! Home Program. Journal of Child and Adolescent Substance Abuse 5 (4): 35-53.

Traeen B (2003) Effect of an intervention to prevent unwanted pregnancy in adolescents: a randomized, prospective study from Nordland County, Norway, 1999-2001. Journal of Community and Applied Social Psychology 13(3):207-23.

Trenholm C, Devaney B, Fortson K, et al (2008) Impacts of Abstinence Education on Teen Sexual Activity, Risk of Pregnancy, and Risk of Sexually Transmitted Diseases. Journal of Policy Analysis and Management 27:22-276.

Tucker JS, Fitzmaurice AE, Imamura M, et al (2007) The effect of the national demonstration project Healthy Respect on teenage sexual health behaviour. European Journal of Public Health 17(1):33-41.

Underhill K, Montgomery P, Operario D (2008) Abstinence-plus programs for HIV infection prevention in high-income countries. Cochrane Database of Systematic Reviews (1).

Underhill K, Operario D, Montgomery P (2007) Abstinence-only programs for HIV infection prevention in high-income countries. The Cochrane database of systematic reviews (4):CD005421-NaN.

Valentine J, Griffith J, Ruthazer R, et al. (1998). Strengthening causal inference in adolescent drug prevention studies: Methods and findings from a controlled study of the urban youth connection program. Drugs & Society 12 (1-2): 127-143.

Vicary JR, Henry KL, Bechtel LJ, et al. (2004). Life skills training effects for high and low risk Rural Junior High School Females. Journal of Primary Prevention 25 (4): 399-416.

Vincent M, Drane JW, Joshi P, et al (2004) Sustained reduction in adolescent pregnancy rates through school and community-based education, 1982-2000. American Journal of Health Education 35(2):76-86.

Vogl L, Teesson M, Andrews G, et al (2009) A computerized harm minimization prevention program for alcohol misuse and related harms: randomized controlled trial. Addiction 104(4):564-576.

Walter HJ, Vaughan RD (1993) AIDS risk reduction among a multiethnic sample of urban high school students. Journal of the American Medical Association 270(6):725-730.

Wang LY, Davis M, Robin L, et al (2000) Economic evaluation of safer choices: A school-based human immunodeficiency virus, other sexually transmitted diseases, and pregnancy prevention program. Archives of Pediatrics and Adolescent Medicine 154(10):1017-1024.

Warren JR, Hecht ML, Wagstaff DA, et al. (2006). Communicating Prevention: The Effects of the keepin' it REAL Classroom Videotapes and Televised PSAs on Middle-School Students' Substance Use. Journal of Applied Communication Research 34 (2): 209-227.

Webster RA, Hunter M, Keats JA (2002) Evaluating the effects of a peer support programme on adolescents' knowledge, attitudes and use of alcohol and tobacco. Drug and Alcohol Review 21(1):7-16.

Weeks K, Levy SR, Zhu C, et al (1995) Impact of a school-based AIDS prevention program on young adolescents' self-efficacy skills. Health Education Research 10(3):329-344.

Werch C, Jobli E, Moore MJ, et al (2005a) A brief experimental alcohol beverage-tailored program for adolescents. Journal of Studies on Alcohol 66(2):284-290.

Werch CC, Moore MJ, DiClemente CC, et al (2005b) A multihealth behavior intervention integrating physical activity and substance use prevention for adolescents. Prevention Science 6(3):213-26.

Werch CE, Anzalone DM, Brokiewicz LM, et al (1996) An intervention for preventing alcohol use among inner-city middle school students. Archives of Family Medicine 5(3):146-52.

Werch CE, Bian H, Moore MJ, et al (2008a) Brief multiple behavior health interventions for older adolescents. American journal of health promotion : AJHP 23(2):92-6.

Werch CE, Carlson JM, Owen DM, et al (2001) Effects of a stage-based alcohol preventive intervention for inner-city youth. Journal of Drug Education 31(2):123-38.

Werch CE, Carlson JM, Pappas DM, et al (2000a) Effects of a brief alcohol preventive intervention for youth attending school sports physical examinations. Substance Use and Misuse 35(3):421-432.

Werch CE, Moore MJ, DiClemente CC (2008b) Brief image-based health behavior messages for adolescents and their parents. Journal of Child & Adolescent Substance Abuse 17(4):19-41.

Werch CE, Owen DM, Carlson JM, DiClemente CC, Edgemon P, Moore M (2003a) One-year follow-up results of the STARS for Families alcohol prevention program. Health Education Research 18(1):74-87.

Werch CE, Pappas DM, Carlson JM, et al (2000b) Evaluation of a brief alcohol prevention program for urban school youth. American Journal of Health Behavior 24(2):120-31.

Werch CE, Owen DM (2002). Iatrogenic effects of alcohol and drug prevention programs. (43 refs.). Journal of Studies on Alcohol 63 (5): 581-590.

Werch CE, Pappas DM, Carlson JM, et al. (1998). Short- and long-term effects of a pilot prevention program to reduce alcohol consumption. Substance Use & Misuse 33 (11): 2303-2321.

Werch C, Moore M, DiClemente CC, et al. (2003b). A sport-based intervention for preventing alcohol use and promoting physical activity among adolescents. Journal of School Health 73 (10): 380-388.

White D, Buckley E, Hassan J (2004). Literature review on the role of external contributors in school drug, alcohol and tobacco education. London: Department for Education and Skills.

Wight D, Raab GM, Henderson M, et al (2002) Limits of teacher delivered sex education: Interim behavioural outcomes from randomised trial. British Medical Journal 324(7351):1430-1433.

Wilhelmsen BU, Laberg JC, Klepp K-I (1994) Evaluation of Two Student and Teacher Involved Alcohol Prevention Programmes. Addiction 89(9):1157-1165.

Williams CL, Perry CL, Dudovitz B, et al. (1995). A Home-Based Prevention Program for Sixth-Grade Alcohol Use: Results from Project Northland. Journal-of-Primary-Prevention 16 (2): 125-147.

Workman GM, LaVome Robinson W, Cotler S, Harper GW (1996) A school-based approach to HIV prevention for inner-city African- American and Hispanic adolescent females. Journal of Prevention and Intervention in the Community 14(1-2):41-60.

Wright NP (1998) Effects of a high school sexuality education program, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 58.

Zimmerman RS, Cupp PK, Donohew L, et al (2008) Effects of a school-based, theory-driven HIV and pregnancy prevention curriculum. Perspectives on Sexual and Reproductive Health 40:42-51.

Appendix 2. References to excluded studies

- **Study did not meet design criteria for inclusion (n=320)**

Anon (1993) California Programs To Prevent and Reduce Drug, Alcohol, and Tobacco Use among In-School Youth: An Interim Report about Tobacco Use. Report No. 2, pp 18. Southwest Regional Lab., Los Alamitos, CA.

Anon (1997) School-Based HIV-Prevention Education--United States, 1994. Journal of School Health 67(3):103-105.

Anon (2001) Halfway There: A Prescription for Continued Progress in Preventing Teen Pregnancy, pp 42. National Campaign To Prevent Teen Pregnancy, Washington, DC.

Anon (2007) Review of Comprehensive Sex Education Curricula, pp 40. Administration for Children and Families (DHHS), Washington, DC.

Anon (2008) Preventing Teenage Pregnancy in Looked-after Children. Community Care:24-25.

Abel EM, Greco M (2008) A Preliminary Evaluation of an Abstinence-Oriented Empowerment Program for Public School Youth. Research on Social Work Practice 18:223-230.

Aggleton P, Brownjohn C, Chalmers H, Tyrer P (2005) SRE: a programme to support community nurses. Community Practitioner 78(6):199-200.

Allen JP, Philliber S (1991) Evaluating Why and How the Teen Outreach Program Works: Years 3-5 of the Teen Outreach National Replication (1986/87-1988/89), pp 12. Association of Junior Leagues, Inc., New York, NY.

Allensworth DD (1994) The research base for innovative practices in school health education at the secondary level. Journal of School Health 64(5):180-188.

Alstead M, Campsmith M, Halley CS, Hartfield K, Goldblum G, Wood RW (1999) Developing, Implementing, and Evaluating a Condom Promotion Program Targeting Sexually Active Adolescents. AIDS Education and Prevention 11(6):497-512.

Archer E, Cahill M (1991) Building Life Options: School-Community Collaborations for Pregnancy Prevention in the Middle Grades, pp 147. Academy for Educational Development, Washington, DC.

Arnold EM, Smith TE, Harrison DF, Springer DW (1999) The effects of an abstinence-based sex education program on middle school students' knowledge and beliefs. Research on Social Work Practice 9:10-24.

Arnold EM, Smith TE, Harrison DF, Springer DW (2000) Adolescents' knowledge and beliefs about pregnancy: the impact of "ENABL". Adolescence 35(139):485-98.

Ashworth CS, DuRant RH, Newman C, Gaillard G (1992) An evaluation of a school-based AIDS/HIV education program for high school students. Journal of Adolescent Health 13(7):582-588.

Ateka GK, Selwyn BJ (2007) Adolescent human immunodeficiency virus and sexually transmitted disease prevention programmes: are gender-blind approaches justified? Public Health 121(9):682-689.

Bagnall G, Lockerbie L (1996) HIV and AIDS education for senior school pupils in Scotland: a quantitative evaluation. Health Education Journal 55(2):141-55.

Barnes ND, Harrod SE (1993) Teen pregnancy prevention: a rural model using school and community collaboration. School Counselor 41(2):137-40.

Barnett JE, Hurst CS (2004) Do adolescents take 'baby think it over' seriously? Adolescence 39(153):65-75.

Basen EK, Parcel GS, Harrist R, Kirby D, Coyle K, Banspach S, Rugg D (1997) The Safer Choices Project: Methodological Issues in School-Based Health Promotion Intervention Research. Journal of School Health 67(9):365-71.

Bearss N, Santelli JS, Papa P (1995) A pilot program of contraceptive continuation in six school-based clinics. Journal of Adolescent Health 17(3):178-83.

Beath L, MacRae-Stevens D, Walters J (1998a) SIECCAN Newsletter: vol. 33, no. 3. Student health services: comprehensive sexual health & STD programming in local secondary schools. Canadian Journal of Human Sexuality 7(4):371-374.

Beath L, MacRae-Stevens D, Walters J (1998b) Student Health Services: Comprehensive sexual health and STD programming in local secondary schools. Canadian Journal of Human Sexuality 7(4):371-373.

Beavet T, Thompson J (1996) Parents talking: sex education in secondary schools. Pastoral Care in Education 14:11-18.

Bechtel LJ, Vicary J, Swisher J, Smith E, Hopkins A, Henry K, Minner D (2006) An interdisciplinary approach for the integration and diffusion of substance abuse prevention programs. American Journal of Health Education 37(4):219-226.

Becker MG, Barth RP (2000) Power through choices: the development of a sexuality education curriculum for youths in out-of-home care. Child Welfare 79(3):269-82.

Bell ML, Bliss K (1997) Project SAVE: Evaluation of Pilot Test Results, pp 70. Texas Alcoholic Beverage Commission, Austin.

Bishop JB (2000) An environmental approach to combat binge drinking on college campuses. Journal of College Student Psychotherapy 15(1):15-30.

Blake SM, Ledsky R, Goodenow C, Sawyer R, Lohrmann D, Windsor R (2003) Condom Availability Programs in Massachusetts High Schools: Relationships with Condom Use and Sexual Behavior. American Journal of Public Health 93(6):955-962.

Boothroyd RI (2004) Analyzing the contribution of environmental change to prevent adolescent pregnancy: A study of three multi-component community initiatives in Kansas, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 65.

Borgia P, Spadea T, Perucci CA, De Pascali V, Fano V, Schifano P, Abeni DDC (1997) Limited effectiveness of a school-based HIV prevention campaign in Italy: a randomised controlled trial. European Journal of Public Health 7(4):411-418.

Brooks RG, Schwendinger A, Smith TE, Spaulding-Givens J, Steen JA (2005) Gender differences in adolescent attitudes and receptivity to sexual abstinence education. Children & Schools 27(1):45-50.

Brown JH, And O (1995) In Their Own Voices: Students and Educators Evaluate California School-Based Drug, Alcohol, and Tobacco, Education (DATE) Programs, pp 63. Pacific Inst. for Research and Evaluation, Bethesda, MD.

Brown HN, Saunders RB (2002) College-bound sisters. Exploring one pregnancy prevention program. AWHONN Lifelines 6(2):146-51.

Brown L, Hutchinson P, Karim AM, Macintyre K, Magnani R (2005a) The impact of life skills education on adolescent sexual risk behaviors in KwaZulu-Natal, South Africa. Journal of Adolescent Health 36(4):289-304.

Brown SA (2001) Facilitating change for adolescent alcohol problems: A multiple options approach, in Innovations in adolescent substance abuse interventions., pp 169-187.

Brown SA, Anderson KG, Schulte MT, Sintov ND, Frissell KC (2005b) Facilitating youth self-change through school-based intervention. Addictive Behaviors 30(9):1797-1810.

Brown SM (1997) Design, implementation and evaluation of a pilot sexuality education curriculum for middle school special education students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 58.

Buckhalt JA, And O (1990) Rural Drug Abuse Prevention: Establishing Needs and Implementing Programs, pp 15.

Buysse A, Van Oost P (1997) Impact of a school-based prevention programme on traditional and egalitarian adolescents' safer sex intentions. Journal of Adolescence 20(2):177-188.

Cagampang HH (1997) Education now and babies later (ENABL): Life history of a campaign to postpone sexual involvement. Family Planning Perspectives 29(3):109-114.

Campbell C, Foulis C-A (2002) Creating Contexts That Support Youth-Led HIV Prevention in Schools. Society in Transition 33(3):312-329.

Carlson CE (1990) HIPP: A comprehensive school-based substance abuse program with cooperative community involvement. Journal of Primary Prevention 10(4):289-302.

Carter DSG (1999) A Whole-School Approach to Adolescent Peer-Leader Development for Affective Learning in Health-Related Curricula. Research Papers in Education Policy and Practice 14(3):295-319.

Carter DSG, Carter SM (1993) The Peer Leader AIDS Education Project, pp 23.

Carter SM, Carter DS (1993) Gender differentiated receptivity to sexuality education curricula by adolescents. Health Education Research 8(2):233-43.

Castro-Vazquez G, Kishi I (2002) "If you say to them that they have to use condoms, some of them might use them. It is like drinking alcohol or smoking": An educational intervention with Japanese senior high school students. Sex Education 2:105-117.

Centers for Disease C, Prevention (1996) School-based HIV-prevention education--United States, 1994. MMWR - Morbidity & Mortality Weekly Report 45(35):760-5.

Chan W, Lederman RP, Roberts-Gray C (2004) Sexual risk attitudes and intentions of youth aged 12-14 years: survey comparisons of parent-teen prevention and control groups. Behavioral Medicine 29(4):155-163.

Chang VN (1993) Prevent and empower: a student-to-student strategy with alcohol abuse. Social Work in Education 15(4):207-214.

Chapman RJ (1990) The La Salle University FIPSE Grant: A Review and Evaluation of the Alcohol and Other Drug Program, 1 September 88 through 30 September 90, pp 43. La Salle Univ., Philadelphia, PA.

Chatterji P (2001) Applying cost analysis methods to school-based prevention programs. Prevention Science 2(1):45-55.

Christopher FS (1995) Adolescent Pregnancy Prevention. Family Relations 44(4):384-91.

Cohen DA (2004) Comparing the cost-effectiveness of HIV prevention interventions. Journal of Acquired Immunodeficiency Syndrome 37(3):1404-1414.

Cole BP, Nelson TD, Steele RG (2008) An evaluation of a peer-based HIV/AIDS education program as implemented in a suburban high school setting. Journal of HIV/AIDS Prevention in Children & Youth 9(1):84-97.

Coll KM (1998) Effectiveness of an Alcohol Education Program Among Community College Students. Community College Journal of Research and Practice 22(2):123-31.

Collins J, Robin L, Wooley S, Fenley D, Hunt P, Taylor J, Haber D, Kolbe L (2002) Programs-That-Work: CDC's Guide to Effective Programs that Reduce Health-Risk Behavior of Youth. Journal of School Health 72(3):93-99.

Craft A (1991) The Living Your Life Programme. British Journal of Special Education 18(4):157-60.

Craft A (1994) Sex education for students with severe learning difficulties. International Journal of Adolescent Medicine and Health 7(2):133-140.

D'Amico EJ, Fromme K (2002) Brief prevention for adolescent risk-taking behavior. Addiction 97(5):563-74.

Damond ME, And O (1993) The Evaluation of Setting and a Culturally Specific HIV/AIDS Curriculum: HIV/AIDS Knowledge and Behavioral Intent of African American Adolescents. Journal of Black Psychology 19(2):169-89.

Dark LS (1996) Peer approaches for increasing HIV awareness on a college campus. ABNF Journal 7(2):54-6.

Davis CN, Sr. (1995) Family Life Education Programs and Student Attitudes, pp 12.

De GJF, And O (1994) Teacher Philosophy and Program Implementation and the Impact on Sex Education Outcomes. Journal of Research and Development in Education 27(4):265-70.

Deck DD (2004) Addressing Adolescent Substance Abuse: An Evaluation of Washington's Prevention and Intervention Services Program. 2001-03 Final Report, pp 72. Washington Office of the State Superintendent of Public Instruction, Olympia.

DeMairo P, Dischell J, Jouthe SA, Horner A (2008) The Teen Outreach Reproductive Challenge: Improving Adolescent Health Care Delivery through Peer Education Projects, in American Journal of Sexuality Education, vol 3, pp 1-17.

DeRidder LM (1993) Teenage Pregnancy: Etiology and Educational Interventions. Educational Psychology Review 5(1):87-107.

Devaney B, Johnson A, Maynard R, Trenholm C (2002) The Evaluation of Abstinence Education Programs Funded Under Title V Section 510: Interim Report, pp 57. Mathematica Policy Research, Princeton, NJ.

DiClemente RJ, Crosby RA (2006) Preventing sexually transmitted infections among adolescents: 'the glass is half full'. Current Opinion in Infectious Diseases 19(1):39-43.

Dielman TE (1994) School-based research on the prevention of adolescent alcohol use and misuse: methodological issues and advances. Journal of Research on Adolescence 4(2):271-93.

Dietz E (1996) Best practices in preventing drug abuse and violence. Intervention in School and Clinic 31(5):313-18.

Donati S, Medda E, Spinelli A, Grandolfo ME (2000) Sex education in secondary schools: An Italian experience. Journal of Adolescent Health 26(4):303-308.

Dotterer S, Axiotis IR (1994) Sex-Tac-Toe. Journal of American College Health 43(3):137-9.

Drolet J, Clark K (1994) The Sexuality Education Challenge: Promoting Healthy Sexuality in Young People. ETR Associates, , Santa Cruz, CA.

Dryfoos JG (1991) Adolescents at risk: A summation of work in the field: Programs and policies. Journal of Adolescent Health 12(8):630-637.

Dunn L, Ross B, Caines T, Howorth P (1998) A school-based HIV/AIDS prevention education program: Outcomes of peer-led versus community health nurse-led interventions. Canadian Journal of Human Sexuality 7(4):339-345.

Dycus S, Costner GM (1990) Healthy Early-Adolescent Development (11-13 Year Olds): Implementing a Human Sexuality Curriculum for Seventh Graders. Elementary School Guidance and Counseling 25(1):46-53.

Dykeman C, Nelson JR (1996) Students' Evaluations of the Effectiveness of Substance Abuse Education: The Impact of Different Delivery Modes. Journal of Child & Adolescent Substance Abuse 5(2):43-61.

Ebert M (2003) Peer programs in prevention of sexually transmitted infections. Acta Dermatovenerologica Alpina, Pannonica et Adriatica 12(2):77-79.

Ebreo A, Feist-Price S, Siewe Y, Zimmerman RS, Main DS (2002) Effects of peer education on the peer educators in a school-based HIV prevention program: where should peer education research go from here? Health Education and Behavior 29(4):411-26.

Elliott KJ, Lambourn AJ (1999) Sex, drugs and alcohol: Two peer-led approaches in Tamaki Makaurau/Auckland, Aotearoa/New Zealand. Journal of Adolescence 22(4):503-513.

Emmerson L (2008) On-site sexual health services in further education are the norm. Education & Health 26(1):10-12.

Ertle V (1993) Sharing Your Success III. Summaries of Successful Programs and Strategies Supporting Drug-Free Schools and Communities. Volume III, pp 175. Western Regional Center for Drug-Free Schools and Communities, Portland, OR.

Faggiano F, Richardson C, Bohrn K, Galanti MR (2007) A cluster randomized controlled trial of school-based prevention of tobacco, alcohol and drug use: The EU-Dap design and study population. Preventive Medicine 44(2):170-173.

Ferguson JL, And O (1991) Experimental Evaluation of "AIDS and You": A Pamphlet for High School Special Education Students, pp 9.

Fisher G, And O (1992) Evaluation of HIV Prevention and Comprehensive Health Education Activities, pp 25.

Fisher LA, Scott DM, Chase JM, Smith MA (2000) Peer-Led Alcohol Education program: a pharmacy student-led program for seventh-graders. Journal of the American Pharmaceutical Association 40(1):82-6.

Fletcher A, Bonell C, Hargreaves J (2008) School effects on young people's drug use: a systematic review of intervention and observational studies (Structured abstract), in Journal of Adolescent Health, vol 42, pp 209-220.

Fletcher A, Harden A, Brunton G, Oakley A, Bonell C (2008) Interventions addressing the social determinants of teenage pregnancy. Health Education 108:29-39.

Fongkaew W, Fongkaew K, Muecke M (2006) HIV/sexual and reproductive health program for HIV prevention: the youth-adult partnership with schools approach. Journal of the Medical Association of Thailand 89(10):1721-32.

Forrest S, Strange V, Oakley A, Johnson A, Stephenson J, Black S, Flux A, Charleston S (2004) What do young people want from sex education: The results of a needs assessment from a peer-led sex education programme. Culture, Health and Sexuality 6(4):337-354.

Franklin C, Corcoran J (2000) Preventing adolescent pregnancy: a review of programs and practices. Social Work 45(1):40-52.

Frisiras S, Lagiou A, Sourtzi P, Vidalaki M (1991) Sex education and family planning messages in Greek school books. Planned Parenthood in Europe 20(1):16-7.

Fromme K, Brown SA (2000) Empirically based prevention and treatment approaches for adolescent and young adult substance use. Cognitive and Behavioral Practice 7(1):61-64.

Frost JJ, Forrest JD (1995) Understanding the impact of effective teenage pregnancy prevention programs. Family Planning Perspectives 27(5):188-195.

Gardner SP, Boellaard R (2007) Does youth relationship education continue to work after a high school class? A longitudinal study. Family Relations 56:490-500.

Garman JF, Crider DA (2002) HIV/AIDS Education: A Six-Year Comparison of Secondary Level Effectiveness, pp 33.

Gay KEM (1997) Collaborative school-based research: Evaluation of an academically integrated HIV/AIDS prevention curriculum for middle school students, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 57.

Gaydos CA, Hsieh YH, Galbraith JS, Barnes M, Waterfield G, Stanton B (2008) Focus-on-Teens, sexual risk-reduction intervention for high-school adolescents: Impact on knowledge, change of risk-behaviours, and prevalence of sexually transmitted diseases. International Journal of STD and AIDS 19(10):704-710.

Ghosh-Dastidar B, Longshore DL, Ellickson PL, McCaffrey DF (2004) Modifying pro-drug risk factors in adolescents: results from Project ALERT. Health Education & Behavior 31(3):318-335.

Gilliland L, Scully J (2005) STI-HIV prevention: a model program in a school-based health center. Nursing Clinics of North America 40(4):681-689.

Glanz K, Maddock JE, Shigaki D, Sorensen CA (2003) Preventing underage drinking: a "roll of the dice". Addictive Behaviors 28(1):29-38.

Glover BL (1995) DINOS (drinking is not our solution): Using computer programs in middle school drug education. Elementary School Guidance & Counseling 30(1):55-62.

Goldsworthy R, Schwartz N (2008) Development and evaluation of a multimedia-enhanced STD/HIV curriculum for middle schools. Journal of Educational Multimedia and Hypermedia 17:413-444.

Goodman J (1991) Redirecting sexuality education for young adolescents. Curriculum and Teaching 6:12-22.

Gorman DM (2002) The "science" of drug and alcohol prevention: The case of the randomized trial of the Life Skills Training program. International Journal of Drug Policy 13(1):21-26.

Graham JW, And O (1991) Modeling Transitions in Latent Stage-Sequential Processes: A Substance Use Prevention Example. Journal of Consulting and Clinical Psychology 59(1):48-57.

Griffin P, Perrotti J, Priest L, Muska M (2002) It Takes a Team! Making Sports Safe for Lesbian, Gay, Bisexual, and Transgender Athletes and Coaches. An Education Kit for Athletes, Coaches, and Athletic Directors, pp 93. Women's Sports Foundation.

Gruen SM, Hayes E, Fritsch-deBruyn R (1991) Setting up a school-based sexual education program to help prevent AIDS and other sexually transmitted diseases. Nurse Practitioner 16(8):47-51.

Guttmacher S, Lieberman L, Ward D, Freudenberg N, Radosh A, Jarlais DD (1997) Condom availability in New York City public high schools: Relationships to condom use and sexual behavior. American Journal of Public Health 87(9):1427-1433.

Guzman BL, Casad BJ, Schlehofer SMM, Villanueva CM, Feria A (2001) C.A.M.P.: A Community-Based Approach to Promoting Safe Sex Behavior in Adolescence, vol 13, pp 40.

Haggerty KP, MacKenzie EP, Skinner ML, Harachi TW, Catalano RF (2006) Participation in "parents who care": predicting program initiation and exposure in two different program formats, in The Journal of Primary Prevention, vol 27, pp 47-65.

Haines MP, Barker GP, Rice R (2003) Using social norms to reduce alcohol and tobacco use in two midwestern high schools, in The social norms approach to preventing school and college age substance abuse: A handbook for educators, counselors, and clinicians., pp 235-244. Jossey-Bass.

Hanna KM, Hanrahan S, Hershey J, Greer D (1997) Evaluation of the effect of an AIDS prevention program on high school students' sexual risk-taking behavior. Issues in Comprehensive Pediatric Nursing 20(1):25-34.

Harden A, Weston R, Oakley A (1999) A review of the effectiveness and appropriateness of peer-delivered health promotion interventions for young people. Evaluation of Health Promotion and Social Interventions:180.

Hardy JB, Zabin LS (1991) Adolescent Pregnancy in an Urban Environment: Issues, Programs, and Evaluation. University Press of America, Lanham, MD.

Harvey J, McLachlin J (1998) STD teaching in high schools. Canadian Journal of Human Sexuality 7(4):383-384.

Haynes NM (1993) Reducing the Risk of Teen Parenthood: An Approach That Works. NASSP Bulletin 77(557):36-40.

Henderson M, Wight D, Raab GM, Abraham C, Parkes A, Scott S, Hart G, Reading R (2007) Impact of a theoretically based sex education programme (SHARE) delivered by teachers on NHS registered conceptions and terminations: final results of cluster randomised trial. Child: Care, Health and Development 33(3):349-349.

Higgins D, King R, Witthaus D (2001) Pride and prejudice: facilitating change in the attitudes of students toward gay men and lesbians. Health Promotion Journal of Australia 12(3):238-242.

Hoyt HH, Broom BL (2002) School-based teen pregnancy prevention programs: A review of the literature, vol 18, pp 11-17.

Hughes C, Julian R, Richman M, Mason R, Long G (2008) Harnessing the power of perception : reducing alcohol-related harm among rural teenagers. Youth Studies Australia 27:26-35.

Hulton LJ (2007) An evaluation of a school-based teenage pregnancy prevention program using a logic model framework. The Journal of School Nursing 23:104-110.

Jacobs CD, Wolf EM (1995) School Sexuality Education and Adolescent Risk-Taking Behavior. Journal of School Health 65(3):91-95.

James WH (1992) A Report on Restructuring Schools: Reducing Alcohol and Other Drug Abuse among Adolescents through a School-Community-University Partnership Program in the Federal Way School District, pp 59. Washington Univ., Seattle. Center for the Study and Teaching of At- Risk Students.

Jarmon BBJ (1998) The Real Life Cost Model: An Early Intervention Strategy for Preventing Teen Fatherhood and Motherhood. Reclaiming Children and Youth Journal of Emotional and Behavioral Problems 7(1):34-38.

Jason LA, Curie CJ, Townsend SM, Pokorny SB, Katz RB, Sherk JL (2002) Health promotion interventions. Child & Family Behavior Therapy 24(1/2):67-83.

Johnson G, Jefferson ACR (2001) HIV/AIDS Prevention: Effective Instructional Strategies for Adolescents with Mild Mental Retardation. TEACHING Exceptional Children 33(6):28-32.

Jorgensen SR (1991) Project Taking Charge: An evaluation of an adolescent pregnancy prevention program. Family Relations 40(4):373-380.

Jurich JA, Adams RA, Schulenberg JE (1992) Factors related to behavior change in response to AIDS. Family Relations 41(1):97-103.

Kerpelman JL, Pittman JF, Adler-Baeder F (2008) Identity as a moderator of intervention-related change: Identity style and adolescents' responses to relationships education. Identity 8:151-171.

Kidger J (2004) 'You realise it could happen to you': The benefits to pupils of young mothers delivering school sex education, vol 4, pp 185-197.

Kims A (1999) Reinforcing Resistance to Drug and Alcohol Use through Teen Role Models. NERCRD Project Report, pp 7. Northeast Regional Center for Rural Development, University Park, PA.

Kinsman J, Harrison S, Kengeya-Kayondo J, Kanyesigye E, Musoke S, Whitworth J (1999) Implementation of a comprehensive AIDS education programme for schools in Masaka District, Uganda. AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV 11(5):591-601.

Kirby D (1992) School-based programs to reduce sexual risk-taking behaviors. Journal of School Health 62(7):280-7.

Kirby D (1999) Reflections on Two Decades of Research on Teen Sexual Behavior and Pregnancy. Journal of School Health 69(3):89-94.

Kirby D (2001) Emerging Answers: Research Findings on Programs To Reduce Teen Pregnancy, pp 242. National Campaign To Prevent Teen Pregnancy, Washington, DC.

Kirby D (2002) The impact of schools and school programs upon adolescent sexual behavior. Journal of Sex Research 39(1):27-33.

Kirby D, DiClemente RJ (1994) School-based interventions to prevent unprotected sex and HIV among adolescents, in Preventing AIDS: Theories and methods of behavioral interventions., pp 117-139.

Kirby D, Korpi M, Barth RP, Cagampang HH (1997) The impact of the postponing sexual involvement curriculum among youths in California. Family Planning Perspectives 29(3):100-108.

Klaus H (1996) The Teen STAR Program, pp 11.

Klaus H (1998) The International Teen STAR Program, pp 10. Teen STAR Program, Bethesda, MD.

Komro KA, And O (1994) Peer Participation in Project Northland: A Community-Wide Alcohol Use Prevention Project. Journal of School Health 64(8):318-22.

Komro KA, And O (1996) Peer-Planned Social Activities for Preventing Alcohol Use among Young Adolescents. Journal of School Health 66(9):328-34.

Komro KA, Toomey TL (2002) Strategies to prevent underage drinking. Alcohol Research & Health 26(1):5-14.

Koo HP, Dunteman GH, George C, Green Y, Vincent M (1994) Reducing adolescent pregnancy through a school- and community-based intervention: Denmark, South Carolina, revisited. Family Planning Perspectives 26(5):206-211+217.

Kourtis AP, Kraft JM, Gavin L, Kissin D, McMichen-Wright P, Jamieson DJ (2006) Prevention of sexually transmitted human immunodeficiency virus (HIV) infection in adolescents. Current HIV Research 4(2):209-219.

Koutakis N, Stattin H, Kerr M (2008) Reducing youth alcohol drinking through a parent-targeted intervention: The Orebro prevention program. Addiction 103(10):1629-1637.

Kralewski J, Stevens-Simon C (2000) Does mothering a doll change teens' thoughts about pregnancy?[see comment]. Pediatrics 105(3):E30.

Kreft IGG (1997) The Evaluation of Drug Prevention Programs and Its Effect on Alcohol Consumption of Junior High School Students, pp 35.

Lagana L, Hayes DM (1993) Contraceptive health programs for adolescents: a critical review. Adolescence 28(110):347-59.

Lamelas CAC, Henderson DL (1996) Adolescent Sex Education Knowledge in American Schools of Mexico, pp 26.

Larkin J, Andrews A, Mitchell C (2006) Guy talk: Contesting masculinities in HIV prevention education with Canadian youth. Sex Education 6:207-221.

Laurs MR (1990) Alcohol Prevention in New Zealand: Working towards a National Alcohol Policy. The International Journal of the Addictions 25:513-532.

Lawrence P, Swain J (1993) Sex education programmes for students with severe learning difficulties in further education and the problem of evaluation. Disability, Handicap & Society 8(4):405-421.

Lazebnik R, Grey SF, Ferguson C (2001) Integrating substance abuse content into an HIV risk-reduction intervention: A pilot study with middle school-aged hispanic students. Substance Abuse 22(2):105-117.

Levy SR, Weeks K, Handler A, Perhats C, Franck JA, Hedeker D, Zhu C, Flay BR (1995) A longitudinal comparison of the AIDS-related attitudes and knowledge of parents and their children. Family Planning Perspectives 27(1):4-10.

Lewis J, Knijn T (2001) A comparison of English and Dutch sex education in the classroom. Education & Health 19(4):59-65.

Lilja J, Wilhelmsen BU, Larsson S, Hamilton D (2003) Evaluation of drug use prevention programs directed at adolescents. Substance Use and Misuse 38(11-13):1831-1863+1923-1926.

Ling DC, Tremblay CH (2005) AIDS education, condom demand, and the sexual activity of American youth. Health Economics 14(8):851-867.

Lloyd K, Lyth N (2003) Evaluation of the use of drama in sex and relationship education. Nursing Times 99(47):32-4.

LoSciuto L, Steinman RB (2004) A re-evaluation of project pride, a redesigned school-based drug abuse prevention program. Journal of Drug Education 34(2):155-66.

Lustig SL (1994) The AIDS prevention magic show: avoiding the tragic with magic. Public Health Reports 109(2):162-7.

Lutzer VD, Day VN (2001) The Healthy Relationships Program: Preventing Sexual Assault of Youth. Reclaiming Children and Youth 10(3):158-61.

Lynagh M, Knight J, Schofield MJ, Paras L (1999) Lessons learned from the Hunter Region Health Promoting Schools Project in New South Wales, Australia. Journal of School Health 69(6):227-32.

Lynagh M, Schofield MJ, Sanson-Fisher RW (1997) School health promotion programs over the past decade: A review of the smoking, alcohol and solar protection literature. Health Promotion International 12(1):43-60.

MacKillop J, Ryabchenko KA, Lisman SA (2006) Life Skills Training outcomes and potential mechanisms in a community implementation: A preliminary investigation. Substance Use and Misuse 41(14):1921-1935.

MacKinnon DP, Johnson CA, Pentz MA, Dwyer JH, Hansen WB, Flay BR, Wang EY (1991) Mediating mechanisms in a school-based drug prevention program: first-year effects of the Midwestern Prevention Project. Health Psychology 10(3):164-72.

Mahat G, Scoloveno MA, Ruales N, Scoloveno R (2006) Preparing peer educators for teen HIV/AIDS prevention. Journal of Pediatric Nursing 21(5):378-84.

Makin J, Butler S (2001) 'Tell me about it' : a community-based project to reduce the rate of teen pregnancy in Wagga Wagga. Youth Studies Australia 20:49-52.

Mann RE, Smart RG (1997) Can school alcohol education programmes contribute to declines in drinking among students? Drugs: Education, Prevention and Policy 4(2):131-7.

Mantell JE, Harrison A, Hoffman S, Smit JA, Stein ZA, Exner TM (2006) The Mpondombili Project: preventing HIV/AIDS and unintended pregnancy among rural South African school-going adolescents. Reproductive Health Matters 14(28):113-22.

Marechal C, Choquet M (1990) Alcohol prevention among adolescents: a French experiment. Drug & Alcohol Dependence 26(3):227-33.

Marick J (2002) HIV/AIDS peer education: A rural health project. The Journal of School Nursing 18:41-47.

Matjasko JL (2001) Are School-Based Prevention and Intervention Programs Effective? Their Impact on At-Risk Adolescent Development, in Dissertation Abstracts International, A: The Humanities and Social Sciences, vol 62, pp 791-a.

Mattox JR, II (1997) A Review of Interventions To Increase Driving Safety among Teenage Drivers, pp 26.

May C (1991) Research on alcohol education for young people: a critical review of the literature. Health Education Journal 50(4).

McCowan RJ, Roberts SW (2004) The effectiveness of infant simulators. Adolescence 39(155):475-487.

McKay A (2000) Common questions about sexual health education. The Canadian Journal of Human Sexuality 9(2):129-137.

McKay A (2000) Prevention of Sexually Transmitted Infections in Different Populations: A Review of Behaviourally Effective and Cost-Effective Interventions. Canadian Journal of Human Sexuality 9(2):95-120.

Merakou K, Kourea-Kremastinou J (2006) Peer education in HIV prevention: An evaluation in schools. European Journal of Public Health 16(2):128-132.

Milburn K (1995) A critical review of peer education with young people with special reference to sexual health. Health Education Research.

Mitchell JM (2003) AIDS Education and Citizenship Development in a University/K-12 Partnership, pp 10.

Montoya ID, Atkinson J, McFaden WC (2003) Best characteristics of adolescent gateway drug prevention programs. Journal of Addictions Nursing 14(2):75-84.

Moore KA, And O (1995) Adolescent Pregnancy Prevention Programs: Interventions and Evaluations, pp 508. Child Trends, Inc., Washington, DC.

Moore L, Graham A, Diamond I (2003) On the Feasibility of Conducting Randomised Trials in Education: Case study of a sex education intervention. British Educational Research Journal 29:673-689.

Morton M, Nelson L, Walsh C, Zimmerman S, Coe RM (1996) Evaluation of a HIV/AIDS education program for adolescents. Journal of Community Health 21(1):23-35.

Murphy JG, Correia CJ, Barnett NP (2007) Behavioral economic approaches to reduce college student drinking. Addictive Behaviors 32:2573-2585.

Murray DM, Clark MH, Wagenaar AC (2000) Intraclass correlations from a community-based alcohol prevention study: the effect of repeat observations on the same communities. Journal of Studies on Alcohol 61(6):881-90.

Murray-Johnson L, Witte K, Liu WY, Hubbell AP, Sampson J, Morrison K (2001) Addressing cultural orientations in fear appeals: promoting AIDS-protective behaviors among Mexican immigrant and African American adolescents and American and Taiwanese college students. Journal of Health Communication 6(4):335-58.

Nader PR, Rissel C, Rowling L, Marshall BJ, Sheehan MM, Northfield JR, Maher S, Carlisle R, St LLH, Stewart DE, Parker E, Gillespie A, Stokes H, Mukherjee D, Nutbeam D, Mitchell A, Ollis D, Watson J (2000) School Health Programs in Australia - A Special Insert. Journal of School Health 70(6):247-264.

Nielsen SK (1995) An ecological assessment of the school-based substance abuse psychological services for Native American youth, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 55.

No authorship i (2006) Section III: Promoting Health and Well-Being: Effective Interventions and Resources.

Noell J, Ary D, Duncan T (1997) Development and evaluation of a sexual decision-making and social skills program: "the choice is yours--preventing HIV/STDs". Health Education & Behavior 24(1):87-101.

O CWR, Jr. (1999) Report of a Study of Successful Programs of HIV Prevention Education in Colleges and Universities, pp 46. National Association of Student Personnel Administrators, Inc.

O'Hara P, Messick BJ, Fichtner RR, Parris D (1996) A peer-led AIDS prevention program for students in an alternative school. Journal of School Health 66(5):176-82.

Olsen J, And O (1992) Student Evaluation of Sex Education Programs Advocating Abstinence. Adolescence 27(106):369-80.

Olsen JA, And O (1991) The Effects of Three Abstinence Sex Education Programs on Student Attitudes toward Sexual Activity. Adolescence 26(103):631-41.

Orange C (2002) Project Northland and the Power of Preventing Underage Drinking. Reclaiming Children and Youth 11(3):164-67.

Ormson S (2008) Blackpool Sixth Form College uses peer-peer support to promote health. Education & Health:12-13.

O'Sullivan LF, Cooper-Serber E, Kubeka M, Harrison A (2007) Body concepts: Beliefs about the body and efforts to prevent HIV and pregnancy among a sample of young adults in South Africa. International Journal of Sexual Health 19:69-80.

Otto N, Middleton J, Freker J (2002) Making Schools Safe: An Anti-Harassment Training Program from the Lesbian & Gay Rights Project of the American Civil Liberties Union, pp 99.

Out JW, Lafreniere KD (2001) Baby Think It Over: using role-play to prevent teen pregnancy. Adolescence 36(143):571-82.

Ozcebe H, Akin L (2003) Effects of peer education on reproductive health knowledge for adolescents living in rural areas of Turkey [2]. Journal of Adolescent Health 33(4):217-218.

Ozer EJ, Weinstein RS, Maslach C (1997) Adolescent AIDS prevention in context: the impact of peer educator qualities and classroom environments on intervention efficacy. American Journal of Community Psychology 25(3):289-323.

Paine-Andrews A, Vincent ML, Fawcett SB, Campuzano MK, et al. (1996) Replicating a community initiative for preventing adolescent pregnancy: From South Carolina to Kansas. Family & Community Health 19(1):14-30.

Panzer RA (2008) The effects of fear versus norm appeals and directive versus cognitively flexible designs in abstinence-centered multimedia education on teen sexual attitudes, intentions and behaviors, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 68.

Pedrazzini A, McGowan H, Lucking L, Johanson R (2000) 'The trouble with sex - It always gets in the way': An evaluation of a peer-produced teenage pregnancy video. British Journal of Family Planning 26(3):131,133-135.

Peerbhoy D, Bourke C (2007) Icebreaker: The Evaluation. Health Education Journal 66:262-276.

Petersen J, Atkinson P, Petrie S, Gibin M, Ashby D, Longley P (2009) Teenage pregnancy-new tools to support local health campaigns. Health & Place 15(1):300-7.

Petronyte G, Zaborskis A, Veryga A (2007) Risk factors for alcohol use among youth and main aspects of prevention programs. Medicina (Kaunas, Lithuania) 43(2):103-9.

Phelps FA, Mellanby AR, Crichton NJ, Tripp JH (1994) Sex education: the effect of a peer programme on pupils (aged 13-14 years) and their peer leaders. Health Education Journal 53(2):127-39.

Philip MR (1994) SPARK Peer Helpers Program, 1992-93 Evaluation. OER Report, pp 64. New York City Board of Education, Brooklyn, NY. Office of Educational Research.

Pick De Weiss S, Givaudan M, Givaudan S (1993) Planeando Tu Vida: sex and family life education: fundamentals of development, implementation, and evaluation. International Journal of Adolescent Medicine & Health 6(3-4):211-24.

Pinkleton BE, Austin EW, Cohen M, Chen Y, Fitzgerald E (2008) Effects of a peer-led media literacy curriculum on adolescents' knowledge and attitudes toward sexual behavior and media portrayals of sex. Health Communication 23(5):462-473.

Piotrow PT, Rimon JG, 2nd (1995) "Enter-educate." Reaching youth with messages of sexual responsibility. Planned Parenthood Challenges (1):41-5.

Pittman V, Gahungu A (2006) Comprehensive Sexuality Education or Abstinence-Only Education: Which Is More Effective? Online Submission 3:32-91.

Puentes WJ, Wassel M (2003) Using peer health education to enhance family life education. Journal of School Nursing 19(6):313-8.

Raab M (1998) Condom availability in high school does not increase teenage sexual activity but does increase condom use. Family Planning Perspectives 30(1):48-50.

Rafferty Y, Radosh A (2000) AIDS prevention and condom availability in an urban school system: facilitating factors and programme challenges. Health Education Journal 59(1):50-69.

Raffoul PR, Lyles E (1993) If You Drink, an alcohol education program. Computers in Human Services 10(1):71-74.

Raj A, Decker MR, Murray JE, Silverman JG (2007) Gender differences in associations between exposure to school HIV education and protective sexual behaviors and sexually transmitted disease/HIV diagnosis among high school students. Sex Education 7(2):191-199.

Rector R (2002) The Effectiveness of Abstinence Education Programs in Reducing Sexual Activity among Youth. The Heritage Foundation Backgrounder, pp 11. Heritage Foundation, Washington, DC.

Reed NA, et al. (1992) An AIDS Prevention Program for Adolescents with Special Learning Needs. Journal of School Health 62(5):195-97.

Remez L (1994) Course on AIDS changed behavior and attitudes of high school students. Family Planning Perspectives 26(1):46-48.

Ringwalt C, Bliss K (2006) The Cultural Tailoring of a Substance Use Prevention Curriculum for American Indian Youth. Journal of Drug Education 36:19-177.

Roberto AJ, Zimmerman RS, Carlyle KE, Abner EL, Cupp PK, Hansen GL (2007) The effects of a computer-based pregnancy, STD, and HIV prevention intervention: a nine-school trial. Health Communication 21(2):115-24.

Rodrick AL, Bhavnagri NP (1997) Strategies for Overcoming Obstacles in AIDS Education for Preteens. Childhood Education 73(2):70-76.

Rohrbach LA, And O (1994) Parental Participation in Drug Abuse Prevention: Results from the Midwestern Prevention Project. Journal of Research on Adolescence 4(2):295-317.

Rolston B, Schubotz D, Simpson A (2005) Sex education in Northern Ireland schools: A critical evaluation, vol 5, pp 217-234.

Ross C, Richard L, Potvin L (1998) One year outcome evaluation of an alcohol and drug abuse prevention program in a Quebec high school. Canadian Journal of Public Health Revue Canadienne de Sante Publique. 89(3):166-70.

Sabatino M (1996) Sounding the Alarm on Safe and Drug-Free Schools. Safe and Drug-Free Schools and Communities. Final Report, 1995-96, pp 69. Austin Independent School District, TX. Dept. of Accountability, Student Services, and Research.

Safer LA, Harding CG (1993) Under pressure program: using live theatre to investigate adolescents' attitudes and behavior related to drug and alcohol abuse education and prevention. Adolescence 28(109):135-48.

Sager RW, Jr. (1993) The Effects of a Kansas Education Class on Students' Knowledge and Attitudes of Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome, pp 98.

Saltz E, Perry A, Cabral R (1994) Attacking the Personal Fable: Role-Play and Its Effect on Teen Attitudes toward Sexual Abstinence. Youth and Society 26(2):223-242.

Samuels S, Smith M (1993) Condoms in the Schools. Henry J. Kaiser Family Foundation, Menlo Park, CA.

Sanderson CA (2000) The effectiveness of a sexuality education newsletter in influencing teenagers' knowledge and attitudes about sexual involvement and drug use. Journal of Adolescent Research 15(6):674-681.

Scales P (1990) Developing capable young people: An alternative strategy for prevention programs. The Journal of Early Adolescence 10(4):420-438.

Schacht RM (1991) Alcohol and Substance Abuse Prevention Curriculum Project: An Assessment of the Effectiveness of the Implementation of the Beauty Way Curriculum and of the Curriculum Itself:

Technical Report on Evaluation Data, pp 89. Northern Arizona Univ., Flagstaff. Inst. for Human Development.

Schinke S, Schwinn T (2005) Gender-specific computer-based intervention for preventing drug abuse among girls. American Journal of Drug and Alcohol Abuse 31(4):609-616.

Schuster MA, Bell RM, Berry SH, Kanouse DE (1998) Impact of a high school condom availability program on sexual attitudes and behaviors. Family Planning Perspectives 30(2):67-72.

Scott DM, Surface JL, Friedli D, Barlow TW (1999) Effectiveness of Student Assistance Programs in Nebraska Schools. Journal of Drug Education 29(2):165-74.

Scott F, Chambers LW, Underwood J, Walter S, Pickard L (1990) AIDS seminars for senior grades in secondary school. Canadian Journal of Public Health 81(4):290-295.

Scott JL, Giedt A, Dimitrievich E (1998) A community medicine project involving an educational session in sexually transmitted diseases for high school students. South Dakota Journal of Medicine 51(9):345-6.

Scott PRD, Milsom GA, Milsom GL (1995) Teachers and parents too - An assessment of Dutch sexual health education. British Journal of Family Planning 21(1):20-21.

Selwyn N, Powell E (2007) Sex and Relationships Education in Schools: The Views and Experiences of Young People, in Health Education, vol 107, pp 219-231.

Sheehan M, Schonfeld C, Hindson E, Ballard R (1995) Alcohol education in an indigenous community school in Queensland, Australia. Drugs: Education, Prevention and Policy 2(3):259-73.

Shegog R, Markham C, Peskin M, Dancel M, Coton C, Tortolero S (2007) "It's your game": an innovative multimedia virtual world to prevent HIV/STI and pregnancy in middle school youth. Studies in Health Technology & Informatics 129(Pt 2):983-7.

Short R (1998) Teaching safe sex in school. International Journal of Gynaecology & Obstetrics 63 Suppl 1:S147-50.

Short RV (2004) Teaching safe sex in English schools. Lancet 364(9431):307-308.

Sidebottom A, Birnbaum AS, Nafstad SS (2003) Decreasing Barriers for Teens: Evaluation of a New Teenage Pregnancy Prevention Strategy in School-Based Clinics. American Journal of Public Health 93(11):1890-1892.

Sigelman C, And O (1996) Mexican-American and Anglo-American Children's Responsiveness to a Theory-Centered AIDS Education Program. Child Development 67(2):253-66.

Sigfusdottir ID, Thorlindsson T, Kristjansson AL, Roe KM, Allegrante JP (2009) Substance use prevention for adolescents: the Icelandic Model. Health Promotion International 24(1):16-25.

Silvia ES, Thorne J (1997) School-Based Drug Prevention Programs: A Longitudinal Study in Selected School Districts. Final Report. Executive Summary, pp 33. Research Triangle Inst., Research Triangle Park, N.C.

Silvia ES, Thorne J, Tashjian CA (1997) School-Based Drug Prevention Programs: A Longitudinal Study in Selected School Districts. Final Report, pp 171. Research Triangle Inst., Research Triangle Park, NC.

Simkin L, Radosh A, Nelsesteun K, Silverstein S (2003) Building Emergency Contraception Awareness among Adolescents. A Toolkit for Schools and Community-Based Organizations, pp 144. Academy for Educational Development, Inc., New York, NY.

Skager R (2007) Replacing ineffective early alcohol/drug education in the United States with age-appropriate adolescent programmes and assistance to problematic users. Drug & Alcohol Review 26(6):577-84.

Slater MD, And O (1996) Adolescent Counterarguing of TV Beer Advertisements: Evidence for Effectiveness of Alcohol Education and Critical Viewing Discussions. Journal of Drug Education 26(2):143-58.

Smith MU, Katner HP (1992) A Controlled Experimental Evaluation of Three AIDS Prevention Activities for Improving Knowledge, Changing Attitudes, and Decreasing Risk Behaviors of High School Seniors, pp 5.

Smith MU, Katner HP (1995) Quasi-experimental, evaluation of three AIDS prevention activities for maintaining knowledge, improving attitudes, and changing risk behaviors of high school seniors. AIDS Education and Prevention 7(5):391-402.

Smylie L, Maticka-Tyndale E, Boyd D, The Adolescent Sexual Health Planning Committee C (2008) Evaluation of a school-based sex education programme delivered to Grade Nine students in Canada. Sex Education 8:25-46.

Snegroff S (1995) Communicating about sexuality: a school/community program for parents and children. Journal of Health Education 26(1):49-52.

Somers CL, Fahlman MM (2001) Effectiveness of the "Baby Think It Over" teen pregnancy prevention program. Journal of School Health 71(5):188-196.

Song EY, Pruitt BE, McNamara J, Colewell B (2000) A Meta-Analysis Examining Effects of School Sexuality Education Programs on Adolescents' Sexual Knowledge, 1960-1997. Journal of School Health 70(10):413-16.

Soon T, Chan RK, Goh CL (1995) Project youth inform--a school-based sexually transmitted disease/acquired immune deficiency syndrome education programme. Annals of the Academy of Medicine, Singapore 24(4):541-6.

Sousa AP, Soares I, Vilar D (2007) Lessons learnt from a secondary school sex education program in Portugal. Sex Education 7:35-45.

Spadea T, Schifano P, Borgia P, Perucci CA (1999) The balance of positive and negative effects of specific messages in the evaluation of interventions for preventing HIV infection. European Journal of Epidemiology 15(2):109-117.

Stammers T (2007) Sexual Health in Adolescents. BMJ 334(7585):103-104.

Stephenson JM, Oakley A, Charleston S, Brodala A, Fenton K, Petruckevitch A, Johnson AM (1998) Behavioural intervention trials for HIV/STD prevention in schools: Are they feasible? Sexually Transmitted Infections 74(6):405-408.

Stephenson JM, Oakley A, Johnson AM, Forrest S, Strange V, Charleston S, Black S, Copas A, Petruckevitch A, Babiker A (2003) A school-based randomized controlled trial of peer-led sex education in England. Controlled Clinical Trials 24(5):643-657.

Stevens MM, Mott LA, Youells F (1996) Rural adolescent drinking behavior: three year follow-up in the New Hampshire substance abuse prevention study. Adolescence 31(121):159-66.

Strachan W, Gorey KM (1997) Infant simulator lifespace intervention: Pilot investigation of an adolescent pregnancy prevention program. Child & Adolescent Social Work Journal 14(3):171-180.

Strange V, Forrest S, Oakley A (2002) What influences peer-led sex education in the classroom? A view from the peer educators. Health Education Research 17(3):339-349.

Sulak PJ, Herbelin SJ, Fix DD, Kuehl TJ (2006) Impact of an adolescent sex education program that was implemented by an academic medical center. American Journal of Obstetrics & Gynecology 195(1):78-85.

Sundar M, Riley SC, Glasier A (2000) A feasibility study of adolescent sex education: Medical students as peer educators in Edinburgh schools. British Journal of Obstetrics and Gynaecology 107(3).

Sunwood J, Brenman A, Escobedo J, Philpott T, Allman K, Mueller J, Jaeger J, Brown LK, Cole FS (1995) School-based AIDS education for adolescents. Journal of Adolescent Health 16(4):309-15.

Sussman S (2004) Project ALERT reduces initiation of cigarette and marijuana use in 12-14 year olds. Evidence-Based Mental Health 7(2):53-54.

Swain R, McNamara M (1997) The effects of a participative programme on Irish pupils' attitudes to HIV/AIDS. Health Education Research 12(2):267-273.

Thakor HG, Kumar P (2000) Impact assessment of school-based sex education program amongst adolescents. Indian Journal of Pediatrics 67(8):551-8.

Thomas CL, Dimitrov DM (2007) Effects of a Teen Pregnancy Prevention Program on Teens' Attitudes toward Sexuality: A Latent Trait Modeling Approach. Developmental Psychology 43:13-185.

Thomas RE, Lorenzetti D, Spragins W (2008) Mentoring of children and adolescents for preventing drug and alcohol use. Cochrane Database of Systematic Reviews (4).

Van BJW, Render GF, Moon CE (1995) A Report of Outcomes of Project D.A.R.E. with Eighth Grade Students, pp 17.

Vanderschmidt HF, Lang JM, Knight-Williams V, Vanderschmidt GF (1993) Risks among inner-city young teens: The prevalence of sexual activity, violence, drugs, and smoking. Journal of Adolescent Health 14(4):282-288.

Vicary JR, Karshin CM (2002) College alcohol abuse: A review of the problems, issues, and prevention approaches. Journal of Primary Prevention 22:299-331.

Vincent ML, And O (1991) Projected Public Sector Savings in a Teen Pregnancy Prevention Program. Journal of Health Education 22(4):208-13.

Wagner EF, Tubman JG, Gil AG (2004) Implementing school-based substance abuse interventions: Methodological dilemmas and recommended solutions. Addiction 99(SUPPL. 2):106-119.

Walker-Shaw M (1993) Applying community organization to developing health promotion programs in the school community. Journal of School Health 63(2):109-11.

Walters ST, Bennett ME (2000) Addressing drinking among college students: A review of the empirical literature. Alcoholism Treatment Quarterly 18(1):61-77.

Walters ST, Bennett ME, Noto JV (2000) Drinking on campus. What Do we know about reducing alcohol use among college students? Journal of Substance Abuse Treatment 19(3):223-8.

Warwick I, Aggleton P (2004) Building on Experience: A Formative Evaluation of a Peer Education Sexual Health Project in South Africa. London Review of Education 2:17-153.

Watson DW, McCuller WJ, Bisesi L, Tanamly S, Sim T, Kavich JA (2004) Preparing adolescents for success in school: A school-based indicated prevention model for adolescents in the alternative high school setting. Journal of HIV/AIDS Prevention in Children and Youth 6(2):7-31.

Watson N, Robertson A (1996) A qualitative evaluation of HIV and AIDS education to senior school children in Lothian Region, Scotland. Health Promotion International 11(4):291-8.

Watt S, Horn E, Higgins C (1997) Teaching education about sexuality: a Scottish regional case study. British Journal of Special Education 24(3):115-23.

Weed S, Jensen L (1993) A second year evaluation of three abstinence sex education programs. Journal of Research & Development in Education 26(2):92-96.

Weis L (1998) Learning To Speak Out in an Abstinence Based Sex Education Group: Gender and Race Work in an Urban Magnet School, pp 38.

Weis L, Fine M (2003) Extraordinary Conversations in Public Schools.

Wight D, Abraham C (2000) From psycho-social theory to sustainable classroom practice: Developing a research-based teacher-delivered sex education programme. Health Education Research 15(1):25-38.

Williams CL, Perry CL (1998) Lessons from Project Northland: preventing alcohol problems during adolescence. Alcohol Health & Research World 22(2):107-16.

Williams KL, Doyle MS, Taylor BA, Ferguson G (1992) Addressing sexual orientation in a public high school. Journal of School Health 62(4):154-157.

Wilson KL, Goodson P, Pruitt BE, Buhi E, Davis-Gunnels E (2005) A review of 21 curricula for abstinence-only-until-marriage programs. Journal of School Health 75(3):90-8.

Wodarski JS, Bordnick PS (1994) Teaching adolescents about alcohol and driving: A 2-year follow-up study. Research on Social Work Practice 4(1):28-39.

Wolk LJ, Rosenbaum R (1995) The benefits of school-based condom availability: Cross-sectional analysis of a comprehensive high school-based program. Journal of Adolescent Health 17(3):184-188.

Wong WCW, Lee A, Tsang KKA, Lynn H (2006) The impact of AIDS/sex education by schools or family doctors on Hong Kong Chinese adolescents. Psychology, Health and Medicine 11(1):108-116.

Wood E, Senn CY, Desmarais S, Verberg N (2000) Offering Sexual Health Fairs To Supplement Existing Sex Education Programs: An Evaluation of Adolescent Students' Knowledge Needs. Alberta Journal of Educational Research 46(4):356-71.

Wood E, Shakeshaft A, Gilmour S, Sanson-Fisher R (2006) A systematic review of school-based studies involving alcohol and the community. Australian & New Zealand Journal of Public Health 30(6):541-9.

Woodside M, Bishop RM, Miller LT, Swisher JD (1997) Experimental evaluation of 'the images within': an alcohol education and prevention program. Journal of Drug Education 27(1):53-65.

Wren PA, Janz NK, Carovano K, Zimmerman MA, Washienko KM (1997) Preventing the spread of AIDS in youth: Principles of practice from 11 diverse projects. Journal of Adolescent Health 21(5):309-317.

Wynn SR, Schulenberg J, Kloska DD, Laetz VB (1997) The Mediating Influence of Refusal Skills in Preventing Adolescent Alcohol Misuse. Journal of School Health 67(9):390-95.

Yampolskaya S, Brown EC, Vargo AC (2004) Assessment of Teen Pregnancy Prevention Interventions Among Middle School Youth. Child & Adolescent Social Work Journal 21:69-83.

Yanqin L, Quanqing Z, Ping L, Zhifang W, Yi W, Xuecheng L (2001) Evaluation on the effect of a short-term intervention of sexual/reproductive health education among rural middle school students. Journal of Xi'an Medical University, English Edition 13(2):89-93.

Yawn BP, Yawn RA (1993) Adolescent pregnancies in rural America: A review of the literature and strategies for primary prevention. Family & Community Health 16(1):36-45.

Young C (1991) Alcohol, Drugs, Driving and You: A comprehensive program to prevent adolescent drinking, drug use, and driving. Journal of Alcohol and Drug Education 36(2):20-25.

Younoszai TM, Lohrmann DK, Seefeldt CA, Greene R (1999) Trends from 1987 to 1991 in alcohol, tobacco, and other drug (ATOD) use among adolescents exposed to a school district-wide prevention intervention. Journal of Drug Education 29(1):77-95.

Zabin LS (1992) School-linked reproductive health services: The Johns Hopkins program, in Preventing adolescent pregnancy: Model programs and evaluations., pp 156-184.

Zabin LS (1994) Addressing adolescent sexual behavior and childbearing: self-esteem or social change? Womens Health Issues 4(2):92-7.

Zagumny MJ, Thompson MK (1997) Does D.A.R.E. Work? An Evaluation in Rural Tennessee. Journal of Alcohol and Drug Education 42(2):32-41.

Zanetta R, Moacyr R, Lancarotte I (2008) Bringing up students in the Healthy Lifestyle Multiplier Students program, Sao Paulo, Brazil. Preventing Chronic Disease 5(3):A98.

- **Population targeted by the intervention(s) did not meet review criteria (n=202)**

Abatemarco DJ, West B, Zec V, Russo A, Sosiak P, Mardesic V (2004) Project Northland in Croatia: a community-based adolescent alcohol prevention intervention. Journal of Drug Education 34(2):167-179.

Abbaspour Z, Saidian M, Abedi P (2007) Peer education vs health provider education in knowledge and attitude about prevention and transmission of AIDS in high school students. Pakistan Journal of Medical Sciences 23(1):108-110.

Abolfotouh MA (1995) The impact of a lecture on AIDS on knowledge, attitudes and beliefs of male school-age adolescents in the Asir Region of southwestern Saudi Arabia. Journal of Community Health 20(3):271-81.

Ackermann ME (2008) The importance of gender and readiness to change in the prediction of drinking and negative consequences of first-year student drinkers, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 68.

Adams TB, Evans DR, Shreffler RM, Beam KJ (2006) Development and Evaluation of Theory-Based Alcohol Education Programs. Journal of Alcohol and Drug Education 50(3):21-30.

Agha S (2002) An evaluation of the effectiveness of a peer sexual health intervention among secondary-school students in Zambia. AIDS Education and Prevention 14(4):269-281.

Agha S, Van Rossem R (2004) Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behavior of Zambian adolescents. Journal of Adolescent Health 34(5):441-452.

Alexander SL (1999) The effects of a self-efficacy enhancement program on self-efficacy and condom use among college students, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 59.

Anavberokhai MO (2006) Adolescents Sexual Behavioural Response to HIV/AIDS Education. Journal of Human Ecology 20(2):129-133.

Anderko L, Uscian M (2002) Academic-community partnerships as a strategy for positive change in the sexual behavior of rural college-aged students. Nursing Clinics of North America 37(2):341-9.

Ang A, Kinsler J, Morisky DE, Sneed CD (2004) Evaluation of a school-based intervention for HIV/AIDS prevention among Belizean adolescents. Health Education Research 19(6):730-738.

Antunes MC, Stall RD, Paiva V, Peres CA, Paul J, Hudes M, Hearst N (1997) Evaluating an AIDS sexual risk reduction program for young adults in public night schools in São Paulo, Brazil. AIDS (London, England) 11(Suppl 1):S121-S127.

Aplasca MR, Siegel D, Mandel JS, Santana-Arciaga RT, Paul J, Hudes ES, Monzon OT, Hearst N (1995) Results of a model AIDS prevention program for high school students in the Philippines. AIDS 9 Suppl 1:S7-13.

Asamoah A (1999) Effects of adult-led didactic presentation and peer-led discussion on AIDS-knowledge of junior secondary school students. IFE Psychologia: An International Journal 7(2):213-228.

Asher KM (2009) Educating college students through judicial response: Examining the effectiveness of judicial sanctions for alcohol-related violations, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 69.

Baer JS, Kivlahan DR, Fromme K, Marlatt GA (1994) Secondary prevention of alcohol abuse with college student populations: A skills-training approach, in Alcohol use and misuse by young adults.,(Howard GS, Nathan PE eds), pp 83-108.

Barnett LA, Far JM, Mauss AL, Miller JA (1996) Changing perceptions of peer norms as a drinking reduction program for college students. Journal of Alcohol and Drug Education 41(2):39-62.

Battistich V, Dean BJ, Gosselink CA, Zavela KJ (2004) Say yes first: follow-up of a five year rural drug prevention program. Journal of Drug Education 34:73-88.

Bauman DW, 3rd (1993) Peer education in the residential context. Journal of American College Health 41(6):271-2.

Bendtsen P, Johansson K, Akerlind I (2006) Feasibility of an email-based electronic screening and brief intervention (e-SBI) to college students in Sweden. Addictive Behaviors 31(5):777-87.

Benson TA, Deskins MM, Eakin D, Flood AM, McDevitt-Murphy ME, Murphy JG, Torrealday O, Vuchinich RE (2004) A comparison of personalized feedback for college student drinkers delivered with and without a motivational interview. Journal of Studies on Alcohol 65(2):200-203.

Bersamin M, Paschall MJ, Fearnow-Kenney M, Wyrick D (2007) Effectiveness of a Web-based alcohol-misuse and harm-prevention course among high- and low-risk students. Journal of American College Health 55(4):247-54.

Blair KE (2000) Evaluation of the effectiveness of a physician intervention program to reduce alcohol consumption among college students, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 61.

Blume AW, Marlatt GA (2004) Motivational Enhancement as a Brief Intervention for College Student Drinkers, in Handbook of motivational counseling: Concepts, approaches, and assessment.,(Miles Cox W, Klinger E eds), pp 409-420. John Wiley & Sons td.

Brewer KK (1997) Behavioral preventions of sexually transmitted diseases and unintended pregnancies in college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 58.

Brondino MJ (1998) Message framing effects on risky decision-making in the context of AIDS prevention programming, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 58.

Bryan AD, Aiken LS, West SG (1996) Increasing condom use: evaluation of a theory-based intervention to prevent sexually transmitted diseases in young women. Health Psychology 15(5):371-82.

Cabezon C, Vigil P, Rojas I, Leiva ME, Riquelme R, Aranda W, Garcia C (2005) Adolescent pregnancy prevention: An abstinence-centered randomized controlled intervention in a Chilean public high school. Journal of Adolescent Health 36(1):64-69.

Caceres CF, Rosasco AM, Mandel JS, Hearst N (1994) Evaluating a school-based intervention for STD/AIDS prevention in Peru. Journal of Adolescent Health 15(7):582-591.

Cai Y, Hong H, Shi R, Ye X, Xu G, Li S, Shen L (2008) Long-term follow-up study on peer-led school-based HIV/AIDS prevention among youths in Shanghai. International Journal of STD and AIDS 19(12):848-850.

Carey KB, Scott-Sheldon LAJ, Carey MP, DeMartini KS (2007) Individual-level interventions to reduce college student drinking: a meta-analytic review. Addictive Behaviors 32(11):2469-94.

Caron SL, Carter DB, Davis CM, Macklin E (1997) Evaluating the effectiveness of workshop interventions on contraceptive use among first-year college students. Journal of Psychology & Human Sexuality 9(3-4):99-120.

Cartagena RG, Veugelers PJ, Kipp W, Magigav K, Laing LM (2006) Effectiveness of an HIV Prevention Program for Secondary School Students in Mongolia. Journal of Adolescent Health 39(6):925.e9-925.e16.

Caudill BD, Luckey B, Crosse SB, Blane HT, Ginexi EM, Campbell B (2007) Alcohol risk-reduction skills training in a national fraternity: a randomized intervention trial with longitudinal intent-to-treat analysis, in Journal of Studies on Alcohol and Drugs, pp 399-409.

Cheng Y, Lou CH, Mueller LM, Zhao SL, Yang JH, Tu XW, Gao ES (2008) Effectiveness of a School-Based AIDS Education Program among Rural Students in HIV High Epidemic Area of China. Journal of Adolescent Health 42(2):184-191.

Chernoff RA (2001) An evaluation of a brief HIV/AIDS prevention intervention using normative feedback to promote risk reduction among sexually active college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 62.

Chernoff RA, Davison GC (2005) An evaluation of a brief HIV/AIDS prevention intervention for college students using normative feedback and goal setting. AIDS Education & Prevention 17(2):91-104.

Chiauzzi E, Green TC, Lord S, Thum C, Goldstein M (2005) My student body: a high-risk drinking prevention web site for college students. Journal of American College Health 53(6):263-74.

Cin SD, MacDonald TK, Fong GT, Zanna MP, Elton-Marshall TE (2006) Remembering the Message: The Use of a Reminder Cue to Increase Condom Use following a Safer Sex Intervention. Health Psychology 25(3):438-443.

Clapp JD, Stanger L (2003) Changing the College AOD Environment for Primary Prevention. Journal of Primary Prevention 23(4):515-23.

Cohen D (1996) The health belief model: Utility in predicting AIDS risk behavior in college students, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 56.

Collins PJ (2006) Message framing and sexual abstinence messages, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 66.

Croom K, Lewis D, Marchell T, Lesser ML, Reyna VF, Kubicki-Bedford L, Feffer M, Staiano-Coico L (2009) Impact of an online alcohol education course on behavior and harm for incoming first-year college students: short-term evaluation of a randomized trial. Journal of American College Health 57(4):445-54.

Curtin L, Stephens RS, Bonenberger JL (2001) Goal setting and feedback in the reduction of heavy drinking in female college students. Journal of College Student Psychotherapy 15(3):17-37.

Czuchry M, Sia TL, Dansereau DF (1999) Preventing alcohol abuse: an examination of the "Downward Spiral" game and educational videos. Journal of Drug Education 29(4):323-35.

Daboer JC, Ogbonna C, Jamda MA (2008) Impact of health education on sexual risk behaviour of secondary school students in Jos, Nigeria. Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria 17(3):324-9.

Dalrymple L, du Toit MK (1993) The evaluation of a drama approach to AIDS education. Educational Psychology 13(2):147-154.

DeJong W, Schneider SK, Towvim LG, Murphy MJ, Doerr EE, Simonsen NR, Mason KE, Scribner RA (2006) A multisite randomized trial of social norms marketing campaigns to reduce college student drinking. Journal of Studies on Alcohol 67(6):868-879.

DiPasquale JA (1990) HIV infection. An educational program on prevention for college freshmen. Cancer Nursing 13(3):152-7.

Donohue B, Allen DN, Maurer A, Ozols J, DeStefano G (2004) A Controlled Evaluation of Two Prevention Programs in Reducing Alcohol Use Among College Students at Low and High Risk for Alcohol Related Problems. Journal of Alcohol and Drug Education 48:13-33.

Dotterer S, Olds RS, Raub CG, Sharp KE, Thombs DL (2004) A close look at why one social norms campaign did not reduce student drinking. Journal of American College Health 53(2):61-68.

Eddy MS (1992) College Alcohol and Drug Abuse Prevention Programs: An Update. ERIC Digest, pp 4. ERIC Clearinghouse on Higher Education, Washington, DC.

Eggleston AM (2008) Components analysis of a brief intervention for college drinkers, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 68.

Ehrhardt BL, Krumboltz JD, Koopman C (2007) Training Peer Sexual Health Educators: Changes in Knowledge, Counseling Self-Efficacy, and Sexual Risk Behavior. American Journal of Sexuality Education 2:39-55.

Elliott JC, Carey KB, Bolles JR (2008) Computer-based interventions for college drinking: a qualitative review. Addictive Behaviors 33(8):994-1005.

Esere MO (2008) Effect of Sex Education Programme on at-risk sexual behaviour of school-going adolescents in Ilorin, Nigeria. African Health Sciences 8(2):120-5.

Evans AE, Edmundson-Drane EW, Harris KK (2000) Computer-assisted instruction: an effective instructional method for HIV prevention education?, in The Journal of adolescent health : official publication of the Society for Adolescent Medicine, pp 244-51.

Fisher JD, Fisher WA, Misovich SJ, Kimble DL, Malloy TE (1996) Changing AIDS risk behavior: effects of an intervention emphasizing AIDS risk reduction information, motivation, and behavioral skills in a college student population. Health Psychology 15(2):114-23

Fitzgerald AM, Stanton BF, Terreri N, Shipena H, Li X, Kahihuata J, Ricardo IB, Galbraith JS, De Jaeger AM (1999) Use of western-based HIV risk-reduction interventions targeting adolescents in an african setting. Journal of Adolescent Health 25(1):52-61.

Fongkaew W, Fongkaew K, Suchaxaya P (2007) Early adolescent peer leader development in HIV prevention using youth-adult partnership with schools approach. JANAC: Journal of the Association of Nurses in AIDS Care 18:60-71.

Fromme K, Corbin W (2004) Prevention of heavy drinking and associated negative consequences among mandated and voluntary college students. Journal of Consulting and Clinical Psychology 72(6):1038-1049.

Fromme K, Orrick D (2004) The Lifestyle Management Class: A harm reduction approach to college drinking. Addiction Research & Theory 12:335-351.

Gallant M, Maticka-Tyndale E (2004) School-Based HIV Prevention Programmes for African Youth. Social Science & Medicine 58(7):1337-1351.

George Washington Univ., Washington, DC. School of Education and Human Development.

Geshi M, Hirokawa K, Taniguchi T, Fujii Y, Kawakami N (2007) Effects of alcohol-related health education on alcohol and drinking behavior awareness among Japanese junior college students: a randomized controlled trial. Acta Medica Okayama 61(6):345-54.

Givaudan M, Leenen I, Van De Vijver FJR, Poortinga YH, Pick S (2008) Longitudinal study of a School based HIV/AIDS early prevention program for Mexican Adolescents. Psychology, Health and Medicine 13(1):98-110.

Givaudan M, Van de Vijver FJR, Poortinga YH, Leenen I, Pick S (2007) Effects of a school-based life skills and HIV-prevention program for adolescents in Mexican high schools. Journal of Applied Social Psychology 37:1141-1162.

Glautier S, Rigney U, Willner P (2001) Motivation for alcohol assessed by multiple variable interval schedule behavior: Effects of reward size and alcohol cues. Behavioural Pharmacology 12(2):81-89.

Goertzel TG, Bluebond-Langner M (1991) What is the impact of a campus AIDS education course? Journal of American College Health 40(2):87-92.

Gonzalez G, Clement V (1994) Research and Intervention. Preventing Substance Abuse in Higher Education, pp 129. Network of Colleges and Universities Committed to the Elimination of Drug and Alcohol Abuse, Washington, DC.

Gregory BM (2001) College alcohol and life skills study with student-athletes, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 62.

Griffin SY (2005) Factors that affect college students' readiness to change their drinking behavior, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 65.

Guarna J (2001) Altering binge drinking behavior: An intervention based on the attention-allocation model, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 61.

Guth LJ, Hewitt GC, Smith S, Fisher MS (2000) Student Attitudes toward AIDS and Homosexuality: The Effects of a Speaker with HIV. Journal of College Student Development 41(5):503-12.

Guth LJ, Lopez DF, Fisher MS (2002) In-Person versus Internet Training: A Comparison of Student Attitudes toward Homosexuality. NASPA Journal 40(1).

Gyarmathy VA, McNutt LA, Molnar A, Morse DL, DeHovitz J, Ujhelyi E, Szamado S (2002) Evaluation of a comprehensive AIDS education curriculum in Hungary - the role of good educators. Journal of Adolescence 25(5):495-508.

Hahn EJ, Hall LA, Rayens MK, Myers AV, Bonnel G (2007) School- and home-based drug prevention: Environmental, parent, and child risk reduction. Drugs: Education, Prevention & Policy 14:319-331.

Haines M, Spear SF (1996) Changing the perception of the norm: a strategy to decrease binge drinking among college students. Journal of American College Health 45(3):134-40.

Harris JL, Ludwig M (1996) The Trading Cards Program: An Evaluation of Use of High School Role Models for Drug Abuse Prevention. Journal of Health Education 27(3):183-86.

Helion AM, Reddy DM, Kies AL, Morris DR, Wilson CM (2008) Influence of communicator's race on efficacy of an HIV/STD prevention intervention among African American and Caucasian college students. Public Health Nursing 25(5):440-50.

Hernandez DV, Skewes MC, Resor MR, Villanueva MR, Hanson BS, Blume AW (2006) A pilot test of an alcohol skills training programme for Mexican-American college students. International Journal of Drug Policy 17:320-328.

Horn PA, Brigham TA (1996) A self-management approach to reducing AIDS risk in sexually active heterosexual college students. Behavior and Social Issues 6(1):3-21.

Huang H, Ye X, Cai Y, Shen L, Xu G, Shi R, Jin X (2008) Study on peer-led school-based HIV/AIDS prevention among youths in a medium-sized city in China. International Journal of STD and AIDS 19(5):342-346.

Hunter Fager J, Mazurek Melnyk B (2004) The effectiveness of intervention studies to decrease alcohol use in college undergraduate students: an integrative analysis. Worldviews on Evidence-Based Nursing 1(2):102-19.

James S, Reddy P, Ruiter RAC, McCauley A, Van Den Borne B (2006) The impact of an HIV and AIDS life skills program on secondary school students in Kwazulu-Natal, South Africa. AIDS Education and Prevention 18(4):281-294.

James S, Reddy PS, Ruiter RAC, Taylor M, Jinabhai CC, Van Empelen P, Van Den Borne B (2005) The effects of a systematically developed photo-novella on knowledge, attitudes, communication and behavioural intentions with respect to sexually transmitted infections among secondary school learners in South Africa. Health Promotion International 20(2):157-165.

Johnsson KO, Berglund M (2006) Comparison between a cognitive behavioural alcohol programme and post-mailed minimal intervention in high-risk drinking university freshmen: results from a randomized controlled trial, in Alcohol and alcoholism (Oxford, Oxfordshire), vol 41, pp 174-80.

Jones SG, Patsdaughter CA, Jorda ML, Hamilton M, Malow R (2008) SENORITAS: an HIV/sexually transmitted infection prevention project for Latina college students at a Hispanic-serving university. Journal of the Association of Nurses in AIDS Care 19(4):311-9.

Kamal AS (1999) Adult awareness strategies in AIDS health education, in Dissertation Abstracts International Section A: Humanities and Social Sciences, vol 60.

Karnell AP, Cupp PK, Zimmerman RS, Feist PS, Bennie T (2006) Efficacy of an American Alcohol and HIV Prevention Curriculum Adapted for Use in South Africa: Results of a Pilot Study in Five Township Schools. AIDS Education and Prevention 18:16-310.

Kashibuchi M, Sakamoto A (2001) The educational effectiveness of a simulation/game in sex education. Simulation & Gaming 32(3):331-343.

Kiene SM, Barta WD (2006) A brief individualized computer-delivered sexual risk reduction intervention increases HIV/AIDS preventive behavior. Journal of Adolescent Health 39(3):404-10.

Kinsler J, Sneed CD, Morisky DE, Ang A (2004) Evaluation of a school-based intervention for HIV/AIDS prevention among Belizean adolescents. Health Education Research 19(6):730-8.

Kinsman J, Nakiyingi J, Kamali A, Carpenter L, Quigley M, Pool R, Whitworth J (2001) Evaluation of a comprehensive school-based aids education programme in rural Masaka, Uganda. Health Education Research 16(1):85-100.

Kirkpatrick WR (1993) The influence of an AIDS awareness program on knowledge, attitudes, opinions, behaviors, and behavioral intentions of college students, in Dissertation Abstracts International, vol 53.

Knaus CS, Pinkleton BE, Austin EW (2000) The ability of the AIDS Quilt to motivate information seeking, personal discussion, and preventative behavior as a health communication intervention. Health Communication 12(3):301-316.

Knight CL (1995) HIV prevention and heterosexual college students: The impact of video instruction on the "safer" sexual behaviors of sexually active men, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 56.

Kritch KM, Bostow DE, Dedrick RF (1995) Level of interactivity of videodisc instruction on college students' recall of AIDS information. Journal of Applied Behavior Analysis 28(1):85-6.

Kuhn L, Steinberg M, Mathews C (1994) Participation of the school community in AIDS education: an evaluation of a high school programme in South Africa. AIDS Care 6(2):161-71.

Kyrychenko P, Kohler C, Sathiakumar N (2006) Evaluation of a School-Based HIV/AIDS Educational Intervention in Ukraine. Journal of Adolescent Health 39(6):900-907.

LaBrie JW, Huchting K, Tawalbeh S, Larimer M, Neighbors C, Pedersen ER, Thompson AD, Shelesky K (2008) A Randomized Motivational Enhancement Prevention Group Reduces Drinking and Alcohol Consequences in First-Year College Women. Psychology of Addictive Behaviors 22(1):149-155.

LaBrie JW, Hummer JF, Neighbors C, Pedersen ER (2008) Live interactive group-specific normative feedback reduces misperceptions and drinking in college students: a randomized cluster trial. Psychology of Addictive Behaviors 22(1):141-8.

Lambert EC (2001) College students' knowledge of human papillomavirus and effectiveness of a brief educational intervention.[see comment]. Journal of the American Board of Family Practice 14(3):178-83.

Larimer ME, Cronce JM (2002) Identification, prevention and treatment: a review of individual-focused strategies to reduce problematic alcohol consumption by college students. Journal of Studies on Alcohol - Supplement (14):148-63.

Larimer ME, Cronce JM (2007) Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. Addictive Behaviors 32(11):2439-2468.

Larimer ME, Kilmer JR, Lee CM (2005) College Student Drug Prevention: A Review of Individually-Oriented Prevention Strategies. Journal of Drug Issues 35:431-456.

Larsen JD, Kozar B (2005) Evaluation of a computer administered alcohol education program for college students. Journal of Alcohol and Drug Education 49:69-83.

Lau HC (2007) Development and evaluation of a single-session expectancy challenge intervention to reduce alcohol use among heavy drinking college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 67.

Lederman LC, Stewart LP, Russ TL (2007) Addressing college drinking through curriculum infusion: A study of the use of experience-based learning in the communication classroom. Communication Education 56:476-494.

Lee MJ, Bichard SL (2006) Effective message design targeting college students for the prevention of binge-drinking: basing design on rebellious risk-taking tendency. Health Communication 20(3):299-308.

Li X, Stanton B, Wang B, Mao R, Zhang H, Qu M, Sun Z, Wang J (2008) Cultural adaptation of the Focus on Kids program for college students in China. AIDS Education & Prevention 20(1):1-14.

Licciardone JC (2003) Outcomes of a Federally Funded Program for Alcohol and Other Drug Prevention in Higher Education. American Journal of Drug and Alcohol Abuse 29(4):803-827.

Lindemann DF (2004) Comparing two condom use components of a HIV/AIDS intervention for college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 64.

Lindemann DF, Brigham TA, Harbke CR, Alexander T (2005) Toward errorless condom use: a comparison of two courses to improve condom use skills. AIDS & Behavior 9(4):451-7.

Lou C-h, Zhao Q, Gao E-S, Shah IH (2006) Can the Internet be used effectively to provide sex education to young people in China? Journal of Adolescent Health 39(5):720-8.

Magnani R, MacIntyre K, Karim AM, Brown L, Hutchinson P (2005) The impact of life skills education on adolescent sexual risk behaviors in KwaZulu-Natal, South Africa. Journal of Adolescent Health 36(4):289-305.

Martinez-Donate AP, Hovell MF, Zellner J, Sipan CL, Blumberg EJ, Carrizosa C (2004) Evaluation of two school-based HIV prevention interventions in the border city of Tijuana, Mexico. Journal of Sex Research 41(3):267-278.

Martiniuk ALC, O'Connor KS, King WD (2003) A cluster randomized trial of a sex education programme in Belize, Central America.[see comment]. International Journal of Epidemiology 32(1):131-6.

Mayhew MJ, Caldwell RJ, Hourigan AJ (2008) The Influence of Curricular-Based Interventions within First-Year "Success" Courses on Student Alcohol Expectancies and Engagement in High-Risk Drinking Behaviors. NASPA Journal 45(1):49-72.

Mba CI, Obi SN, Ozumba BC (2007) The impact of health education on reproductive health knowledge among adolescents in a rural Nigerian community. Journal of Obstetrics & Gynaecology 27(5):513-7.

Meyer WA, Steyn M (1992) AIDS Preventive Education and Life Skills Training Programme for Secondary Schools: Development and Evaluation, pp 156. Human Sciences Research Council, Pretoria (South Africa).

Michael KD, Curtin L, Kirkley DE, Jones DL, Harris R, Jr. (2006) Group-based motivational interviewing for alcohol use among college students: An exploratory study. Professional Psychology: Research and Practice 37:629-634.

Montgomery AJ (1996) AIDS education: knowledge, sexual attitudes and sexual behavioral responses of selected college students. ABNF Journal 7(2):57-60.

Moore MJ, Soderquist J, Werch C (2005) Feasibility and efficacy of a binge drinking prevention intervention for college students delivered via the Internet versus postal mail. Journal of American College Health 54(1):38-44.

Murphy JG (2003) A comparison of personal feedback for college student drinkers delivered with and without a counseling session, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 64.

Murphy JG, Duchnick JJ, Vuchinich RE, Davison JW, Karg RS, Olson AM, Smith AF, Coffey TT (2001) Relative efficacy of a brief motivational intervention for college student drinkers, in Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors, pp 373-9.

Nelson TF, Weitzman ER, Wechsler H (2005) The effect of a campus-community environmental alcohol prevention initiative on student drinking and driving: Results from the "A Matter of Degree" program evaluation. Traffic Injury Prevention 6(4):323-330.

Nokes KM (1996) Intervention to promote safer sexual behaviors and educate peers about HIV/AIDS. Journal of Nursing Education 35(5):227-9.

Oswalt SB, Shutt MD, English E, Little SD (2007) Did it work? Examining the impact of an alcohol intervention on sanctioned college students. Journal of College Student Development 48:543-557.

Ozcebe H, Akin L, Aslan D (2004) A peer education example on HIV/AIDS at a high school in Ankara. Turkish Journal of Pediatrics 46(1):54-59.

Parwej S, Kumar R, Walia I, Aggarwal AK (2005) Reproductive health education intervention trial. Indian Journal of Pediatrics 72(4):287-91.

Paschall MJ, Bersamin M, Fearnow-Kenney M, Wyrick D, Currey D (2006) Short-Term Evaluation of a Web-based College Alcohol Misuse and Harm Prevention Course (College Alc). Journal of Alcohol and Drug Education 50:49-65.

Peeler CM (2001) An analysis of the effects of a course designed to reduce the frequency of high-risk sexual behavior and heavy drinking (immune deficiency), in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 61.

Peeler CM, Far J, Miller J, Brigham TA (2000) An analysis of the effects of a program to reduce heavy drinking among college students. Journal of Alcohol and Drug Education 45(2):39-54.

Peleg A, Neumann L, Friger M, Peleg R, Sperber AD (2001) Outcomes of a brief alcohol abuse prevention program for Israeli high school students. Journal of Adolescent Health 28(4):263-9.

Perkins HW, Craig DW (2002) A Multifaceted Social Norms Approach To Reduce High-Risk Drinking: Lessons from Hobart and Williams Smith Colleges, pp 44. Higher Education Center for Alcohol and Other Drug Prevention, Newton, MA.

Perold JJ, Schoeman JB, Visser MJ (2004) Evaluation of HIV/AIDS prevention in South African schools. Journal of Health Psychology 9(2):263-280.

Peterson KE (1992) AIDS education and prevention at colleges and universities. AIDS prevention and treatment: Hope, humor, and healing.:121-141.

Petrie J, Bunn F, Byrne G (2007) Parenting programmes for preventing tobacco, alcohol or drugs misuse in children <18: a systematic review. Health Education Research 22(2):177-191.

Ploem C, Byers ES (1997) The effects of two AIDS risk-reduction interventions on heterosexual college women's AIDS-related knowledge, attitudes and condom use. Journal of Psychology & Human Sexuality 9(1):1-24.

Polonec LD, Major AM, Atwood LE (2006) Evaluating the believability and effectiveness of the social norms message "most students drink 0 to 4 drinks when they party". Health Communication 20(1):23-34.

Rainer JP (1994) The effect of intimate exposure to alcohol abuse on the acquisition of knowledge about drinking. Journal of Addictive Diseases 13(2):21-33.

Rajbhandari MMS (2008) Impact of Sexuality Education in Preventing STD-HIV/AIDS among Teenagers of School Going Students, pp 56.

Rasler ML (1993) Development of a Sex Education Syllabus for Health Science at American River College. Emergence of Higher Education in America, pp 103.

Rehnberg T, Barabasz M (1994) The Effect of a Health Belief Intervention on Safer Sex Practices, pp 10.

Reis J, Riley W, Baer J (2000) Interactive multimedia preventive alcohol education: An evaluation of effectiveness with college students. Journal of Educational Computing Research 23(1):41-65.

Reis J, Trockel M, Wall A (2003) Promoting Student Support for Alcohol Misuse Prevention on Campus: The Role of Secondhand Consequence Expectancies. NASPA Journal 40(2).

Reis J, Tymchyshyn P (1992) A longitudinal evaluation of computer-assisted instruction on contraception for college students. Adolescence 27(108):803-11.

Roberts LJ, Neal DJ, Kivlahan DR, Baer JS, Marlatt GA (2000) Individual drinking changes following a brief intervention among college students: clinical significance in an indicated preventive context, in Journal of Consulting and Clinical Psychology, pp 500-5.

Sain R (2006) Analysis of a program to increase condom use by sexually active college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 66.

Saleh MA, al-Ghamdi YS, al-Yahia OA, Shaqran TM, Mosa AR (1999) Impact of health education program on knowledge about AIDS and HIV transmission in students of secondary schools in Buraidah city, Saudi Arabia: an exploratory study. Eastern Mediterranean Health Journal 5(5):1068-75.

Sanderson CA (1999) Role of relationship context in influencing college students' responsiveness to HIV prevention videos. Health Psychology 18(3):295-300.

Sanderson CA, Jemmott JB, III (1996) Moderation and mediation of HIV-prevention interventions: Relationship status, intentions, and condom use among college students. Journal of Applied Social Psychology 26(23):2076-2099.

Sankaranarayan S, Naik E, Reddy PS, Gurunani G, Ganesh K, Gandewar K, Singh KP, Vermund SH (1996) Impact of school-based HIV and AIDS education for adolescents in Bombay, India. Southeast Asian Journal of Tropical Medicine & Public Health 27(4):692-5.

Sawyer RG, Pinciaro P, Bedwell D (1997) How peer education changed peer sexuality educators' self-esteem, personal development, and sexual behavior. Journal of American College Health 45(5):211-7.

Schenker II, Greenblatt CL (1993) Israeli youth and AIDS: Knowledge and attitude changes among high school students following an AIDS education program. Israel Journal of Medical Sciences 29(10 SUPPL.):41-47.

Schroeder CM, Prentice DA (1998) Exposing pluralistic ignorance to reduce alcohol use among college students. Journal of Applied Social Psychology 28(23):2150-2180.

Scott KJ, Miller G, Gridley B (1997) Voluntary alcohol education: Whom do we reach? Journal of College Student Development 38(3):305-307.

Shapiro Cohen EL (2001) High-risk sexual behavior in the context of alcohol use: An intervention for college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 61.

Sharmer LA (2000) Evaluation of alcohol education on attitude, knowledge and self-reported behavior of college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 61.

Shen LX, Hong H, Cai Y, Jin XM, Shi R (2008) Effectiveness of peer education in HIV/STD prevention at different types of senior high schools in Shanghai, People's Republic of China. International Journal of STD and AIDS 19(11):761-767.

Shulman HA, Sweeney B, Gerler ER (1995) A computer-assisted approach to preventing alcohol abuse: Implications for the middle school. Elementary School Guidance & Counseling 30(1):63-77.

Smith BH (2004) A randomized study of a peer-led, small group social norming intervention designed to reduce drinking among college students. Journal of Alcohol and Drug Education 47(3):67-75.

Smith EA, Dickson LL (1993) The impact of a condom desensitization program on female college students. Health Values: The Journal of Health Behavior, Education & Promotion 17(3):21-31.

Spradlin K (2007) Integration of the Transtheoretical Model of Change and the Elaboration Likelihood Model in approaching HIV/AIDS prevention, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 68.

Stamper GA (2007) The evaluation of program fidelity in two college alcohol interventions, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 67.

Stamper GA, Smith BH, Gant R, Bogle KE (2004) Replicated findings of an evaluation of a brief intervention designed to prevent high-risk drinking among first-year college students: Implications for social norming theory, vol 48, pp 53-72.

Stanton BF, Li X, Kahihuata J, Fitzgerald AM, Neumbo S, Kanduuombe G, Ricardo IB, Galbraith JS, Terreri N, Guevara I, Shipena H, Strijdom J, Clemens R, Zimba RF (1998) Increased protected sex and abstinence among Namibian youth following a HIV risk-reduction intervention: A randomized, longitudinal study. AIDS 12(18):2473-2480.

Steffian G (1999) Correction of normative misperceptions: an alcohol abuse prevention program. Journal of Drug Education 29(2):115-38.

Stiff J, And O (1990) Learning about AIDS and HIV Transmission in College-Age Students. Communication Research 17(6):743-58.

Stock ML (2008) It only takes once: Influence of sexual risk status, social comparison, and a public service announcement on absent-exempt cognitions, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 68.

Straub DM, Pomputius P, Boyer CB, Someillan NS, Perrin K (2007) HIV prevention education and testing among youth: is there a correlation? Journal of Adolescent Health 41(1):105-108.

Taylor EL (1992) Impact of an AIDS Education Course on University Student Attitudes. Health Education 23(7):418-22.

Thato R, Jenkins RA, Dusitsin N (2008) Effects of the culturally-sensitive comprehensive sex education programme among Thai secondary school students. Journal of Advanced Nursing 62(4):457-69.

Thomas N (1998) The effectiveness of a peer-led, self-management program on reducing AIDS risk in college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 59.

Thompson SC, Kyle D, Swan J, Thomas C, Vrungos S (2002) Increasing condom use by undermining perceived invulnerability to HIV. AIDS Education & Prevention 14(6):505-14.

Toomey TL, Lenk KM, Wagenaar AC (2007) Environmental policies to reduce college drinking: An update of research findings. Journal of Studies on Alcohol and Drugs 68(2):208-219.

Turner JC, Garrison CZ, Korpita E, Waller J, Addy C, Hill WR, Mohn LA (1994) Promoting responsible sexual behavior through a college freshman seminar. AIDS Education & Prevention 6(3):266-77.

Turner JC, Korpita E, Mohn LA, Hill WB (1993) Reduction in sexual risk behaviors among college students following a comprehensive health education intervention. Journal of American College Health 41(5):187-93.

Vachhrajani B (1996) Impact of self instructional material on sex education and attitude towards sex. Indian Journal of Psychometry & Education 27(1):27-31.

Valus KL (1999) Do AIDS peer educators have increased safer sex behaviors? (immune deficiency), in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 60.

Visser MJ (2005) Life skills training as HIV/AIDS preventive strategy in secondary schools: evaluation of a large-scale implementation process. SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance 2(1):203-16.

Visser MJ (2007) HIV/AIDS prevention through peer education and support in secondary schools in South Africa. SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance 4(3):678-94.

Visser MJ, Schoeman JB, Perold JJ (2004) Evaluation of HIV/AIDS Prevention in South African Schools. Journal of Health Psychology 9(2):263-280.

Vrungos SM (2003) Increasing HIV intervention effectiveness using an enhanced motivational approach: An evaluation of a multi-component motivation-skills program on HIV risk reduction behavior and condom use in heterosexual college students, in Dissertation Abstracts International: Section B: The Sciences and Engineering, vol 63.

Walker D, Gutierrez JP, Torres P, Bertozzi SM (2006) HIV prevention in Mexican schools: Prospective randomised evaluation of intervention. British Medical Journal 332(7551):1189-1192.

Walters ST (2000) In praise of feedback: An effective intervention for college students who are heavy drinkers. Journal of American College Health 48(5):235-238.

Walters ST, Vader AM, Harris TR (2007) A controlled trial of web-based feedback for heavy drinking college students, in Prevention science : the official journal of the Society for Prevention Research, pp 83-8.

Walters ST, Vader AM, Harris TR, Field CA, Jouriles EN (2009) Dismantling motivational interviewing and feedback for college drinkers: A randomized clinical trial. Journal of Consulting and Clinical Psychology 77:64-73.

Wechsler H, Nelson TE, Lee JE, Seibring M, Lewis C, Keeling RP (2003) Perception and reality: a national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use. Journal of Studies on Alcohol 64(4):484-94.

Weinhardt LS, Carey KB, Carey MP (2000) HIV risk sensitization following a detailed sexual behavior interview: a preliminary investigation. Journal of Behavioral Medicine 23(4):393-8.

Weitzman ER, Nelson TF, Lee H, Wechsler H (2004) Reducing drinking and related harms in college: Evaluation of the "a matter of degree" program. American Journal of Preventive Medicine 27(3):187-196.

Wellings K, Wadsworth J, Johnson AM, Field J, Whitaker L, Field B (1995) Provision of sex education and early sexual experience: The relation examined. British Medical Journal 311(7002):417-420.

Wiefferink CH, Poelman J, Linthorst M, Vanwesenbeeck I, Van Wijngaarden JCM, Paulussen TGW (2005) Outcomes of a systematically designed strategy for the implementation of sex education in Dutch secondary schools. Health Education Research 20(3):323-333.

Wilson CE (2004) Raising college students' alcohol awareness: a successful program at the University of Virginia. Journal of Emergency Nursing 30(1):64-7.

Wright SS, Kyes KB (1996) The effects of safer-sex stories on college students' attitudes toward condoms. Journal of Psychology & Human Sexuality 8(4):1-18.

Wyrick DL, Fearnow-Kenney MD, Wyrick CH, Bibeau DL (2005) College alcohol education and prevention: A case for distance education. Journal of Alcohol and Drug Education 49(4):5-14.

Yosefy C, Reuven Viskoper J, Friedman M, Biton Y, Glick S (1998) Health education in Israeli public schools by undergraduate medical students. Education for Health 11(1):73-81.

Yzer MC, Fisher JD, Bakker AB, Siero FW, Misovich SJ (1998) The effects of information about AIDS risk and self-efficacy on women's intentions to engage in AIDS preventive behavior. Journal of Applied Social Psychology 28(20):1837-1852.

Zellner J, Martinez-Donate A, Hovell M, Sipan C, Blumberg E, Carrizosa C, Rovniak L (2006) Feasibility and use of school-based condom availability programs in Tijuana, Mexico. AIDS & Behavior 10(6):649-658.

Ziemelis A, Bucknam RB, Elfessi AM (2002) Prevention efforts underlying decreases in binge drinking at institutions of higher education. Journal of American College Health 50(5):238-253.

Zisserson RN, Palfai T, Saitz R (2007) 'No-contact' interventions for unhealthy college drinking:efficacy of alternatives to person-delivered intervention approaches. Substance Abuse 28(4):119-31.

- **Intervention(s) examined was not based in a school setting (n=38)**

Allen JP, Philliber S, Herrling S, Kuperminc GP (1997) Preventing teen pregnancy and academic failure: Experimental evaluation of a developmentally based approach. Child Development 64:729-742.

Babor TE, Higgins-Biddle J, Dauser D, Higgins P, Burleson JA (2005) Alcohol screening and brief intervention in primary care settings: implementation models and predictors, in Journal of Studies on Alcohol, vol 66, pp 361-8.

Baldwin JA, Daley E, Brown EJ, August EM, Webb C, Stern R, Malow R, Devieux JG (2008) Knowledge and Perception of STI/HIV Risk Among Rural African-American Youth: Lessons Learned in a Faith-Based Pilot. Journal of HIV/AIDS Prevention in Children and Youth 9(1):97-114.

Benshoff JM, Alexander SJ (1993) The Family Communication Project: Fostering Parent-Child Communication about Sexuality. Elementary School Guidance and Counseling 27(4):288-300.

Brody GH, Kogan SM, Chen Yf, Murry VM (2008) Long-Term Effects of the Strong African American Families Program on Youths' Conduct Problems. Journal of Adolescent Health 43(5):474-481.

Cohen DA, Rice JC (1995) A Parent-targeted Intervention for Adolescent Substance Use Prevention: Lessons Learned. Evaluation Review 19(2):159-80.

D'Amico EJ, Orlando Edelen M (2007) Pilot Test of Project CHOICE: A Voluntary Afterschool Intervention for Middle School Youth. Psychology of Addictive Behaviors 21(4):592-598.

DiIorio C, McCarty F, Resnicow K, Lehr S, Denzmore P (2007) REAL men: a group-randomized trial of an HIV prevention intervention for adolescent boys, in American Journal of Public Health, vol 97, pp 1084-9.

Downs JS, Murray PJ, Bruine de Bruin W, Penrose J, Palmgren C, Fischhoff B (2004) Interactive video behavioral intervention to reduce adolescent females' STD risk: a randomized controlled trial, in Social science & medicine (1982), pp 1561-72.

Fager JH, Melnyk BM (2004) The effectiveness of intervention studies to decrease alcohol use in college undergraduate students: an integrative analysis (Structured abstract), in World Views on Evidence-Based Nursing, pp 102-119.

French RS, Mercer CH, Kane R, Kingori P, Stephenson JM, Wilkinson P, Grundy C, Lachowycz K, Jacklin P, Stevens M, Brooker S, Wellings K (2007) What Impact Has England's Teenage Pregnancy Strategy Had on Young People's Knowledge of and Access to Contraceptive Services? Journal of Adolescent Health 41(6):594-601.

Gao E-S, Lou C-H, Shen Y, Wang B (2004) Effects of a community-based sex education and reproductive health service program on contraceptive use of unmarried youths in Shanghai. Journal of Adolescent Health 34(5):433-440.

Harrison C, Parker P, Honey S (2005) Stepping Stones: parenting skills in the community. Community Practitioner 78(2):58-62.

Jemmott IJB, Jemmott LS, Fong GT (1998) Abstinence and safer sex HIV risk-reduction interventions for African American adolescents a randomized controlled trial. Journal of the American Medical Association 279(19):1529-1536.

Jemmott JB, III, And O (1992) Reductions in HIV Risk-Associated Sexual Behaviors among Black Male Adolescents: Effects of an AIDS Prevention Intervention. American Journal of Public Health 82(3):372-77.

Kipke MD, Boyer C, Hein K (1993) An evaluation of an AIDS Risk Reduction Education and Skills Training (ARREST) program. Journal of Adolescent Health 14(7):533-539.

Lederman RP, Mian TS (2003) The parent-adolescent relationship education (PARE) program: a curriculum for prevention of STDs and pregnancy in middle school youth. Behavioral Medicine 29(1):33-41.

Lee J, Donlan W, Paz J (2009) Culturally competent HIV/AIDS prevention: understanding program effects on adolescent beliefs, attitudes, and behaviors. Journal of HIV/AIDS & Social Services 8(1):57-80.

Meltzer IJ, Fitzgibbon JJ, Leahy PJ, Petsko KE (2006) A youth development program: Lasting impact. Clinical Pediatrics 45(7):655-660.

Midford R, McBride N, Farringdon F, Woolmer J (2000) The impact of a Youth Alcohol Forum: What changes for the participants? International Journal of Health Promotion and Education 38(2):65-70.

Miller BC, And O (1993) Impact Evaluation of FACTS & Feelings: A Home-Based Video Sex Education Curriculum. Family Relations 42(4):392-400.

Pearlman DN, Camberg L, Wallace LJ, Symons P, Finison L (2002) Tapping youth as agents for change: evaluation of a peer leadership HIV/AIDS intervention, in The Journal of adolescent health : official publication of the Society for Adolescent Medicine, pp 31-9.

Philliber S, Kaye JW, Herrling S, West E (2002) Preventing pregnancy and improving health care access among teenagers: an evaluation of the Children's Aid Society-Carrera Program. Perspectives on Sexual & Reproductive Health 34(5):244-252.

Pinkerton SD (2000) Economic evaluation of HIV risk reduction intervention in African-American male adolescents. Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology 25:164-172.

Rohrbach LA, Johnson CA, Mansergh G, Fishkin SA, Neumann FB (1997) Alcohol-related outcomes of the Day One Community Partnership. Evaluation and Program Planning 20(3):315-322.

Schinke SP, Cole KCA, Fang L (2009) Gender-Specific Intervention to Reduce Underage Drinking Among Early Adolescent Girls: A Test of a Computer-Mediated, Mother-Daughter Program. Journal of Studies on Alcohol and Drugs 70(1):70-77.

Smith LW, Brown HN, Lewallen LP, Penny JM (2006) Religious activities and health outcomes: the College Bound Sisters Program. Issues in Mental Health Nursing 27(2):199-212.

Spoth R, Redmond C, Shin C, Azevedo K (2004) Brief Family Intervention Effects on Adolescent Substance Initiation: School-Level Growth Curve Analyses 6 Years Following Baseline. Journal of Consulting and Clinical Psychology 72(3):535-542.

Spoth R, Shin C, Guyll M, Redmond C, Azevedo K (2006) Universality of effects: an examination of the comparability of long-term family intervention effects on substance use across risk-related

subgroups. Prevention science : the official journal of the Society for Prevention Research 7(2):209-24.

Spoth RL, Guyll M, Day SX (2002) Universal family-focused interventions in alcohol-use disorder prevention: cost-effectiveness and cost-benefit analyses of two interventions. Journal of Studies on Alcohol 63(2):219-28.

St Pierre TL, And O (1995) A 27-Month Evaluation of a Sexual Activity Prevention Program in Boys & Girls Clubs across the Nation. Family Relations 44(1):69-77.

Summerville G, Canova K (2006) The Power of Plain Talk: Exploring One Program' Influence on the Adolescent Reproductive Health Field, pp 34. Public/Private Ventures, Philadelphia, PA.

Toomey TL, And O (1996) An Alcohol Primary Prevention Program for Parents of 7th Graders: The Amazing Alternatives! Home Program. Journal of Child and Adolescent Substance Abuse 5(4):35-53.

Turner-Musa JO, Rhodes WA, Harper PTH, Quinton SL (2008) Hip-hop to prevent substance use and HIV among African-American youth: A preliminary investigation. Journal of Drug Education 38(4):351-365.

Turrisi R, Jaccard J, Taki R, Dunnam H, Grimes J (2001) Examination of the short-term efficacy of a parent intervention to reduce college student drinking tendencies. Psychology of Addictive Behaviors 15(4):366-72.

Villalbi JR (2000) Effects on attitudes, knowledge, intentions and behaviour of an AIDS prevention programme targeting secondary school adolescents. Promotion et Education 7(3):17-22.

Villarruel AM, Jemmott IJB, Jemmott LS (2006) A randomized controlled trial testing an HIV prevention intervention for Latino youth. Archives of Pediatrics and Adolescent Medicine 160(8):772-777.

Walker KE, Kotloff LJ (1999) Plain Talk: Addressing Adolescent Sexuality through a Community Initiative. A Final Evaluation Report, pp 143. Public/Private Ventures, Philadelphia, PA.

- **Intervention targeted ‘at risk’ or high risk population (n=4)**

Carter-Jessop L, Franklin LN, Heath Jr JW, Jimenez-Irizarry G, Peace MD (2000) Abstinence education for urban youth. Journal of Community Health 25(4):293-304.

Conrod PJ, Stewart SH, Comeau N, Maclean AM (2006) Efficacy of cognitive-behavioral interventions targeting personality risk factors for youth alcohol misuse. Journal of Clinical Child & Adolescent Psychology 35(4):550-63.

Longshore D, Ellickson PL, McCaffrey, DF, St Clair PA (2007) School-Based Drug Prevention among At-Risk Adolescents: Effects of ALERT Plus. Health Education and Behavior 34:18-66

Watson DW, Bisesi L, Tanamly S (2004) Substance Use HIV Intervention Program (SHIP): A School-Based Indicated Prevention Model for Juvenile Offenders in the Alternative School Setting. Journal of Correctional Education 55:24-259.

- **Intervention examined was not alcohol education and/SRE related (n=17)**

Casey MK, Timmermann L, Allen M, Krahn S, Turkiewicz KL (2009) Response and self-efficacy of condom use: A meta-analysis of this important element of AIDS education and prevention, vol 74, pp 57-78.

Cuijpers P (2002) Peer-led and adult-led school drug prevention: a meta-analytic comparison. Journal of Drug Education 32(2):107-119.

Dixon DJ, McLearen AM (2002) The Effectiveness of an Alcohol Abuse Prevention Program among High School Students in Rural Missouri. Rural Educator 24(1):18-21.

Feltey KM, Ainslie JJ, Geib A (1991) Sexual Coercion Attitudes among High School Students: The Influence of Gender and Rape Education. Youth and Society 23(2):229-250.

Foshee VA, Linder GF, Bauman KE, Langwick SA, Arriaga XB, Heath JL, McMahon PM, Bangdiwala S (1996) The Safe Dates Project: theoretical basis, evaluation design, and selected baseline findings 5:S39-47

Elder RW, Nichols JL, Shults RA, Sleet DA, Barrios LC, Compton R (2005) Effectiveness of school-based programs for reducing drinking and driving and riding with drinking drivers: a systematic review. American Journal of Preventive Medicine 28(5 Supplement):288-304.

Griffin KW, Botvin GJ, Nichols TR (2004) Long-term follow-up effects of a school-based drug abuse prevention program on adolescent risky driving, in Prevention science : the official journal of the Society for Prevention Research, pp 207-12.

McCambridge J, Strang J (2004) The efficacy of single-session motivational interviewing in reducing drug consumption and perceptions of drug-related risk and harm among young people: Results from a multi-site cluster randomized trial. Addiction 99(1):39-52.

McCambridge J, Strang J (2005) Deterioration over time in effect of Motivational Interviewing in reducing drug consumption and related risk among young people. Addiction 100(4):470-478.

Moyers PA, Stoffel VC (2004) An evidence-based and occupational perspective of interventions for persons with substance-use disorders. American Journal of Occupational Therapy 58(5):570-586.

Sheehan M, Schonfeld C, Ballard R, Schofield F, Najman J, Siskind V (1996) A three year outcome evaluation of a theory based drink driving education program. Journal of Drug Education 26(3):295-312.

Shope JT, Elliott MR, Raghunathan TE, Waller PF (2001) Long-term follow-up of a high school alcohol misuse prevention program's effect on students' subsequent driving. Alcoholism: Clinical & Experimental Research 25(3):403-10.

Simons-Morton B, Haynie D, Saylor K, Crump AD, Chen R (2005) Impact analysis and mediation of outcomes: the Going Places program. Health Education & Behavior 32(2):227-41.

Weisz AN, Black BM (2001) Evaluating a Sexual Assault and Dating Violence Prevention Program for Urban Youth. Social Work Research 25(2):89-100.

Wilkins TT (2000) The "Stay Alive From Education"(SAFE) program: Description and preliminary pilot testing. Journal of Alcohol and Drug Education 45(2):1-11.

Wright V, Akers SW, Rita S (2000) The Community Awareness Rape Education (CARE) program for high school students. Journal of Emergency Nursing 26(2):182-5.

Yates BA, Dowrick PW (1991) Stop the Drinking Driver: A Behavioral School-Based Prevention Program. Journal of Alcohol and Drug Education 36(2):12-19.

Appendix 3. Summary of quality assessment

Table 10.1Quality assessment: Randomised controlled trials

	Aarons, et al., 2000	Bellingham, et al., 1993	Blake, et al., 2001	Borawski, et al., 2009	Borgia, et al., 2005	Coyle, 1999	Coyle, 2004	Coyle, 2006	Eisen, 1990
Section 1: Population									
1.1 Is the source population or source area well described?	NR	-	+	NR	NR	NR	++	NR	++
1.2 Is the eligible population or area representative of the source population or area?	NR	+	++	NR	+	NR	++	-	++
1.3 Do the selected participants or areas represent the eligible population or area?	NR	++	++	NR	+	NR	++	-	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	+	+	NR	++	++	+	NR	+	NR
2.2 Were interventions (and comparisons) well described and appropriate?	-	+	++	++	+	++	+	++	++
2.3 Was the allocation concealed?	NR	NR	NR	+	NR	NR	NR	NA	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	-	-	NR	+	NR	NR	NA	NR
2.5 Was the exposure to the intervention and comparison adequate?	-	+	++	++	+	++	++	+	-
2.6 Was contamination acceptably low?	NR	NR	NR	++	++	++	++	NR	NR
2.7 Were other interventions similar in both groups?	NR	NA	++	NR	++	++	++	NR	+
2.8 Were all participants accounted for at study conclusion?	++	++	-	+	+	+	+	+	+
2.9 Did the setting reflect usual UK practice?	+	++	++	NA	+	NR	+	+	NA
2.10 Did the intervention or control comparison reflect usual UK practice?	+	++	+	NA	+	NR	+	+	+
Section 3: Outcomes									
3.1 Were outcome measures reliable?	NR	++	++	++	++	++	++	+	+

	Aarons, et al., 2000	Bellingham, et al., 1993	Blake, et al., 2001	Borawski, et al., 2009	Borgia, et al., 2005	Coyle, 1999	Coyle, 2004	Coyle, 2006	Eisen, 1990
3.2 Were all outcome measurements complete?	++	++	++	NA	++	NA	+	++	++
3.3 Were all important outcomes assessed?	++	++	++	++	++	++	++	++	++
3.4 Were outcomes relevant?	++	++	++	++	++	++	++	++	++
3.5 Were there similar follow-up times in exposure and comparison groups?	++	++	++	++	++	++	++	++	NR
3.6 Was follow-up time meaningful?	+	-	-	++	+	++	++	++	++
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	NR	+	++	-	+	++	+	++
4.2 Was Intention to treat (ITT) analysis conducted?	NR	NR	NA	NR	NR	NR	NR	NR	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	+	NR	NR	-	NR	+	NR	NR
4.4 Were the estimates of effect size given or calculable?	++	++	++	-	+	++	NR	++	NR
4.5 Were the analytical methods appropriate?	+	+	++	+	+	++	+	++	++
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	+	++	NR	-	+	++	++	++	NR
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**+**	**+**	**+**	**+**	**+**	**+**	**+**	**++**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**++**	**+**	**+**	**+**	**-**	**+**	**-**	**+**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.2Quality assessment: Randomised controlled trials continued

	Flay, et al., 2004	Graham, et al., 2002	Graham, et al., 1990	Harrington, et al., 2001	Komro, et al., 2008	Kulis, et al., 2007	Kvalem, et al., 1996	Lachausse, 2006	Levy, et al., 1995
Section 1: Population									
1.1 Is the source population or source area well described?	++	++	-	++	+	+	NR	+	NR
1.2 Is the eligible population or area representative of the source population or area?	++	++	-	++	++	++	NR	+	NR
1.3 Do the selected participants or areas represent the eligible population or area?	++	++	-	++	++	++	NR	+	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	++	++	NR	NR	++	NR	+	+	+
2.2 Were interventions (and comparisons) well described and appropriate?	++	++	+	++	++	+	++	++	++
2.3 Was the allocation concealed?	NR	++	NR	NR	NR	NR	NR	NR	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	-	NR	NR	NR	NR	NR	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	++	++	NR	NR	++	++	+	NR	++
2.6 Was contamination acceptably low?	++	++	NR	NR	++	NR	NR	NR	NA
2.7 Were other interventions similar in both groups?	++	NR	NA	++	++	+	NR	NA	NR
2.8 Were all participants accounted for at study conclusion?	++	NR	NR	NR	++	+	++	+	+
2.9 Did the setting reflect usual UK practice?	-	++	++	++	++	-	NA	++	+
2.10 Did the intervention or control comparison reflect usual UK practice?	++	++	++	++	++	-	NA	++	-
Section 3: Outcomes									
3.1 Were outcome measures reliable?	++	+	++	++	++	++	NR	++	NR

	Flay, et al., 2004	Graham, et al., 2002	Graham, et al., 1990	Harrington, et al., 2001	Komro, et al., 2008	Kulis, et al., 2007	Kvalem, et al., 1996	Lachausse, 2006	Levy, et al., 1995
3.2 Were all outcome measurements complete?	++	NA	++	++	++	++	NA	++	NA
3.3 Were all important outcomes assessed?	++	+	++	++	++	+	+	++	+
3.4 Were outcomes relevant?	++	++	++	++	++	+	+	++	+
3.5 Were there similar follow-up times in exposure and comparison groups?	++	++	++	++	++	++	++	++	+
3.6 Was follow-up time meaningful?	++	+	++	++	++	++	++	+	-
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	++	++	++	++	++	+	+	+
4.2 Was Intention to treat (ITT) analysis conducted?	NR	++	NR	NA	++	++	NR	NR	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	++	++	++	++	++	NR	+	NR
4.4 Were the estimates of effect size given or calculable?	++	++	++	++	++	NR	+	++	++
4.5 Were the analytical methods appropriate?	++	++	++	++	++	-	+	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	++	++	++	++	NR	+	-	++	++
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**++**	**++**	**-**	**+**	**++**	**+**	**-**	**+**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**++**	**++**	**-**	**++**	**++**	**+**	**-**	**+**	**-**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.3Quality assessment: Randomised controlled trials continued

	McNeal, et al., 2004	Mitchell-Dicenso, et al., 1997	Morgenstern, et al., 2009	Newton, et al., 2009	O'Donnell, et al., 1999	Patton, et al., 2006	Roberto, et al., 2007	Schaalma, et al., 1996	Shortt, et al., 2007
Section 1: Population									
1.1 Is the source population or source area well described?	-	+	NR	NR	NR	NR	-	NR	NR
1.2 Is the eligible population or area representative of the source population or area?	++	++	+	NR	-	NR	NR	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	++	++	NR	NR	+	NR	NR	NR	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	NR	+	+	+	NR	+	+	+	+
2.2 Were interventions (and comparisons) well described and appropriate?	++	++	+	++	+	+	+	++	+
2.3 Was the allocation concealed?	NR	NR	+	NR	NR	NR	NR	NR	++
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	NR	NR	NR	NR	NR	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	NR	++	+	+	NR	++	+	++	NR
2.6 Was contamination acceptably low?	NR	NR	++	+	NR	++	+	++	++
2.7 Were other interventions similar in both groups?	NA	NA	NR	++	NR	+	NR	NR	NR
2.8 Were all participants accounted for at study conclusion?	NR	+	++	++	-	NA	-	+	++
2.9 Did the setting reflect usual UK practice?	++	++	+	+	+	NA	NA	NA	NR
2.10 Did the intervention or control comparison reflect usual UK practice?	++	++	+	+	+	NA	NA	NA	NR
Section 3: Outcomes									
3.1 Were outcome measures reliable?	++	++	+	++	NR	+	+	+	++

	McNeal, et al., 2004	Mitchell-Dicenso, et al., 1997	Morgenstern, et al., 2009	Newton, et al., 2009	O'Donnell, et al., 1999	Patton, et al., 2006	Roberto, et al., 2007	Schaalma, et al., 1996	Shortt, et al., 2007
3.2 Were all outcome measurements complete?	++	++	NA	NA	+	NA	NA	NA	NA
3.3 Were all important outcomes assessed?	++	++	++	++	+	+	+	+	++
3.4 Were outcomes relevant?	++	++	++	++	++	+	+	+	++
3.5 Were there similar follow-up times in exposure and comparison groups?	++	++	++	++	NR	+	+	+	+
3.6 Was follow-up time meaningful?	++	++	++	+	-	+	-	-	+
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	NR	+	+	NR	+	+	NR	NR
4.2 Was Intention to treat (ITT) analysis conducted?	NR	++	++	NR	+	++	NR	-	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	++	NR	NR	NR	++	NR	NR	NR
4.4 Were the estimates of effect size given or calculable?	++	++	++	+	+	+	-	+	++
4.5 Were the analytical methods appropriate?	++	++	++	+	+	+	+	++	++
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	++	++	++	+	++	+	-	-	++
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**+**	**+**	**++**	**+**	**+**	**+**	**+**	**+**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**+**	**+**	**-**	**+**	**+**	**-**	**-**	**++**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.4Quality assessment: Randomised controlled trials continued

	Smith, 1994	Spoth, et al., 2008	Stanton, et al., 2006	Stephenson, et al., 2004	Traeen, 2003	Vogl, et al., 2009	Weeks, et al., 1995	Werch, et al., 2008	Werch, et al., 2008
Section 1: Population									
1.1 Is the source population or source area well described?	NR	NR	NR	-	NR	NR	NR	NR	+
1.2 Is the eligible population or area representative of the source population or area?	NR	++	NR	+	NR	NR	NR	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	NR	NR	NR	+	NR	NR	NR	NR	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	+	+	+	++	+	+	+	+	NR
2.2 Were interventions (and comparisons) well described and appropriate?	+	+	+	++	+	++	++	++	+
2.3 Was the allocation concealed?	NR	NR	NR	NR	NR	NR	NR	NR	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	NR	NR	NR	++	NR	NA	NR
2.5 Was the exposure to the intervention and comparison adequate?	+	++	+	+	NR	+	+	+	++
2.6 Was contamination acceptably low?	-	NR	NR	+	++	NA	NR	NR	-
2.7 Were other interventions similar in both groups?	NR	NA	NR	NR	NR	NR	-	+	+
2.8 Were all participants accounted for at study conclusion?	++	++	+	++	++	++	++	+	+
2.9 Did the setting reflect usual UK practice?	NR	++	NR	++	++	+	+	NA	NR
2.10 Did the intervention or control comparison reflect usual UK practice?	NR	++	NR	+	++	+	+	NA	NR
Section 3: Outcomes									
3.1 Were outcome measures reliable?	++	++	++	NR	++	++	NR	+	++

	Smith, 1994	Spoth, et al., 2008	Stanton, et al., 2006	Stephenson, et al., 2004	Traeen, 2003	Vogl, et al., 2009	Weeks, et al., 1995	Werch, et al., 2008	Werch, et al., 2008
3.2 Were all outcome measurements complete?	NA	++	NA	+	+	++	+	NA	++
3.3 Were all important outcomes assessed?	+	++	++	++	++	++	+	++	+
3.4 Were outcomes relevant?	+	++	++	++	++	++	++	++	+
3.5 Were there similar follow-up times in exposure and comparison groups?	+	++	++	++	++	++	++	++	++
3.6 Was follow-up time meaningful?	-	++	+	++	++	++	+	+	-
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	+	++	+	+	NR	+	++	+	++
4.2 Was Intention to treat (ITT) analysis conducted?	NR	++	++	-	NR	NR	NR	NR	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	++	NR	NR	+	+	NR	NR	NR
4.4 Were the estimates of effect size given or calculable?	-	++	+	++	+	+	+	+	+
4.5 Were the analytical methods appropriate?	-	++	+	+	++	+	+	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	-	++	+	++	++	+	++	+	NR
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**-**	**++**	**+**	**++**	**+**	**+**	**+**	**+**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**-**	**++**	**+**	**+**	**+**	**+**	**+**	**-**	**+**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.5Quality assessment: Randomised controlled trials continued

	Wight, et al., 2002	Workman, et al., 1996	Zimmerman, et al., 2008
Section 1: Population			
1.1 Is the source population or source area well described?	NR	NR	NR
1.2 Is the eligible population or area representative of the source population or area?	NR	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	NR	NR	NR
Section 2: Method of allocation			
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	+	+	+
2.2 Were interventions (and comparisons) well described and appropriate?	+	++	++
2.3 Was the allocation concealed?	NR	NR	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	+	++	++
2.6 Was contamination acceptably low?	NR	NR	NR
2.7 Were other interventions similar in both groups?	NR	NR	NR
2.8 Were all participants accounted for at study conclusion?	++	-	+
2.9 Did the setting reflect usual UK practice?	++	-	+
2.10 Did the intervention or control comparison reflect usual UK practice?	++	-	+
Section 3: Outcomes			
3.1 Were outcome measures reliable?	NR	+	++

	Wight, et al., 2002	Workman, et al., 1996	Zimmerman, et al., 2008
3.2 Were all outcome measurements complete?	+	NA	++
3.3 Were all important outcomes assessed?	++	+	++
3.4 Were outcomes relevant?	++	+	++
3.5 Were there similar follow-up times in exposure and comparison groups?	NR	++	-
3.6 Was follow-up time meaningful?	++	-	++
Section 4: Analyses			
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	NR	+
4.2 Was Intention to treat (ITT) analysis conducted?	NR	NR	-
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	++	NR	NR
4.4 Were the estimates of effect size given or calculable?	++	-	-
4.5 Were the analytical methods appropriate?	+	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	++	-	++
Section 5: Summary			
5.1 Are the study results internally valid (i.e. unbiased)?	**++**	**-**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**-**	**+**
a RCT based on randomisation at the individual level			
NR – not reported; NA – not applicable			

Table 10.6. Quality assessment: Non-randomised controlled trials

	Borawski, et al., 2005	Boyer, et al., 1997	Caron, et al., 2004	Dempster, et al., 2006	Denman, et al., 1995	Denny, et al., 1999	Denny, et al., 2006	Donnelly, et al., 2001	Fisher, et al., 2002
Section 1: Population									
1.1 Is the source population or source area well described?	-	++	-	NR	NR	NR	NR	-	NR
1.2 Is the eligible population or area representative of the source population or area?	+	NR	+	NR	NR	NR	NR	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	+	NR	+	NR	NR	NR	NR	NR	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	NR	-	NR	-	-	-	-	NR	-
2.2 Were interventions (and comparisons) well described and appropriate?	+	+	+	+	+	+	+	+	++
2.3 Was the allocation concealed?	NR	NA	NR	NR	NA	NR	-	NR	NA
2.4 Were participants and/or investigators blind to exposure and comparison?	-	NA	-	NR	NA	NR	NA	NR	NA
2.5 Was the exposure to the intervention and comparison adequate?	-	++	+	+	+	NR	NR	NR	++
2.6 Was contamination acceptably low?	-	++	-	NR	-	NR	+	NR	++
2.7 Were other interventions similar in both groups?	+	NA	++	NR	NR	NR	NR	NA	++
2.8 Were all participants accounted for at study conclusion?	+	+	+	NR	+	-	-	NR	-
2.9 Did the setting reflect usual UK practice?	-	+	+	++	NR	NA	NA	-	++
2.10 Did the intervention or control comparison reflect usual UK practice?	-	+	+	++	NR	NA	NA	++	+
Section 3: Outcomes									
3.1 Were outcome measures reliable?	NR	+	+	+	NR	+	+	+	++
3.2 Were all outcome measurements complete?	+	++	+	NR	NA	NA	NR	NR	++

	Borawski, et al., 2005	Boyer, et al., 1997	Caron, et al., 2004	Dempster, et al., 2006	Denman, et al., 1995	Denny, et al., 1999	Denny, et al., 2006	Donnelly, et al., 2001	Fisher, et al., 2002
3.3 Were all important outcomes assessed?	+	++	+	++	-	+	+	+	++
3.4 Were outcomes relevant?	+	++	++	++	+	+	+	++	++
3.5 Were there similar follow-up times in exposure and comparison groups?	+	++	++	++	+	+	+	++	++
3.6 Was follow-up time meaningful?	+	+	++	-	-	-	+	-	++
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	+	++	++	NR	+	NR	NR	+	++
4.2 Was Intention to treat (ITT) analysis conducted?	NR	NR	NR	NR	NR	-	NA	NA	++
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	NR	+	NR	NR	NR	NR	NR	++
4.4 Were the estimates of effect size given or calculable?	+	++	NR	-	-	+	NR	-	++
4.5 Were the analytical methods appropriate?	+	++	+	+	+	+	+	-	++
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	+	++	-	-	-	+	NR	-	NR
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**+**	**+**	**+**	**-**	**-**	**-**	**-**	**-**	**++**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**+**	**+**	**-**	**-**	**-**	**-**	**+**	**++**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.7. Quality assessment: Non-randomised controlled trials continued

	Hubbard, et al., 1998	Jorgensen, et al., 1993	Kirby, 1991	Larsson, et al., 2006	Lennox, et al., 2008	Magnusson, et al., 2004	Mellanby, et al., 1995	Roosa, et al., 1990	Siegel, 1998
Section 1: Population									
1.1 Is the source population or source area well described?	-	++	NR	-	NR	NR	++	NR	NR
1.2 Is the eligible population or area representative of the source population or area?	-	++	NR	NR	+	NR	++	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	-	++	NR	NR	+	NR	++	NR	NR
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	+	+	+	NR	+	-	NR	-	-
2.2 Were interventions (and comparisons) well described and appropriate?	+	++	++	+	+	+	NR	-	+
2.3 Was the allocation concealed?	NR	NR	NR	NA	NR	NR	NR	-	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	NR	NR	NR	NR	-	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	-	NR	NR	+	NR	+	++	-	+
2.6 Was contamination acceptably low?	NR	NR	+	NA	NR	++	NR	-	++
2.7 Were other interventions similar in both groups?	NR	NA	NR	NR	+	NR	NR	NR	NR
2.8 Were all participants accounted for at study conclusion?	-	NR	-	+	+	+	NA	-	-
2.9 Did the setting reflect usual UK practice?	+	++	+	NA	-	++	++	-	+
2.10 Did the intervention or control comparison reflect usual UK practice?	+	++	+	NA	-	++	+	-	+
Section 3: Outcomes									
3.1 Were outcome measures reliable?	NR	++	NR	NR	++	NR	+	+	NR

	Hubbard, et al., 1998	Jorgensen, et al., 1993	Kirby, 1991	Larsson, et al., 2006	Lennox, et al., 2008	Magnusson, et al., 2004	Mellanby, et al., 1995	Roosa, et al., 1990	Siegel, 1998
3.2 Were all outcome measurements complete?	+	++	++	NA	++	NA	++	NA	+
3.3 Were all important outcomes assessed?	+	++	+	+	++	+	++	++	+
3.4 Were outcomes relevant?	++	++	++	+	++	+	++	++	++
3.5 Were there similar follow-up times in exposure and comparison groups?	NR	++	+	+	++	+	NR	++	++
3.6 Was follow-up time meaningful?	++	+	++	-	+	-	++	-	+
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	++	++	+	+	NR	NR	NR	+
4.2 Was Intention to treat (ITT) analysis conducted?	-	NR	NR	NR	NR	NR	NA	NR	-
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	++	NR	+	++	NA	+	NR	NR
4.4 Were the estimates of effect size given or calculable?	++	++	+	+	+	-	++	-	NR
4.5 Were the analytical methods appropriate?	+	++	+	+	+	-	++	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	+	++	+	+	NR	-	++	-	NR
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**+**	**+**	**+**	**+**	**+**	**-**	**+**	**-**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**+**	**+**	**-**	**+**	**-**	**++**	**-**	**+**
a RCT based on randomisation at the individual level									
NR – not reported; NA – not applicable									

Table 10.8. Quality assessment: Non-randomised controlled trials continued

	Somers, 2006	Tucker, et al., 2007	Walter, et al., 1993	Wright, 1998
Section 1: Population				
1.1 Is the source population or source area well described?	NR	+	NR	NR
1.2 Is the eligible population or area representative of the source population or area?	NR	NR	NR	NR
1.3 Do the selected participants or areas represent the eligible population or area?	NR	NR	NR	NR
Section 2: Method of allocation				
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	-	NA	+	+
2.2 Were interventions (and comparisons) well described and appropriate?	-	NA	++	++
2.3 Was the allocation concealed?	+	NR	NR	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	+	NR	+	++
2.6 Was contamination acceptably low?	++	NR	NR	++
2.7 Were other interventions similar in both groups?	NR	NR	NR	NR
2.8 Were all participants accounted for at study conclusion?	-	NA	-	++
2.9 Did the setting reflect usual UK practice?	+	++	++	NR
2.10 Did the intervention or control comparison reflect usual UK practice?	-	++	+	NR
Section 3: Outcomes				
3.1 Were outcome measures reliable?	-	NR	NR	++
3.2 Were all outcome measurements complete?	++	++	++	NA

	Somers, 2006	Tucker, et al., 2007	Walter, et al., 1993	Wright, 1998
3.3 Were all important outcomes assessed?	+	++	++	++
3.4 Were outcomes relevant?	++	++	++	++
3.5 Were there similar follow-up times in exposure and comparison groups?	-	+	+	++
3.6 Was follow-up time meaningful?	-	+	-	++
Section 4: Analyses				
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	-	NR	-	++
4.2 Was Intention to treat (ITT) analysis conducted?	NR	NA	NR	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	++	++	NR
4.4 Were the estimates of effect size given or calculable?	+	++	+	-
4.5 Were the analytical methods appropriate?	+	++	++	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	NR	++	++	-
Section 5: Summary				
5.1 Are the study results internally valid (i.e. unbiased)?	**-**	**-**	**+**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**+**	**+**	**+**
a RCT based on randomisation at the individual level				
NR – not reported; NA – not applicable				

Table 10.9. Quality assessment: Controlled before and after studies

	Christopher, et al., 1990	Gillies, et al., 1990	Lemieux, et al., 2008	Paine-Andrews, et al., 1999	Mellanby et al., 2001	Somers, et al., 2001	Stout, et al., 1996	Teitler, 1997	Trenholm, et al., 2008
Section 1: Population									
1.1 Is the source population or source area well described?	+	NR	-	+	NR	++	+	NR	+
1.2 Is the eligible population or area representative of the source population or area?	+	NR	NR	NA	NR	+	++	NR	+
1.3 Do the selected participants or areas represent the eligible population or area?	+	NR	NR	NA	NR	+	++	NR	+
Section 2: Method of allocation									
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	-	-	+	-	-	NR	+	NA	+
2.2 Were interventions (and comparisons) well described and appropriate?	++	-	+	+	+	++	-	+	+
2.3 Was the allocation concealed?	NR	NR	-	NA	-	NR	-	NR	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NR	NR	-	NA	-	NR	NR	NR	NR
2.5 Was the exposure to the intervention and comparison adequate?	+	NR	++	+	+	NR	NR	-	+
2.6 Was contamination acceptably low?	-	++	NR	NA	+	NR	NR	NR	-
2.7 Were other interventions similar in both groups?	NR	NR	NR	NA	+	NA	NA	NR	+
2.8 Were all participants accounted for at study conclusion?	-	+	NR	NA	+	NR	NR	NA	+
2.9 Did the setting reflect usual UK practice?	+	NR	NR	NA	+	++	+	+	-
2.10 Did the intervention or control comparison reflect usual UK practice?	-	NR	NR	NA	+	++	+	+	-
Section 3: Outcomes									
3.1 Were outcome measures reliable?	+	NR	+	+	+	+	++	NR	+

	Christopher, et al., 1990	Gillies, et al., 1990	Lemieux, et al., 2008	Paine-Andrews, et al., 1999	Mellanby et al., 2001	Somers, et al., 2001	Stout, et al., 1996	Teitler, 1997	Trenholm, et al., 2008
3.2 Were all outcome measurements complete?	++	NA	+	NA	-	++	++	+	+
3.3 Were all important outcomes assessed?	-	-	++	+	-	++	+	-	+
3.4 Were outcomes relevant?	++	+	++	+	+	++	++	++	+
3.5 Were there similar follow-up times in exposure and comparison groups?	++	+	NR	NR	+	++	NR	++	+
3.6 Was follow-up time meaningful?	-	-	NR	NR	-	+	NR	++	++
Section 4: Analyses									
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	++	+	NR	NR	-	+	+	-	+
4.2 Was Intention to treat (ITT) analysis conducted?	NR	NR	NA	NA	-	NR	NA	NA	NR
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	NR	NR	NA	NR	NR	NR	-	NR
4.4 Were the estimates of effect size given or calculable?	+	-	NR	-	+	++	NR	+	NR
4.5 Were the analytical methods appropriate?	+	+	++	-	+	++	+	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	-	-	+	-	+	++	NR	+	NR
Section 5: Summary									
5.1 Are the study results internally valid (i.e. unbiased)?	**-**	**-**	**-**	**-**	**+**	**-**	**-**	**-**	**+**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**-**	**+**	**-**	**+**	**-**	**+**	**+**	**+**
a RCT based on randomisation at the individual level NR – not reported; NA – not applicable									

Table 10.10. Quality assessment: Other study types

	Lewis, et al., 1999	Strange, et al., 2002	Vincent, et al., 2004
Section 1: Population			
1.1 Is the source population or source area well described?	+	NR	++
1.2 Is the eligible population or area representative of the source population or area?	+	NR	+
1.3 Do the selected participants or areas represent the eligible population or area?	NR	++	+
Section 2: Method of allocation			
2.1 Allocation to intervention (or comparison). How was selection bias minimised?	NA	NA	NR
2.2 Were interventions (and comparisons) well described and appropriate?	+	++	-
2.3 Was the allocation concealed?	NA	NA	NR
2.4 Were participants and/or investigators blind to exposure and comparison?	NA	NA	NR
2.5 Was the exposure to the intervention and comparison adequate?	+	NA	NR
2.6 Was contamination acceptably low?	NR	NA	NR
2.7 Were other interventions similar in both groups?	NR	NA	NR
2.8 Were all participants accounted for at study conclusion?	NR	++	NA
2.9 Did the setting reflect usual UK practice?	+	++	-
2.10 Did the intervention or control comparison reflect usual UK practice?	+	++	NR
Section 3: Outcomes			
3.1 Were outcome measures reliable?	NR	NR	NA
3.2 Were all outcome measurements complete?	+	++	++

	Lewis, et al., 1999	Strange, et al., 2002	Vincent, et al., 2004
3.3 Were all important outcomes assessed?	+	-	-
3.4 Were outcomes relevant?	++	+	++
3.5 Were there similar follow-up times in exposure and comparison groups?	NA	NA	++
3.6 Was follow-up time meaningful?	++	-	++
Section 4: Analyses			
4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?	NA	NA	NR
4.2 Was Intention to treat (ITT) analysis conducted?	NA	NR	NA
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?	NR	+	NR
4.4 Were the estimates of effect size given or calculable?	NA	+	NR
4.5 Were the analytical methods appropriate?	+	+	+
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?	+	-	+
Section 5: Summary			
5.1 Are the study results internally valid (i.e. unbiased)?	**-**	**-**	**-**
5.2 Are the findings generalisable to the source population (i.e. externally valid)?	**+**	**-**	**+**
a RCT based on randomisation at the individual level			
NR – not reported; NA – not applicable			

Table 10.11. Quality assessment for published economic evaluation studies

Study identification Include author, title, reference, year of publication		**Pentz, 1998**	**Swisher et al., 2004**	**Wang et al., 2000**
Evaluation criterion				
1.	**Was a well-defined question posed in answerable form?**	Yes	Partly, the use of a do-nothing comparator is specified in the cluster randomised trial but not really mentioned in the economic evaluation	Yes
1.1	Did the study examine both costs and effects of the service(s) or programme(s)?	Yes	Partly, costs are listed (but not resource use items) but effects are not specified nor quantified.	Yes
1.2	Did the study involve a comparison of alternatives?	Yes	Yes: Infused Life Skill Training (ILST) with Life Skill Training (LST) compared to control (standard practice).	Yes, vs. standard, information only HIV programme
1.3	Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?	Yes	Yes, a societal viewpoint and set in a school	Private sector in base case, public sector considered in sensitivity analyses
2.	**Was a comprehensive description of the competing alternatives given (that is, can you tell who? did what? to whom? where? and how often?)?**	Partly	No, especially the ILST description which is vague	Partially
2.1	Were any important alternatives omitted?	The text is a book chapter so alternatives are not mentioned in detail. There is a control intervention in the relevant C-RCT but the intervention may not be the same as that mentioned as an alternative in the ICER.	No clear description of incremental costs	No

Study identification Include author, title, reference, year of publication		**Pentz, 1998**	**Swisher et al., 2004**	**Wang et al., 2000**
2.2	Was (Should) a do-nothing alternative (be) considered?	No	Yes, in the C-RCT, see answer to 1 above	No, not really practical as would likely be some intervention in schools related to HIV
3.	**Was the effectiveness of the programmes or services established?**	Difficult to say because the results of the C-RCT are not mentioned but a figure of 9% reduction over 3 years of drunkenness is mentioned in the paper.	Yes	Yes
3.1	Was this done through a randomised, controlled clinical trial? If so, did the trial protocol reflect what would happen in regular practice?	There is a discrepancy between the C-RCT results and description of intervention and its effects in the economic evaluation.	Yes a C-RCT. Probably	Yes
3.2	Was effectiveness established through an overview of clinical studies?	No, C-RCT	No primary research	NA
3.3	Were observational data or assumptions used to established effectiveness? If so, what are the potential biases in results?	Not clear	No	NA
4.	**Were all the important and relevant costs and consequences for each alternative identified?**	Probably	No	Probably
4.1	Was the range wide enough for the research question at hand?	Probably	Yes	Yes, the authors reported all costs incorporated into the analyses.
4.2	Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third-party payers.)	Yes	Only societal viewpoint	Assumptions made re: societal costs. i.e. for societal costs for PID were 50% of private sector costs

Study identification Include author, title, reference, year of publication		**Pentz, 1998**	**Swisher et al., 2004**	**Wang et al., 2000**
4.3	Were capital costs, as well as operating costs, included?	N/A	No, for good reasons only staff and material costs were considered	Not reported
5.	**Were costs and consequences measured accurately in appropriate physical units (for example, hours of nursing time, number of physician visits, lost work-days, gained life-years)?**	Yes	Costs were expressed, partly without resource consumption/unit cost breakdown. Effects were not defined (i.e. cost per smoking habit year gained at end of year 2).	Not reported
5.1	Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?	No	No	No
5.2	Were there any special circumstances (for example, joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?	Not clear	Appeared to be	No
6.	**Were costs and consequences valued credibly?**	Not clear		Yes
6.1	Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views and health professionals' judgements.)	Not clear	No	Yes
6.2	Were market values employed for changes involving resources gained or depleted?	Not clear	Mainly staff salaries and student materials. Impossible to say if valuation was realistic	NR
6.3	Where market values were absent (for example, volunteer labour), or did not reflect actual values (for example, clinic space donated at reduced rate), were adjustments made to approximate market values?	Not clear	Not applicable	NR

Study identification Include author, title, reference, year of publication		**Pentz, 1998**	**Swisher et al., 2004**	**Wang et al., 2000**
6.4	Was the valuation of consequences appropriate for the question posed (that is, has the appropriate type or types of analysis – cost-effectiveness, cost-benefit, cost-utility – been selected)?	Yes	No, not mentioned	NR
7.	**Were costs and consequences adjusted for differential timing?**	No		Yes
7.1	Were costs and consequences which occur in the future 'discounted' to their present values?	N/A	No	Medical costs discounted at 5%
7.2	Was any justification given for the discount rate used?	N/A	N/A	No
8.	**Was an incremental analysis of costs and consequences of alternatives performed?**	Yes		No
8.1	Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits or utilities generated?	Yes	Incremental costs were expressed (vaguely compared to standard practice), but no ICERs were calculated	No
9.	**Was allowance made for uncertainty in the estimates of costs and consequences?**	No		Partially
9.1	If data on costs or consequences were stochastic, were appropriate statistical analyses performed?	No	No	NR
9.2	Were study results sensitive to changes in the values (within the assumed range for sensitivity analysis, or within the confidence interval around the ratio of costs to consequences)?	N/A	Sensitivity analysis presented is a projection to year 3 of costs per student or teacher of each programme.	Yes, appropriate multivariate sensitivity analyses were conducted on key variables
10.	**Did the presentation and discussion of study results include all issues of concern to users?**	Partly	Partly, the issue of generalisability of results and meaning of the evaluation are not discussed	No

Study identification Include author, title, reference, year of publication		**Pentz, 1998**	**Swisher et al., 2004**	**Wang et al., 2000**
10.1	Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (for example, cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?	Yes	No	No summary benefit measure used
10.2	Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential differences in study methodology?	No	No	Not directly
10.3	Did the study discuss the generalisability of the results to other settings and patient/client groups?	No	No	Yes, briefly considered, acknowledge that the cost-effectiveness of the programme may vary by geographic region.
10.4	Did the study allude to, or take account of, other important factors in the choice or decision under consideration (for example, distribution of costs and consequences, or relevant ethical issues)?	No	No	No
10.5	Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?	Yes	No	No
OVERALL ASSESSMENT OF THE STUDY				
How well was the study conducted? Code ++, + or –		+	-	+
Are the results of this study directly applicable to the patient group targeted by this guideline?		Possibly. Difficulties in implementation are not discussed.	No, vague text, rural US situation, predominantly white males and low-socio economic status. Absence of description of effects.	Possibly, based on conservative estimates. But programmes based on abstinence-plus approach

Appendix 4. Summary of quality assessment for studies included in Jones et al (2007)

Table 10.12. Quality assessment for systematic reviews and meta-analyses

1.1 The study addresses an appropriate and clearly focused question

1.2 A description of the methodology used is included

1.3 The literature search was sufficiently rigorous to identify all relevant studies

1.4 Study quality is assessed and taken into account

1.5 There are enough similarities between the studies selected to make combining them reasonable

Key: ++ Well covered + Adequately covered - Poorly covered NR Not reported N/A Not applicable

Reference(s)	Questions					Coding
	1.1	1.2	1.3	1.4	1.5	
Bruvold 1990	+	-	NR	NR	+	-
Coggan et al., 2003	+	-	++	-	N/A	+
Cuijpers 2002	++	-	-	NR	+	-
Dusenbury et al., 1997	+	-	+	+	N/A	+
Foxcroft et al., 2002	++	++	++	++	N/A	++
Loveland-Cherry 2003	++	+	++	++	+	+
Skara and Sussman 2003	++	++	+	-	+	+
Tobler, 1993	+	+	-	+	+	+
Tobler et al., 1997	+	++	-	++	++	+
Tobler et al., 2000	++	+	-	++	+	+
Werch and Owen 2002	++	+	+	-	×	+
White et al., 2004	++	++	++	+	N/A	++

Table 10.13. Quality assessment for RCTs

1.1 The study addressed an appropriate and clearly focused question

1.2 The assignment of participants to intervention groups is randomised

1.3 An adequate concealment method is used

1.4 Participants and investigators are kept 'blind' about intervention allocation

1.5 The intervention and control groups are similar at the start of the trial

1.6 The only difference between groups is the intervention under investigation

1.7 All relevant outcomes are measured in a standard, valid and reliable way

1.8 What percentage of the participants or clusters recruited into each intervention arm of the study dropped out before the study was completed?

1.9 All participants are analysed in the groups to which they were allocated? (ITT)

1.10 Where the study is carried out at more than one site, results are comparable for all sites

Key: ✓✓✓ Well covered ✓✓ Adequately covered ✓ Poorly covered × Not addressed NR Not reported N/A Not applicable

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Baumann, 2006	✓✓	×	×	N/A	✓	✓	✓✓	42% from intervention and 25% from control	✓	N/A	-
Bennett, 1995	See Clayton et al., 1991, 1996										-
Bond et al., 2004	✓✓✓	✓✓✓	×	N/A	✓✓✓	×	✓✓	10%	✓✓✓	×	++
Botvin et al., 1990a, 1995a	✓✓	✓	×	N/A	✓✓	×	✓✓	24% lost at 1 year follow-up	×	×	+
Botvin et al., 1990b	✓✓	✓✓	×	N/A	✓✓	✓✓	✓✓	NR.	×	×	+

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Botvin et al., 1995b	✓✓✓	✓✓	NR	N/A	✓✓	✓✓	✓✓	NR	NR	×	+
Botvin et al., 2001a; 2001b; Griffin et al., 2003	✓✓	✓	×	N/A	✓✓	×	✓✓✓	17% not followed up.	×	×	+
Brewer, 1991	✓✓✓	✓✓✓	NR	NR	✓✓✓	✓✓✓	✓✓✓	NR	✓✓✓	N/A	+
Chou et al., 1998	✓✓	✓✓✓	✓	×	✓✓✓	✓✓✓	✓✓✓	Complete cases Intervention (42.72%) control (41.03%)	✓✓✓	✓✓	-
Clayton et al., 1991, 1996	✓✓	✓	×	×	×	×	✓	Overall, 45% rate of attrition.	×	×	-
Colnes 2000	✓✓✓	✓✓	×	N/A	✓✓✓	×	✓✓✓	47%	×	×	+
Dent et al., 2001	✓✓✓	✓	NR	N/A	✓✓	✓✓	✓✓	37%	✓	NR	-
Donaldson et al., 1995, 2000	✓✓	✓	NR	N/A	NR	NR	✓✓✓	NR	NR	N/A	-
Eisen et al., 2002	✓✓	✓	×	N/A	✓✓	NR	✓	16% didn't complete PT survey	×	×	+
Ellickson et al.,1990, 1993a	✓✓	✓✓	NR	NR	✓	✓	✓✓	40%	NR	N/A	+
Ellickson et al.,1993b	✓✓	✓✓✓	NR	NR	✓✓	✓✓	✓✓	125% failed to take 10th or 12th grade survey.	✓✓	✓✓✓	+
Ellickson et al., 2003	✓✓	✓✓	NR	NR	✓✓	✓	✓	9%	✓✓	×	+

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Fearnow-Kenney et al., 2003	✓✓	✓	×	N/A	×	×	✓✓	~20%	×	×	-
Graham et al., 1990	✓✓✓	✓	✓	NR	✓	✓✓	✓✓✓	30%	NR	NR	+
Hansen & Graham 1991	✓✓	✓✓	NR	NR	✓✓	✓	✓	20%	NR	N/A	-
Hecht et al., 2003; Gosin et al., 2003	✓✓	✓✓	NR	NR	NR	NR	NR	NR	NR	N/A	-
Johnson et al., 1990	✓✓	✓✓	N/A	N/A	✓✓	✓✓	✓✓	32%	NR	NR	+
Komro et al., 1999	✓✓✓	✓✓	×	N/A	N/A	N/A	✓✓✓	NR	✓✓	✓✓	+
Kreft 1998	✓✓	✓✓	NR	N/A	NR	NR	✓		NR	N/A	-
Kulis et al., 2005	✓✓✓	✓	×	N/A	✓	✓✓	✓✓✓	NR	×	NR	-
Lynam et al., 1999	See Clayton et al., 1991, 1996										
Newman et al., 1992	✓✓✓	✓	NR	N/A	NR	✓	✓✓✓	NR	NR		-
Palmer et al., 1998	✓✓	✓✓	NR	NR	✓✓	✓✓	NR		NR	N/A	-
Perry et al., 1996; Komro et al., 2001	✓✓✓	✓	×	N/A	✓✓	×	✓✓	19% lost at end of 8th grade	✓	×	+
Perry et al., 2003	✓✓	×	×	N/A	✓✓	✓	✓✓	0.16	×	✓	+

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Perry et al., 2002	✓✓✓	✓	×	✓✓	✓✓	×	✓✓	15% in 98	✓	×	+
Piper et al., 2000	✓✓✓	✓	×	N/A	✓✓	×	✓✓✓	32%	×	×	-
Ringwalt et al., 1991	✓	×	×	N/A	✓✓	×	✓✓	9% drop out	×	×	-
Shope et al., 1992	✓✓	×	×	N/A	✓	×	✓	28% at 2.5 yr	×	×	-
Shope et al., 1994	✓✓	×	×	NR	✓	×	✓✓	31%	NR	NR	-
Simons-Morton et al., 2005	✓✓✓	✓	×	N/A	✓	✓✓	✓✓✓	~50% lost to follow-up	×	NR	+
Slater et al., 2006	✓✓	✓	×	N/A	✓✓✓	✓✓✓	✓✓✓	31.4% over 2 years	✓✓	✓✓	+
Smith et al., 2004; Vicary et al., 2004	✓✓	✓	×	N/A	✓✓	×	✓✓	~10%	×	×	+
Spoth et al., 2002; 2005	✓✓✓	✓	×	N/A	✓✓	✓✓	✓✓	14%	✓	×	+
Sussman et al., 1998; Sun et al., 2006	✓✓	✓✓	×	NR	✓✓	✓	✓✓	~45%	NR	N/A	+
Sussman et al., 2003	✓✓	✓✓	×	N/A	NR	NR	✓✓	~45%	NR	N/A	+
Toomey et al., 1996	See Perry et al., 1996										
Warren et al., 2006	✓✓	✓✓	×	NR	✓✓	✓✓	✓✓	NR	NR	N/A	+

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Werch et al., 1996a	✓✓✓	✓✓	×	NR	✓✓✓	✓✓✓	✓✓✓	3.8% dropped out of the intervention group and 1.9% dropped out of the control group.	✓✓✓	N/A	+
Werch et al 1996b	✓✓✓	✓✓	×	N/A	✓✓✓	✓✓✓	✓✓✓	12% intervention group, and 9% control group.	✓✓✓	N/A	++
Werch et al., 1998	✓✓	✓✓	×	N/A	✓✓	✓	✓✓	11%	×	N/A	+
Werch et al., 2000a, 2001, 2003a	✓✓✓	✓	×	N/A	✓✓	✓✓	✓✓	23% from intervention group and 21% from the control group.	×	N/A	+
Werch et al., 2000b	✓✓✓	✓✓	NR	N/A	✓✓	✓✓	✓✓✓	NR	×	N/A	+
Werch et al., 2003b	✓✓✓	✓✓✓	✓✓	N/A	✓✓	✓	✓✓✓	2%	✓✓	N/A	++
Werch et al., 2005a	✓✓✓	✓✓	×	N/A	✓✓✓	✓✓	✓✓✓	3.3%	×	N/A	+
Werch et al., 2005b	✓✓✓	✓✓✓	NR	N/A	✓✓✓	✓✓✓	✓✓✓	42 and 48 students dropped out at 12 months from the two arms respectively.	NR	N/A	++
Werch et al., 2005c	✓✓✓	✓	NR	N/A	✓✓	✓✓✓	✓✓✓	13%	NR	N/A	+
Williams et al., 1995	See Perry et al., 1996										

Table 10.14. Quality assessment for NRCT

1.11 The study addressed an appropriate and clearly focused question

1.12 The assignment of participants to intervention groups is randomised

1.13 An adequate concealment method is used

1.14 Participants and investigators are kept 'blind' about intervention allocation

1.15 The intervention and control groups are similar at the start of the trial

1.16 The only difference between groups is the intervention under investigation

1.17 All relevant outcomes are measured in a standard, valid and reliable way

1.18 What percentage of the participants or clusters recruited into each intervention arm of the study dropped out before the study was completed?

1.19 All participants are analysed in the groups to which they were allocated? (ITT)

1.20 Where the study is carried out at more than one site, results are comparable for all sites

Key: ✓✓✓ Well covered ✓✓ Adequately covered ✓ Poorly covered × Not addressed NR Not reported N/A Not applicable

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Botvin et al., 1997	✓✓	N/A	N/A	N/A	✓✓	×	✓✓	14%	×	×	-
Caplan et al., 1992	✓✓	N/A	N/A	N/A	✓✓	✓	✓✓✓	NR	×	×	-
Cuijpers et al., 2001; Smit et al., 2003	✓✓	N/A	N/A	N/A	NR	NR	✓✓✓	32% of intervention group; 20% dropped out from the control group	×	×	+
Dedobbeleer & Desjardins, 2001	✓✓	N/A	N/A	N/A	✓✓	✓✓	✓✓✓	60% lost to follow at 30 months	NR	NR	-

Reference(s)	Question										Rating
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	
Ennett et al., 1994;	✓✓✓	N/A	N/A	N/A	✓✓	✓✓	✓	12% not followed up at 2 years (7th/8th grade); attrition at 6 years not clear/	NR	NR	+
Fraguela et al., 2003	✓✓✓	N/A	N/A	N/A	✓✓	✓	✓	60%	×	×	-
McBride et al., 2000, 2003, 2004	✓✓✓	N/A	N/A	N/A	✓	×	✓✓	~25%	×	×	+
Padget et al., 2005	✓✓	N/A	N/A	N/A	✓✓	✓✓	✓✓✓	18%	×	×	+
Rosenbaum al., 1994	See Ennett et al., 1994										
Rosenbaum & Hanson, 1998	See Ennett et al., 1994										
Schnepf, 2002	✓✓	N/A	N/A	N/A	✓✓	×	✓✓	NR	×	N/A	-
Valentine et al., 1998	✓✓✓	N/A	N/A	N/A	✓ ✓	✓ ✓	✓ ✓	71% middle school, 48% high school completed	✓✓✓	N/A	-
Webster et al., 2002	✓✓✓	N/A	N/A	N/A	NR	✓✓✓	✓✓	28% intervention and 19% control students	✓✓✓	×	+
Wilhelmsen et al., 1994	✓✓✓	N/A	N/A	N/A	×	NR	✓✓	Not clear	NR	✓	-

Table 10.15. Quality assessment for controlled before and after studies

1.1 Contemporaneous data collection

• Score DONE pre and post intervention periods for study and control sites are the same.

• Score NOT CLEAR if it is not clear in the paper, e.g. dates of collection are not mentioned in the text.

• Score NOT DONE if data collection was not conducted contemporaneously during pre and post intervention periods for study and control sites.

1.2 Appropriate choice of control site

Studies using second site as controls:

• Score DONE if study and control sites are comparable with respect to dominant reimbursement system, level of care, setting of care and academic status.

• Score NOT CLEAR if not clear from paper whether study and control sites are comparable.

• Score NOT DONE if study and control sites are not comparable.

1.3 Baseline measurement

• Score DONE if performance or patient outcomes were measured prior to the intervention, and no substantial differences were present across study groups (e.g. where multiple pre intervention measures describe similar trends in intervention and control groups);

• Score NOT CLEAR if baseline measures are not reported, or if it is unclear whether baseline measures are substantially different across study groups;

• Score NOT DONE if there are differences at baseline in main outcome measures likely to undermine the post intervention differences (e.g. are differences between the groups before the intervention similar to those found post intervention).

1.4 Characteristics for studies using second site as control

• Score DONE if the authors state explicitly that the primary outcome variables were assessed blindly OR the outcome variables are objective e.g. length of hospital stay, drug levels as assessed by a standardised test;

• Score NOT CLEAR if not specified in the paper;

• Score NOT DONE if the outcomes were not assessed blindly.

1.5 Blinded assessment of primary outcome(s)

• Score DONE if the authors state explicitly that the primary outcome variables were assessed blindly OR the outcome variables are objective e.g. length of hospital stay, drug levels as assessed by a standardised test;

• Score NOT CLEAR if not specified in the paper;

• Score NOT DONE if the outcomes were not assessed blindly.

1.6 Protection against contamination

Studies using second site as control

• Score DONE if allocation was by community, institution, or practice and is unlikely that the control group received the intervention;

• Score NOT CLEAR if providers were allocated within a clinic or practice and communication between experimental and group providers was likely to occur;

• Score NOT DONE if it is likely that the control group received the intervention (e.g. cross-over studies or if individuals rather than providers were randomised).

1.7 Reliable primary outcome measure(s)

• Score DONE if two or more raters with at least 90% agreement or kappa greater than or equal to 0.8 OR the outcome is obtained from some automated system e.g. length of hospital stay, drug levels as assessed by a standardised test;

• Score NOT CLEAR if reliability is not reported for outcome measures that are obtained by chart extraction or collected by an individual;

• Score NOT DONE if agreement is less than 90% or kappa is less than 0.8.

1.8 Follow up of professionals (protection against exclusion bias)

• Score DONE if outcome measures obtained 80-100% subjects allocated to groups. (Do not assume 100% follow-up unless stated explicitly.);

• Score NOT CLEAR if not specified in the paper;

• Score NOT DONE if outcome measures obtained for less than 80% of individuals allocated to groups.

1.9 Follow up of individuals

• Score DONE if outcome measures obtained 80-100% of individuals allocated to groups or for individuals who entered the study. (Do not assume 100% follow-up unless stated explicitly.);

• Score NOT CLEAR if not specified in the paper;

• Score NOT DONE if outcome measures obtained for less than 80% of individuals allocated to groups or for less than 80% of individuals who entered the study.

Reference(s)	Question									Coding
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	
Argentos et al., 1991	Done	Not clear	Not clear	Not clear	Done	Not clear	Done	Not clear	Not clear	-
Bagnall, 1990	Not clear	Not clear	Not clear	Not clear	Done	Not clear	Done	Not clear	Not clear	-
Bremberg & Arborelius, 1994	Done	Not clear	Done	Done	Done	Not clear	Not clear	Not clear	Not clear	-
Dukes et al., 1996, 1997	Done	Not clear	Not clear	Not clear	Not done	Not clear	Not clear	Not done	Not done	-
Harmon, 1993	Done	Done	Not done	Done	Done	Done	Done	Done	Done	+
Klitzner et al., 1994	Done	Done	Done	Done	Done	Done	Not clear	Not done	Not done	+
Moberg & Piper, 1990	Done	Not clear	Done	Done	Not done	Done	Done	Not clear	Not clear	+
Shope et al., 1996a	Done	Not clear	Done	Not clear	Not done	Done	Not clear	Done	Done	+
Shope et al., 1996b; Shope et al., 1998	Not clear	Not clear	Not clear	Not clear	Done	Done	Done	Not clear	Not clear	-
Snow et al., 1992	Done	Not clear	Not clear	Not done	Not clear	Not clear	Not clear	Not clear	Not clear	-
Snow et al., 1997	Not clear	Not clear	Not clear	Not done	Not done	Not clear	Not clear	Not clear	Not clear	-

Appendix 5. Conversion table for English key stages and US grade equivalents

Age	England		USA	
		Year		Grade
0-4	Pre-School	-		-
4-5		-	Pre Kindergarten	-
5-6	Primary School (Key Stage 1)	1	Kindergarten	-
6-7		2	Elementary School	1
7-8	Junior School (Key stage 2)	3		2
8-9		4		3
9-10		5		4
10-11		6		5
11-12	Lower Secondary (Key stage 3)	7	Middle School	6
12-13		8		7
13-14		9		8
14-15	Upper Secondary (Key stage 4)	10	High School	9
15-16		11		10
16-17	6th Form College	-		11
17-18		-		12