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The Effectiveness of Interventions to change Health-Related Behaviours: a review of reviews.

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Executive summary

The aim of this report was to identify evaluations of interventions to change health-related behaviours. The report was based, where possible, on evidence from good quality systematic reviews. Only reviews published since 1995 were included, as reviews published before this date are likely to be out of date and may not reflect the current evidence. In areas where there were no reviews, other evidence from randomised controlled trials was used. Six health-related behaviours were selected and the evidence summarised for each of these behaviours. Below is a brief summary of the evidence and conclusions from the reviews. The interventions have been classified by the author as having a reasonable effect, a more modest (small) effect, likely to be ineffective or not having enough evidence of effect on behavioural outcomes.

Tobacco smoking

The evidence base: Nineteen Cochrane reviews and several other high quality reviews have been undertaken in this area. The majority of the prevention trials were carried out in the USA and the conclusions from the preventive reviews should be, therefore, interpreted with caution. Smoking cessation trials were conducted in many different countries.

Evidence of a reasonable effect

- Effective pharmacological interventions include nicotine replacement therapy.
- Effective behavioural and educational interventions include: physician advice; smoking cessation programmes implemented in pregnancy; smoking cessation advice and counselling given by nurses; training health professionals to provide smoking cessation interventions; group programmes and individual smoking cessation counselling; There was no evidence of a difference in effect between individual and group counselling.

Evidence of modest effect or likely to be effective

- Mass media campaigns and community interventions targeted at young people can be effective in preventing the uptake of smoking in young people, but overall the evidence is not strong.
- School-based programmes have achieved limited success, although social reinforcement/social norms type programmes seem to be more effective than traditional knowledge-based interventions.
- Pharmacological interventions that have a small effect include antidepressants.
- Behavioural and educational interventions that have a small effect on smoking cessation include simple physician advice and self-help materials.

Likely to be ineffective

- There is little evidence that local ordinances alone reduce the prevalence of smoking in young people, who are easily able to obtain tobacco products from other sources.
- Pharmacological interventions which appear to have no effect include anxiolytics and clonidine.
- Complementary therapies that appear to have no long-term effect on smoking cessation include acupuncture.
- Milder versions of aversive smoking seem to be ineffective.

Not enough evidence of effect

- Preventative measures for which there is not enough evidence of an effect include restrictions on smoking in public places

- Pharmacological interventions for which there is not enough evidence of effectiveness include silver acetate, mecamylamine, and lobeline.
- Other interventions for which there is not enough evidence of an effect include aversive therapy, hypnotherapy, incentives and exercise.

Alcohol Drinking

The evidence base: No Cochrane reviews have been undertaken in this area, but there are several high quality reviews. The majority of preventive trials included in the reviews were carried out in the USA. Trials to reduce alcohol consumption were conducted in many different countries. Generalisability of the studies from the preventive trials may therefore be limited and conclusions should be interpreted with caution.

Evidence of a reasonable effect

- Brief interventions (simple motivational counselling techniques) are effective in reducing alcohol consumption by over 20%. The effect on women alone is unclear.
- Pharmacotherapy is effective in reducing relapse and number of drinking days.
- Drink/drive interventions have a positive effect on reducing alcohol-related traffic events.

Not enough evidence

- There is limited evidence to recommend any of the prevention programmes in young people. Methodologically sound studies on this topic are rare.
- Two RCTs investigating interventions to encourage women to cut down on alcohol during pregnancy had conflicting results. No systematic reviews were undertaken in this area.
- There is not enough evidence to assess the effectiveness of psychosocial interventions or couple counselling.

Exercise

The evidence base: One Cochrane review has been undertaken in this area; the other evidence was from good quality systematic reviews. Over 90% of the trials promoting physical activity were carried out in the USA, thus generalisability may be limited.

Evidence of a reasonable effect

- Results from some trials are encouraging in that they suggest that patients do respond positively to GP advice to take more exercise.
- Behaviour modification approaches produce larger effect sizes than other techniques, and effect sizes are larger in studies using mediated approaches compared to face-to-face delivery. Behavioural, diet and exercise programmes have all been shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination.

Evidence of a modest (small) effect or likely to be effective

- Physical activity promotion schemes in primary care.
- Workplace interventions to increase the number of workers who exercise regularly.
- Interventions that encourage walking and do not require attendance at a facility are most likely to lead to sustainable increases in overall physical activity. The small number of trials limits the strength of any conclusions and highlights the need for more research.

Not enough evidence

- Back injury prevention interventions in the workplace.
- Exercise for the prevention of back pain.
- Exercise in treating obesity in children and adolescents.
- Regular aerobic exercise during pregnancy appears to improve (or maintain) physical fitness, but the available data are insufficient to exclude important risks or benefits for the mother or infant.

Diet

The evidence base: Two Cochrane reviews have been undertaken in this area; the other evidence derives from good quality systematic reviews. A good quality RCT undertaken in the UK is also included. The reviews did not state in which countries the trials were conducted, thus generalisability of the results may be limited.

Evidence of a reasonable effect

- For the general population, the more effective health promotion interventions were those based on theories of behavioural change, which may, for example, encourage clear goal-setting.
- The most successful breastfeeding promotion interventions were based in the USA and in general were long term, spanning the pre-and postnatal period and intensive, involving multiple contacts with a professional breastfeeding promoter or peer counsellor.
- Family therapy programmes were effective in preventing the progression of obesity in already obese children.
- Behavioural, diet and exercise programmes were shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination.

Evidence of a modest (small) effect or likely to be effective

- Dietary advice as a primary preventive in adults.
- School-based programmes that include eating behaviours as a component of the intervention.
- Some evidence for the success of health promotion interventions to improve diet in elderly people (USA studies only).
- Weight-reducing diets in overweight hypertensive persons.
- Nutritional advice appears effective in increasing pregnant women's energy and protein intakes but has rather modest health benefits.
- Community-based programmes aimed at women of childbearing age provide evidence of effectiveness in the short term (USA studies only).
- Diet plus exercise for weight loss.

Likely to be ineffective

- Studies based on a "dissemination of information and teaching of skills" model were not very effective in bringing about behavioural change.
- The least successful breastfeeding promotions were implemented during the postnatal period only, or in countries other than the USA.

Not enough evidence

- Interventions to prevent weight gain exhibited various degrees of effectiveness. Definite statements about the elements of the intervention that were associated with increased effect size cannot be made as only one of the five RCTs reported a significant effect on weight.

- Interventions to promote healthy feeding in infants under one year of age, particularly during the weaning period.
- Interventions to promote healthy eating in pre-school children.
- Nutritional health promotion among ethnic minority groups, particularly those in the UK.

Sexual risk-taking in young people

The evidence base: No Cochrane review has been undertaken in this area, but there were several high quality reviews. Some reviews, however, only included evidence from trials conducted in the USA. Thus, generalisability may be limited, and the conclusions should be interpreted with caution.

Evidence of a reasonable effect

- AIDS risk reduction interventions can be effective in improving knowledge, attitudes, and behavioural intentions and in reducing risk practices. The most effective approach to HIV/AIDS risk reduction among young people is one that provides practical information and support in a non-didactic way.
- School-based sex education can be effective in reducing teenage pregnancy especially when linked to access to contraceptive services.
- All of the theoretically-based interventions (multi-session programmes, which included skills training and strategies to modify perceived peer or partner beliefs about risk-taking behaviour) were effective in increasing condom use.

Not enough evidence

- There is no good evidence indicating whether school-based programmes, focusing only on abstinence, delay the onset of intercourse or reduce the frequency of intercourse. School-based programmes did not hasten intercourse in older students, while evidence for younger students is less consistent. Some programmes can increase the use of condoms or other contraceptives.

Illicit drug use in young people

The evidence base: Only one good quality systematic review has been undertaken in this area. The results of several RCTs are reported, but most of them concentrated on alcohol, cigarette smoking and marijuana use. All trials were conducted in the USA, which limits the generalisability of the results. Any conclusions, therefore, should be interpreted with caution. The majority of studies that have been undertaken in this area are school-based interventions targeting 'gateway' drugs.

Evidence of a modest effect

Some school-based prevention programmes showed evidence of effect in the short term (three months period).

Likely to be ineffective

- Programmes such as Project DARE (Drug Abuse Resistance Education) report that long term the intervention increased outcomes such as attitudes and knowledge, but overall there was little difference in drug use between those who participated and those who did not.

Not enough evidence of effectiveness

- Health promotion with young people for the prevention of substance misuse.
- All other interventions for the prevention of substance misuse in young people.

List of abbreviations

CI	Confidence Interval
CRD	Centre for Reviews and Dissemination
DARE	Database of Abstracts of Reviews of Effectiveness
NRT	Nicotine replacement therapy
OR	Odds ratio
RCT	Randomised controlled trial
RR	Relative risk
SE	Standard error

Glossary

Specialised terms and abbreviations are used throughout this report. The meaning is usually clear from the context but a glossary is provided for the non-specialist reader. In some cases usage differs from that found in the literature, but the term has a constant meaning throughout the report.

Blinding (synonym: masking)
Keeping confidential group assignment (e.g. to intervention or control) from the study participants or investigators. Blinding is used to protect against the possibility that knowledge of assignment may affect participant response to intervention, provider behaviours (performance bias) or outcome assessment (detection bias).

Cochrane Review
A Cochrane Review is a systematic, up-to-date summary of reliable evidence of the benefits and risks of healthcare. Cochrane Reviews are intended to help people make practical decisions. Reviewers adhere to guidelines published in the Cochrane Handbook, are published on The Cochrane Library and are updated regularly.

Confidence interval (CI)
The range within which the "true" value (e.g. size of effect of an intervention) is expected to lie with a given degree of certainty (e.g. 95% or 99%). Note: Confidence intervals represent the probability of random errors, but not systematic errors (bias).

Controlled trial
Refers to a study that compares one or more intervention groups to one or more comparison (control) groups. In this review, the term ‘controlled trials’ was used to describe trials that used non-random methods to allocate participants to two or more groups (e.g. cohort with concurrent control).

Generalisability (synonyms: applicability, external validity, relevance, and transferability)
Generalisability is the degree to which the results of a study or systematic review can be extrapolated to other circumstances, in particular to routine health care situations.

Methodological quality (synonyms: validity, internal validity, and quality)
Extent to which the design and methodology of a trial are likely to have prevented systematic errors (bias). Variation in quality can explain variation in results of trials included in systematic reviews. More rigorously designed (better 'quality') trials are more likely to yield results that are closer to the 'truth'.

Odds ratio (OR)
The ratio of the odds of an event in the experimental (intervention) group to the odds of an event in the control group. Odds are the ratio of the number of people in a group with an event to the number without an event. Thus, if a group of 100 people had an event rate of 0.20, 20 people had the event and 80 did not, and the odds would be 20/80 or 0.25. An odds ratio of one indicates no difference between comparison groups. For undesirable outcomes an OR that is less than one indicates that the intervention was effective in reducing the risk of that outcome. When the event rate is small, odds ratios are very similar to relative risks.

P-value
The probability (ranging from zero to one) that the observed results in a study could have occurred by chance. In a meta-analysis the p-value for the overall effect assesses the overall statistical significance of the difference between the intervention and control groups, whilst the p-value for the heterogeneity statistic assesses the statistical significance of differences between the effects observed in each study.

Quality assessed reviews
Published and unpublished systematic reviews that have been assessed according to strict quality criteria by the NHS Centre for Reviews and Dissemination at the University of York, UK.

Quasi-randomised trial
A trial using a quasi-random method of allocating participants to different forms of care (ie date of birth, day of the week, medical record number, month of the year, or the order in which participants are included in the study (e.g. alternation). There is a greater risk of selection bias in quasi-random trials where allocation is not adequately concealed compared with randomised controlled trials with adequate allocation concealment.

Randomised Controlled Trial (RCT) (Synonym: randomised clinical trial)
An experiment in which investigators randomly allocate eligible people into (e.g. intervention and control) groups to receive or not to receive one or more interventions that are being compared. The results assess and compare the outcomes of the intervention and control groups.

Relative Risk (RR) (synonym: risk ratio)
The ratio of risk in the intervention group to the risk in the control group. The risk (proportion, probability or rate) is the ratio of people with an event in a group to the total in the group. A relative risk of one indicates no difference between comparison groups. For undesirable outcomes a RR that is less than one indicates that the intervention was effective in reducing the risk of that outcome.

Statistical significance
An estimate (usually expressed as a p-value) of the probability of an association (effect) as large or larger than what is observed in a study occurring by chance. The cut-off for statistical significance is usually taken at 0.05, but sometimes at 0.01 or 0.10. These cut-offs are arbitrary and have no specific importance.

Systematic review (synonym: systematic overview)
A review of a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies. See also Cochrane Review.

Aims and objectives

The aim of this report was to identify interventions targeting six health-related behaviours. The primary outcomes of interest were prevention of, or changes in health-related behaviour (e.g. not taking up smoking, reducing alcohol consumption), rather than biological or physiological outcomes (e.g. control of diabetes, reduction in blood pressure). The inclusion and exclusion criteria for interventions and populations for each health-related behaviour are described below:

Smoking
Interventions to prevent the uptake of smoking and interventions aimed at smoking cessation. Outcomes included were prevention of smoking or smoking cessation.

Alcohol
Interventions aimed at preventing/reducing alcohol abuse; interventions aimed at problem drinkers and drink drivers. Interventions aimed at people with alcohol dependence and interventions to maintain abstinence are excluded. Outcomes included were prevention of the taking up of alcohol drinking, or a reduction in alcohol consumption.

Exercise
Interventions to promoting physical exercise in the general population and interventions aimed at preventing specific problems (e.g. back injury prevention). Interventions aimed at treating health problems (e.g. back pain, arthritis, and intermittent claudication) were excluded. Outcomes included were an increase in physical activity.

Diet
Interventions aimed at promoting healthy eating habits in the general population or in groups with slightly raised risk (e.g. sedentary people, overweight people, and pregnant women). Interventions aimed at groups who are already ill (e.g. diabetics, or people with heart disease) or interventions for which the outcome is primarily the reduction of risk factors only (e.g. blood pressure, hypertension) are excluded. Outcomes included were a change in dietary patterns or weight loss.

Illicit drug use
Interventions aimed at preventing illicit drug use. Interventions aimed at illicit drug users were excluded. Outcomes included were the prevention of illicit drug use.

Sexual risk taking in young people
Interventions aimed at reducing sexual risk taking, promoting HIV/AIDS awareness. Interventions aimed at sexual risk takers were excluded. Outcomes included were a reduction in sexual risk taking including pregnancy.

Types of evidence included in the review

For the purpose of this report, Cochrane reviews were considered to be the best available evidence as they appear to have greater methodological rigour and are more frequently updated than systematic reviews or meta-analyses published in paper.[1] In areas where a Cochrane review has been undertaken, other systematic reviews may be mentioned, but not described in detail. Published and unpublished systematic reviews that have been assessed according to strict quality criteria by the Centre for Reviews and Dissemination (CRD) in York, UK are used as the second level of evidence. Abstracts of these reviews, with an assessment of quality, appear on the Database of Abstracts of Reviews of Effectiveness (DARE). In areas where no quality-assessed reviews have been undertaken, other reviews are used as the third level. Only systematic reviews, which have been undertaken in the last 5 years, are considered. Reviews published before this date are likely to be out of date and may not reflect the current evidence. In areas where there are either no reviews or only poor quality reviews, other evidence is considered as well, firstly from well designed randomised controlled trials (RCTs) and secondly from other evidence.

In summary, the levels of evidence for reviews included in this report are:

- Cochrane reviews
- Reviews that meet the CRD quality criteria (described in this report as *quality assessed reviews*)
- Other reviews and well conducted RCTs
- Other evidence (cohort studies, qualitative research etc)

Search Strategy

The Cochrane Database of Systematic Reviews (CDSR), Database of Reviews of Effectiveness (DARE), Cochrane Controlled Trials Register were searched for relevant systematic reviews, meta-analyses, RCTs and other evidence up until March 2000. The following search terms were used (MeSH and/or free text): tobacco, smoking, smoking-cessation, alcohol, alcohol abuse, alcohol misuse, alcoholism, alcohol-related disorders, exercise, health education, nutrition, diet, dietary fibre, weight control, weight reduction programs, diet therapy, diet reducing, weight management/loss, health disorder prevention, sexual risk taking, sex behavior, sex behaviour, HIV-infection, sex-education, substance abuse prevention, drug abuse, drug misuse, substance abuse, substance misuse.

MEDLINE and CINAHL were searched from 1990-March 2000 using similar terms and initially restricting the search to 'evidence-based reviews'. If no good quality evidence was found from either search, the MEDLINE or CINAHL search was expanded, first to include all reviews, and then to include other evidence. Review Group Co-ordinators of the relevant Cochrane Collaborative Review Groups (Drugs and Alcohol Group, HIV/AIDS Group, and Tobacco Addiction Group) were contacted and asked to provide details of additional systematic reviews or relevant information not published within the Cochrane Library.

Experts in the areas included in the review were contacted and asked to provide details of reviews and/or trials completed or being undertaken.

Some of this report consists of synopses of the abstracts from Cochrane reviews and DARE. Most of the Cochrane reviews and published systematic reviews, however, have been read fully and extra details included as necessary.

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1. Tobacco Smoking

Prevention of smoking in the general population

1. Restrictions on smoking in public places

Several interventions to prevent exposure to tobacco smoke in public places have been carried out in places such as health centres, educational centres, stores or restaurants. However, the overall impact of those interventions to reduce the sale and consumption of tobacco in public places, and their components, has not been established. A Cochrane review in this area is being prepared but has not yet been completed.[2] In the USA, several RCTs have been undertaken. One trial of worksite smoking control, discouragement, and cessation concluded that a comprehensive program of smoking control, discouragement, and cessation was more effective than cessation alone.[3] Another trial of workplace compliance with a no-smoking law randomised businesses to receive or not receive a low-cost mailed programme of education about the law.[4] The authors concluded that the law was popular and contributed to a high prevalence of workplace smoking restrictions. Different interpretations of the law by policy makers and businesses seemed to explain why formal compliance was low. The mailing increased awareness of, but not compliance with, the law.

Prevention of smoking in young people

1. School-based prevention programmes in young people

i) Quality assessed review: Preventing the uptake of smoking in young people.[5]
Selection criteria/characteristics of included studies: A review of reviews. Eight reviews met the inclusion criteria, and between them included over 170 studies. One of the reviews met only minimum criteria for inclusion and did not cover all the evidence identified, and is therefore not considered further. Due to the different inclusion criteria used in each review, no single review included all primary studies. The intervention evaluated ranged from tobacco-specific through to general health education programmes. *Main results:* The evidence to date for the effectiveness of school-based programmes in preventing the uptake of smoking in young people is limited. However, social reinforcement/social norms type programmes which include curricular components on the short-term health consequences of smoking, combined with information on the social influences that encourage smoking, together with training on how to resist the pressures to smoke seem to be more effective than traditional knowledge-based interventions. In addition to considering the specific components that should be included in a programme, it is likely that other issues need to be addressed. For example, the training given to teachers that deliver the programmes, and how well each component is delivered and implemented are likely to impact on effectiveness. The ages of the young people targeted may also affect outcomes. Most programmes were aimed at 11 to 17 year olds and it is likely that attitudes and beliefs about smoking and experimentation with cigarettes may already be established by this time. Programme implementation before regular patterns of smoking behaviour are formed should be considered. This may involve targeting children as young as four to eight years of age. In addition, methodological weaknesses with several of the systematic reviews, such as heterogeneity in effect sizes, suggesting differences between the studies combined, means that the results should be interpreted with caution. Most of the evaluated school-based programmes have focused almost entirely on developing knowledge and skills.

Less attention has been paid to the role that schools may play in influencing smoking behaviour.

Authors' conclusions: School-based programmes have achieved limited success, although social reinforcement/social norms type programmes seem to be more effective than traditional knowledge-based interventions.

ii) Systematic review: Developing options for a programme on adolescent smoking in Wales.[6]
Selection criteria/characteristics of included studies: Any trial of children 10-16 years old. Six out of the eight trials identified were conducted in the USA. One was undertaken in London and the other in Norway. Interventions included social influence programmes, training in resistance skills, health promotion programmes, and information. *Main results: Detailed* results from the trials not presented in the review. *Limitations of the review:* No assessment of quality of the trials, and no meta-analysis or presentation of results.

Authors' conclusions: School programmes can delay but not prevent onset of smoking; school programmes are more effective in reaching low than high risk youth; further improvement in the success rate of schools programmes is unlikely; more comprehensive programmes may be more effective than tobacco-specific and stand-alone programmes

A Cochrane review of school based programmes for preventing smoking is also in progress.[7]

2. Non school-based prevention strategies aimed at young people

i) Cochrane review: Mass media interventions for preventing smoking among young people.[8]
Selection criteria/ characteristics of included studies: RCTs, controlled trials without randomisation and time series studies that assessed the effectiveness of mass media campaigns (defined as channels of communication such as television, radio, newspapers, bill boards, posters, leaflets or booklets intended to reach large numbers of people and which are not dependent on person to person contact) in influencing the smoking behaviour (either objective or self-reported) of young people under the age of 25 years. *Main results:* Six controlled trials out of a total of 63 studies reporting information about mass media smoking campaigns met all of the inclusion criteria. Five out of six were undertaken in the USA. Two studies concluded that the mass media were effective in influencing the smoking behaviour of young people. Both of the effective campaigns had a solid theoretical basis, used formative research in designing the campaign messages, and message broadcast was of reasonable intensity over extensive periods of time.

Authors' conclusions: There is some evidence that the mass media can be effective in preventing the uptake of smoking in young people, but overall the evidence is not strong

ii) Cochrane review: Community interventions for preventing smoking in young people.[8]
Selection criteria/ characteristics of included studies: Randomised and non-randomised controlled trials that assessed the effectiveness of multi-component community interventions compared to no intervention or to single component or school-based programmes only. Reported outcomes included smoking behaviour in young people under the age of 25 years. *Main results:* Thirteen studies were included in the review, 44

studies did not meet all of the inclusion criteria. All studies used a controlled trial design, with four using random allocation of schools or communities. Of nine studies that compared community interventions to no intervention controls, two, which were part of cardiovascular disease prevention programmes, reported lower smoking prevalence. Of three studies comparing community interventions to school-based programmes only, one found differences in reported smoking prevalence. One study reported a lower rate of increase in prevalence in a community receiving a multi-component intervention compared to a community exposed to a mass media campaign alone. One study reported a significant difference in smoking prevalence between a group receiving a media, school and homework intervention compared to a group receiving the media component only.

Authors' conclusions: There is some limited support for the effectiveness of community interventions in helping prevent the uptake of smoking in young people.

***iii) Cochrane review*:** Interventions for preventing tobacco sales to minors.[9]
Selection criteria/ characteristics of included studies: Controlled trials and uncontrolled studies with pre- and post intervention assessment of interventions to change retailers' behaviour. The outcomes were changes in retailer compliance with legislation (assessed by test purchasing), changes in young people's smoking behaviour, and perceived ease of access to tobacco products. *Main results:* 27 studies were identified of which 13 were controlled. Active enforcement of legislation and mobilising community support reduced the level of illegal sales. Educational interventions alone were less effective. In three controlled trials, there was little effect of intervention on young people's self-perceived ease of access or prevalence of smoking.

Authors' conclusions: Effective restriction on purchase of tobacco by youths requires enforcement and community support. There is little evidence that local ordinances alone reduce the prevalence of smoking in young people, who are easily able to obtain tobacco products from other sources. Stronger regional, national and international strategies are required if restriction of youth access is to contribute to reduction in smoking prevalence.

A Cochrane review is presently underway to evaluate studies where the primary aim is to reduce children's exposure to environmental smoke (thereby preventing adverse health outcomes), but where secondary outcomes include reduction in familial/parental/carer smoking, or changes in infant and child health measures.[10]

Smoking cessation interventions aimed at the general population

In the majority of Cochrane reviews of smoking cessation, the main outcome measure was abstinence from smoking after at least twelve weeks (or six months) follow-up. Biochemically-validated rates were used, if available. Subjects lost to follow-up were counted as continuing smokers.

1. Pharmacological agents

i) Cochrane review: Nicotine replacement therapy for smoking cessation.[11]
Selection criteria/ characteristics of included studies: RCTs in which nicotine replacement therapy (NRT) was compared to placebo or no treatment, or where different doses of NRT were compared. *Main results:* 49 trials of nicotine gum, 24 of transdermal nicotine patch, four of intranasal nicotine spray and four of inhaled nicotine were identified. Three trials compared combinations of two forms of nicotine therapy with one form alone. The OR for abstinence with NRT compared to control was 1.73 (95% CI: 1.60 to 1.86), The ORs for the different forms of NRT were 1.63 for gum, 1.84 for patches, 2.27 for nasal spray and 2.08 for inhaled nicotine. These odds were largely independent of the

intensity of additional support provided or the setting in which the NRT was offered. Eight weeks of patch therapy was as effective as longer courses and there was no evidence that tapered therapy was better than abrupt withdrawal. Wearing the patch only during waking hours (16 hours/day) was as effective as wearing it for 24 hours/day. The OR for abstinence in the trials which directly compared 4 mg versus 2 mg gum in highly dependent smokers found a significant benefit in favour of 4 mg gum (2.67, 95% CI: 1.69 to 4.22).

Authors' conclusions: All of the commercially available forms of NRT are effective as part of a strategy to promote smoking cessation. They increase quit rates approximately 1.5 to twofold, regardless of setting. Since all the trials of NRT reported so far have included at least some form of brief advice to the smoker, this represents the minimum that should be offered in order to ensure its effectiveness.

ii) Cochrane review: Clonidine for smoking cessation.[12]
Selection criteria/ characteristics of included studies: RCTs of clonidine versus placebo with a smoking cessation endpoint assessed at least 12 weeks following the end of treatment. *Main results:* Six trials met the inclusion criteria. There were three trials of oral, and three of transdermal clonidine. Some form of behavioural counselling was offered to all participants in five of the six trials. There was a statistically significant effect of clonidine in one trial. The pooled OR for success with clonidine vs placebo was 1.89 (95% CI: 1.30 to 2.74). There was a high incidence of dose-dependent side effects, particularly dry mouth and sedation.

Authors' conclusions: Based on a small number of trials, in which there are potential sources of bias, clonidine is effective in promoting smoking cessation. Prominent side effects limit the usefulness of clonidine for smoking cessation.

iii) Cochrane review: Lobeline for smoking cessation.[13]
Selection criteria/ characteristics of included studies: RCTs comparing lobeline to placebo or an alternative therapeutic control. *Main results:* No trials meeting the full inclusion criteria including long term follow-up were found.

Authors' conclusions: There is no evidence available from long-term trials that lobeline can aid smoking cessation.

iv) Cochrane review: Mecamylamine for smoking cessation.[14]
Selection criteria/ characteristics of included studies: RCTs of mecamylamine, either alone or in combination with nicotine replacement therapy. Because of the preliminary nature of available data, meta-analysis was not performed. *Main results*: Two studies were identified, both from the same investigators. In a study of 48 volunteers, a combination of mecamylamine plus nicotine patch was more effective than nicotine patch alone (abstinence rate at one year 37.5% vs 4.2%). In a second study, 80 volunteers were treated for four weeks prior to cessation with one of four treatments: nicotine patch plus mecamylamine capsules; nicotine alone; mecamylamine alone; no active drug. In the doses used, mecamylamine was well tolerated, although up to 40% of subjects required reductions in dose, usually because of constipation.

Authors' conclusions: Data from two small studies suggest that the combination of nicotine and mecamylamine may be superior to nicotine alone in promoting smoking cessation. However, these results require confirmation in larger studies before the treatment can be recommended clinically.

v) *Cochrane review:* Silver acetate for smoking cessation.[15]
Selection criteria/ characteristics of included studies: RCTs of silver acetate for smoking cessation. *Main results:* Two studies provided long-term follow-up data on patients randomised to silver acetate or placebo. In one of these studies, there was a third arm, randomised to 2-mg nicotine gum. The combined OR for quitting for silver acetate vs placebo was 1.05 (95% CI: 0.63 to 1.73).

Authors' conclusions: Existing trials show little evidence for a specific effect of silver acetate in promoting smoking cessation. The lack of effect of silver acetate may reflect poor compliance with a treatment whose rationale is to create an unpleasant stimulus.

vi) Cochrane review: Anxiolytics and antidepressants for smoking cessation[16]
Selection criteria/ characteristics of included studies: RCTs comparing anxiolytic or antidepressant drugs to placebo or an alternative therapeutic control for smoking cessation. *Main results:* There was one trial each of the effectiveness of the anxiolytics meprobamate, diazepam, oxprenolol and metoprolol. There were two trials of the anxiolytic buspirone. Neither trial showed evidence of effectiveness in helping smokers to quit. There was one trial each of the antidepressants moclobemide, fluoxetine and nortriptyline, and three trials of bupropion. There was evidence that fluoxetine and bupropion have a small effect on cessation and that other antidepressants might also be effective. No studies comparing antidepressants to nicotine replacement therapy were identified.

Authors' conclusions: There is no evidence that anxiolytics aid smoking cessation. There is evidence that some antidepressants can aid smoking cessation. It is not clear whether these effects are specific for individual drugs.

2. Education for smokers or health professionals, advice and encouragement

i) Cochrane review: Physician advice for smoking cessation.[17]
Selection criteria/ characteristics of included studies: RCTs of smoking cessation advice from a medical practitioner in which abstinence was assessed at least six months after advice was first provided. *Main results:* Thirty-one trials including over 26,000 smokers were identified. In some trials, subjects were at risk of specified diseases (chest disease, diabetes, and ischaemic heart disease), but most were from unselected populations. Pooled data from 16 trials of brief advice versus no advice (or usual care) revealed a small but significant increase in the odds of quitting (OR: 1.69, 95% CI: 1.45 to 1.98). This equates to an absolute difference in the cessation rate of about 2.5%. Direct comparison of intensive versus minimal advice showed a small advantage of intensive advice (OR 1.44, 95% CI: 1.23 to 1.68).

Authors' conclusions: Simple advice has a small effect on cessation rates. Additional manoeuvres appear to have only a small effect, though more intensive interventions are marginally more effective than minimal interventions.

ii) Cochrane review: Nursing interventions for smoking cessation.[18]
Selection criteria/ characteristics of included studies: RCTs of nursing delivered smoking cessation interventions, with follow-up of at least 6 months. *Main results:* 15 studies, comparing nursing intervention to a control or usual care, found the intervention significantly increased the odds of quitting (OR 1.43, 95% CI: 1.24 to 1.66). There was heterogeneity between the study results, but pooling using a random effects model did not alter the estimate of effect. There was no evidence from indirect comparison that interventions classified as intensive had a larger effect than less intensive ones. There was limited evidence that interventions were more effective for hospital inpatients with

cardiovascular disease than for inpatients with other conditions. Interventions in non-hospitalised patients also showed evidence of efficacy. Three studies of nurse counselling on smoking cessation during a screening health check, not included in the main meta-analysis, suggested that under these conditions nursing intervention was likely to have less effect.

Authors' conclusions: The results indicate the potential benefits of smoking cessation advice and counselling given by nurses to their patients, with reasonable evidence that interventions can be effective. The challenge will be to incorporate smoking cessation intervention as part of standard practice so that all patients are given an opportunity to be queried about their tobacco use and to be given advice to quit along with reinforcement and follow-up.

iii) Cochrane review: **Training health professionals in smoking cessation.**[19]
Selection criteria/ characteristics of included studies: RCTs in which the intervention was training of health care professionals in smoking cessation. Trials were considered only if they reported outcomes for both professional performance and patient smoking rates at least six months after the intervention. *Main results:* Healthcare professionals who had received training were significantly more likely to perform tasks of smoking cessation than untrained controls. There was a modest increase in the odds of stopping smoking for smokers attending health care professionals who had received training compared with patients attending control practitioners (OR 1.48, 95% CI: 1.20 to 1.83). The effects of training were increased if prompts and reminders were used.

Authors' conclusions: Training health professionals to provide smoking cessation interventions had a measurable effect on professional performance. There was also a modest effect on patient outcome.

3. Behaviour modification and self-help strategies

i) Cochrane review: Group behaviour therapy programmes for smoking cessation.[20]
Selection criteria/ characteristics of included studies: RCTs that compared group therapy with self-help, individual counselling, another intervention or usual care or waiting list control. Also trials which compared two group programmes with manipulation of the group interaction and social support components. *Main results:* Thirteen studies compared a group programme with a self-help programme. There was an increase in cessation with the use of a group programme (OR 2.10, 95% CI: 1.64 to 2.70). Group programmes were more effective than no intervention or minimal contact interventions (OR 1.91, 95% CI: 1.20 to 3.04). There was no evidence from two trials that group therapy was more effective than a similar intensity of individual counselling. There was no evidence that manipulating the social interactions between participants in a group programme had an effect on outcome. There was limited evidence that the addition of group therapy to other forms of treatment, including advice from a health professional or nicotine replacement produced extra benefit. There was variation in the extent to which those offered group therapy accepted the treatment.

Authors' conclusions: There is evidence that groups are better than self-help and other less intensive interventions. There is not enough evidence on their effectiveness compared to intensive individual counselling. From the public health perspective, the impact of groups on smoking prevalence will depend on their uptake.

ii) Cochrane review: Individual behavioural counselling for smoking cessation.[21]
Selection criteria/ characteristics of included studies: RCTs or quasi-RCTs with at least one treatment arm consisting of face to face individual counselling from a health care

worker not involved in routine clinical care. The outcome was smoking cessation at follow-up at least six months after the start of counselling. *Main results:* Eleven trials were identified, 10 compared individual counselling to a minimal intervention, two compared two intensities of counselling, and one compared individual counselling to group therapy. Individual counselling was more effective than control. The OR for successful smoking cessation was 1.55 (95% CI: 1.27 to 1.90). There was no evidence that more intensive counselling was more effective than brief counselling (OR 1.17, 95% CI: 0.59 to 2.34). There was no evidence of a difference in effect between individual counselling and group therapy (OR 1.33, 95% CI: 0.83 to 2.13).

Authors' conclusions: Smoking cessation counselling can assist smokers to quit.

Cochrane review: Aversive smoking for smoking cessation.[22]
Selection criteria/ characteristics of included studies: RCTs which compared aversion treatments with 'inactive' procedures or which compared aversion treatments of different intensity for smoking cessation. *Main results:* Twenty-four RCTs met the inclusion criteria. Ten included rapid smoking and ten used other aversion methods. Ten RCTs included two or more conditions allowing assessment of a dose-response to aversive stimulation. The OR for abstinence following rapid smoking compared to control was 2.08 (95% CI: 1.39 to 3.12). Several factors suggest that this finding should be interpreted cautiously. Most trials had a number of serious methodological problems likely to lead to spurious positive results. The single study fulfilling current criteria for methodological adequacy yielded only a non-significant trend, while methodologically less adequate small studies tended to report better results. Other aversion methods were not shown to be effective (OR 1.19, 95% CI: 0.77 to 1.83).

Authors' conclusions: The existing studies provide insufficient evidence to determine the efficacy of rapid smoking, or whether there is a dose-response to aversive stimulation. Milder versions of aversive smoking seem to lack specific efficacy. Rapid smoking is an unproven method with sufficient indications of promise to warrant evaluation using modern rigorous methodology.

iv) Cochrane review: Self-help interventions for smoking cessation.[23]
Selection criteria/ characteristics of included studies: RCTs of smoking cessation with follow-up of at least six months, where at least one arm tested a self-help intervention. Self-help was defined as structured programming for smokers trying to quit without intensive contact with a therapist. *Main results:* 45 trials were identified. Twenty-seven compared self-help materials to no intervention or tested materials as an adjunct to advice. In nine trials in which self-help was compared to no intervention there was a pooled effect, which just reached statistical significance (OR 1.23, 95% CI: 1.02 to 1.49). There was no evidence of benefit from adding self-help materials to face to face advice, or to nicotine replacement therapy. There was evidence from eight trials using materials which were tailored for the characteristics of individual smokers that such personalised materials were more effective than standard materials (OR 1.41, 95% CI: 1.14 to 1.75). Adding follow-up telephone calls from counsellors also appeared to increase quitting (OR 1.62, 95% CI: 1.33 to 1.97). One trial of offering access to a hotline also showed an effect.

Authors' conclusions: Self-help materials may provide a small increase in quitting compared to no intervention. There is no evidence that they have an additional benefit over other minimal interventions such as advice from a health care professional, or nicotine replacement therapy. There is evidence that materials tailored for individual smokers are more effective.

4. Complementary therapies

***i) Cochrane review*: Acupuncture** for smoking cessation.[24]
Selection criteria/ characteristics of included studies: All RCTs comparing a form of acupuncture with sham acupuncture, another intervention or no intervention. Patients were tobacco smokers aged over 18 years, who wished to stop smoking. *Main results:* 18 RCTs with 20 comparisons were included in the review. Acupuncture was not superior to sham acupuncture in smoking cessation at any time point. The odds ratio (OR) for early outcomes was 1.22 (95% confidence interval 0.99 to 1.49); the OR after 6 months was 1.38 (95% confidence interval 0.90 to 2.11) and after 12 months 1.02 (95% confidence interval 0.72 to 1.43). Similarly, when acupuncture was compared with other anti-smoking interventions, there were no differences in outcome at any time point. Acupuncture appeared to be superior to no intervention in the early results, but this difference was not sustained. The results with different acupuncture techniques do not show any one particular method (i.e. auricular acupuncture or non-auricular acupuncture) to be superior to control intervention.

Authors' conclusions: There is no clear evidence that acupuncture is effective for smoking cessation.

ii) Cochrane review: Hypnotherapy for smoking cessation.[25]
Selection criteria/ characteristics of included studies: RCTs of hypnotherapy which reported smoking cessation rates at least six months after the beginning of treatment. *Main results:* Nine studies compared hypnotherapy with 14 different control interventions, including waiting list/no treatment controls (3 studies), attention/advice interventions (4 studies), psychological treatments (2 studies) and rapid or focused smoking (2 studies). In three studies hypnotherapy plus counselling was compared with counselling alone. The studies varied in the type of hypnotic induction used and the duration of the hypnosis session. The number of sessions also varied greatly (from one to nine) and the total duration of hypnosis administered during treatment varied from 80 minutes to seven hours. There was significant heterogeneity between the results of the individual studies, with conflicting results for the effectiveness of hypnotherapy compared to no treatment or to advice. Therefore pooled ORs for the overall effect of hypnotherapy were not calculated. There was no evidence of an effect of hypnotherapy compared to rapid smoking or psychological treatment.

Authors' conclusions: It was not shown that hypnotherapy has a greater effect on six month quit rates than other interventions or no treatment. The effects of hypnotherapy on smoking cessation claimed by uncontrolled studies were not confirmed by analysis of RCTs.

5. Incentives

i) Quality assessed review: The use and impact of incentives in population-based smoking cessation programs: a review.[26]
Selection criteria/characteristics of included studies: Smoking cessation interventions that were both incentive-based (cash incentives, cash and holiday prizes) and population-based were included. Participants were tobacco smokers in the general population. The majority of studies specifically included only adult smokers (aged 16 years or over). *Main results:* The population-based interventions generally attracted 1-2% of the target population, regardless of the publicity or recruitment tactics used. No specific type of recruitment strategy was shown to be consistently more effective than others. The quit rates for the programs ranged from 13-45% and were in part dependent upon the length of follow-up, with lower quit rates more likely to be reported when this

time was prolonged. The evidence was limited as most studies used a quasi-experimental or non-experimental design. There was no evidence that particular types of incentives were able to influence participation or quit rates more than others, but the size of the incentive did appear to be important. Larger incentives were viewed as more effective at motivating smokers to quit and stay smoke free than smaller ones.

Authors' conclusions: Incentive-based smoking cessation programs that target an entire community have the advantage of reaching a large and diverse group of smokers. They may, however, attract only smokers who are already motivated to quit. Realistically, incentive-based programmes aimed at the general population can expect 1% of all their smokers to quit smoking. Quit rates among participants may initially be high (i.e. mean quit rate of 34% at 1-month follow-up) but decrease over time (i.e. mean rate of 23% at 1 year). The results of this review suggest a continued need to establish standard and valid criteria for the evaluation of smoking cessation interventions. Methodological differences among existing studies make them difficult to compare and interpret.

6. Exercise

i) Quality assessed review: A meta-analytic review of the effect of exercise on smoking cessation.[27]
Selection criteria/characteristics of included studies: Published controlled studies of smoking cessation exercise programmes. *Main results:* Five RCTs met the inclusion criteria. In three of these, smoking cessation was the main aim and exercise was employed for relapse prevention concurrently with or after a group smoking cessation programmes. The summary OR of the three studies where smoking cessation was the main aim was 2.35 (95% CI: 0.75 to 7.31). When the other two studies were added, it dropped to 1.85 (95% CI: 0.65 to 5.24).

Authors' conclusions: Due to the small number of studies and the sample size for each study, the effect remains unclear. Further analysis, both qualitative and quantitative, is necessary to clarify these issues.

Smoking cessation Interventions aimed at pregnant women

i) Cochrane review: Interventions for promoting smoking cessation during pregnancy.[28]
Selection criteria/ characteristics of included studies: RCTs and quasi-RCTs of smoking cessation programs implemented during pregnancy. *Main results:* 45 trials were identified: 37 trials including 16,916 women provided data on smoking cessation and/or perinatal outcomes, as did one cluster-randomised trial including 3,000 women. Over 800 women were included in trials of smoking relapse prevention. There was substantial variation in the intensity of the intervention and the extent of reminders and reinforcement through pregnancy. Based on 34 trials there was a significant reduction in smoking in the intervention groups (OR 0.53, 95% CI: 0.47 to 0.60), an absolute difference of 6.4% women continuing to smoke. The eight trials with validated smoking cessation, a high intensity intervention and a high quality score had an OR of 0.53 (95% CI: 0.44 to 0.63) and an absolute difference in continued smoking of 8.1%. Five trials of smoking relapse prevention showed no significant difference. The single large cluster-randomised trial showed no evidence of a decrease in continued smoking.

Authors' conclusions: Smoking cessation programs in pregnancy appear to reduce smoking.

Other ongoing reviews of interventions for smoking cessation

Two Cochrane review are underway on interventions for smoking cessation in hospitalised patients[29] and community interventions for reducing smoking among adults, both of which are expected to be completed in late 2000.[30]

2. Alcohol drinking

Preventing/reducing Alcohol misuse in young people

i) Quality assessed review: Alcohol misuse prevention for young people: a systematic review reveals methodological concerns and lack of reliable evidence of effectiveness.[31]
Selection criteria/characteristics of included studies: Experimental or quasi-experimental trials of prevention programmes for alcohol misuse, whether primary prevention measures to arrest onset of alcohol use or secondary prevention measures to minimise alcohol misuse. Participants included in the review were young people aged 8 to 25 years. Outcomes reported included changes in actual or self-reported drinking behaviour and changes in alcohol related incidents such as accidents or crime. Of the 155 trials that passed the initial pre-screen, just over three-quarters took place in the USA. *Main results: O*nly 10 of the 33 studies included met four core methodological criteria. Overall, no prevention programme was convincingly effective. Of the 29 studies of prevention programmes with short-term follow-up, 16 were partially effective (i.e. some self-reported measures were positively influenced), 11 were ineffective (i.e. having no influence on self-reported drinking behaviour) and five had negative effects (increased alcohol consumption). The prevention programmes with negative effects did not appear to differ in content from the effective and partially effective programmes.

Authors' conclusions: The prevention programmes reviewed provided limited evidence to recommend any of the programmes. There were limited differences between the programmes that claimed partial success, no effect or negative effects. Some programmes varied in effectiveness depending on length of follow-up. Good quality research, in terms of methodology, was rare. Studies considered for review lacked suitable control groups (non-random allocation or non-equivalent design), did not provide pre-test information, and had high levels of attrition and poor quality presentation of results.

Reducing alcohol misuse in the general population

1. Education and counselling

Four quality-assessed reviews examined the evidence in this area. Many of the relevant trials were included in all the reviews.

i) Quality assessed review: Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: a meta-analysis.[32]
Selection criteria/characteristics of included studies: RCTs of very brief (5-20 minutes) interventions and extended (several visits) brief interventions. Six comparison groups for brief interventions included 320 intervention and 314 control subjects, and 8 comparison groups for extended interventions included 1,040 intervention and 1,042 control subjects. *Main results:* For very brief interventions, the change in alcohol consumption was not significant for either men or women. For extended brief interventions, the pooled effect estimate of change in alcohol intake was -51 g of alcohol per week (95% CI: -74 to -29; $p<0.05$) among women. Among men, the estimate was of similar magnitude but it was not statistically significant.

Authors' conclusions: Extended brief interventions were effective among women. Other brief interventions seem to be effective sometimes, but not always, and the average age

effect cannot be reliably estimated. The lack of uniform effectiveness should be explored.

ii) Quality assessed review: Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers.[33]
Selection criteria/characteristics of included studies: RCTs of more than 30 participants which evaluated the effectiveness of brief interventions (less than one hour and incorporated simple motivational counselling techniques) versus no intervention. Twelve RCTs met the inclusion criteria with a total of 3948 heavy or problem drinkers. *Main results:* A combined OR of 1.91 (95% CI: 1.61 to 2.27) was found in favour of brief alcohol interventions over no interventions. This result was consistent across gender, intensity of intervention, type of clinical setting, and higher quality clinical trials.

Authors' conclusions: Heavy drinkers who received a brief intervention were twice as likely to moderate their drinking 6 to 12 months after an intervention when compared with heavy drinkers who received no intervention. Brief intervention is a low-cost, effective preventive measure for heavy drinkers in outpatient settings.

Two other quality assessed systematic reviews looked at similar studies and outcomes.[34, 35] One evaluated GP-based brief or intensive advice for a variety of lifestyle interventions and reported that half of the trials found that consumption was significantly reduced when advice was provided but this was not felt to provide conclusive evidence for or against the effectiveness of this intervention.[35] The other review concluded that the trials support the use of brief interventions by physicians for patients with drinking problems.[34] The authors' conclusions, however, did not appear to take account of the lack of evidence for the treatment of women. Moreover, benefit of the intervention was not demonstrated for all outcomes.

Authors' conclusions: GP-based health programmes have a modest and variable effect on health outcomes. These interventions show promise in effecting small changes in behaviour.[34] The trials support the use of brief interventions by physicians for patients with drinking problems.[35]

2. Other interventions to reduce alcohol consumption

i) Quality assessed review: The efficacy of treatments in reducing alcohol consumption: a meta-analysis.[36]
Selection criteria/characteristics of included studies: RCTs which utilised reports from informants or lab results to confirm patients' accounts and reported standard deviations of alcohol consumption. Interventions included various alcohol misuse programmes including drug therapy, counselling (couples therapy, individual therapy, coping skills), behavioural therapy, GP advice and monitoring. Outcomes assessed were a reduction in alcohol consumption. *Main results:* 12 RCTs with 21 comparisons and a total of 2,566 subjects were included. At four months follow-up patients who received treatment consumed 16 drinks less per week than the controls (intervention group mean = 13.2 vs control group mean = 29.3). At 12 months the intervention group drank five less drinks per week (intervention group mean = 22.1 vs control group mean 26.5). There were no differences between the two groups at 6 months. At four-month follow-up trials of drug therapies generated inconsistent findings. The six-month studies did not manifest significant differences between intervention and control groups. Within the 12-month studies couple counselling (effect size 2.4) and advice with education (effect size 6.3) were found to be relatively powerful interventions. However, the sample size in the couples counselling study was very small (n=8). *Limitations of the review:* The search strategy is very limited. The summary tables provide extensive details of studies

including design limitations but these limitations are not fully considered in the narrative summary.

Authors' conclusions: When the studies were pooled regardless of follow-up assessment periods, the intervention group drank significantly less than the control. Primary studies have not systematically monitored the effects of psychosocial interventions.

Preventing/ Reducing alcohol consumption in pregnant women

No reviews were identified. Three RCTs, however, looked at interventions to encourage women to cut down on alcohol during pregnancy. One evaluated a self-help programme to reduce alcohol consumption among economically disadvantaged pregnant women in the USA.[37] The intervention included a 10-minute educational session and a self-help manual. A higher alcohol quit rate was observed among the intervention participants (88%) than controls (69%). The effect was strongest for "light" drinkers, African-Americans, and non-Protestants. The authors concluded that this approach might be useful in clinics where staff time is limited.

Another RCT, undertaken in Latin America, assessed the effect of an educational intervention for pregnant women at risk and the support person.[38] Half of the participants (n = 1115) received a home intervention, a reinforcement of adequate health services utilisation for the pregnant woman and a support person. The control group (n = 1120) received routine prenatal care. No differences between groups were observed in improvement on diet, cigarette and alcohol consumption. The authors concluded that the intervention failed to show any benefit on health-related behaviour.

The third RCT assessed whether health education materials designed to discourage alcohol use in pregnant women were more effective when written at a lower rather than a higher reading level.[39] Among English-speaking participants, the material written at the lower reading level was shown to be more effective. Among Spanish-speaking participants, test scores were unchanged after reading either health education material. The authors concluded that health care providers design or purchase materials that are easy-to-read and provide face-to-face counselling about abstaining from alcohol. Providers should not rely on written materials to communicate important messages when working with pregnant women.

Interventions for drink/drive offenders

i) Quality assessed review: Final results from a meta-analysis of remedial interventions with drink/drive offenders.[40]

Selection criteria/characteristics of included studies: RCTs, studies with matched or non-matched controls, pre-test and post-test single group designs were included in the review. Interventions included were psychotherapy/counselling; education; contact probation; Alcoholics Anonymous; antabuse; general alcohol treatment; combined interventions. Participants included in the review were drink/drive offenders. Outcomes assessed in the review were various, including: alcohol and non-alcohol related crashes; and other measures of drinking and drinking/driving; knowledge, attitude and behavioural intention. *Main results:* 194 primary studies were included, 15 of which met fairly rigorous standards of random allocation. The majority of studies were conducted in the USA (164/194). Effect sizes were calculated for 105 studies. Educational interventions (48 studies): Mean effect size (SE) = 0.08 (0.02); 15 studies had a negative effect size. Education alone (24 studies): Mean effect size (SE) = 0.04 (0.03); 8 studies had a negative effect size. Education with another intervention (21 studies): Mean effect size (SE) = 0.12 (0.03); 5 studies had a negative effect size. Psychotherapy/counselling (25

studies): Mean effect size (SE) = 0.07 (0.04); 7 studies had a negative effect size. Psychotherapy/counselling with education (19 studies): Mean effect size (SE) = 0.13 (0.03); 4 studies had a negative effect size. Probation (16 studies): Mean effect size (SE) = 0.01 (0.02); Median effect size = 0.03; 7 studies had a negative effect size. Alcoholics anonymous (3 studies): Mean effect size (SE) = -0.12 (0.20); 2 studies had a negative effect size. Antabuse (5 studies): Mean effect size (SE) = 0.08 (0.06); 1 study had a negative effect size. Although the mean effect size was larger for studies in which treatment was combined with more severe license sanctions, no definitive patterns could be identified. *Limitations of the review:* The number of studies examining the impact of a specific intervention on a specific outcome was small.

Authors' conclusions: This meta-analysis established that drinking/driving remediation generally has a positive effect on alcohol-related traffic events (an effect of at least 7-9% reduction in drinking/driving recidivism and alcohol-related crashes). It also suggested that some combined interventions might be more effective than single strategy approaches.

3. Exercise

Promoting physical exercise in the general population

1. Education and advice

i) Quality assessed review: A systematic review of the effectiveness of promoting lifestyle change in general practice.[35]
Selection criteria/characteristics of included studies: RCTs with any length of follow-up of GP-based lifestyle interventions, in the form of brief or intensive advice. Participants included in the review were GP attendees, no apparent age restrictions. Outcomes assessed in the review were changes in the duration and frequency of exercise, change in blood pressure lipid levels and body weight. *Main results:* Six RCTs assessed exercise-related interventions. Four trials found positive effects of advice, one of them conducted over a period of two years. Results of the primary studies made it difficult to determine the effectiveness of intervention in influencing exercise patterns, however, a range of parameters relevant to cardiovascular disease risk (e.g., lipid levels, blood pressure or weight reduction) were affected by provision of advice relating to exercise.

Authors' conclusions: Overall, the results from four of the trials are encouraging in that they suggest that patients do respond positively to advice to take more exercise.

2. Other health promotion strategies

i) Quality assessed review: Increasing physical activity: a quantitative synthesis.[41]
Selection criteria/characteristics of included studies: All types of trials were included. Interventions included: behavioural modification, cognitive-behavioural interventions, health education, health risk appraisal, exercise prescription, physical education curriculum programs, and combination programs. A range of participants was included in the primary studies: obese, CHD or high risk, developmentally disabled, physically disabled, and healthy. The outcomes included a variety of physical activity measures, such as self-report, attendance at exercise classes or observation of frequency of specific activities. *Main results:* 27 studies (approximately 131,156 people) were included. Overall mean effect size: r=0.34 (95% CI: 0.26 to 0.42), or 0.75 (95% CI: 0.70 to 0.79) (unweighted). Effect sizes did not differ between males and females, between age groups, or between white or non-white participants. The effect sizes were larger in healthy participants. Behaviour modification approaches produced larger effect sizes than other techniques, and effect sizes were larger in studies using mediated approaches compared to face-to-face delivery. Interventions in community settings and interventions delivered to groups produced larger effect sizes. Effects were larger when physical activity was not supervised compared with a supervised physical activity program. Effect sizes were unrelated to the number of weeks the intervention or the follow-up period lasted. Effects for active leisure times were larger contrasted with exercise programs prescribing strength, aerobic exercise, or aerobic exercise combined with other fitness activities.

Authors' conclusions: Interventions for increasing physical activity have a moderately large effect.

ii) Quality assessed review: *S*ystematic review of physical activity promotion strategies.[42]
Selection criteria/characteristics of included studies: RCTs of physical activity promotion in apparently healthy free-living adults. Intervention periods ranged from 5 weeks to 2 years. Subjects were mainly white, middle aged and well educated and ages ranged from 18 to 72 years with a mean age of 49 years. Males and females were equally represented but the review was limited to trials from the USA. Outcomes assessed included: self-reported walking level, frequency of exercise, number of exercise sessions/month and jogging hours per week. *Main results:* 7 RCTs were used to assess interventions on home based exercise (1101 subjects) and 5 RCTs were used to assess interventions on facility based exercise (598 subjects). It was considered that a formal meta-analysis was inappropriate in view of the incompatible data and varying quality of the primary studies. Home-based activities: 5 of the 7 studies reported a positive outcome. Facility-based activities: 2 of the five trials showed a significant difference between intervention subjects and controls. *Limitations of the review:* As the authors mention in the discussion all the participants were volunteers recruited through media advertisements in the USA and results may differ in different populations. Suggestions for future research includes trials in the United Kingdom that involve groups other than middle aged middle class whites such as the over 75 years. An earlier systematic review by the same authors reported similar results[43]

Authors' conclusions: Interventions that encourage walking and do not require attendance at a facility are most likely to lead to sustainable increases in overall physical activity. The small number of trials limits the strength of any conclusions and highlights the need for more research.

iii) Quality assessed review: Effectiveness of physical activity promotion schemes in primary care: a review.[44]
Selection criteria/characteristics of included studies: Studies of adults (>16 years) which aimed to improve physical activity levels, mediators of physical activity, or attitudes/ intentions towards physical activity. Studies had to be initiated within a primary care setting, be UK based, and have physical activity or related as an outcome or focus. *Main results*: 12 studies satisfied all the inclusion criteria, of which six were RCTs, four were controlled trials, and two were non-controlled with a pre-test post-test design. No large-scale UK based RCTs were found. The majority of the studies reported some form of improvement in either physical activity or related measures. However, the size of the effect was generally small, and there was limited consistency across studies. Non-UK studies were reviewed for comparison and similar effects were observed.

Authors' conclusions: Published studies demonstrate small but possibly meaningful improvements in physical activity patterns and other activity-related measures. No existing UK programmes are based on an accepted model of behaviour change. The role of the leisure centre may be problematic and needs a conceptual review. It may be that the projected 'healthy living centres' are a more appropriate setting. Expectations of programme success should be realistic. Major changes in large numbers of participants are unlikely to happen. However, small but positive effects are meaningful when large number of people experience them.

3. Strategies in the workplace

The three quality assessed reviews described below examined the evidence from trials of different interventions to promote exercise in the workplace.

i) Quality assessed review: A systematic review of controlled clinical trials on the prevention of back pain in industry.[45]
Selection criteria/characteristics of included studies: RCTs of exercise, education on back pain and body mechanics, and lumbar supports. *Main results:* Three RCTs with 313 participants evaluated the effectiveness of exercise on the prevention of back pain in industry. Three studies on exercise reported a combined positive effect of effect size of 0.53 (95% CI: 0.26 to 0.79) for the effectiveness of exercise on reduction of incidence of back pain. Two of the exercise studies produced a combined effect size of 0.56 (95% CI: 0.22 to 0.90) in reduction of sick leave.

Authors' conclusions: There is limited evidence that exercise has some effect in the prevention of back pain

ii) Quality assessed review: Adherence to worksite exercise programs: an integrative review of recent research.[46]
Selection criteria/characteristics of included studies: Randomised controlled trials (RCTs), quasi-experimental, time series and pre-experimental studies of interventions to improve exercise adherence in the workplace. Participants were volunteers of both sexes and included police officers, university employees, university graduate students, and employees of several companies. Mainly "white collar "workers were involved with only one study involving "blue collar "workers. The mean age of the participants ranged from 36 to 53 years. The main outcomes assessed were actual exercise performed, fulfilment of pre-determined goals, attendance or participation in an exercise class or fitness centres and through direct observation. *Main results:* Number of studies included: 2 randomised controlled trials (136 worksite employees); 3 quasi-intervention studies (3860 worksite employees); 5 pre-intervention studies (1398 worksite employees). Varying time frames, samples and measures made comparisons across studies difficult and general observations only were made. Nine out of the ten included studies showed that exercise adherence strategies worked to increase or improve exercise behaviour. The most impressive results came from programmes having multiple interventions.

Authors' conclusions: Careful planning of interventions to increase adherence will increase the number of workers who exercise regularly.

iii) Quality assessed review: Back injury prevention interventions in the workplace: an integrative review.[47]
Selection criteria/characteristics of included studies: True experimental (not stated if randomised) and quasi-experimental (non-equivalent control groups). Four types of worksite back injury prevention programmes: back belt programmes; back school programmes; exercise/flexibility programmes and education programmes. One study excluded all currently back-injured subjects whereas two studies included only those with back injuries. The age of subjects ranged from 16 to 45 years (from 10 studies). Outcomes assessed in the review were back injury\back pain rates; lost time; costs; muscle strength\flexibility; body mechanic usage; exercise behaviour. *Main results:* Seven true experiments and 8 quasi-experimental design (non-equivalent control groups). Theoretically consistent associations between intervention and outcome were found in 3 out of 4 back belt programmes (1 reached statistical significance); five out of six back school programmes (2 statistically significant); all six exercise\flexibility programmes (5 statistically significant) and 2 out of 3 education programmes (both

statistically significant). Theoretically inconsistent associations were found in 2 of the back belt programmes, 1 exercise flexibility programme and 1 education programme.

Authors' conclusions: Positive programme outcomes were reported in all four programme types; however the back school and exercise flexibility training programmes were studied more frequently and demonstrated a greater proportion of positive results than the other two programme types. Conclusions should be viewed cautiously due to the small number of studies reviewed and their methodological limitations.

Promoting physical exercise in pregnant women

i) Cochrane review: Regular aerobic exercise during pregnancy.[48]
Selection criteria/ characteristics of included studies: All acceptably controlled comparisons of prescribed aerobic exercise programmes. *Main results:* 5 trials (146 women) were identified, but details of countries not provided. Three trials reported significant improvement in physical fitness in the exercise group. One trial reported similar, albeit statistically non-significant, findings, while an even smaller trial (13 women) reported no significant increase in fitness in the exercise group. Non-significant results on pregnancy outcomes were reported in two small trials but permit exclusion only of extremely large effects.

Authors' conclusions: Regular aerobic exercise during pregnancy appears to improve (or maintain) physical fitness. Unfortunately, the available data are insufficient to exclude important risks or benefits for the mother or infant.

Promoting physical exercise in obese or overweight adults

i) Quality assessed review: Systematic review of interventions in the treatment and prevention of obesity.[49]
Selection criteria/characteristics of included studies: As few RCTs were available, non-randomised studies with a concurrent control group were included. Interventions included behavioural, dietary, exercise, pharmacological, surgical and alternative therapies. Individuals suffering from eating disorders were excluded. Outcomes included: weight change, fat content and fat distribution. *Main results:* 99 studies in total: 13 RCTs on children and adolescents; 1 RCT and 2 non-randomised trials on preventive interventions; 13 RCTs on behavioural interventions; 12 RCTs on behavioural interventions with dietary component; 5 RCTs on behavioural interventions with dietary and exercise components; 2 RCTs on dietary interventions; 1 RCT on dietary and exercise interventions; 13 RCTs on pharmacological interventions; 15 RCTs on surgical interventions; 9 RCTs on maintenance; 11 RCTs on comprehensive interventions. *Results of the review*: Small sample sizes, high dropout rates and a lack of intention-to-treat analysis made the interpretation of results difficult. Family therapy programmes were effective in preventing the progression of obesity in already obese children. Behavioural, diet and exercise programmes have all been shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination. Two dietary trials found that fibre supplements were more effective than placebo at increasing weight loss when given in conjunction with a 1200-1600 kcal/day diet. However, this does not appear to lead to a greater mean weight loss than a low fibre/low calorie diet. Pharmacological interventions appear to produce weight loss for up to 9 months, after which time a proportion of participants regains weight. Surgery is normally considered only for morbidly obese patients. The weight loss associated with surgical interventions is greater and more sustained than that achieved by non-surgical methods. However, surgery is associated with complications that may affect the patient's

quality of life. Maintenance strategies have been shown to be effective at reducing the amount of weight regain following weight loss after treatment.

Authors' conclusions: Potentially effective interventions for the management of obesity are available. However, due to problems with methodological quality research findings indicative of promising interventions should be replicated. The role for the primary health care team needs to be defined and supported by the appropriate resources.

Promoting physical exercise in obese or overweight children

i) Quality assessed review: Exercise in treating obesity in children and adolescents.[50]
Selection criteria/characteristics of included studies: Studies in which obese children or adolescents were provided either different types of exercise programmes or an exercise programme compared with a no-exercise control condition were included if the purpose of the intervention was weight loss. Programmes designed to reinforce activity and to reduce sedentary behaviour were included. Ages of subjects ranged from 6 to 15 years and both sexes were included. The main outcomes assessed were body composition and fitness measures. *Main results:* There is a shortage of controlled studies examining the influence of exercise in the treatment of child and adolescent obesity. Exercise versus no exercise (2 studies): neither study showed significant effects of exercise on weight variables or fitness. Diet versus diet and exercise (5 studies): better changes in weight and fitness for diet plus exercise groups compared with diet alone. Diet versus diet and exercise versus non-intervention(3 studies): none of the studies found differences between the diet and diet plus exercise groups. Structure of exercise programmes (2 studies): studies showed that programmes achieved longer maintenance of weight loss and increased fitness compared with aerobic or calisthenic exercises.

Authors' conclusions: The results support the continued use of exercise in combination with diet for child and adolescent obesity treatment but the limited number of controlled studies indicates the need for more research in this area.
See also: ' systematic review of interventions in the treatment and prevention of obesity' under section 4.

Other ongoing reviews of interventions to increase physical exercise

A Cochrane review on physical activity for the prevention and treatment of osteoporosis in men is currently being prepared and is due to be completed in mid-2001.[51]

4. DIET

Promoting healthy eating habits in the general population

1. Health promotion and education

i) Quality ***assessed review:*** Health promotion interventions to promote healthy eating in the general population: a review.[52]
Selection criteria/characteristics of included studies: RCTs and controlled trials of health promotion interventions to promote healthy eating. For the setting of supermarkets and catering outlets only, uncontrolled studies with a pre- and post-intervention measure of food choice or purchases were included. The target population was free-living adults, adolescent and school-aged children. *Main results:* 76 healthy eating interventions were included of which 29 were well designed and well conducted. Overall, those studies that were of good quality and included some dietary outcome measure showed a beneficial intervention effect (15/25). The most frequently measured outcome was dietary fat, and the review found that this was reduced by 1 to 4% of energy intake in long term interventions in the general population. The greatest reductions in fat intake (10 to 16% of energy) and blood cholesterol (7 to 10%) were seen in highly motivated individuals taking part in intensive programmes. Passively manipulating the composition of food, instead of actively promoting healthier items, decreased the fat content of catered meals by 6 to 12% of energy intake. The most effective healthy eating interventions in schools, workplaces, primary care and the community tended to focus on diet only or diet and exercise. The more effective interventions in these settings were based on theories of behavioural change, which may, for example, encourage clear goal setting. Other characteristics associated with effectiveness included a degree of personal contact with individuals or small groups within the interventions, some family involvement, and scope for personalisation. Feedback on behaviour change and changes in risk factors were also seen to be successful in these settings. Finally, other characteristics of effective interventions were the promotion of changes in local environment (e.g. the catering sector), and multiple contacts over substantial periods of time.

Authors' conclusions: In general, this review shows that healthy eating interventions in a variety of populations and settings are worthwhile and effective. The magnitude of change seen in many of the studies is small, for example a reduction in blood cholesterol of between 2 and 5%. Whether or not this is sufficient to justify the intervention will continue to be debated, but it is estimated that overall, every reduction in 1% in blood cholesterol will result in a 2 to 3% lower risk of heart disease on a population basis. Effective interventions resulted in a decrease in fat intake of 1 to 4% of energy which works towards the Health of the Nation population target of reducing total fat intake by about 5% of energy intake. In view of the multiple benefits of dietary changes on a variety of chronic conditions, healthy eating interventions in a variety of populations and settings should be implemented.

ii) Quality assessed review: The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: a review of research.[53]
Selection criteria/ characteristics of included studies: RCTs or quasi-experimental studies of strategies used to deliver nutrition education for the US population. Participants included were children, adults, pregnant women and caregivers of infants, and older adults. Outcomes assessed in the review were changes in eating and other nutrition-related behaviours, knowledge, attitudes or other mediating variables. *Main results:* 217 nutrition education intervention studies were included. Positive results were often

achieved only in some components in large, multi-component interventions. In general, interventions that used educational methods directed at behavioural change as a goal were more effective than interventions that focused on dissemination of information with the assumption that such information will result in change in attitudes and behaviours. Behaviourally focused nutrition education uses a set of learning experiences to facilitate the voluntary adoption of food- and nutrition-related behaviours that are conducive to health and well being. The behaviours addressed are identified from the needs, perceptions, motivations, and desires of the target audience, as well as from national nutrition and health goals and science-based research findings.

Authors' conclusions: Nutrition education programmes should be ongoing and multifaceted. The more effective programs are those that are behaviourally focused and based on appropriate theory and prior research. This review has also found that effective programs use a combination of contemporary models of individual, social, and environmental change. Studies based on a "dissemination of information and teaching of skills" model were not very effective in bringing about behavioural change.

iii) Quality assessed review: A systematic review of the effectiveness of promoting lifestyle change in general practice.[35]
Selection criteria/ characteristics of included studies: RCTs with any length of follow-up of GP-based lifestyle interventions, in the form of brief or intensive advice. Outcomes assessed in the review were in fat and fibre intake, lipid and blood pressure levels and body weight. *Main results:* 10 trials assessed dietary interventions but the results of the trials were mixed, making it difficult to draw conclusions. Six trials examined the efficacy of dietary advice only, three of which were for people with a specific health condition such as hypertension or hypercholesteraemia. Of the trials assessing dietary behaviour change (fat and fibre), one found very positive results, one found no significant differences, and the remaining two studies found significant differences for one measure but not the other. In general, the methodological quality of the trials was poor.

Authors' conclusions: Interpretation of the data from these trials is complicated by the fact that in some case dietary advice was given as part of lifestyle advice.

iv) Quality assessed review: Can dietary interventions change diet and cardiovascular risk factors?[54]
Selection criteria/ characteristics of included studies: Primary prevention RCTs of free-living adults that lasted more than 3 months. *Main results:* 17 trials that included 6893 participants (estimated 51% women), with 3736 (54%) in the intervention groups, were identified. Dietary advice decreased dietary fat as a percentage of total calories by 2.5% (CI 1.1% to 3.9%) for 4 trials 3 to 6 months in duration when the trials of breast cancer were excluded. The intervention also reduced systolic blood pressure by an average of 1.9 mm Hg (CI 0.8 to 3.0 mm Hg, $P < 0.001$) in 5 trials 9 to 18 months in duration; it reduced diastolic blood pressure by 0.7 mm Hg (CI 0.0 to 1.5 mm Hg, $P = 0.06$) in 8 trials 3 to 6 months in duration, with a trend toward reduction (1.2 mm Hg reduction, CI -0.2 to 2.6 mm Hg, $P = 0.09$) in 5 trials 9 to 18 months in duration. Total serum cholesterol levels were also reduced by 0.22 mmol/L (CI 0.05 to 0.39 mmol/L) in 5 trials 9 to 18 months in duration.

Authors' conclusion: Dietary advice as a primary preventive therapy modestly reduces dietary sodium and fat levels and lowers systolic and diastolic blood pressure and total serum cholesterol levels.

v) Systematic review: Interventions to prevent weight gain: a systematic review of psychological models and behaviour change methods.[55]
Selection criteria/ characteristics of included studies: Any studies in which participants were selected regardless of weight, or age and the primary aim was to prevent weight gain. Outcome was weight loss and physical activity. Nine studies met the inclusion criteria, of which five were RCTs. Seven were undertaken in the USA and two were undertaken in Italy. Five were undertaken in schools, and four in the wider community. All included an information component and other components were goal/target setting, incentives and rewards, rehearsal of relevant skills and environmental changes. *Main results:* Where diet and physical activity outcomes were described, positive effects were usually obtained, but all were measured by self-report. Effects on weight were mixed but follow-up was generally short. Smaller effects on weight gain were found among low-income participants, smokers and students. Many participants in the community-based studies were overweight or obese. Study dropout was higher among thinner and lower-income students.

Authors' conclusions: Interventions to prevent weight gain exhibited various degrees of effectiveness. Definite statements about the elements of the intervention that were associated with increased effect size cannot be made as only one of the five RCTs reported a significant effect on weight. This intervention involved a correspondence programme and a mix of behaviour change methods including goal setting, self-monitoring and contingencies. Future intervention might be more effective if they were explicitly based on methods of behaviour that have been shown to work in other contexts. Effective interventions would be more easily replicated if they were explicitly described. Effectiveness might be more precisely demonstrated if more objective measures of physical activity and diet were used, and if follow-up was over a longer period.

A RCT of nutrition education intervention to increase fruit and vegetable intake was undertaken in the UK.[56, 57] The authors concluded that about two-thirds of intervention subjects achieved the recommended fruit and vegetable target, but practical issues and situational barriers need to be addressed for the success of future public health campaigns. The intervention led to significant increases in fruit and vegetable intakes largely via conventional eating habits, with some desirable effects on macro and micronutrient intakes.

Promoting healthy eating habits in babies and young children

i) Quality assessed review: Effectiveness of interventions to promote healthy feeding in infants under one year of age: a review.[58]
Selection criteria/ characteristics of included studies: Published and unpublished studies in the English language since 1985 of interventions to promote healthy feeding of infants under one year of age. RCTs, non-RCTs, prospective cohort studies with concurrent controls, intervention studies with a historical control group, or retrospective controlled studies. Studies must have either focused on, or included as a component, healthy feeding promotion. Outcomes included breast feeding initiation and/or duration and or exclusivity for infants aged 0-4 months. For weaning outcomes included dietary intake, biochemical, anthropometric, food choice and behaviour of parents or carers. A total of twenty-six studies were included in the review. Of these, twenty were aimed at promoting breastfeeding, and six aimed to promote good feeding practice in the weaning and post-weaning period. Studies included in the review were undertaken in Western, industrialised countries between the years 1984 and 1996. Eleven studies were undertaken in the USA, five were undertaken in the UK, three in Australia and one in Canada. Fourteen of the 26 studies were RCTs. *Main results:* The most successful

breastfeeding promotion interventions were based in the USA and in general were long term, spanning the pre-and postnatal period and intensive, involving multiple contacts with a professional breastfeeding promoter or peer counsellor. The least successful breastfeeding promotions were implemented during the postnatal period only, or in countries other than the USA, where breastfeeding prevalence is relatively low. The least successful were also those that involved multiple health promotion programmes where breastfeeding promotion was only one of a number of components, including special visits to the hospital or clinic in addition to routine visits, or where postnatal support was provided by telephone only. Interventions designed to promote good feeding practice in the weaning and post-weaning period focused upon the timing of introduction of solids, general nutritional status, iron deficiency anaemia, dietary fat intake and the overall diet quality. One pre-natal intervention comprised a culturally specific series of lectures on general infant health topics in a clinic setting, and had no effect on growth or biochemical indices of nutritional status at one year of age in Asian infants in the UK. However, compliance in this intervention was very low. One in-patient USA intervention that involved post-natal lactation support from a counsellor significantly delayed introduction of first solid foods. Modification of the contents of commercial packs given to women on hospital discharge also delayed the introduction of daily solids. One-to-one dietary counselling from seven months of age was reported to reduce energy derived from fats and saturated to polyunsaturated fatty acids ratios in a Finnish study, although this outcome may not be appropriate for the UK. Regular maternal contact with peer supporters throughout the first year of an infant's life was shown to delay the introduction of unmodified cows milk and improved overall dietary quality at one year of age in Irish infants.

Authors' conclusions: This review provides some evidence for the effectiveness of interventions to improve frequency of, and knowledge about, breastfeeding. There is a pressing need for good quality research in this area, particularly with UK populations. The inclusion of issues that are important to mothers and their partners and families in interventions should be investigated.

ii) Quality assessed review: Effectiveness of interventions to promote healthy eating in preschool children aged 1- 5 years.[58]
Selection criteria/ characteristics of included studies: RCTs, non-RCTs, prospective cohort studies with concurrent controls, intervention studies with a historical control group, or retrospective controlled studies. The studies must have focused on, or included as a component, healthy eating promotion, in 1-5 year old children. Outcomes were biomedical, anthropometric and dietary indices, knowledge, attitudes, food choices and food behaviour. Studies included in the review were undertaken in Western, industrialised countries between the years 1984 and 1996. All except one were U.S.-based. *Main results: 14* reports (7 RCTs, 5 controlled trials, one retrospective study and one uncontrolled trial) were included. The most frequent outcome was nutrition knowledge of children and/or career. Most were set in pre-school, day-care, home, primary care, welfare or study centre. Most studies demonstrated some positive effect on nutrition knowledge but impact on eating behaviour was less frequently assessed and the outcome was variable. There were no data to evaluate long-term effects of the interventions on knowledge or behaviour.

Authors' conclusions: There is currently insufficient evidence available to predict the format of successful healthy eating interventions that are likely to be effective at improving the nutritional well being of UK preschool children. There is pressing need for good quality research to aid the development of intervention programmes to address the nutritional and dietary problems common to this age group.

iii) Quality assessed review: Heart healthy eating behaviours of children following a school-based intervention: a meta-analysis.[59]
Selection criteria/ characteristics of included studies: Randomised experimental, within-subjects design, non-equivalent control group designs with pre-test, and time series studies of elementary (9-11 years) school-based cardiovascular health promotion programmes with nutrition (heart healthy eating) as a component. Outcomes were quantifiable measures of eating behaviour such as self-reports, physiological measures (serum cholesterol), observation of food intake, and anthropometric measures. Twelve studies were included in the review, with a total of 3,828 participants. *Main results:* The weighted average effect size for the sample of 12 studies was 0.24 (95% CI 0.174 to 0.301), showing that school- based cardiovascular health promotion programs had a significant effect on heart healthy eating behaviour of student participants. The quality score ranged from 9-16. *Limitations of the review:* Very little information is presented about individual studies and despite finding significant heterogeneity between included studies the results were pooled. This was not appropriate and the results should therefore be considered with great caution.

Authors' conclusions: Limitations of this meta-analysis include the dearth of studies that limits the ability to generalise the results. The measurements of heart healthy eating behaviours were varied and generally lacked reported reliability. Although the overall effect size was small, the results do support school-based programs that include eating behaviours as a component of the intervention.

Promoting healthy eating habits in minority ethnic groups

i) Quality assessed review: Effectiveness of interventions to promote healthy eating in people from minority ethnic groups: a review.[60]
Selection criteria/ characteristics of included studies: All studies related to non-European minority populations, of interventions aiming to promote nutritional change where the outcome measures were a change in dietary practices or health consequences, or correlates of dietary or nutritional variation. Publications were limited to English language, published between 1984-1996. *Main results:* 29 studies were found, two of which were conducted in the UK, and 23 were conducted in the USA. A wide range of interventions and setting was represented in the studies. Overall, 13 out of the 29 studies demonstrated some degree of effectiveness, though only seven were judged to be effective for their main nutritional aims in minority groups. No single method was especially effective, nor any setting more suited to promoting healthy eating in minority ethnic groups.

Authors' conclusions: The review has revealed a dearth of relevant research on nutritional health promotion among ethnic minority groups in the UK. Much of the research that has been published comes from the USA. Much of this research is inconclusive because of methodological flaws or limitations. We have therefore, been able to make a number of recommendations for research but fewer recommendations about future policy and practice. (*the recommendations are lengthy and can be found in the original report)*

Promoting healthy eating habits in elderly people

i) Quality assessed review: Effectiveness of interventions to promote healthy eating in elderly people living in the community: a review.[61]
Selection criteria/characteristics of included studies: RCTs, non-RCTs, and uncontrolled studies with pre-and post intervention measures of interventions to promote healthy eating in free living elderly individuals aged 65 years or more. Outcomes included dietary behaviour or diet-related physiological measures, dietary knowledge, attitudes and beliefs. Twenty-three studies were included, of which eight were RCTs, eight were controlled studies and seven were uncontrolled studies. Twenty-one studies were undertaken in the USA, one in Australia and one in France. The majority of studies used nutrition interventions to reduce risk for coronary heart disease, placing emphasis on reducing saturated fat intake, increasing fruit and vegetable consumption, and reducing salt intake. *Main results:* Overall, there was some evidence for the effectiveness of health promotion interventions to promote healthy eating in elderly people. Two large studies that included nutrition as part of a general health promotion strategy showed some benefits, however they were carried out in the context of USA health insurance schemes and this makes their conclusions difficult to generalise to the UK population. Two smaller studies in the setting of community programmes for elderly people also showed benefits. One of these studies specifically targeted elderly people at risk of nutritional deficiencies; the other focused upon risk for coronary heart disease using a multi-factor approach.

Authors' conclusions: This review provides some evidence for the success of health promotion interventions to improve diet in elderly people. However, nutritional interventions in elderly people may differ from those that are successful with middle aged or younger groups. There is a lack of evidence to inform nutritional recommendations for elderly people, and more research is required to inform the development of adequate interventions. Healthy eating interventions that specifically target elderly people need further evaluation in the UK context. These interventions should implement nutritional guidelines for this age group and include minimum nutritional requirements for elderly people as well as reduction in disease risk, as the nutrition status of elderly people is not homogenous.

Promoting healthy eating habits in hypertensive adults

i) Cochrane review: Weight-reduction through dieting for control of hypertension in adults.[62]
Selection criteria/ characteristics of included studies: Inclusion criteria were RCTs with one group assigned to a weight-loss diet and the other group assigned to either normal diet or antihypertensive therapy; ambulatory adults with a mean blood pressure of at least 140 mm Hg systolic and/or 90 mm Hg diastolic; active intervention consisting of a calorie-restricted diet intended to produce weight loss (excluded studies simultaneously implementing multiple lifestyle interventions where the effects of weight loss could not be disaggregated); and outcome measures included weight loss and blood pressure. *Main results:* Eighteen RCTs were included. In general, participants assigned to weight-reduction groups lost weight compared to control groups. Six trials involving 361 participants assessed a weight-reducing diet versus a normal diet. The data suggested weight loss in the range of 4% to 8% of body weight was associated with a decrease in blood pressure in the range of 3-mm Hg systolic and diastolic. Three trials involving 363 participants assessed a weight-reducing diet versus treatment with antihypertensive medications. These suggested that a stepped-care approach with antihypertensive medications produced greater decreases in blood pressure (in the range of 6/5-mm Hg systolic/diastolic) than did a weight-loss diet. Trials that allowed adjustment of

participants' antihypertensive regimens suggested that patients required less intensive antihypertensive drug therapy if they followed a weight-reducing diet. Data was insufficient to determine the relative efficacy of weight-reduction versus changes in sodium or potassium intake or exercise.

Authors' conclusion: Weight-reducing diets in overweight hypertensive persons can affect modest weight loss in the range of 3-9% of body weight and are probably associated with modest blood pressure decreases of roughly 3 mm Hg systolic and diastolic.

Promoting healthy eating habits in pregnant women

i) Cochrane review: Nutritional advice in pregnancy.[63]
Selection criteria/ characteristics of included studies: All acceptably controlled comparisons of nutritional advice, whether administered on a one-to-one basis or to groups of women. *Main results:* Four trials involving 1108 women were included. Advice to increase energy and protein intakes seems to be successful in achieving those goals, but the increases are lower than those reported in trials of actual protein/energy supplementation. Data concerning effects on pregnancy outcome are available only from one trial, and, given the fact that its analysis was based on individual women despite randomisation by clinic, the calculated confidence intervals are undoubtedly too narrow. Moreover, the 'significant' reduction in preterm birth associated with advice is not consistent with the total absence of effect on mean gestational age. One trial found no reduction in the incidence of pre-eclampsia. No data have been reported on potential adverse effects that might accompany increased fetal size, such as an increased risk of prolonged labour or Caesarean section.

Authors' conclusions: Nutritional advice appears effective in increasing pregnant women's energy and protein intakes, but the implications for fetal, infant, or maternal health cannot be judged from the available trials. Given the rather modest health benefits demonstrated with actual protein/energy supplementation, however, the provision of such advice is unlikely to be of major importance.

ii) Quality assessed review: Effectiveness of interventions to promote healthy eating in pregnant women and women of childbearing age.[64]
Selection criteria/characteristics of included studies: Controlled studies of interventions to promote healthy eating in pregnant women and women of childbearing age Five interventions were aimed at women of childbearing age, and four at women who were currently pregnant. *Main results:* Nine studies were included, but only two were carried out in the UK. Taken together, the interventions aimed at women of childbearing age provide evidence for the effectiveness of community-based programmes in the short term. However, further research is required on long-term outcomes of such interventions. The studies that focused on women who are pregnant provide some evidence for the effectiveness of health promotion interventions with this group, although this evidence is weakened by methodological problems within the evaluation research. Three out of four interventions aimed at pregnant women were designed to improve pregnancy outcomes in women who were identified as being at some obstetric risk, for example, of producing a low birth weight baby. All four interventions included an educational component. Small but positive differences in knowledge and attitudes were found as a result of the intervention, however no significant differences were found in women's dietary behaviour. The three interventions which targeted women who were at-risk of having low birth weight babies or other diet-related obstetric problems provide some evidence for an improvement in prenatal diet, however this evidence is limited by some methodological and analytical problems in the published research.

Authors' conclusions: There is a dearth of good quality research in this area that has either been carried out in the UK, or which is applicable to UK settings. Research is needed on the development of health promotion interventions aimed at women who are pregnant and those of childbearing age. It is also suggested that there is a need for researchers evaluating health promotion initiatives in this area to improve their understanding of evaluative techniques.

Promoting healthy eating habits in overweight/obese adults & children

A Cochrane review of the long-term effect of advice on low-fat diets for reducing obesity is presently underway.[65]

i) Quality assessed review: Systematic review of interventions in the treatment and prevention of obesity.[49]
Selection criteria/characteristics of included studies: As few RCTs were available, non-randomised studies with a concurrent control group were included. Interventions included behavioural, dietary, exercise, pharmacological, surgical and alternative therapies. Individuals suffering from eating disorders were excluded. Outcomes included: weight change, fat content and fat distribution. *Main results:* 99 studies in total were included: 13 RCTs on children and adolescents; one RCT and two non-RCTs on preventive interventions; 13 RCTs on behavioural interventions; 12 RCTs on behavioural interventions with dietary component; five RCTs on behavioural interventions with dietary and exercise components; one RCTs on dietary interventions; one RCT on dietary and exercise interventions; 13 RCTs on pharmacological interventions; 15 RCTs on surgical interventions; nine RCTs on maintenance; and 11 RCTs on comprehensive interventions. Small sample sizes, high dropout rates and a lack of intention-to-treat analysis made the interpretation of results difficult. Family therapy programmes were effective in preventing the progression of obesity in already obese children. Behavioural, diet and exercise programmes were shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination. The two dietary trials found that fibre supplements were more effective than placebo at increasing weight loss when given in conjunction with a 1200-1600 kcal/day diet. However, this does not appear to lead to a greater mean weight loss than a low fibre/low calorie diet.

Authors' conclusions: Potentially effective interventions for the management of obesity are available. However, due to problems with methodological quality, research findings indicative of promising interventions should be replicated. The role for the primary health care team needs to be defined and supported by the appropriate resources.

ii) Quality assessed review: A meta-analysis of the past 25 years of weight loss research using diet, exercise or diet plus exercise intervention.[66]
Selection criteria/characteristics of included studies: Unclear what designs included studies used, but most appeared to retrospective or prospective studies that compared participants' weight before and after intervention. Interventions included diet (e.g. calorie restriction or reduced energy intake), aerobic exercise, or diet plus aerobic exercise. *Main results:* 493 study groups (with more than 16,000 patients) were included in the review. Exercise programmes were least effective in producing body compositional changes. The effect size (standard error) for weight lost (kg) in obese adults following diet, exercise or diet plus exercise intervention was 5.1 (0.5), 2.1(0.5), or 5.5 (0.7) respectively. The actual weight lost (kg) (standard error) through diet, exercise and diet plus exercise was 10.7 (0.5), 2.9 (0.4) and 11.0 (0.6) respectively. At one-year follow up, diet plus exercise tended to be the superior programme. *Limitations of the review:* No study details provided. The evidence presented in the review appears to be mainly observational and the conclusions need to be interpreted with great caution.

Authors' conclusions: Weight loss research has been very narrowly focused on a middle-aged population that is only moderately obese, while the interventions lasted for only short periods of time. The data shows, however, that a 15 week diet or diet plus exercise program, produce a weight loss of about 11 kg, with a 6.6 (se 0.5) and 8.6 (se 0.8) kg maintained loss after one year, respectively.

Other reviews underway

A Cochrane review of interventions for preventing obesity in children is presently being prepared, due to be completed in mid-2000.[67]

5. Sexual risk taking in young people

Reducing / preventing sexual risk taking; promoting HIV/AIDS awareness

1. HIV/AIDS education programmes

i) Quality assessed review: Effectiveness of the 40 adolescent aids-risk reduction interventions.[68].
Selection criteria/ characteristics of included studies: RCTs of educational awareness. Participants included in the review were adolescents with a mean age of 14.3 years, range 10-18 years. University students were excluded. Only studies that were conducted in the USA were included. Outcomes assessed in the review were improved attitudes about AIDS risk and protective behaviours, knowledge of risks, increased intention to abstain from sexual intercourse or to use condoms, and reduced sexual risk behaviours. *Main results:* 40 studies were included. 32 were RCTs of which only 4 provided sufficient detail on outcomes to be pooled by meta-analysis. Percentage of studies recording a positive intervention impact: changes in knowledge 88%; changes in attitude 58%; changes in intention to use condoms 60%; use a condom 73%; decrease in number of sexual partners 64%. Interventions that demonstrated an increase in intention to use a condom were significantly more likely to be theory based than those that did not show any significant changes in intention (100% vs 0%, p = 0.048). Interventions that increased condom use and decreased the number of sexual partners were longer in duration than those that did not improve these outcomes. The meta-analysis (n=4) showed a significant reduction in the proportion of participants who indicated using a condom at their last episode of sexual activity for a 6 month (p = 0.005) and 12 month (p = 0.015) follow-up. There were no differences in the proportion of participants who always used a condom. *Limitations of the review:* Limited to US studies so generalisability may be limited.

Authors' conclusions: AIDS risk reduction interventions can be effective in improving knowledge, attitudes, and behavioural intentions and in reducing risk practices.

ii) Quality assessed review: Risk, knowledge and behaviour: HIV/AIDS education programmes and young people. Report for North Thames Regional Health Authority [69]
Selection criteria/ characteristics of included studies: RCTs and pre and post-test studies with a control group of health education interventions including both information giving and skills based programmes. Participants included in the review were young people aged 10 to 19 years in university (7,108 subjects), school (10,272 subjects), home (221 subjects), community (1,183 subjects) and health care settings (599 subjects). Outcomes assessed were knowledge, attitudes, behaviour, self-efficacy, and intentions. *Main results:* 36 studies were included, of which only 12 met the core quality criteria. Eleven of those 12 studies were judged to be reports of effective or partially effective interventions. Most evaluations were carried out in schools or other educational settings (69%). The intervention most frequently used was a combination of information giving and skills training (61% of all evaluations). Only two of these studies demonstrated any impact on risk-taking behaviours.

Authors' conclusions: The most effective approach to HIV/AIDS risk reduction among young people is one that provides practical information and support in a non-didactic way, and is based on an accurate, qualitative assessment of young peoples' needs. Evaluation design in the field of HIV/AIDS risk reduction and young people needs to be improved. There should be more use of randomised controlled trials.

Two Cochrane reviews are presently being prepared on interventions for preventing HIV infection in street youth,[70] and interventions for preventing HIV infection in young people.[71]

2. School-based programs to reduce sexual risk behaviours

i) Quality assessed review: Preventing and reducing the adverse effects of unintended teenage pregnancies.[72]
Selection criteria/ characteristics of included studies: RCTs of educational approaches in the area of teenage pregnancy. *Main results*: 25 studies were included. Programmes that appear to be effective included school-based skills building combined with factual information (4 studies); school-based programmes + contraceptive services (3 studies); programmes encouraging vocational development (4 studies); and non-school based programmes targeting 'hard to reach groups' (3 studies). Programmes that did not appear to be effective included abstinence programmes (2 studies). Programmes with no evidence of effectiveness included school-based and school-linked clinics (4 methodologically weak studies) and one-to-one counselling (5 studies showing mixed effects).

Authors' conclusions: School-based sex education can be effective in reducing teenage pregnancy especially when linked to access to contraceptive services. The most reliable evidence shows that it does not increase sexual activity or pregnancy rates. Increasing the availability of contraceptive clinic services for young people is associated with reduced pregnancy rates.

ii) Quality assessed review: School-based programs to reduce sexual risk behaviors: a review of effectiveness.[73]
Selection criteria/ characteristics of included studies: Experimental or quasi-experimental studies of school based programmes to reduce sexual risk behaviours. Outcomes assessed in the review were reported sexual or contraceptive behaviour or their outcomes. Participants included in the review were males and females of school age. *Main results:* 23 studies were included: 6 experimental and 10 quasi-experimental studies that evaluated impact, plus 7 national surveys (results not reported here). Specific Program evaluation (16 studies): Abstinence programmes: There is insufficient evidence to determine whether school-based programs that focus only upon abstinence delay the onset of intercourse or affect other sexual or contraceptive behaviours. Sexuality and AIDS-STD education programmes. There is no evidence that programmes significantly hasten the onset of intercourse and some programmes can delay the initiation of sexual activity. None of the programmes significantly increased or decreased the frequency of intercourse. Some, but not all, programmes increased contraceptive use. Only two of eight programmes significantly increased contraceptive use among all sexually experienced youths.

Authors' conclusions: The programmes reviewed did not hasten intercourse in older students, while evidence for younger students is less consistent. Some programmes can increase the use of condoms or other contraceptives.

iii) Quality assessed review: Sexual health education interventions for young people: a methodological review.[74]
Selection criteria/ characteristics of included studies: Controlled trials of sexual health education/information. Participants included in the review were young people aged 10 to 19 years, which included high school students, university students and runaway adolescents at a residential shelter. Outcomes were changes in knowledge, attitudes or

sexual behaviour. *Main results:* 73 outcome evaluations (of which only 12 were controlled trials and met the core quality criteria). Only three of the methodologically sound evaluations were (judged by the reviewers to be) effective in showing an impact on young peoples' sexual behaviour.

Authors' conclusions: The design of evaluations in sexual health intervention needs to be improved so that reliable evidence of the effectiveness of different approaches to promoting young people's sexual health may be generated.

3. Other interventions

i) Quality assessed review: HIV sexual risk reduction interventions for women: a review.[75]
Selection criteria/ characteristics of included studies: RCTs, non-RCTs and before-and-after studies of non-theory-based interventions and theoretically based interventions. Non-theory-based interventions typically included single sessions communicating HIV preventive strategies through individual or group counselling or video presentations. Theoretically based interventions were typically multi-session programs, which included skills training and strategies to modify peer or partner beliefs about risk-taking behaviour. Participants included in the review were women aged from 12 to 40 years. The majority of women included in the review were women from an ethnic minority. Outcomes assessed in the review were primarily reduction in sexual risk behaviours, knowledge, and condom use. *Main results*: Five RCTs (697 participants); one non-RCT (214 participants) and one before and after trial (241 participants) were included. All of the theoretically-based interventions (all investigated in RCTs) were effective in increasing condom use. The lengths of follow-up of these trials ranged from 3 to 12 months. All effective interventions emphasised gender-related influences on risk, were peer-led, and were multiple-session programs. *Limitations:* It is not clear whether the lower quality studies are given less weight in drawing conclusions, and non-US studies were excluded, therefore generalisability may be limited.

Authors' conclusions: In general, behavioural interventions that were theory-driven, peer-led, addressed gender-relations and used multiple sessions were more effective in promoting the adoption of condom use.

6. Illicit drug use

Only one systematic review has been undertaken in this area within the last five years. The results of several recent RCTs are also reported but most of them concentrate on alcohol, cigarette smoking and marijuana use. All were conducted in the USA.

Reducing/preventing illicit drug use

1. Health promotion

i) Quality assessed review: Health promotion with young people for the prevention of substance misuse.[76]

Selection criteria/ characteristics of included studies: Controlled studies that evaluated interventions targeting illicit drug use, use of solvents or hallucinatory mushrooms, and that provided sufficient detail of the intervention and the design of the evaluation to allow judgements to be made on the soundness of the studies. The 62 studies evaluated 53 separate programmes and the majority was undertaken in the USA, with only one UK-based study, one Israeli and three Australian. *Main results:* Sixty-two studies (30 RCTs) met the inclusion criteria, but only two met all the quality criteria. All school-based studies targeted tobacco, alcohol and illicit drugs simultaneously. The majority of studies were school-based interventions targeting 'gateway' drugs. The only interventions to be adequately evaluated are those directed at school aged children, which target marijuana use and have been implemented in the USA or in Australia. However, there are insufficient data to allow clear conclusions to be drawn. Few studies examined long-term programme effectiveness. Those that did suggested that programme gains (if any) dissipate rapidly. At present, there is insufficient evidence to assess the effectiveness of the range of approaches to drug education. There is a need for more methodologically sound evaluations of he effectiveness of existing approaches. Need to develop more focused interventions and the targeting of hard-to-reach groups have not been carried out adequately. Promising approaches include teaching relapse prevention skills to dependent users and interventions directed at pregnant women. However, not many evaluations of these approaches have been carried out and more studies are needed to confirm their effectiveness.

Authors' conclusions: There is not enough evidence to assess the effectiveness of different approaches to drugs education. Better evaluation is needed. More focused interventions should be developed. In particular, too little attention has been paid to the contexts within which drug use occurs and the need to match interventions to the specific needs and experiences of individuals and groups. Interventions aimed at minimising drug-related harm have not been evaluated adequately. Again, more effort needs to be put into better evaluation.

Another review investigated a range of prevention interventions and reported that universal school-based drug-prevention programmes such as the US Project DARE (Drug Abuse Resistance Education), increased outcomes such as attitudes and knowledge, but found little difference in drug use between those who participated and those who did not.[77] This conclusion was confirmed recently in a report of the impact of Project DARE, 10 years after administration. A total of 1,002 individuals, who in 6th grade had either received DARE or a standard drug-education curriculum, were re-evaluated at age 20. Few differences were found between the 2 groups in terms of actual drug use, drug attitudes, or self-esteem, and in no case did the DARE group have a more successful outcome than the comparison group.[78] Another report also assessed

the long-term effects of a substance abuse prevention programme (social pressures resistance training approach) delivered in sixth and seventh grades.[79] Classrooms were assigned randomly to receive the curriculum or be in a comparison group. The follow-up study found that the significant effects evident at seventh grade for alcohol use and misuse, as well as cigarette, cocaine, and other drug use were generally not maintained through twelfth grade. Ongoing reinforcement of effective prevention was recommended. Two recent RCTs evaluated the short-term effects of school-based drug abuse prevention programmes in inner-city minority youths[80] and girls aged 11-14 who were considered to be at high risk.[81] Both found that the programmes (drugs resistance skills, and Girls Incorporated Friendly PEERsuasion) were moderately effective in preventing or reducing drug misuse.

2. Improvement of life skills

One RCT examined the effectiveness of social skills training/social network restructuring in the primary and secondary prevention of drug use in a multiethnic cohort of 296 female adolescents ages 14 to 19 years who were pregnant or parenting and/or at risk for drug use.[82] Subjects were randomly assigned to one of two conditions: (a) PALS Skills Training or (b) a control intervention involving no skills training. PALS Skills Training is a combination of cognitive and behavioural techniques to improve social skills and to restructure the teens' social network. All students also participated in a 16-week normative education "Facts of Life" course. The prevalence of alcohol and any drug use increased significantly over the three assessment periods in the PALS Skills group but not in the No Skills group. Teens in the PALS Skills group who reported no drug use at baseline were 2.9 times as likely to be using marijuana than teens in the No Skills group at 3 months post-intervention. PALS Skills Training was no more effective in the secondary prevention of drug use than the control intervention. The authors concluded that social skills training was ineffective as a means of primary prevention among non-drug-using high-risk adolescents and may even be counterproductive as a means of primary prevention of marijuana use in this population. When combined with normative information on drug use prevalence, acceptability, and hazards, social skills training is no more effective as a means of secondary prevention than normative education alone.

3. Verbal mediational training

An RCT in the USA evaluated the impact of a 12-week verbal mediational program (Think Aloud), which taught children and parents cognitive and social problem-solving skills and addressed early childhood risk factors related to the onset of drug use in adolescence.[83] Fifty children and parents were randomly divided into four groups: two groups received either a verbal mediation condition comprising the Think Aloud training or time to complete homework assignments. Each of the topic groups was subdivided into two groups, one in which the parents served as models and one in which the experimenter served as the model. Measures of family cohesion, expressiveness, and conflict, family organisation and control, social skills, level of disruptiveness of the child's peer choice, academic competence, and the child's problem behaviours were administered to the parents and the teachers pre- and post-intervention. Children in the verbal mediation condition with parental models were expected to show the greatest reduction in risk factor scores, and children in the verbal mediation condition with the experimenter model were predicted to show the second greatest reduction in risk factor scores at post-test. Children involved in the Think Aloud program showed improvement on four of the six factors on post-test measures. The superiority of the parental model was not found.

Conclusions

The aim of this report was to identify evaluations of interventions to change health-related behaviours. Overall, only a few interventions were found to be effective, due to the lack of good quality trials. Furthermore, generalisabilty may be limited as many of the studies included in the reviews were undertaken in the USA. There was evidence of effectiveness for the following interventions:

Tobacco smoking: Effective smoking cessation interventions included nicotine replacement therapy; physician advice; smoking cessation programmes implemented in pregnancy; smoking cessation advice and counselling given by nurses; training health professionals to provide smoking cessation interventions; group programmes and individual smoking cessation counselling. There was no evidence of a difference in effect between individual and group counselling.

Alcohol drinking: Brief interventions (simple motivational counselling techniques) were effective for men, but effect on women alone is less clear; pharmacotherapy was effective in reducing relapse and number of drinking days; drink/drive interventions had a positive effect on reducing alcohol-related traffic events.

Exercise: GP advice to take more exercise; behavioural, diet and exercise programmes have all been shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination.

Diet: For the general population, the more effective health promotion interventions were those based on theories of behavioural change; the most successful breastfeeding promotion interventions were based in the USA and in general were long term, spanning the pre-and postnatal period and intensive, involving multiple contacts with a professional breastfeeding promoter or peer counsellor; family therapy programmes were effective in preventing the progression of obesity in already obese children; behavioural, diet and exercise programmes were shown to be effective in the treatment of adult obesity, particularly when two or more approaches are used in combination.

Sexual risk-taking in young people: AIDS risk reduction interventions can be effective in improving knowledge, attitudes, and behavioural intentions and in reducing risk practices. The most effective approach to HIV/AIDS risk reduction among young people is one that provides practical information and support in a non-didactic way. School-based sex education can be effective in reducing teenage pregnancy especially when linked to access to contraceptive services. All of the theoretically-based interventions (multi-session programmes, which included skills training and strategies to modify perceived peer or partner beliefs about risk-taking behaviour) were effective in increasing condom use.

Illicit drug use in young people: Some school-based prevention programmes show evidence of effect in the short term (three months period).

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