Evidence of effectiveness of interventions to prevent tobacco, alcohol and drug use

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Background

- School is an appropriate setting for drugs use prevention programs
- In European countries almost all schools carry out interventions to prevent the onset of substance use
  - most are theory-based, some aren't
  - most have been evaluated only for intermediate variables (knowledge, intentions…)
  - but the evaluation of effectiveness in reducing the use of drugs is very rare
- There is a solid suspicion that some programmes can make harm (Dukes 1997; Hawthorne 1996)

Systematic review on drug prevention preliminary results

Author	Study design	Program focus	Program components	Study pop/ controls	Results (RR)	
Pentz 1989 JAMA	CPS	skills for resistance social environment	mass media education parents policy change	3011/ 2054	Cigarette Alcohol Marijuana	=0.40 =0.43 =0.51
Botvin 1995 JAMA	RCT	skills for resistance	education	1128/1327/ 1142	Cigarette Alcohol Marijuana	=0.82 =1.02 =0.93
DeJong 1987 J Drug Educ	CPS	DARE	education	288/ 310	Cigarette Beer Drug m Drug f	=1.14 =1.32 =0.96 =1.04
Dukes 1997 Eval Review	CPS	DARE	education	351/ 263	Cocaine m Cocaine f	=0.68 =1.27
Hawthorne 1995 Addiction	CPS	life education (Moskowitz model)	education	1721/1298	Cigarette Alcohol Other subst	=1.60 =1.40 =1.40

When the data are extrapolated to the state-wide smoking and drinking estimates, these showed that of all smoking among year 6 schollchildren, 25% of girls' and 19% of boys' smoking could be attributed to participation in Life Education, as could 22% of all boys' recent drinking.

The program was extended to all Australia, UK, USA, … India, China, … South Africa….

The findings suggest that intervention programmes should be thoroughly evaluated prior to widespread implementation…

Hawthorne 1995

Background

- Considering the risk of harm,
- on the ethical point of view, the ***evaluation of effectiveness*** of prevention programmes is essential

Nancy Tobler was the first who carried out a systematic evaluation of adolescent prevention programmes, firstly in 1986

His work is now regularly updated by the Nancy Tobler Foundation

TABLE 1. *Major content in adolescent drug prevention programs.*

KNOWLEDGE
Knowledge of drug effects
Knowledge of media and social influences
Knowledge of actual drug use by peers (normative education)
AFFECTIVE
Self-esteem and feelings
Personal insight and self-awareness
Attitudes, beliefs, and values
REFUSAL SKILLS
Drug-related refusal skills
Public commitment activities
Cognitive behavioral skills
Support systems/networking with nondrug-using adolescents
GENERIC SKILLS
Communication skills
Assertiveness skills
Decisions/problemsolving skills
Coping skills
Social/dating skills
Goal-setting
Identifying alternatives
SAFETY SKILLS
Skills to protect self in a drug-related situation
Skills to protect other peers in a drug-related situation
Drinking/driving safety
EXTRACURRICULAR ACTIVITIES
Paid job activities or training
Organized sports
Organized cultural activities
Nondrug leisure time activities
Volunteer work in the community
OTHER
Peer counseling/facilitating/helping
Homework exercises
Rewards, token economy, and reinforcement
Parent involvement
Communitywide coordination and involvement

NIDA monograph # 170/1996

Review on drug prevention

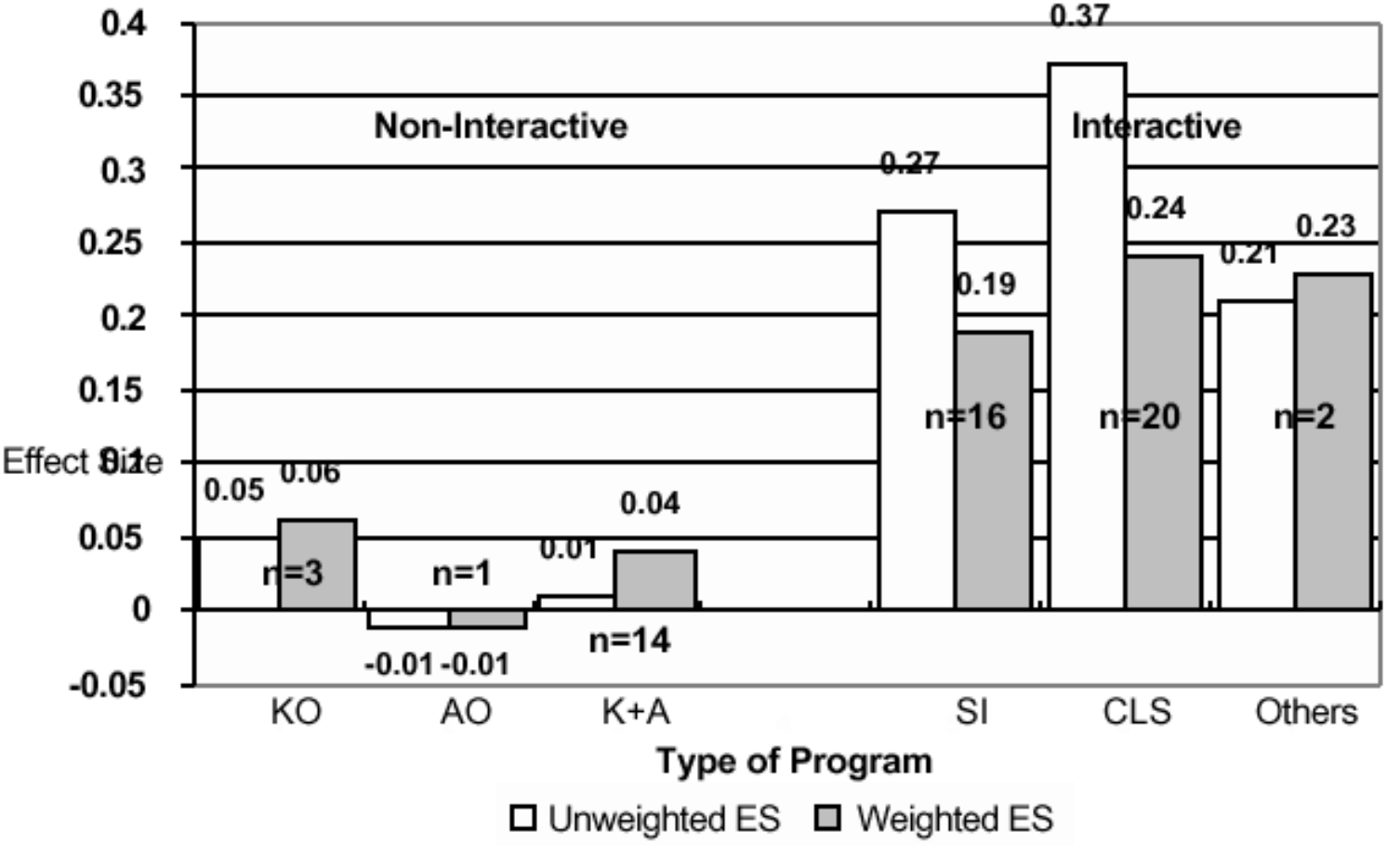
(N. Tobler)

TABLE 3. *Type of program by content and process.*

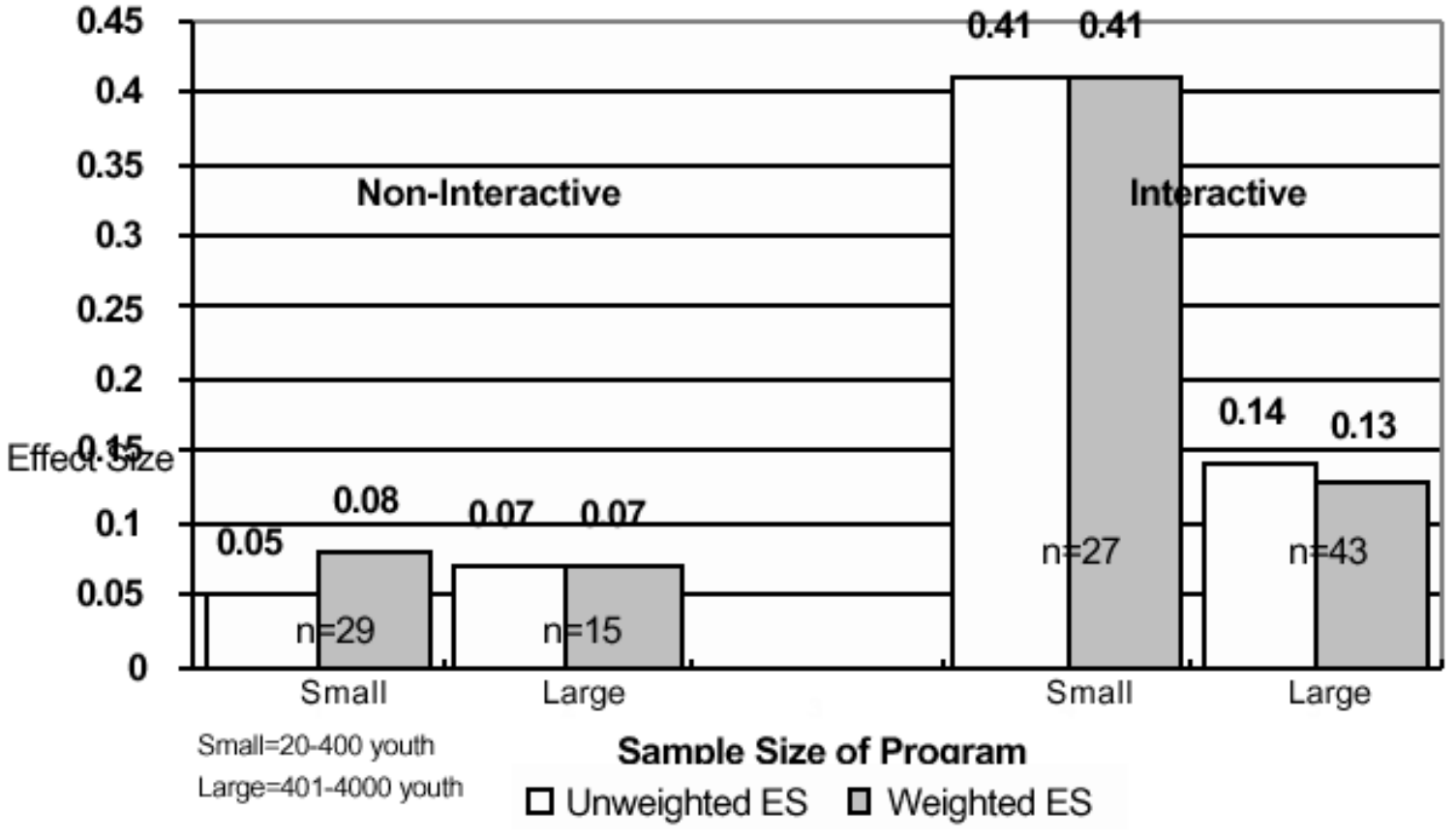
Content	Process
NONINTERACTIVE: KNOWLEDGE ONLY	
Knowledge	Group A
Knowledge	Film/theater
Knowledge + Attitudes	Group A
Drinking + Driving	Group A
Drinking + Driving	Scare tactics
AFFECTIVE ONLY	
Affective	Group B *ECM
Affective	Group B
KNOWLEDGE PLUS AFFECTIVE	
Knowledge + Affective	Group B
Knowledge + Affective + Attitudes + Values	Group B
Knowledge + Affective + Decisions	Group B
Knowledge + Affective + Generic	Group B
Knowledge + Affective + Refusal + Generic	Group B
Knowledge + Affective + Generic + Community	Group B
Drinking + Driving	Group B
INTERACTIVE: SOCIAL INFLUENCES	
Knowledge + Refusal	Group C
Knowledge + Refusal + Community**	Group C
Drinking + Driving	Group C
COMPREHENSIVE LIFE SKILLS	
Knowledge + Refusal + Generic	Group C
Knowledge + Refusal + Generic + Community**	Group C
Drinking + Driving	Group C
OTHERS	
Knowledge + Norm-changing	Group C
Knowledge + Affective	Group C
Knowledge + Affective	Group D
Knowledge + Affective + Generic	Group C
Knowledge + Affective + Refusal + Generic	Group D

KEY: * = Effective classroom management for teachers; ** = Total community effort supporting the school-based program.

Subset of 56 high quality studies



Subset of 56 high quality studies



Reviews

School-based prevention for illicit drugs' use

by Faggiano F, Vigna-Taglianti FD, Versino E et al – 2005

School-based programmes for preventing smoking

by Thomas R. - 2002

Primary prevention for alcohol misuse in young people

by Foxcroft D et al - 2003

Methods

Literature search and inclusion criteria

- All RCTs evaluating any intervention program versus a control condition
- All CPS (Controlled Prospective Studies) comparing intervention vs control
- The following databases have been searched (from beginning to feb 2004)
  - Medline & Embase
  - ERIC, Sociological Abstracts, Psychinfo
  - Cochrane databases

Methods

Literature search and inclusion criteria

- To discover unpublished researches/results, research teams, and 18 authors of the included and excluded studies were contacted: 6 authors sent published/unpublished results

- The target populations were primary or secondary school pupils

Methods

Data collection and extraction

- 2216 abstracts have been retrieved and were read by two reviewers for relevance
- 678 reports have been obtained in full text and independently assessed by two reviewers
- 65 (40 RCTs) reports have been provisionally included
- 24 (21 RCTs) reports were excluded for methodological reasons

Methods

Data collection and extraction

- For the 29 RCTs included, interventions and control arms were classified as:
  - ***skills focused***, aimed to enhance students' abilities in generic, refusal, and safety skills
  - ***affective focused***, aimed to modify inner qualities (personality traits such as self-esteem and self-efficacy, and motivational aspects such as the intention to use drugs)
  - ***knowledge focused programs***, aimed to enhance knowledge of and the effects, and consequences of drug use
  - ***usual curricula***

Methods

Data collection and extraction

- The interventions were also classified as follows:
  - **interactive programs**, in which participants are actively involved in the activities
  - **passive programs**

- and also by type of involvement
  - teachers
  - external educators
  - peers

Methods

Outcomes

- The following outcomes were considered:
  - final outcomes:
    - use of drugs
  - intermediate outcomes:
    - drug knowledge
    - drug attitudes
    - acquirement of personal skills
    - peers/adults drug use
    - intention to use drugs

Methods

Quality assessment

- The quality of the studies included was assessed by two reviewers
- according to the CDAG's check list studies were grouped in 3 classes:
  - ***A***: low risk of bias (scores 9-11)
  - ***B***: moderate risk of bias (scores 6-8)
  - ***C***: high risk of bias (scores 0-5)
- Disagreements were settled by a third reviewer

Results

Included studies

- 29 studies (41 reports) were included
- 14 did not present data for inclusion in the meta-analyses (limited reporting from statistical models)
- 18 studies were of 6 and 7th grade students

- 18 studies presented a post-test assessment;
- 13 provided data at 1 year follow-up.
- Few studies provided data for longer periods

- 28/29 were conducted in the USA (1 RCT in the UK)

Results

Included studies

- Type of programmes
  - 25 studies evaluated skills focused programs
  - 6 assessed affective programs,
  - 6 included a knowledge focused arm
- 27 out of 29 studies presented results for programmes performed using interactive techniques
- Administrators were external educators in 20 studies, teachers in 10, peer leaders in 4, and others (policemen) in 2

Results

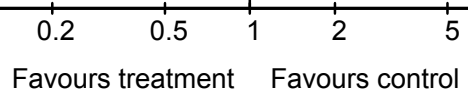
Skills versus usual curricula

- The only comparison showing significant results are skills vs usual curricula

Review: School-based prevention for illicit drugs' use.
Comparison: 02 skills vs usual curricula
Outcome: 07 drug use

Study or sub-category	Treatment n/N	Control n/N	RR (random) 95% CI	Weight %	RR (random) 95% CI
Ringwalt 1991	65/685	77/585		52.56	0.72 [0.53, 0.98]
Snow 1992	63/575	63/526		47.44	0.91 [0.66, 1.27]
Total (95% CI)	1260	1111		100.00	0.81 [0.64, 1.02]

Total events: 128 (Treatment), 140 (Control)
Test for heterogeneity: Chi² = 1.06, df = 1 (P = 0.30), I² = 6.0%
Test for overall effect: Z = 1.80 (P = 0.07)



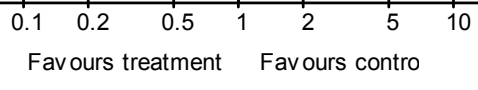
Results

Skills versus usual curricula

Review: School-based prevention for illicit drugs' use. (Vs first published 2/200
Comparison: 02 skills vs usual curricula
Outcome: 13 hard drugs use

Study or sub-category	Treatment n/N	Control n/N	RR (random) 95% CI	Weight %	RR (random 95% CI
Sussman 2002	9/200	15/176		61.43	0.53 [0.24, 1.18]
Furr-Holden 2004	5/192	13/178		38.57	0.36 [0.13, 0.98]
Total (95% CI)	392	354		100.00	0.45 [0.24, 0.85]

Total events: 14 (Treatment), 28 (Control)
Test for heterogeneity: Chi² = 0.36, df = 1 (P = 0.55), I² = 0
Test for overall effect: Z = 2.47 (P = 0.0



Results

Skills versus usual curricula

Review: School-based prevention for illicit drugs' use. (Vs first published 2/200

Comparison: 02 skills vs usual curricula

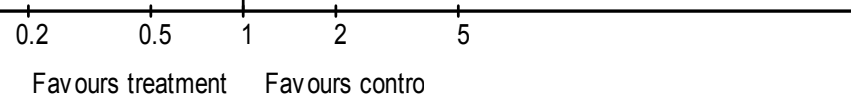
Outcome: 08 marijuana use (all studies)

Study or sub-category	Treatment n/N	Control n/N	RR (random) 95% CI	Weight %	RR (randor 95% CI
Sussman 2002	46/199	44/172		10.09	0.90 [0.63, 1.29]
Botvin 1990	147/1128	160/1142		28.69	0.93 [0.76, 1.15]
Ellickson 2003	332/2553	293/1723		55.38	0.76 [0.66, 0.88]
Furr-Holden 2004	25/192	34/178		5.85	0.68 [0.42, 1.10]
Total (95% CI)	4072	3215		100.00	0.82 [0.73, 0.92]

Total events: 550 (Treatment), 531 (Control)

Test for heterogeneity: Chi² = 3.15, df = 3 (P = 0.37), I² = 4.8

Test for overall effect: Z = 3.43 (P = 0.000



Results

Skills versus usual curricula

- Skills based intervention reduced
  - drug use (RR=0.81)
  - hard drug use (0.45)
  - marijuana use (RR=0.82)
- Moreover
  - drug knowledge (WMD=2.60; CI95%: 1.17, 4.03)
  - decision making skills (SMD=0.78; CI95%: 0.46, 1.09)
  - peer pressure resistance (RR=2.05; CI95%: 1.24, 3.42)
  - self-esteem (SMD= 0.22; CI95%: 0.03, 0.40)

Other results

- Other interventions
  - No significant differences were found comparing other programmes with usual curricula
  - neither in comparisons between programmes
- interactive vs passive
  - only 1 study compared interactive vs passive and showed lower hard drug use but no differences in marijuana use
- peer involvement
  - no final outcomes have been used by studies comparing peer involvement vs control

Discussion

- Skills focused programs have a positive effect on both mediating variables and final outcomes, compared to usual curricula
  - 20% lower use of marijuana
  - 55% lower use of hard drugs

- This result appear to persist even years after the intervention
- most of the RCTs included have a satisfactory methodological quality (mainly quality score=B)

First conclusion

- Number needed to treat (NNT; 1/ARR) is 33 for marijuana use

- Since the prevalence of marijuana among controls was 16.5%, 5 out of 33 students (16.5% of 33) will use this drug.
- Of this, 1 would be prevented by the intervention

So the intervention should be able to obtain a 20% reduction of the new initiators

General considerations

- Study quality
  - none of the RCTs satisfied all the quality criteria of the review.
  - there are few data from long-term follow-ups
  - only six studies were designed to take account of the cluster effect

- Heterogeneity
  - many studies present only statistical indicators (f, p...) instead of epidemiologic measures (RR, ARR…)
  - the choice of effect measure appears to be done by chance (or by opportunity); in many cases it was impossible to combine them into the meta-analysis

General considerations

- Efficiency of the process of the research
- The vast amount of research undertaken since 1980, has not generated the expected evidence
- out of 50 selected RCTs, only 29 were included
- the wide variability of indicators, scales and scores employed, and the limited reporting of data, made it difficult to summarise the evidence:
  - the maximum number of RCTs comprised in a single meta-analysis was only 4 out of 29

General considerations

- Lastly, there is the question of generalisability: 28/29 RCTs included were conducted in the USA

- Authors stated for a need of further corroboration of results by well designed, long term follow-up, cluster-randomised trials, especially in countries other than the USA

Primary prevention for alcohol use

- School-based interventions are considered together with other interventions targeting adolescence

- Because of heterogeneity of methods and outcome measures, no studies are considered suitable to be pooled

Primary prevention for alcohol use

Main results

- 20 of the 56 studies included showed evidence of ineffectiveness.
- No firm conclusions about the effectiveness in the short- and medium-term were possible.
- Over the longer-term, the Strengthening Families Program (SFP) showed promise as an effective prevention intervention. The NNT for the SFP over 4 years was 9.
- One study also highlighted the potential value of culturally focused skills training over the longer-term (NNT=17 over 3.5 years for 4+ drinks in the last week).

2. Primary prevention for alcohol misuse in young people

A=life skills
B=life skills involving local communities
ISFP=Iowa Strengthening Families Program
PDFY=Preparing for the Drug Free Years programme

Program (follow-up)	Outcome	ARR (95% CI)	NNT (95% CI) (rounded up)
Skills Training (culturally focused) (Schinke et al, 2000) (3.5 years)	4+ drinks in last week	A vs C: 6.23% (0.09% to 12.36%) B vs C: 4.09 (-2.17% to 10.27%)	A vs C:17 (9 to 1149) B vs C:25 (10 to infinity)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever used alcohol	ISFP vs Ctrl: 11.39% (-0.40% to 23.19%) PDFY vs Ctrl: 4.97% (-6.90% to 16.83%)	ISFP vs Ctrl: 9 (5 to infinity) PDFY vs Ctrl: 21 (6 to infinity)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever used alcohol without permission	ISFP vs Ctrl: 11.98% (0.63% to 23.33%) PDFY vs Ctrl: 4.69% (-6.82% to 16.19%)	ISFP vs Ctrl: 9 (5 to 160) PDFY vs Ctrl: 22 (7 to infinity)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever been drunk	ISFP vs Ctrl: 11.27% (0.31% to 22.24%) PDFY vs Ctrl: 5.56% (-5.73% to 16.86%)	ISFP vs Ctrl: 9 (5 to 327) PDFY vs Ctrl: 18 (6 to infinity)

2. Primary prevention for alcohol misuse in young people

A=life skills
B=life skills involving local communities
ISFP=Iowa Strengthening Families Program
PDFY=Preparing for the Drug Free Years programme

Program (follow-up)	Outcome	ARR (95% CI)	NNT (95% CI)
			(rounded up)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Monthly alcohol use	A vs C: N/A B vs C: 1.81% (-5.25% to 8.88%)	A vs C: N/A B vs C: 56 (12 to infinity)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Weekly alcohol use	A vs C: N/A B vs C: 3.02% (-2.52% to 8.56%)	A vs C: N/A B vs C: 34 (12 to infinity)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	3+ drinks per occasion	A vs C: 1.21% (-4.34% to 6.75%) B vs C: 2.42% (-105.46% to 110.29%)	A vs C: 83 (15 to infinity) B vs C: 42 (1 to infinity)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Drunkeness in las month	A vs C: 3.62% (-1.92% to 9.17%) B vs C: 4.23% (-2.84% to 11.30%)	A vs C: 28 (11 to infinity) B vs C: 24 (9 to infinity)

Authors' conclusions

1. Research into important outcome variables needs to be undertaken.
2. Methodology of evaluations needs to be improved.
3. The Strengthening Families Programme needs to be evaluated on a larger scale and in different settings.
4. Culturally-focused interventions require further development and rigorous evaluation.
5. An international register of alcohol and drug misuse prevention interventions should be established and criteria agreed for rating prevention intervention in terms of safety, efficacy and effectiveness.

School-based programmes for preventing smoking

Main results

- **Of the 76 RCTs identified, we classified 16 as category one (most valid).**
- **There were no category one studies of information giving alone.**
- **There were 15 category one studies of social influences interventions. Of these, eight showed some positive effect of intervention on smoking prevalence, and seven failed to detect an effect on smoking prevalence. The largest and most rigorous study, the Hutchinson Smoking Prevention Project, found no long-term effect of an intensive 8-year programme on smoking behaviour.**

School-based programmes for preventing smoking

Main results (cont'd)

- **There was a lack of high quality evidence about the effectiveness of combinations of social influences and social competence approaches.**
- **There was limited evidence about the effectiveness of multi-modal approaches including community initiatives.**

Authors' conclusions

- there is no rigorous test of the effects of information giving about smoking.
- There are well-conducted RCTs to test the effects of social influences interventions: in half of the group of best quality studies those in the intervention group smoke less than those in the control, but many studies showed no effect of the intervention.
- There is a lack of high-quality evidence about the effectiveness of combinations of social influences and social competence interventions, and of multi-modal programmes that include community interventions.

General conclusions about the effectiveness of the Life Skills Model

- Prevention interventions in the school setting adopting Life Skills Model appears:
  - to show weak evidence of effectiveness in smoking and alcohol prevention
  - to show significant evidence of effectiveness in drug prevention
  - to be the more promising model of prevention
  - to require more, and more valid, research
  - especially in different cultural contexts

Crititics on Life Skills model of prevention

Education's uncertain saviour

A 20-year series of studies of a relatively unknown US programme kept hopes alive that schools can prevent drug use. The record is impressive – but is it enough to salvage drug education's prevention credentials?

by Blaine Stothard
& Mike Ashton

Blaine Stothard is an independent consultant in health education. He can be contacted at blaine@healthed.demon.co.uk.
Mike Ashton is the editor of *Drug and Alcohol Findings*.

Do we need a programme?

Whatever the virtues of Life Skills Training, are universally applied school programmes of any kind the way to prevent drug problems? One view is that while education about drugs can and should be universal, prevention should be far more targeted and flexible.

[.....]

The counter-argument is based on the fact that most children do not use illegal drugs and very few become problem drinkers or drugtakers. Perversely, while universal prevention programmes hit many who do not need intervention, they miss many who do. Serious drug use in adolescence is often accompanied by truancy, school exclusion and a disdain for drug education. In this vision what schools need is not a universal prevention programme, but mechanisms to pick up on the atypical few at serious risk (who will often manifest a range of behaviour problems) and then suitable people and services to refer them on to for individualised help.

It's assumed that kids are ignorant, deficient, and pressured by friends. All three are wrong

DRUG AND ALCOHOL ISSUE 3 2000

Golden Bullets

Essential practice points from this article

- Life Skills Training can result in lasting curbs on regular smoking, multi-drug use and problem drinking which could help preserve physical health throughout life.
- However, there is insufficient consistency in the findings to be confident that implementing Life Skills will cut legal or illegal drug use, only that it can do and has done, most consistently in relation to smoking.
- Keys to the programme's successes seem to be its intensity, use of booster sessions, interactivity, emphasis on skills, and its potential for delivery by peer leaders.
- Even the best school programmes usually only achieve delays and small reductions in the extent and intensity of drug use. Nevertheless, thousands of lives could saved at lower cost than many medical interventions.
- Use prevention effects are gained by correcting misconceptions about the normality and acceptability of drug use, improving drug-related knowledge and assertiveness in using drug refusal skills, and heightening anti-drug attitudes – all drug-specific variables. General skills and psychological variables seem less relevant.
- Whether any such programme can prevent drug problems is an open question; for Life Skills the evidence is strongest in relation to heavy smoking and drinking to intoxication.
- Normalisation of drug use creates a need for approaches which do not assume that personal and social deficits lead to drug use and for research and programmes permitted to adopt harm reduction objectives.
- To prevent serious drug problems, rather than universal programmes it may be more cost-effective to target the few potentially affected pupils with individualised help while still providing drug education to all.
- British schools could profitably adapt elements of Life Skills' teaching methods and content, especially as much of it could double as a general personal and social skills curriculum, but the full programme is unlikely to be considered appropriate or to be implemented.

…for all these reasons

the EU-Dap trial has been designed, and carried out