A systematic review of school-based marijuana and alcohol prevention programs targeting adolescents aged 10-15

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CRD summary

This review concluded that comprehensive intervention programmes that included anti-drug information with refusal skills, self-management skills and social skills training were the most effective programmes for long-term reduction of marijuana and alcohol use in adolescents (10 to 15 years). Variation between studies and the risk of missing data suggested that the author’s conclusions may not be reliable.

Authors’ objectives

To determine the effectiveness of school-based marijuana and alcohol prevention programmes for the prevention of marijuana and alcohol use in adolescents (10 to 15 years).

Searching

PubMed, PsycINFO, CINAHL, ERIC and EMBASE were searched from January 1980 to December 2007 for published studies written in English. Search terms were reported. Relevant government departments, educational departments, research agencies and other relevant organisations were contacted by email to locate unpublished data. Reference lists of retrieved articles were checked for further studies.

Study selection

Randomised controlled trials (RCTs), prospective cohort studies and longitudinal studies that assessed the effectiveness of validated school-based interventions to prevent marijuana and or alcohol use in adolescents (10 to 15 years) were eligible for inclusion in the review. Eligible studies had a follow-up of at least one year. Alcohol and marijuana usage was defined as the number of days used in the past 30 days pre- and post-intervention. Types of interventions and outcome measures were defined further in the review. Studies that spanned the age range of interest, but did not exclusively consider this age group were included. Eligible studies had to be carried out in Canada, USA, western Europe, Australia or New Zealand and use a sample size of at least 300 participants. Case studies, natural experiments and cross-sectional studies were excluded. Studies that compared clinical settings with school settings were excluded. Studies that did not present baseline data or for which baseline data were not available upon request were excluded.

All of the included studies were performed in USA using state or regional population samples. Half of the studies assessed knowledge-based interventions and half assessed comprehensive-based programmes. All included studies except one were interactive. Control groups were knowledge only, curriculum only, printed pamphlets and standard care. In half of the included studies the intervention was delivered by an external educator; in the remaining studies teachers and/or peers were used. One of the studies failed to describe the control group used. The length of the intervention varied considerably from one session to multiple sessions over a period of three years; half of the studies used booster sessions. Half of the studies assessed alcohol and marijuana use and the rest assessed alcohol usage alone; none assessed marijuana usage alone. Other assessed outcomes included knowledge and skills and the incidence of problem behaviours.

Studies were assessed for inclusion by three independent reviewers.

Assessment of study quality

Quality was assessed by three independent reviewers using the criteria: well-stated research question; inclusion and exclusion criteria reported; participation rate reported; adequate sample size; adequate description of population identification and selection; outcome measures reported; baseline and follow-up data reported; use of similar data collection methods for all study groups; discussion of outcome measures; appropriate statistical methods; adjustments performed for covariates; and outcomes quantified. Each study was awarded a score up to a maximum of 14 points. Studies had to score at least 10 points to be included in the review.
Data extraction
Mean alcohol or alcohol and marijuana usage per study group was extracted and used to calculate the mean usage ratio (MUR) using formulae reported within the review.

The authors did not report how many reviewers performed data extraction.

Methods of synthesis
Studies were grouped according to the type of intervention (knowledge-based versus comprehensive-based), then by outcome and study duration. Pooled MUR with 95% CIs were calculated using a random effects model. Levels of statistical heterogeneity were assessed and p-values reported. Potential sources of heterogeneity were assessed using stratification according to study design, year of publication and outcome scale (used to assess marijuana and alcohol usage). Sensitivity analyses were carried out to investigate the influence of single studies and studies with the largest weighting in the analyses. Funnel plots were used to assess the risk of publication bias.

Results of the review
Six RCTs (n=11,926) were included in the review. Quality assessment data were not reported. Sample sizes ranged from 604 to 3,989.

All studies combined (knowledge and comprehensive program interventions) using a combined outcome measure (alcohol and marijuana use) reported a pooled MUR of 0.95 (95% CI 0.91 to 1.00) in comparison with control.

In comparison with no exposure, comprehensive intervention programs resulted in a mean absolute reduction of seven days in marijuana use per month (MUR 0.93, 95% CI 0.92 to 0.94, range six to eight days; two studies) and 12 days of alcohol usage (MUR 0.88, 95% CI 0.87 to 0.89, range of 11 to 13 days; three studies)

Knowledge-only programmes resulted in a mean absolute usage of two days of alcohol usage per month (MUR 0.98, 95% CI 0.92 to 1.04, range four to six days; two studies). One study of a knowledge-based outcome assessed marijuana use

Sensitivity analyses did not significantly alter the review findings. The risk of publication bias could not be assessed due to the paucity of studies.

Authors’ conclusions
Comprehensive programmes that included anti-drug information with refusal skills, self-management skills and social skills training were the most effective programmes for long-term reduction of marijuana and alcohol use in adolescents aged 10 to 15 years.

CRD commentary
This review answered a clearly defined review question with a broadly defined set of study designs. Extensive searches were carried out for published and unpublished studies. The limitation to studies written in English may have resulted in relevant data being missed. Attempts were made to reduce risks of reviewer error and bias during study selection and quality assessment; it was unclear whether similar precautions were taken during data extraction. Study quality was assessed with appropriate criteria that considered factors appropriate to the wide variety of included study designs. The authors did not report the quality of the individual studies. Methods used to pool studies appeared appropriate. Studies varied in their clinical characteristics; the authors made attempts to investigate the potential effects of this heterogeneity in their analyses. Several limitations of the review, which included problems with the study outcome measures, were discussed by the reviewers. Given these limitations, variation between studies and the risk that data were missed, the author's conclusions should be interpreted with caution and may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that, although more complicated to initiate, comprehensive multi-factorial interventions appeared to result in better long-term effectiveness in actual behavioural change.
Research: The authors stated that further rigorous studies of the long-term effectiveness of school-based programmes for prevention of marijuana and alcohol use in adolescents (10-15 years) were required. Future studies should assess the effects of mediating variables such as age, gender, cultural status and socio-economic status on the effectiveness of the interventions.

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