Canadian Centre on Substance Abuse

CCSA - CCLAT

A Meta-analytic Review of School-based Prevention Programs in Reducing Cannabis Use

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Introduction

- **Cannabis is the most prevalent illicit drug used among youth (CADUMS, 2008)**
  - 32.7% of youth 15–24 years of age reported past year use
  - Rate is more than 4 times higher than the rate of 7.3% for adults 25 years and older
- **Average age of initiation among youth aged 15–24 years is 15.5 years (CADUMS, 2008)**
- **Cannabis use is associated with various health and behavioural problems**

Types of Prevention Programs

- **Informational**
  - Provide information on harmful consequences of drugs
- **Affective**
  - Focus is on youth's values, self-esteem, communication and decision making skills
- **Social influence/social learning**
  - Building confidence in their ability to resist pro-drug pressures
  - Increasing awareness of, and sense of susceptibility to, the consequences of cannabis use
  - These programs tend to be highly interactive; avoid lecture-style teaching

What do you think are some features of effective school-based drug prevention programs?

Features of Effective Programs

- **Grounded in a social influence model; skills development**
- **Interactive style of program delivery**
- **Facilitator of the program**
  - Requires sufficient motivation, training and time
- **Program fidelity**
- **Evidence is mixed regarding:**
  - Duration of the program
  - Age of program recipients

The Present Study

- Review of the scientific evidence from 1999–2007 on the effectiveness of school-based programs in reducing cannabis use among youth aged 12–19

- Examine features of programs that are related to variability in the size of program effects

Method: Search Procedures

- **Search of relevant databases**
  - PsychInfo, PubMed, Medline, EMBASE, ERIC, Education, Health Sciences, Sociological Abstracts, British Humanities Index
  - Keywords: adolescen*, youth, student*, prevention, preventive intervention, prevention program, marijuana, cannabis, initiation, uptake, experimentation, and school*

- **Limited to English peer-reviewed journal articles, books and book chapters to minimize risk of admitting studies of poor quality**

- **Obtained additional articles from References sections and review articles**

Method: Selection Criteria

- **To ensure only high-quality studies were included in the meta-analysis, studies had to meet the following criteria:**
  1. Adoption of an experimental or quasi-experimental design with a control group.
  2. Tested hypothesis that the program reduced or prevented the use of cannabis over an alternative form of the program or no program at all.
  3. Program was not confounded with other types of programs.
  4. Used self-reported cannabis use measures as evidence of program success or lack thereof.
  5. Reported statistics permitting calculation or estimation of effect sizes.

- **Total of 15 articles included in the meta-analysis**

Method: Coding the Studies

- **Characteristics of the prevention program, youth population and study methodology, measures of cannabis use and observed effects on these measures were coded using a coding instrument**

- **Studies were independently coded by two researchers**

- **Inter-coder reliability was 90.9%**
  - Four disagreements were factual errors that were corrected
  - Three disagreements due to differences in interpretation

Selection Bias: File Drawer Problem

- By including only published studies in the meta-analysis this may have introduced a selection bias as only statistically significant findings tend to be published
- Fail-safe number calculated to verify that the inclusion of only published studies did not overestimate the effect of the studied programs
- More than 3,038 additional studies with null results would be required to bring down the combined effect found in the current analysis to a probability level of .05

Method: Meta-analytic Procedures

- **A statistical technique for combining the results of several studies on a given issue**
- **Cohen's *d* used to compare the 15 studies**
- **Effect sizes within studies combined by:**
  - Using median effect size of all cannabis use measures
  - Using cannabis use measures for the longest delayed post-test
- **Potential outliers were assessed**
  - one identified, so analyses were run with and without it
  - outlier was included in all but one analysis

Results: Overall Effects

- Set of 15 programs had a significant impact on reducing cannabis use among youth (*d* = 0.58, 95% CI: 0.55, 0.62)
- There was considerable variability in the magnitude of the effect sizes across the set of studies (ranged from 0.50 to 2.90)
- Follow-up tests conducted to determine if characteristics of the program, youth population and study design could account for this variability

Does the Prevention Model Moderate Program Effectiveness?

Type of Prevention Model	Mean Weighted *d*	95% Confidence Interval	Contrast
Social learning (5)	0.19	0.14, 0.23	Social learning < Mixed*
Mixed (10)	1.27	1.22, 1.33	

*$p < .00001$

Does the Number of Program Sessions Moderate Program Effectiveness?

Number of Program Sessions	Mean Weighted *d*	95% Confidence Interval	Contrast
Short: < 15 (7)	0.10	0.06, 0.14	Short < Long*
Long: ≥ 15 (8)	1.40	1.33, 1.47	

*$p < .00001$

Does the Program Facilitator Moderate Program Effectiveness?

Program Facilitator	Mean Weighted *d*	95% Confidence Interval	Contrast
Teachers (10)	0.57	0.54, 0.61	Teachers < Not teachers*
Not teachers (5)	0.74	0.61, 0.87	

*p = .01

Does the Method of Delivery Moderate Program Effectiveness?

Delivery Method[a]	Mean Weighted *d*	95% Confidence Interval	Contrast
Interactive (10)	0.57	0.54, 0.61	Interactive > Didactic*
Didactic (4)	0.02	-0.15, 0.19	

[a]One study was excluded from this analysis as the program consisted of a one-to-one session

*$p < .00001$

Does the Age of the Participant Moderate Program Effectiveness?

Participant Age[a]	Mean Weighted *d*	95% Confidence Interval	Contrast
Younger: < 14 years (6)	0.17	0.13, 0.21	Younger < Older*
Older: ≥ 14 years (8)	0.39	0.30, 0.49	

[a]One study was excluded from this analysis as it was acting as an outlier

*$p < .00001$

Does the Fidelity of the Program Moderate Program Effectiveness?

Program Fidelity	Mean Weighted *d*	95% Confidence Interval	Contrast
Checked (8)	0.93	0.89, 0.98	Checked > Not checked*
Not checked (7)	0.06	0.01, 0.12	

*$p < .00001$

Conclusions

- School-based programs are effective in significantly reducing cannabis use among youth aged 12–19
- Mean weighted effect size of 0.58 corresponds to a 27.9% rate of success for programs compared to the control condition
- Several factors found to moderate program effectiveness

Recommendations for Effective Programs

- **Programs need to be interactive in nature**
  - Need for effective facilitator training
- **Teachers may need further support in order to be effective facilitators**
  - Time for training, motivation to teach drug prevention
- **Programs should be based on a variety of prevention models**
- **More program sessions are better**
- **Program content must be developmentally appropriate**
- **Programs need to be implemented with fidelity**

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