

Quarterly

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Preventing problematic substance use among youth

OVERVIEW

Recognizing risks, building strengths

REVIEW

Helping youth who are coping
with challenges





**Children's
Health Policy
Centre**

About the *Quarterly*

We summarize the best available research evidence on a variety of children's mental health topics, using systematic review and synthesis methods adapted from the *Cochrane Collaboration* and *Evidence-Based Mental Health*. We aim to connect research and policy to improve children's mental health. The BC Ministry of Children and Family Development funds the *Quarterly*.

About the Children's Health Policy Centre

We are an interdisciplinary research group in the Faculty of Health Sciences at Simon Fraser University. We focus on improving social and emotional well-being for all children, and on the public policies needed to reach these goals.

To learn more about our work, please see childhealthpolicy.ca.

Quarterly Team

Scientific Writer

Christine Schwartz, PhD, RPsych

Scientific Editor

Charlotte Waddell, MSc, MD, CCFP, FRCPC

Research Manager

Jen Barican, BA, MPH

Senior Research Assistant

Donna Yung, BSc, MPH

Production Editor

Daphne Gray-Grant, BA (Hon)

Copy Editor

Naomi Pauls, MPub

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Recognizing risks, building strengths

Risks for problematic substance use do not occur equally among young people. We examine what factors create risk as well as what can protect youth and build strengths.



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Helping youth who are coping with challenges

We feature six high-quality studies evaluating five targeted programs for preventing youth substance use problems. Three programs showed some success: CHAT, Middle School Success and Preventure.



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NEXT ISSUE

Reaching more kids: Part 1

Effective prevention programs are crucial to improving children's mental health. But to have the greatest impact, these programs must reach large numbers of children. In the next issue of the *Quarterly*, we identify interventions to help achieve this goal.



How to Cite the *Quarterly*

We encourage you to share the *Quarterly* with others and we welcome its use as a reference (for example, in preparing educational materials for parents or community groups). Please cite this issue as follows:

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Recognizing risks, building strengths

Risks for problematic substance use do not occur equally among young people — and neither do the factors that protect youth and help build strengths. To develop programs with the best potential for helping young people, we need to understand what contributes to these risk and protective factors.

Because they follow large, representative samples of young people over an extended time, longitudinal surveys can be particularly helpful in identifying both risk and protective factors associated with the development of substance use problems. We report on several such surveys that looked at youth substance use, including interrelated influences at the societal, family and individual levels.



Parents can be crucial in protecting young people from developing substance use problems.

Family socio-economic disadvantage

For youth, most risk factors for problematic substance use pertain to adverse family circumstances. In particular, family socio-economic disadvantage was identified as an important risk factor in surveys involving thousands of young people from Canada, New Zealand and the United States (US).¹⁻⁴ And the risks were considerable. When children came from disadvantaged families, the risk of repeatedly being diagnosed with substance use disorders between early and middle adulthood was 80% higher compared with children from more advantaged families.¹

Yet these surveys also pointed to opportunities for building strengths. In the US, for example, when low-income families received annual income supplements, children from these families had fewer alcohol and cannabis problems when they reached early adulthood, compared with children from families not receiving income supplements.⁴

Other family risks

As well, two of the surveys found that parents' behaviours and parenting styles specifically influenced children's risk in two important ways. When children were maltreated, their risk of repeatedly meeting criteria for a substance use disorder between early and middle adulthood was more than 60% higher compared with children who were not maltreated.¹ In addition, when parents had symptoms of antisocial personality disorder, had substance use disorders or had negative relationships with their children, young people were more likely to develop alcohol use disorders.²

Yet parents can also be crucial in protecting young people from developing substance use problems. For example, surveys have found that when parents provided high levels of supervision and conveyed the

For youth, most risk factors for problematic substance use pertain to adverse family circumstances.

importance of not using substances, children were less likely to use substances.⁵⁻⁶ Also, youth who felt strongly connected to and supported by their families and who had meaningful opportunities for family participation were less likely to engage in problematic substance use.⁷⁻⁹

Peers and individual circumstances

Beyond societal and family factors, peers and individual circumstances also contribute to both risk and protective factors. Specifically, having friends with behaviour problems increased young people's risk for developing an alcohol use disorder.² As well, being diagnosed with behaviour disorders, attention-deficit/hyperactivity disorder or depression increased the risk for developing substance use disorders.¹⁰ Beyond this, frequent substance use in early adolescence increased the risk of repeatedly being diagnosed with substance use disorders between early and middle adulthood by 276%.¹

Youth with strong principles were less likely to misuse alcohol or cannabis.

Surveys have also identified individual characteristics that *protect* young people from problematic substance use. Youth with strong principles, such as valuing being honest even if it leads to punishment, were less likely to misuse alcohol or cannabis.⁷ Further, youth with high self-esteem were less likely to use cannabis or cocaine or to engage in binge drinking.¹¹ And “individual” circumstances are also inextricably linked with larger societal and family factors that influence child development. For example, parents can help young people choose healthier peer groups and can encourage the development of children's ethics and self-esteem.

Building on the research

Research on risk and protective factors can inform prevention programs that aim to reduce problematic substance use and to build strengths for youth who are coping with adversity. In the [Review article](#) that follows, we describe five such interventions and their outcomes. 🙌



Knowledge about protective factors can be used to help build strengths for youth.

Helping youth who are coping with challenges

What works to prevent problematic substance use for youth who are coping with challenging circumstances? To answer this question, we conducted a systematic review to identify the most effective programs. We built quality assessment into our inclusion criteria to ensure that we reported on the best available research. This included requiring studies to use randomized controlled trial (RCT) evaluation methods and to assess outcomes at least one year after the intervention ended. Our Methods section gives more details on our search strategy and inclusion criteria.

We retrieved and evaluated 82 studies published in the past 10 years. Six RCTs met our inclusion criteria, evaluating five prevention programs: Brief Intervention, CHAT, Middle School Success, Preventure (two RCTs), and Strengthening Families.^{12–19} Each program focused on factors known to put youth at risk for problematic substance use.^{10, 20} But specific circumstances varied across the studies, encompassing early substance use, socio-economic disadvantage, child maltreatment and mental health symptoms, including depression and attention-deficit/hyperactivity disorder (ADHD).^{12–19}



Schools can play an important role in preventing substance use problems.

What did the programs entail?

Brief Intervention reached out to American youth who had used cannabis in the past year. This single-session intervention used motivational interviewing techniques, including discussing the pros and cons of substance use and supporting youth to deal with peer pressure and negative emotions.¹² The intervention was delivered either by a therapist or by computer. Control youth received a brochure outlining the warning signs of cannabis problems and listing community resources.

CHAT was delivered to socio-economically disadvantaged American youth who were engaging in risky alcohol use. It consisted of a single session using motivational interviewing techniques, including education on typical adolescent substance use and discussion on the pros and cons of substance use and making healthy choices in risky situations.¹³ Control youth received a brochure reviewing the effects of substance use, preparing youth for risky situations and listing community resources.

Middle School Success was offered to American girls in foster care. The girls took part in six group sessions focused on increasing their social skills and self-confidence and decreasing their involvement with peers engaged in challenging behaviours.¹⁴ Girls then had up to 40 individual coaching sessions focused on encouraging positive peer relationships, increasing their sense of competence and understanding the risks of substance use. Caregivers also received up to 46 group sessions focused on developing and implementing

Problematic substance use has profound developmental and other costs for young people, their families and society.

a reinforcement program to encourage positive behaviours for the girls in home, school and community settings. Control youth received typical services for youth in foster care.¹⁴

Prevention, delivered in schools, involved English youth with mental health symptoms such as hopelessness, anxiety, impulsivity or sensation seeking.¹⁵ The program consisted of two 90-minute group sessions delivered by school staff such as teachers, counsellors and educational specialists.^{15, 17-18} Both Prevention evaluations began with a goal-setting exercise to increase motivation for change.^{15, 18} Education was then provided to discourage young people from engaging in behaviours such as aggression, risk-taking, or problematic substance use, depending on their specific risk profile.^{15, 18} Cognitive-behavioural therapy techniques were also used to encourage youth to challenge cognitive distortions that can lead to problematic behaviours.^{15, 18} Control youth received a standard drug education curriculum.^{15, 18}

Enhancing cultural relevance

To better serve Indigenous youth, a group of researchers set out to adapt the Strengthening Families program to make it more culturally relevant.²¹ The program was renamed Bii-Zin-Da-De-Dah (or Listening to One Another to Grow Strong) and was modified and implemented across four culturally-distinct First Nations communities in Canada. Because of the diversity across the communities — located in BC, Manitoba, Ontario and Quebec — each added content consistent with its own traditions, values and needs.²¹ Adaptations included new material on promoting mental health and preventing adolescent suicide, while retaining core program elements.²² Based on preliminary data, the program was well received, with community members asking to participate and with positive attendance and graduation rates.²² This project shows that interventions can be meaningfully adapted for Indigenous youth by engaging with their communities.

Finally, Strengthening Families was delivered to socio-economically disadvantaged German families. Seven core and four booster sessions focused on establishing family rules, encouraging consistent and affectionate parenting, and building children’s self-efficacy and ability to cope with stress and peer pressure.¹⁹ All sessions began with separate groups for parents and youth and ended with the groups together.¹⁹ Control families received a two-hour parenting program.¹⁹ (The accompanying sidebar highlights an adapted version of Strengthening Families developed with four Indigenous communities, including one in BC.) Table 1 provides more details on these five programs and their evaluations.

Program	Risk factors	Ages (Years)
		Country
		Sample size
Brief Intervention: 1 individual youth session using motivational interviewing ¹²	Youth cannabis use in the past year	12–18
		United States
		328
CHAT: 1 individual youth session using motivational interviewing ¹³	Family socio-economic disadvantage and youth at risk for alcohol use problems	12–18
		United States
		294
Middle School Success: 6 group child sessions followed by up to 40 individual child sessions using skills training + up to 46 group caregiver sessions using parent training ¹⁴	Youth in foster care	10–12
		United States
		100
Prevention I: 2 group youth sessions using education, motivation enhancement + cognitive-behavioural therapy ¹⁵⁻¹⁶	Youth with elevated levels of hopelessness, anxiety, impulsivity or sensation seeking	13–16
		United Kingdom
		732
Prevention II: As above ¹⁷⁻¹⁸	As above	13–14
		United Kingdom
		1,210
Strengthening Families: 11 group family sessions using youth skills training + parent training ¹⁹	Family socio-economic disadvantage	11–13
		Germany
		292

How effective were these programs?

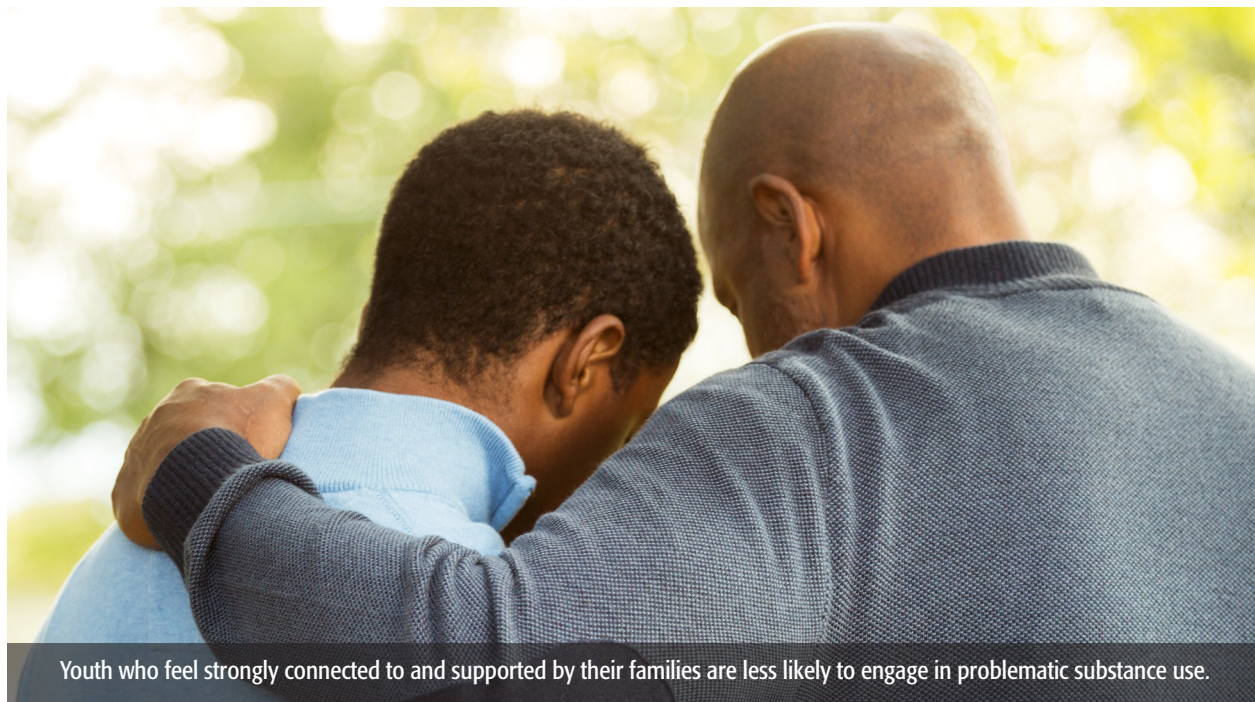
Brief Intervention, delivered to youth who used cannabis within the past year, made no significant difference in the frequency of alcohol, cannabis or other drug use by the one-year follow-up, whether the program was delivered by practitioner or computer.¹² As well, at final follow-up, this single-session intervention had no impact on problems related to cannabis use, such as missing out on other experiences because of money spent on cannabis or driving while under the influence of cannabis.¹²

In contrast, the single-session CHAT program, delivered to disadvantaged youth with risky alcohol use, reduced negative consequences of both alcohol and cannabis use by the one-year follow-up.¹³ For example, youth were significantly less likely to report doing something they regretted because of drinking or having trouble concentrating due to cannabis use. Yet despite reducing these negative consequences, CHAT did not significantly reduce the frequency of alcohol or cannabis use, the frequency of binge drinking, or the amount of alcohol or cannabis used.¹³

Middle School Success, the multi-session program delivered to girls in foster care and their caregivers, succeeded at reducing cannabis use.¹⁴ Specifically, the program reduced the frequency of use at the two-year follow-up, with a moderate effect size (Cohen's $d = 0.57$).¹⁴ However, the program had no impact on alcohol use during this same follow-up period.

The brief, school-based Preventure program was tested in two trials, delivered to youth with mental health symptoms in both cases. In the first trial, at the two-year follow-up, intervention youth had fewer symptoms of problem drinking, with a small effect size ($d = 0.22$). But there were no improvements in either the quantity and frequency of drinking or in the frequency of binge drinking.¹⁶ That said, for substances other than alcohol, Preventure youth used fewer types and used less frequently during the two-year follow-up, also with small effect sizes ($d = 0.18$ and $d = 0.25$, respectively).¹⁵ Researchers also examined Preventure's effectiveness in stopping the onset of drug use in youth who reported never using substances prior to the first RCT. In this subsample, Preventure youth had significantly lower odds of trying cocaine during the two-year follow-up (odds ratio = 0.2). They also had half the odds of trying any drug other than marijuana during this same follow-up period.¹⁵ Preventure made no difference, however, in the likelihood of marijuana use in this subsample.¹⁵

Even though many young people experiment with alcohol or cannabis, most do not develop problematic use.



Youth who feel strongly connected to and supported by their families are less likely to engage in problematic substance use.

In the second Preventure trial, during two-year follow-up, intervention youth had fewer problem drinking symptoms than control youth.¹⁷ Specifically, Preventure youth had significantly lower odds of endorsing symptoms of problematic alcohol use (odds ratio = 0.71). Also during this same follow-up period, Preventure youth were less likely than control youth to report binge drinking and less likely to report consuming alcohol.¹⁷ However, the two groups showed no difference in the frequency of alcohol use.¹⁷ As well, there were no differences between the groups for cannabis use, including any use or frequency of use during the final follow-up.¹⁸

Strengthening Families involved multiple sessions delivered to socio-economically disadvantaged youth and their parents. The trial assessed abstinence from of *any* alcohol or cannabis during the 1½ years after the intervention ended, and it found no significant differences between intervention and control youth.¹⁹ Table 2 summarizes the outcomes for all five programs.

Table 2: Substance Use Prevention Outcomes			
Program	Follow-up	Outcomes	
Brief Intervention ¹²	1 year	<ul style="list-style-type: none"> ⊘ Alcohol use frequency ⊘ Cannabis use related problems ⊘ Cannabis use prior to driving ⊘ Cannabis use frequency ⊘ Drug use frequency (other than cannabis) 	
CHAT ¹³	1 year	<ul style="list-style-type: none"> ↓ Alcohol use negative consequences ⊘ Alcohol use quantity ⊘ Alcohol use frequency ⊘ Binge drinking frequency ↓ Cannabis use negative consequences ⊘ Cannabis use quantity ⊘ Cannabis use frequency 	
Middle School Success ¹⁴	2 years	<ul style="list-style-type: none"> ⊘ Alcohol use frequency ↓ Cannabis use frequency 	
Preventure I ^{*15–16}	2 years	All youth <ul style="list-style-type: none"> ↓ Alcohol use problems ⊘ Alcohol use quantity + frequency ⊘ Binge drinking frequency ↓ Drug use frequency ↓ Number of drugs used 	Youth without prior substance use <ul style="list-style-type: none"> ⊘ Cannabis use ever ↓ Cocaine use ever ↓ Drug use ever (other than cannabis or cocaine)
Preventure II ^{17–18}	2 years	<ul style="list-style-type: none"> ↓ Alcohol use problems ↓ Alcohol use quantity ⊘ Alcohol use frequency ↓ Binge drinking frequency ⊘ Cannabis use quantity ⊘ Cannabis use frequency 	
Strengthening Families ¹⁹	1 ½ years	<ul style="list-style-type: none"> ⊘ Alcohol abstinence ⊘ Cannabis abstinence 	
<ul style="list-style-type: none"> ⊘ No statistically significant difference between intervention and control participants. ↓ Statistically significant improvements for intervention over control participants. * Study authors defined drug use as any substance other than alcohol. 			

Encouraging outcomes for prevention programs

Based on this systematic review, Preventure stood out — showing positive outcomes across two RCTs with young people who had mental health symptoms. Involving only two 90-minute group sessions delivered in schools, this program reduced not only problems associated with alcohol but also binge drinking and the

amounts consumed. The program also reduced the frequency and the number of other substances consumed. As well, youth who had never used substances prior to the program were less likely to try any drugs other than cannabis. (Our sidebar describes a BC community's successful efforts in delivering Preventure in local high schools.)

The single-session CHAT program focused on disadvantaged youth engaging in risky alcohol use. It resulted in fewer negative consequences from not only alcohol but also cannabis use.

The third successful program, Middle School Success, focused on girls in foster care and their caregivers. It was more intensive — providing six group sessions coupled with up to 40 individual sessions for girls and up to 46 sessions for caregivers. The program proved effective at reducing the frequency of cannabis use.

The two other programs failed to significantly reduce substance use. One-session Brief Intervention was delivered to youth who had consumed cannabis in the past year. But during follow-up, *both* intervention and control youth reduced their cannabis use (from two to three days per month to one day per month or less, on average).¹² It is possible that these findings were due to the low substance use threshold for participating in the study, meaning that the youth were at lower risk.

Strengthening Families, meanwhile, involved 11 sessions with disadvantaged families — both children and parents. But it failed to increase alcohol or cannabis abstinence. Across both intervention and control groups, approximately 55% of youth drank alcohol and approximately 30% used cannabis during the 18-month follow-up period.¹⁹ These findings may reflect the fact that abstinence was the only outcome indicator measured. Alcohol use is common, as is occasional cannabis use, for many young people in North America and Europe, so this measure may not be realistic.²³ When Strengthening Families was delivered universally to Swedish students, it also failed to reduce drunkenness or other substance use. However, when the program was delivered universally to American students, although it did not reduce alcohol-related problems or other substance use, it did significantly reduce polysubstance use and episodes of drunkenness at nine-year follow-up.

Bringing Preventure to BC

Roughly three years ago, Vernon high-school staff decided there was enough evidence to invest in the Preventure program.²⁴ They began by delivering Preventure to at-risk Grade 8 students in three schools. Early results showed that students had reduced levels of problematic alcohol and cannabis in schools that offered the program, compared with those in schools that did not. The program has now been expanded to all five high schools in the region.

Implications for practice and policy

The results of our systematic review suggest five recommendations for practitioners and policy-makers.

- **Consider underlying factors.** While targeted prevention efforts should include youth with early substance use, other underlying factors should also be considered and addressed. For example, Preventure focused on youth with mental health symptoms (depression and ADHD), while Middle School Success focused on youth who had been maltreated and were in foster care.
- **Weigh the value of short programs.** Two interventions with beneficial outcomes, CHAT and Preventure, involved only one or two sessions. These findings indicate that for some youth — even those coping with challenges such as socio-economic disadvantage and mental health symptoms — very brief formats may curtail problematic substance use.
- **Tailor interventions to the level of adversity.** Some youth have experienced very serious adversities, such as child maltreatment necessitating foster care, and may require more intensive interventions. For example, Middle School Success successfully reduced cannabis use for girls who had been in foster care for extended periods and who had experienced changes in placement.¹⁴

- **Recognize the value of school-based delivery.** In a [previous Quarterly](#), we described schools as a good venue for delivering universal interventions to prevent substance use. Based on this review, schools can also be a good venue for targeted prevention programs, given the success of Preventure. This program was also successfully delivered in only two sessions, making it feasible for schools.
- **Address youth substance use with a comprehensive strategy.** Targeted prevention programs are important in reducing problematic substance use, and these programs need to be implemented within a comprehensive public health strategy. Such a strategy needs to include addressing social determinants such as family socio-economic disadvantage that can contribute to substance problems for young people; providing effective [universal prevention programs](#); and providing effective [treatment programs](#) for all youth with substance use disorders. (See previous *Quarterly* issues for more information on universal prevention and on treatment.) As well, as detailed in the sidebar that follows, programs aimed at preventing other mental health concerns may also have a substantial impact on adolescent substance use.

Problematic substance use has profound developmental and other costs for young people, their families and society. Yet even though many young people experiment with alcohol or cannabis, most do not develop problematic use.²⁰ For those whose use does escalate, effective interventions need to be offered to reduce the associated harms and to address underlying risk factors. Our findings suggest that practitioners and policy-makers have several good options for achieving these goals — starting with Preventure, CHAT and Middle School Success. 🙌

Unintended positive consequences of prevention

Some prevention programs may exceed original expectations. During our searches, we found three programs that reduced substance use even though they were originally designed to prevent other mental health problems. [Fast Track](#) focused on disadvantaged children, aiming to prevent conduct problems. The program started in kindergarten, delivering social skills training to children; it also delivered a parenting intervention over a 10-year period.²⁵ In addition to reducing youth criminal behaviours at eight-year follow-up, Fast Track also reduced problematic substance use in general and alcohol misuse in particular.²⁵

Similarly, the Montreal Prevention Program aimed to reduce behaviour problems with disadvantaged seven-year-old boys, teaching social skills and problem-solving over two school years.²⁶ The program reduced the number of drugs the boys tried when they were between 14 and 17 years old.²⁶ As well, a cognitive-behavioural therapy (CBT) program designed to prevent adolescent depression in those at risk achieved this goal and more. CBT also significantly reduced substance use two years after the program ended.²⁷

These findings suggest that it is possible to prevent substance use by addressing other social and emotional concerns. They also suggest that unintended positive consequences can accrue many years later, for example, in the cases of Fast Track and the Montreal Prevention Program.

METHODS

We use systematic review methods adapted from the *Cochrane Collaboration* and *Evidence-Based Mental Health*. We build quality assessment into our inclusion criteria to ensure that we report on the best available research evidence — requiring that intervention studies use randomized controlled trial (RCT) evaluation methods and also meet additional quality indicators. For this review, we searched for RCTs on preventing problematic substance use in at-risk youth. Table 3 outlines our database search strategy.

Table 3: Search Strategy	
Sources	• Campbell, Cochrane, CINAHL, ERIC, Medline and PsycINFO
Search Terms	• Substance-related disorder, substance abuse, substance use, drug abuse or addiction <i>and</i> prevention or intervention
Limits	• Peer-reviewed articles published in English between 2009 and 2019 • Pertaining to children aged 18 years or younger • Systematic review, meta-analysis or RCT methods used

To identify additional RCTs, we also hand-searched reference lists from previous Children’s Health Policy Centre publications. Using this approach, we identified 82 RCTs. Two team members then independently assessed each RCT, applying the inclusion criteria outlined in Table 4.

Table 4: Inclusion Criteria for RCTs
<ul style="list-style-type: none">• Participants were randomly assigned to intervention and comparison groups (i.e., no or only minimal intervention)• Studies provided clear descriptions of participant characteristics, settings and interventions• Interventions aimed to prevent problematic substance use among at-risk youth• Interventions were evaluated in settings that were applicable to Canadian policy and practice• Follow-up was 12 months or more (from the end of the intervention)• Attrition rates were 20% or less at final assessment and/or intention-to-treat analysis was used• Child outcome indicators included (self-reported) alcohol and drug use, assessed at follow-up• Studies reported levels of statistical significance for primary outcome measures

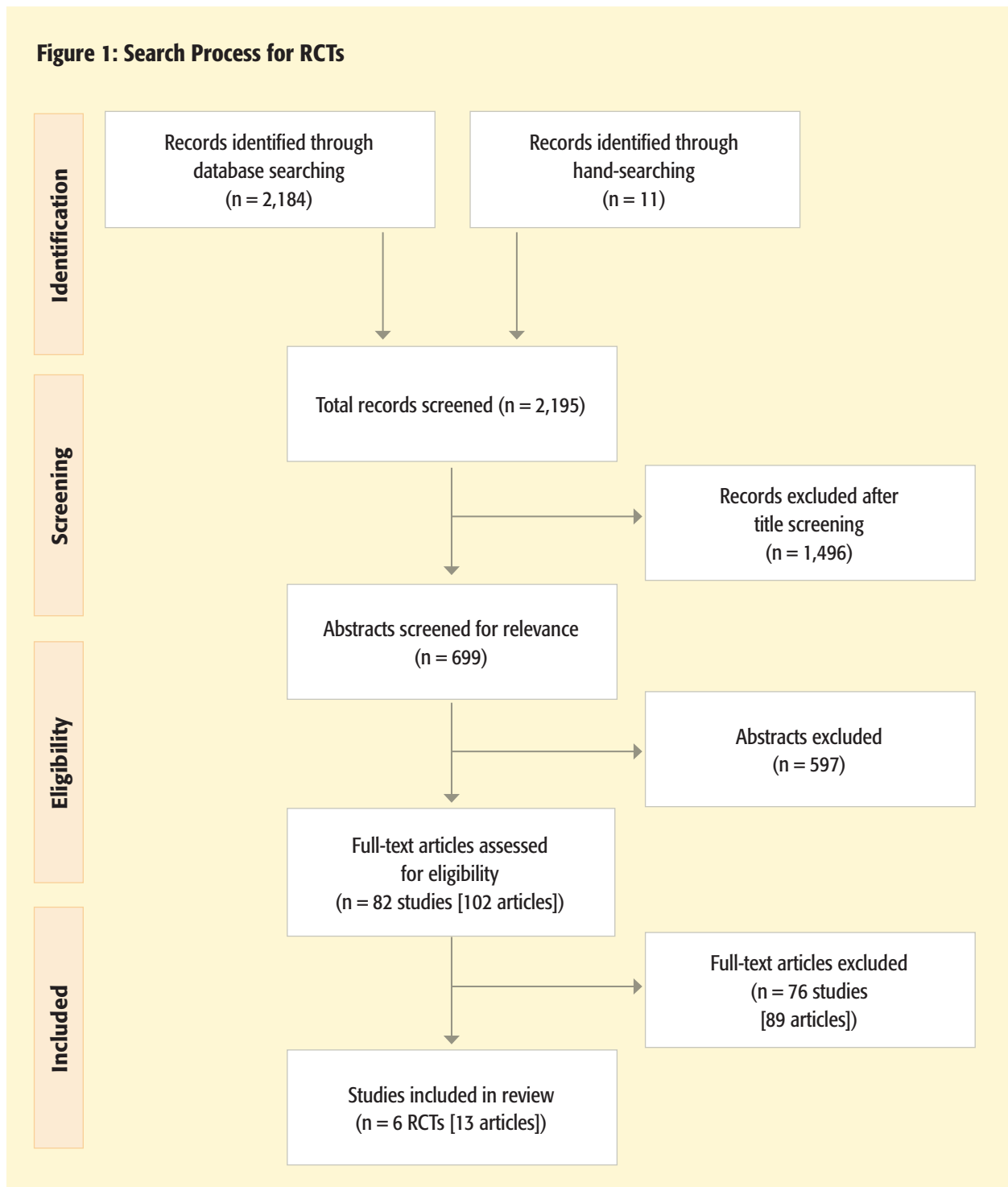
Six RCTs met all the inclusion criteria. Figure 1, adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), depicts our search process. Data from these studies were then extracted, summarized and verified by two or more team members. Throughout our process, any differences between team members were resolved by consensus. 🤝

For more information on our research methods, please contact

Jen Barican, chpc_quarterly@sfu.ca

Children’s Health Policy Centre, Faculty of Health Sciences

Simon Fraser University, Room 2435, 515 West Hastings St. Vancouver, BC V6B 5K3

Figure 1: Search Process for RCTs

RESEARCH TERMS EXPLAINED

To best help children, practitioners and policy-makers need good evidence about whether a given intervention works. **Randomized controlled trials** (RCTs) are the gold standard for assessing whether an intervention is effective. In RCTs, children are randomly assigned to the intervention group or to a comparison or control group. By randomizing participants — that is, giving every child an equal likelihood of being assigned to a given group — researchers can help ensure the only difference between the groups is the intervention. This process provides confidence that benefits are due to the intervention rather than to chance or other factors.

Then, to determine whether the intervention actually provides benefits, researchers analyze salient child outcomes. If an outcome is found to be **statistically significant**, it helps provide certainty the intervention was effective rather than it appearing that way due to random error. In the studies we reviewed, researchers set a value enabling at least 95% confidence that the observed results are real.

Once an intervention has been found to have statistically significant benefits, it is helpful to quantify how much difference it made, or the **effect size**. Beyond identifying that the intervention works, effect size shows whether the intervention made a clinically meaningful difference in children's lives or not. The effect size measures reported in this issue included **Cohen's d** and **odds ratio** (OR). Values for Cohen's d , also known as d , can range from 0 to 2. Standard interpretations are 0.2 = small effect; 0.5 = medium effect; and 0.8 = large effect. An odds ratio indicates the chances of a given outcome occurring. For example, an OR of 0.5 indicates that intervention youth had half the odds of using a given substance compared to control youth. 🙌

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BC government staff can access original articles from [BC's Health and Human Services Library](#). Articles marked with an asterisk (*) include randomized controlled trial data that was featured in our Review article.

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