CHILDREN'S MENTAL HEALTH RESEARCH

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Treating substance misuse in young people

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Children's Health Policy Centre

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.

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.*

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This Issue

NEXT ISSUE

Preventing child maltreatment

Maltreatment is a common and avoidable form of childhood adversity. We identify interventions that can prevent this experience.

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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Errata Earlier copies of this publication contained two errors, which have now been corrected:

- Table 2 incorrectly identified the ages of participants in an evaluation of Multidimensional Family Therapy. The correct ages are 13–18 years.
- Table 5 incorrectly identified the number of substance use problems for young people who had participated in Multidimensional Family Therapy vs. CBT III as increasing at 8¼-month follow-up. In fact, those problems decreased.

OVERVIEW

When use goes beyond experimentation

Young people commonly experiment with substances such as alcohol and cannabis.[1] Still, for the vast majority, experimentation does not lead to problematic use. In fact, at any given time, only an estimated 2.4% of Canadian youth use alcohol or drugs at a level that qualifies for a substance use disorder diagnosis — with alcohol and cannabis problems being the most common.[2] Table 1 describes the diagnostic criteria used to identify substance use disorders in young people.[3]

Understanding what puts young people at risk can help prevent substance use disorders or prevent them from getting worse.

Table 1: Diagnostic Criteria for Substance Use Disorders

A substance use disorder is defined as experiencing at least two of the following symptoms during a one-year period, leading to significant impairment.

- Using the substance in larger amounts or over a longer period of time than was intended
- Having a persistent desire to use less, or making repeated unsuccessful attempts to use less
- Spending a lot of time obtaining the substance or using it or recovering from its effects
- Having cravings for the substance
- Using in ways that result in failure to meet major obligations at home, at school or in the community
- Using despite having social problems as a result
- Reducing or giving up important social, school or recreational activities because of substance use
- Using the substance repeatedly in situations that are dangerous
- Using the substance despite knowing it is causing or worsening physical or mental health problems
- Developing tolerance, e.g., needing more to achieve the same effect, or having reduced effects with the same amounts
- Developing withdrawal symptoms or using the substance to relieve or avoid these symptoms

Source: Adapted from the *Diagnostic and Statistical Manual of Mental Disorders: DSM-5* (2013).

Why focus on risk?

Understanding what puts young people at risk can help prevent substance use disorders or prevent them from getting worse. To this end, researchers have studied a number of risk factors — by following large, representative groups of children over time. While these kinds of longitudinal surveys cannot establish causation, they can nevertheless point to risks that can be modified, in turn informing interventions. We identified four such child surveys from Canada, New Zealand and the United States, reporting on the risk factors they identified that may be amenable to change.

Different countries, similar adversities

The Canadian survey followed nearly 4,000 residents of Quebec from kindergarten onwards. Researchers examined a range of substances in this study. It found two modifiable factors that predicted who would get a substance use disorder diagnosis in early adulthood, namely family adversity and child behaviour.[4] Family adversity when children were in kindergarten was significantly associated with later cocaine use disorders. (Adversity included challenges such as low parental education or occupational status, young parental age and "non-intact family structure.") The impact of family adversity was large, with affected children experiencing more than five times the odds of later being diagnosed with cocaine use disorder. The second modifiable factor was child behaviour. Children with symptoms of oppositional defiant disorder at any time between ages six and 12 were significantly more likely to develop cannabis and cocaine use disorders as young adults. The impact was large here as well, with affected children experiencing more than two times the odds of later being diagnosed with either of these disorders.[4]

Researchers in New Zealand identified similar modifiable risk factors for "persistent" substance use disorders after following more than 1,000 children from ages three to 38.[5] To be deemed as having a "persistent" disorder, participants had to meet diagnostic criteria for substance dependence at multiple points during the study. Two kinds of childhood adversity were predictive — family socio-economic disadvantage (based on parental occupational levels over the first 15 years of the child's life) and child maltreatment (at any time between ages three and 11). Maltreatment included maternal rejection, harsh discipline or physical abuse, two or more changes in primary caregiver, and/or sexual abuse. Children who experienced family socio-economic disadvantage had an 80% increase in risk for being diagnosed with a persistent substance use disorder, while those who experienced child maltreatment had a 62% increase in risk. This survey also identified one important risk factor that emerged in adolescence. Frequent drug and alcohol use in early adolescence and mid-adolescence increased the risk for later "persistent" substance use diagnoses by 276%.[5]

Children who experienced family socio-economic disadvantage had an 80% increase in risk for being diagnosed with a persistent substance use disorder.

One of the two American studies, meanwhile, followed from birth more than 1,000 Minnesotan children, all twins, to identify risk factors at age 17 that predicted alcohol use disorder by age 29.[6] Once again, family adversity emerged as a risk factor — including family socio-economic disadvantage, negative parent-child relationships, and parental behaviour symptoms. Women who had experienced these forms of adversity had 1.5 times the odds of being diagnosed with alcohol use disorder, while men had 1.6 times the odds. Beyond family adversity, serious behaviour problems in late adolescence also increased the likelihood for an alcohol use diagnosis, approximately doubling the odds. Having peers with behaviour problems was an added risk factor, leading to women having 2.1 times the odds and men having 1.4 times the odds of receiving an alcohol use diagnosis. Heavy alcohol and drug use at age 17 were other risk factors for an alcohol use disorder, with between 1.8 and 4.3 times the odds, depending on sex and substance type. Finally, depressive symptoms at age 17 predicted later alcohol use disorder, but only for females — who had 1.6 times the odds of receiving this diagnosis.[6]

The fourth study, also American, involved researchers following more than 1,400 children from North Carolina for up to 12 years, investigating how family income supplements might influence child outcomes.[7] The supplements were provided to Indigenous families, starting partway through the study, and were sufficient to move many families out of poverty — while allowing comparisons to families not receiving supplements. Increased family income was associated with significantly reduced odds of young people later receiving any substance use diagnosis, or receiving alcohol or cannabis diagnoses more specifically.[7] For cannabis in

particular, serious behaviour issues between ages nine and 16 were a modifiable risk factor for problematic use in early adulthood, independent of family income.[8] Similarly, early use of tobacco, alcohol and illegal drugs each predicted problematic cannabis use in early adulthood.[8]

Addressing avoidable early adversities

These four surveys point to ways of preventing young people from developing substance use disorders — by addressing avoidable early adversities such as family socio-economic disadvantage and child maltreatment. The North Carolina study shows how socio-economic disadvantage may be addressed by providing families with income supplements that lift them out of poverty.[7] Parenting programs can also avert childhood maltreatment, as highlighted in our Spring 2009 issue.

Serious behaviour problems in late adolescence also increased the likelihood for an alcohol use diagnosis, approximately doubling the odds.

Some of the secondary effects of childhood adversities can also be addressed. Child behaviour problems can be prevented with parenting programs, as highlighted in our Fall 2015 issue. Youth depression can also be prevented with Cognitive-Behavioural Therapy, as highlighted in our Summer 2017 issue. And substance use in the teen years can be reduced with universal school prevention programs, as highlighted in our Winter 2018 issue.

Yet even if effective early interventions were made widely available, some young people would still go on to use substances in harmful ways. Effective treatments therefore need to be made readily available as well. In the Review article that follows, we identify recent research evidence on these treatments.

What about Indigenous youth?

To learn more about Indigenous youth in Canada, the First Nations Information Governance Centre, a non-profit organization operating under a mandate from the Assembly of First Nations, conducted a survey. The survey examined multiple indicators of health and well-being for Indigenous people living on-reserve and in northern communities.[9] As part of this work, nearly 5,000 youth (aged 12 to 17) from 253 communities across the country were asked about their experiences with substance use. More than 70% of youth reported consuming no alcohol or street drugs in the past year. Among the street drugs, cannabis was the most common choice, used by 27.2% (compared with 2.3% for hallucinogens, 2% for cocaine, 1.1% for ecstasy, and less than 1% for stimulants and inhalants).

These findings parallel those from an earlier survey conducted in BC by the First Nations Health Authority.[10] For this survey, researchers canvassed 437 youth from 36 on-reserve and other communities across the province. More than 60% of youth (aged 12 to 17) reported consuming no alcohol in the past year. Similarly, nearly 70% reported using no street drugs in the past year.

Despite the legacies of colonialism and racism, including residential schools and ongoing socio-economic disadvantage for many, the findings from these two surveys suggest resilience and strength in First Nations youth. These surveys also suggest that the percentage of Indigenous youth who are struggling with substance use is limited. To meet the needs of these young people, the First Nations Information Governance Centre calls for interventions that encompass a comprehensive model involving physical, emotional, spiritual and mental well-being.[9] To promote well-being for young people, the authors also emphasize the importance of strong connections with communities and with families.[9]

REVIEW

Effective treatments for youth substance use disorders

Youth who develop substance use disorders need to receive effective treatments. And to ensure good care for these young people, practitioners and policy-makers need to know what works. To identify effective treatments, we therefore conducted a systematic review, updating and building on findings presented in our Summer 2010 issue.

CBT, Multidimensional Family Therapy and Motivational Interventions all have strong evidence of effectiveness.

Building on approaches that work

Our Summer 2010 issue identified three effective treatment categories: Cognitive-Behavioural Therapy (CBT), Ecological Family Therapies, and Motivational Interventions.[11]

- CBT involved teaching youth to modify their thinking and behaviour. Techniques included identifying triggers for substance use and engaging in activities that discouraged use, for example, spending time with peers who did not use.
- Ecological Family Therapies included different specific therapies that targeted substance use in the context of relationships with families, schools and peers. These interventions included Ecologically Based Family Therapy, Multidimensional Family Therapy and Multisystemic Therapy (MST).
- Motivational Interventions involved brief therapies aimed at building on the youth's own motivation to reduce their substance use, helping them to then change their behaviour. The specific therapies included Brief Motivational Intervention and Motivational Enhancement Therapy.

There are many effective community-based treatments for substance use disorders, so practitioners should choose one that most suits the young person.

Evaluating new evidence

Building on this earlier review, we searched for new randomized controlled trials (RCTs) evaluating adolescent substance use interventions published in the past 10 years. We built quality assessment into our inclusion criteria to ensure that we reported only on the best available evidence. Specifically, studies had to use a control group, receiving either no treatment or treatment-as-usual, to rule out other factors that could account for benefits, such as the passage of time. We also accepted head-to-head trials — designed to directly compare the effectiveness of two or more treatments — provided at least one of the treatments had already been established as effective. Treatments that could be classified as CBT, Ecological Family Therapies and/or Motivational Interventions were all included. (Please see our Methods for further details on our search strategy and inclusion criteria.)

We retrieved and assessed 104 studies; of these, eight RCTs met our inclusion criteria. These RCTs evaluated nine different therapies, or combinations of therapies, all delivered in outpatient clinics or homes. None evaluated interventions delivered in residential treatment centres. Youth in these trials were recruited from various settings, including the youth justice system in some cases. Two RCTs tested interventions using a control group, and the other six RCTs involved head-to-head comparisons.

Treatment trials with control groups

Both RCTs that used control groups focused on cannabis. One RCT assessed Adolescent Cannabis Check-Up, which used a combination of CBT and Motivational Enhancement Therapy techniques — compared with no-treatment controls.[12] The other RCT assessed Multidimensional Family Therapy, compared with control participants who received treatment-as-usual.[13] Table 2 provides more information on these two interventions and their associated RCTs.

Table 2: Treatment Trials with Control Groups

Treatment	Substance targeted	Approach	Sample size	Child ages (Country)
Adolescent Cannabis Check-Up[12]	Cannabis	2 youth sessions over 2 weeks	40	14–19 years (Australia)
Multidimensional Family Therapy[13]	Cannabis	52 youth + parent + family sessions over 6 months	450	13–18 years (5 European countries)

Head-to-head treatment trials

The remaining interventions were evaluated in six head-to-head trials, including Case Management, CBT, CBT plus Motivational Interviewing, Community Reinforcement, Ecologically Based Family Therapy, Motivational Enhancement Therapy, Motivational Interviewing and Multidimensional Family Therapy. These treatments are described below (with the exception of CBT, which was described previously; please see page 6).

Case Management involved paraprofessionals linking youth to community resources, including housing and health care, using a strengths-based approach; this was the only intervention that was not delivered by practitioners.[14] Community Reinforcement used behavioural techniques such as identifying triggers, consequences and alternatives to substance use; the intervention also taught communication and problem-solving skills.[14–15] Ecologically Based Family Therapy focused on changing family interactions that were inadvertently supporting problematic substance use.[15] Motivational Interviewing (both alone and adjunctively with CBT) and Motivational Enhancement Therapy involved practitioners expressing empathy, while supporting youth to have self-efficacy and to increase their motivation and capability to reduce their using.[14–16] (We classified both therapies as falling into the category of Motivational Interventions.)[14] Multidimensional Family Therapy, meanwhile, entailed teaching skills such as relapse prevention, family communication, problem-solving and parenting.[17]

Providing community-based programs to all youth in need early on can also prevent the need for more costly and disruptive residential care.

For these six head-to-head trials, detailed in Table 3, five did not limit involvement by type of substance used. Only one — Multidimensional Family Therapy II compared to CBT — focused exclusively on cannabis.[18] Notably, youth involved in these head-to-head trials faced challenges that went well beyond substances. For example, many were involved in the justice system and some had experienced unstable housing.[14–19] Table 3 provides more information on these interventions and their associated RCTs.

Table 3: Head-to-Head Treatment Trials

Treatment	Substances targeted	Approach	Sample size	Child ages (Country)
Multidimensional Family Therapy I[17]	All	17–26 family + 17–26 youth + parent sessions over 4–6 months	224	12–17 years (United States)
Cognitive Behavioural Therapy (CBT)		15–24 youth + 2 family sessions over 4–6 months		
Multidimensional Family Therapy II[18]	Cannabis	43–52 youth, parent + family sessions over 5–6 months*	109	13–18 years (The Netherlands)
CBT		21–26 youth sessions + 5–6 parent sessions over 5–6 months		
Multidimensional Family Therapy III[19]	All	24–32 youth, parent + family sessions over 3–4 months	83	11–15 years (United States)
CBT		24–32 group youth sessions over 3–4 months		
Multidimensional Family Therapy IV[16]	All	34–52 youth, parent + family sessions over 4–6 months	112	13–18 years (United States)
CBT + Motivational Interviewing		52–78 group youth sessions over 4–6 months		
Motivational Interviewing[15]	All	4 youth sessions over 6 months	179	12–17 years (United States)
Community Reinforcement		14 youth sessions over 6 months		
Ecologically Based Family Therapy		14 family sessions over 6 months		
Motivational Enhancement Therapy[14]	All	2 youth sessions over 6 months	270	14–20 years (United States)
Community Reinforcement		12 youth sessions over 6 months		
Case Management		12 youth sessions over 6 months		

* Practitioners also provided sessions or had contact with school, court and other (unspecified) individuals.

Outcomes for treatment trials with control groups

Both interventions assessed in these trials revealed benefits. Adolescent Cannabis Check-Up resulted in teens reporting significantly fewer cannabis use disorder symptoms at three-month follow-up. This outcome was also clinically meaningful as demonstrated by its moderate effect size (Cohen's d = 0.70). Treatment youth also reported fewer days of cannabis use and less overall use, with moderate and small effect sizes, respectively (d = 0.71 and d = 0.22).[12]

Adolescence is the optimal time to intervene to avert far more serious problems later on.

Similarly, Multidimensional Family Therapy resulted in teens reporting significantly fewer cannabis use disorder symptoms at six-month follow-up.[13] The effect size for this outcome was large (d = 1.66). Still, there were no differences in diagnoses or days of cannabis use between intervention and control groups.[13] Table 4 details the outcomes for these two RCTs.

Table 4: Outcomes for Treatment Trials with Control Groups

Treatment	Follow-up	Child outcomes
Adolescent Cannabis Check-Up[12]	3 months	↓ Symptoms of cannabis use disorder ↓ Days of cannabis use ↓ Quantity of cannabis use
Multidimensional Family Therapy[13]	6 months	↓ Symptoms of cannabis use disorder ^{NS} Cannabis use disorder diagnoses ^{NS} Days of cannabis use

↓ Statistically significant reductions for treatment group over comparison group.
^{NS} No significant difference between treatment and comparison group.

Outcomes for head-to-head treatment trials

Among the six head-to-head evaluations, two compared Multidimensional Family Therapy and individual CBT. In the first of these trials, both interventions showed statistically significant benefits on two of five substance use outcomes at one-year follow-up. These benefits were decreases in substance use severity overall and decreases in frequency of cannabis use.[17] Compared with CBT, Multidimensional Family Therapy also led to reduced severity of problematic substance use and to fewer days of using substances other than alcohol or cannabis, with moderate and small effect sizes (d = 0.59 and d = 0.32, respectively). As well, significantly more Multidimensional Family Therapy youth reported abstaining from using all substances during one-year follow-up, compared with those receiving CBT.

In the second RCT comparing Multidimensional Family Therapy to individual CBT, both interventions produced statistically significant reductions in the number of days of cannabis use and in the quantity of cannabis used by six-month follow-up.[18] However, there were no differences between the two treatments on these two measures, or on measures of treatment response or treatment recovery. (The authors defined "treatment response" as having at least 30% fewer cannabis-using days in the 90 days preceding final follow-up compared to baseline, with no substantial increase in other substances used. They defined "treatment recovery" as living in the community and abstaining from cannabis and other substances, but still drinking up to 5 or fewer servings of alcohol a day, despite this quantity of alcohol being problematic.) At six-month follow-up, 41.8% of Multidimensional Family Therapy youth and 44.4% of CBT youth achieved treatment response, while 14.5% and 5.6%, respectively, achieved treatment recovery.[18]

Youth substance misuse is a problem we can address.

In the third RCT, Multidimensional Family Therapy was compared to group CBT. Youth in both treatments reported significantly fewer problems due to their substance use from the start of the treatments to final follow-up of just over eight months.[19] Similarly, youth in both interventions reported increasing abstinence from all substances over the course of treatment. However, Multidimensional Family Therapy youth reported significantly fewer problems as a result of their substance use than CBT youth, with a large effect size (d = 1.36). As well, more Multidimensional Family Therapy youth reported being abstinent than CBT youth, with over double the odds of abstaining (odds ratio = 2.20). Multidimensional Family Therapy youth also reported fewer overall days of substance use than CBT youth, with a large effect size (d = 0.77).[19]

The fourth and final RCT assessing Multidimensional Family Therapy compared it to a group using a combination of CBT and Motivational Interviewing. For both interventions, youth reported fewer substance use problems by 18-month follow-up, with no significant difference between the two.[16] Similarly, for both interventions, youth reported using fewer substances overall at 18-month follow-up, also with no significant difference between the two.[16] Table 5 details all substance use outcomes for the head-to-head comparisons of Multidimensional Family Therapy and CBT.

Table 5: Outcomes for Head-to-Head Treatments

Treatment	Follow-up	Child outcomes
Multidimensional Family Therapy vs. **Cognitive Behavioural Therapy (CBT) I**[17]	1 year	**Both treatments resulted in** ↓ Substance use problem severity ↓ Days of cannabis use ^{NS} Days of alcohol use **Multidimensional Family Therapy outperformed CBT in** ↓ Substance use problem severity ↓ Days of substance use (other than alcohol + cannabis) ↑ Substance use abstinence
Multidimensional Family Therapy vs. **CBT II**[18]	6 months	**Both treatments resulted in** ↓ Days of cannabis use ↓ Quantity of cannabis use ^{NS} Treatment response ^{NS} Treatment recovery
Multidimensional Family Therapy vs. **CBT III**[19]	8¼ months	**Both treatments resulted in** ↓ Number of substance use problems ↑ Substance use abstinence **Multidimensional Family Therapy outperformed CBT in** ↓ Number of substance use problems ↓ Days of substance use ↑ Substance use abstinence
Multidimensional Family Therapy vs. **CBT + Motivational Interviewing**[16]	1½ years	**Both treatments resulted in** ↓ Number of substance use problems ↓ Number of substances used
Motivational Interviewing vs. **Community Reinforcement** vs. **Ecologically-Based Family Therapy**[15]	1½ years	**All treatments resulted in** ↓ Days of substance use
Motivational Enhancement Therapy vs. **Community Reinforcement** vs. **Case Management**[14]	6 months	**All treatments resulted in** ↓ Days of alcohol use ↓ Days of drug use

↓/↑ Statistically significant benefits for given treatments over time or for given treatment over alternative treatment.
^{NS} No statistically significant benefits for given treatments.

The remaining two of six head-to-head evaluations each compared three different treatments, as shown in Table 5, above. In the RCT evaluating Motivational Interviewing, Community Reinforcement and Ecologically Based Family Therapy, all three treatments led to statistically significant declines in days of substance use over 18-month follow-up.[15] There were no differences for this outcome across the three treatments.[15]

Similarly, in the RCT comparing Motivational Enhancement Therapy, Community Reinforcement and Case Management, all three treatments led to statistically significant declines in days of alcohol and drug use over six-month follow-up, as shown in Table 5.[14] Once again, there were no differences on either outcome across the three treatments.[14]

Implications for practice and policy

For treating youth substance misuse, findings from this and our previous reviews show that there are many effective interventions. CBT, Multidimensional Family Therapy and Motivational Interventions all have strong evidence of effectiveness, with positive outcomes from multiple RCTs. As well, Community Reinforcement, Ecologically Based Family Therapy, Adolescent Cannabis Check-Up, Case Management and Multisystemic Therapy were each successful in at least one RCT. Several recommendations emerge for practice and policy:

- *Choose the treatment that fits the youth.* There are many effective community-based treatments for substance use disorders, so practitioners should choose one that most suits the young person. For example, Multidimensional Family Therapy may be a particularly good fit where parents are able and willing to

engage. Alternatively, where youth want individual treatment or where parents cannot engage, CBT is a good option. And for youth who want briefer approaches, Motivational Interventions may be best. Young people should always have a voice in these choices.

- *Break down treatment barriers.* Many teenagers who struggle with substance use have other mental health challenges, including with behaviour. So when a young person wants help with substance use, practitioners should be prepared to address other challenges as well. Providing treatments for everything in one venue is also far better than making youth attend different practitioners at different locations. Waitlists create a further barrier for young people, so these should be avoided.
- *Give practitioners the tools to help.* Practitioners need the appropriate education and experience to provide youth with effective treatments for substance use disorders. CBT is a good place to start. Many practitioners already have considerable experience with CBT. For those who do not, short courses for mental health professionals are readily available. In contrast, training in other therapies can be far more costly. For example, the cost of certifying four practitioners (the minimum required) in Multidimensional Family Therapy is over $30,000 for the first year and approximately $10,000 per year after that, plus trainer travel costs.[20] Policy-makers can help by supporting publicly funded mental health teams to acquire the training they need.
- *Help all youth in need early on.* As with other mental health problems, all young people who struggle with substance misuse need access to effective treatments, as well as to effective prevention programs, as discussed in our previous issue. This review has provided examples of effective treatments, all of which could be adapted and provided in Canada, preferably with concomitant local evaluations. Providing community-based programs to all youth in need early on can also prevent the need for more costly and disruptive residential care, while alleviating burdens caused by substance misuse.

Substance use disorders take a tremendous toll. These disorders also typically become entrenched if effective interventions are not provided early in life. Yet we know how to treat and prevent these disorders in young people. In fact, adolescence is the optimal time to intervene to avert far more serious problems later on. Here we have outlined several treatments that have been tested in multiple RCTs and that could be feasibly offered to young people in BC. These interventions should be made readily available to all youth in need, in youth-friendly and youth-empowering formats and settings. Youth substance misuse is a problem we can address. Effective efforts to do so in turn can reduce much needless distress and avoidable harm associated with substance misuse in adulthood.

Addressing the opioid emergency

BC's Provincial Health Officer declared a public health emergency in response to overdose deaths from opioids.[21] As part of this response, some youth with opioid use disorders are being prescribed methadone or buprenorphine/naloxone (BUP/NAL; brand name Suboxone). Unfortunately, no evaluations of these treatments met the inclusion criteria for our review. We decided to present the best available evidence pertaining to youth. We identified one randomized controlled trial (RCT) evaluating BUP/NAL.[22]

This RCT included 152 young people between ages 15 and 21 who were attending community clinics in the US. Participants were randomly assigned to receive either 12 weeks of BUP/NAL (up to 24 mg/day for nine weeks, then tapered and discontinued by 12 weeks) or two weeks of BUP/NAL (up to 14 mg/day, then tapered and discontinued by two weeks). Youth in both groups also received weekly individual and group counselling for 12 weeks.[22]

Over the course of the three- to nine-month follow-up, young people who received 12 weeks of higher-dose BUP/NAL had significantly fewer opioid-positive urine tests than comparison youth.[22] As well, at nine-month follow-up, those who received 12 weeks of BUP/NAL reported significantly less opioid use in the past month than those who received the medication for just two weeks. The two groups, however, did not significantly differ regarding self-reported alcohol, marijuana, cocaine and injection drug use (types not specified) over the follow-up period. Although there were no reported serious adverse events attributed to BUP/NAL, the authors noted that the sample size was too small to draw conclusions about the drug's safety.[22] Still, electrocardiogram data found that the short-term use of BUP/NAL was *not* associated with problematic changes in heart rate.[23]

Researchers also conducted a cost analysis, including direct treatment costs as well as costs associated with other health services, crime, education and workforce participation.[24] The 12-week intervention cost more per participant than the two-week version.[24] Still, given significantly improved quality-adjusted life-years associated with the longer BUP/NAL treatment, the authors concluded that there was evidence that longer treatment provided value.[24] (BUP/NAL is covered under BC PharmaCare's Psychiatric Medications Plan.)[21]

These evaluation results provide preliminary evidence that BUP/NAL is an effective treatment for youth with opioid use disorder. However, further research is needed on BUP/NAL's long-term efficacy and safety for this population.

METHODS

We use systematic review (SR) 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 evidence — requiring that intervention studies use randomized controlled trial (RCT) methods and also meet additional quality indicators. For this review, we searched for RCTs on treating substance use disorders in young people. Table 6 outlines our database search strategy.

Table 6: Search Strategy

Sources	• Campbell, Cochrane, CINAHL, ERIC, Medline and PsycINFO
Search Terms	• Substance-related disorder, substance abuse, substance dependence, substance use, drug abuse, drug dependence or addiction *and* treatment, therapy or intervention
Limits	• Peer-reviewed articles published in English between 2007 and 2017 • 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 a published SR on outpatient behavioural treatments,[25] and from previous Children's Health Policy Centre publications. Using this approach, we identified 104 studies. Two team members then independently assessed each study, applying the inclusion criteria outlined in Table 7.

Table 7: Inclusion Criteria for RCTs

- Participants were randomly assigned to intervention and control groups (i.e., no intervention or treatment-as-usual), or to different intervention groups (i.e., head-to-head trials)
- For head-to-head trials, at least one intervention was already established as being effective according to the systematic review featured in our Summer 2010 issue
- Clear descriptions were provided of participant characteristics, settings and interventions
- Interventions aimed to treat adolescent substance use disorders
- Interventions were evaluated in settings that were applicable to Canadian policy and practice
- At study outset, most participants had a substance use disorder diagnosis
- Studies assessing continuing or after-care interventions were excluded if the initial treatment was not evaluated
- Follow-up was three months or more (from the end of the intervention)
- Attrition rates were 20% or less at follow-up and/or intention-to-treat analysis was used
- Outcome indicators included substance use disorder diagnoses or symptoms, assessed at follow-up
- Reliability and validity of all primary outcome measures or instruments was documented
- Levels of statistical significance were reported for primary outcome measures
- Studies were excluded where authors indicated lack of statistical power for assessing primary outcomes
- For medication studies, double-blinding procedures were used

Eight RCTs met all the inclusion criteria. Figure 1, on the following page, shows a flow diagram of our search process, adapted from *PRISMA*. 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.

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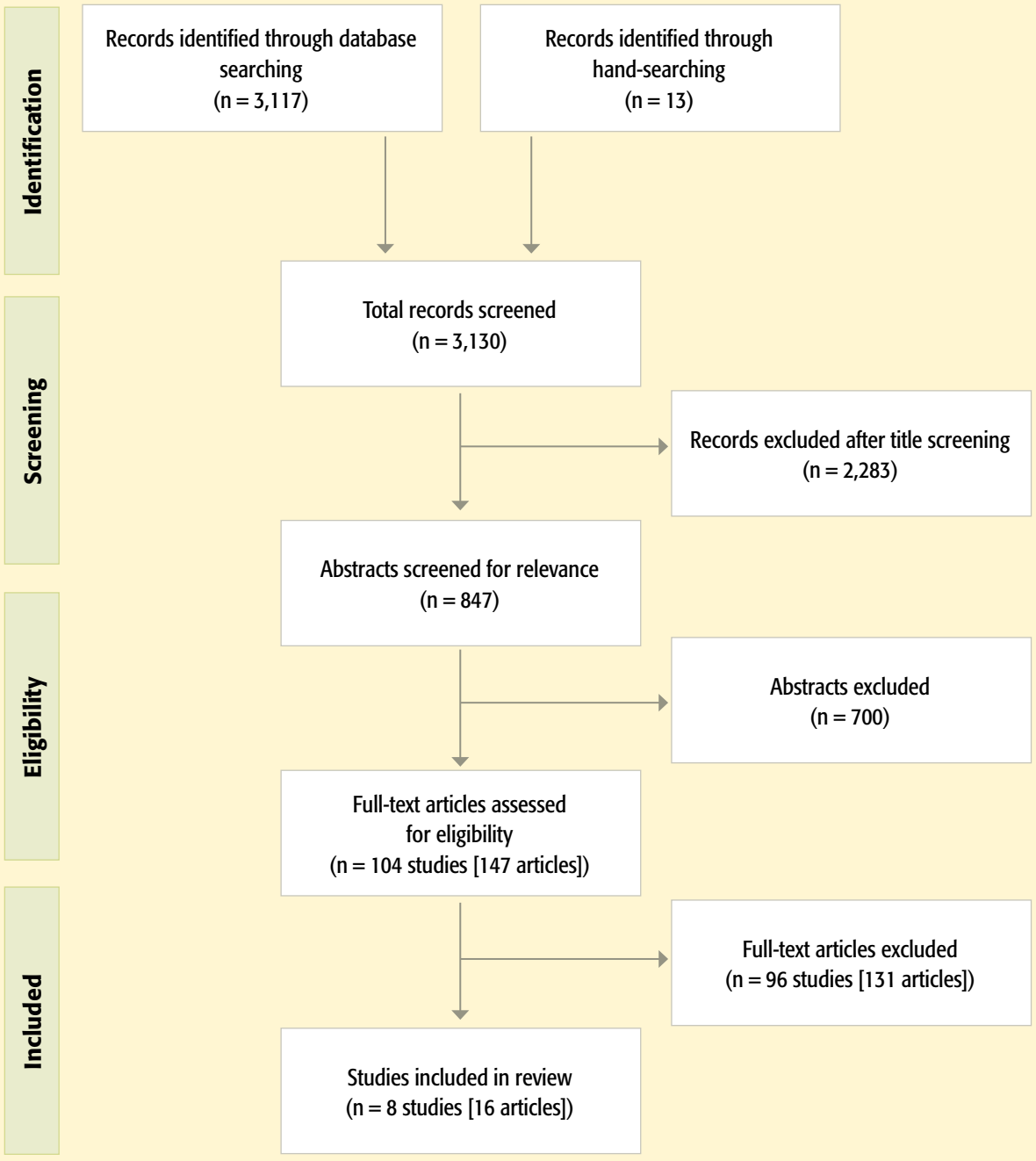
Figure 1: Search Process for RCTs



RESEARCH TERMS EXPLAINED

To best help children, practitioners and policy-makers need good evidence on whether or not a given intervention works. **Randomized controlled trials** (RCTs) are the gold standard for assessing if 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 two groups is the intervention. This process provides confidence that any benefits are due to the intervention rather than to chance or other confounding factors.

Then, to determine whether the intervention actually provides benefits to children, researchers analyze key 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 a random error. In the studies that we review, researchers set a value enabling at least 95% confidence that the observed results are real. Once an intervention has been found to have a statistically significant benefit, it is helpful to quantify the magnitude of difference it made, or its **effect size.** Beyond identifying that the intervention works, an effect size provides an indicator of how much of a clinically meaningful difference the intervention makes in children's lives. **Cohen's *d*** is the most commonly used measure of effect size. Values can range from 0 to 2. Standard interpretations are 0.2 = small effect; 0.5 = medium effect; 0.8 = large effect. **Odds ratio** is another frequently used measure of effect size. It indicates how many times greater or lesser the chances are of a given outcome occurring. For example, an odds ratio of 2.0 indicates that youth who received the intervention had twice the odds (e.g., of being abstinent from drugs).

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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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LINKS TO PAST ISSUES

The *Children's Mental Health Research Quarterly* Subject Index provides a detailed listing of topics covered in past issues, including links to information on specific programs.

2018 / Volume 12

1 – Preventing youth substance misuse: Programs that work in schools

2017 / Volume 11

4 – Helping children with depression
3 – Preventing childhood depression
2 – Supporting LGBTQ+ youth
1 – Helping children with ADHD

2016 / Volume 10

4 – Promoting self-regulation and preventing ADHD symptoms
3 – Helping children with anxiety
2 – Preventing anxiety for children
1 – Helping children with behaviour problems

2015 / Volume 9

4 – Promoting positive behaviour in children
3 – Intervening for young people with eating disorders
2 – Promoting healthy eating and preventing eating disorders in children
1 – Parenting without physical punishment

2014 / Volume 8

4 – Enhancing mental health in schools
3 – Kinship foster care
2 – Treating childhood obsessive-compulsive disorder
1 – Addressing parental substance misuse

2013 / Volume 7

4 – Troubling trends in prescribing for children
3 – Addressing acute mental health crises
2 – Re-examining attention problems in children
1 – Promoting healthy dating relationships

2012 / Volume 6

4 – Intervening after intimate partner violence
3 – How can foster care help vulnerable children?
2 – Treating anxiety disorders
1 – Preventing problematic anxiety

2011 / Volume 5

4 – Early child development and mental health
3 – Helping children overcome trauma
2 – Preventing prenatal alcohol exposure
1 – Nurse-Family Partnership and children's mental health

2010 / Volume 4

4 – Addressing parental depression
3 – Treating substance abuse in children and youth
2 – Preventing substance abuse in children and youth
1 – The mental health implications of childhood obesity

2009 / Volume 3

4 – Preventing suicide in children and youth
3 – Understanding and treating psychosis in young people
2 – Preventing and treating child maltreatment
1 – The economics of children's mental health

2008 / Volume 2

4 – Addressing bullying behaviour in children
3 – Diagnosing and treating childhood bipolar disorder
2 – Preventing and treating childhood depression
1 – Building children's resilience

2007 / Volume 1

4 – Addressing attention problems in children
3 – Children's emotional wellbeing
2 – Children's behavioural wellbeing
1 – Prevention of mental disorders

