CHILDREN'S MENTAL HEALTH RESEARCH

Quarterly

FALL 2022 VOL. 16, NO. 4

Suicide prevention: Reaching the greatest number of young people

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FALL

Quarterly

VOL. 16, NO. 4 2022

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*. 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.

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THIS ISSUE

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NEXT ISSUE

Suicide prevention: Reaching young people who are experiencing more risk

We identify factors that create risk and those that protect young people from experiences with suicide. We also review the effectiveness of targeted interventions that aim to help youth at risk.

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:

> Schwartz C, Yung D, Barican J, Gray-grant D, Waddell C. (2022). Suicide prevention: Reaching the greatest number of young people. *Children's Mental Health Research Quarterly*, *16*(4), 1–16. Vancouver, BC: Children's Health Policy Centre, Faculty of Health Sciences, Simon Fraser University.

We celebrate the Indigenous Peoples whose traditional lands Quarterly team members live and work on.

How many young people are affected?

Suicide is the second leading cause of death for 15- to 19-year-olds in Canada.

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Suicide still affects far too many young Canadians and their families. In fact, suicide is the second leading cause of death in this country, behind only unintentional injuries, for 15- to 19-year-olds, and the third leading cause for 10- to 14-year-olds.[1]

To help meet the goal of reducing youth suicide, the World Health Organization (WHO) has been a leader in collecting vital information. A recent meta-analysis of WHO data compared suicide rates for 10- to 19-year-olds across 35 countries, including Canada.[2] From 2010 to 2018, the suicide rate for Canadian youth was 5.01 per 100,000 — putting Canada above the average global rate of 3.77 per 100,000.[2] Still, WHO data revealed declining Canadian youth suicide rates in recent years, with the comparable figure for 2000 to 2011 being 5.36 per 100,000.[3] WHO data also showed that across nations, including Canada, the most common ways that youth die by suicide are hanging or suffocation.[2] The other most common forms of suicide for Canadian youth include poisoning, using firearms, and jumping from a height or lying in front of a moving object.[2]

How age and gender influence rates

Suicides involving Canadian youth differ based on age, gender and the interaction of the two. Regarding age, suicides are more frequent for 15- to 19-year-olds.[1] Regarding gender, and as typical of other countries, boys account for the most suicides among older teens, at 70%.[4] But among those between 10 and 14 years, girls account for 59% of suicides[4] — making Canada the only country among the 35 included in the meta-analysis of WHO data with higher suicide rates for girls than for boys in this younger age group.[2]

Suicide attempts warrant serious attention because they are an important risk factor for subsequent attempts, including fatal ones.

Researchers have also documented differing patterns in Canadian youth suicide rates over time, by gender. Between 2000 and 2018, the suicide rate for boys between 10 and 19 years declined slightly. The comparable suicide rate for girls showed a statistically significant increase of 0.09 deaths per 100,000.[5]

Suicide attempts among Canadian youth

As well as suicide deaths, attempts are another serious concern. In Canada, much was learned from the National Longitudinal Survey of Children and Youth, which followed a representative sample of young people for more than a decade.[6] Importantly, most young people (96.0%) had never attempted suicide. But among the 4.0% who did make an attempt, researchers found clear patterns. For half of these young people, attempts

occurred only during adolescence, while for the other half, they continued into adulthood. Where attempts were limited to the teen years, risk peaked at ages 14 to 15 and then declined. In contrast, where attempts continued into adulthood, risk increased steadily throughout adolescence.[6]

Identifying and responding to youth who have thoughts of suicide is critical since about one-third will make a suicide attempt within a year.

BC data on youth suicide attempts are also available. Among the 38,000 students in Grades 7 to 12 participating in the McCreary Centre Society's most recent BC Adolescent Health Survey, 5% acknowledged attempting suicide in the past year[7] — a figure in keeping with the Canadian data noted above.

Suicide attempts warrant serious attention because they are an important risk factor for subsequent attempts, including fatal ones.[8] So in addition to understanding deaths, data on suicide attempts are important for informing intervention efforts.

Troubling thoughts

While the number of youth attempting suicide is troubling, even more young people struggle with thoughts of suicide. Specifically, the National Longitudinal Survey of Children and Youth found that among a representative sample of 14- and 15-year-old Canadian youth, 13.0% reported having seriously considered attempting suicide in the past year.[9–10]

Also concerning, the most recent BC Adolescent Health Survey found that overall, 17% of respondents reported seriously considering killing themselves in the past year. These findings featured considerable differences by gender, with 23% of girls reporting this experience compared with 11% of boys.[7]

Identifying and responding to youth who have thoughts of suicide is critical since about one-third will make a suicide attempt within a year.[11] The adjacent sidebar has information on easy-to-access resources for young people experiencing thoughts of suicide.

Resources for young people

Services immediately available to children and youth in BC who are struggling with thoughts of suicide include the following:

- **YouthInBC.com** provides assistance from a crisis responder 24 hours a day by phone (1-800-784-2433 or 604-872-3311 for youth in Greater Vancouver) and online chatting from noon to 1 a.m. through their website: youthinbc.com.
- **Kids Help Phone** provides support from a professional counsellor 24 hours a day by phone (1-800-668-6868) or from a crisis responder by text (686868) or via Facebook Messenger through their website: kidshelpphone.ca. Young people can be connected with First Nations, Inuit or Métis crisis responders.
- **Youth Space** provides support from trained volunteers from 6 p.m. to midnight by chat through their website (youthspace.ca) or by text (778-783-0177).

Young people may also receive support from practitioners at Child and Youth Mental Health clinics in BC as well as from their doctors, nurse practitioners and school counsellors.

Helping youth in need

Beyond the data on suicide, it is crucial to understand and address what creates risk and what protects young people from suicide. The next *Quarterly* will examine these issues and will also present interventions to help youth who are experiencing suicidal thoughts or behaviours. Meanwhile, the Review article that follows describes universal prevention programs that aim to reduce suicide among populations of young people, regardless of risk levels.

REVIEW

Reaching all youth

Suicide prevention programs may be either universal (delivered to all children in a given population) or targeted (delivered to those most at risk). Both approaches have a role in preventing youth suicide. Universal programs have the benefits of reaching large numbers of young people without stigmatizing them and without requiring extensive screening efforts.[12] However, targeted programs can be more efficient by focusing on those most at risk.[12] Here we have focused on universal programs, conducting a systematic review to identify those that have been rigorously evaluated. (The next *Quarterly* will focus on targeted programs.)

School-based prevention programs have the potential to reduce the number of young people making suicide attempts and experiencing suicidal ideation.

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To ensure that we included only high-quality studies in our review, we required randomized controlled trial (RCT) evaluation methods. We also required that studies be conducted in high-income countries, for Canadian policy and practice relevance. We conducted new searches for studies published since our previous *Quarterly* issue on preventing suicide and also reviewed that issue for studies that met our current inclusion criteria. (Please see the Methods section for details on our search strategy and inclusion criteria.)

From the 110 articles we assessed, only four RCTs met our acceptance criteria. Three were school-based: Aussie Optimism Program,[13] Signs of Suicide (SOS)[14] and Youth Aware of Mental Health (YAM) Programme.[15] The fourth — the Apache Youth Entrepreneurship Program — was delivered in the Fort Apache community.[16] More information about each of these programs follows.

The brief program YAM led to decreases in suicide attempts and in serious suicidal ideation by one-year follow-up.

Going beyond the basic curriculum

Aussie Optimism aimed to prevent anxiety, depression and suicide through a school-based program.[13] Two versions were assessed — regular and enhanced — for children in Grades 6 and 7, over two school years. For both, teachers provided lessons based on cognitive-behavioural therapy. Students in Grade 6 received

10 social skills lessons that covered decision-making, communication and coping strategies. Students in Grade 7 received 10 lessons in effective thinking skills that covered topics such as challenging unhelpful thoughts. Children and parents both received booklets to accompany the school sessions. For parents of Grade 7 students, the booklets also provided information on dealing with transitions and developing friendships.[13] While not a specific program focus, suicide was still addressed indirectly (e.g., by helping children challenge unhelpful thinking that can occur when there is suicidal ideation). Meanwhile, the enhanced version added up to five hours of teacher coaching to support program implementation. Participating youth were randomized to receive either Aussie Optimism (regular or enhanced) or the control intervention, which included regular health education lessons covering self-management and interpersonal skills, among other topics.[13]

All studies that we reviewed used RCT designs, enhancing the likelihood of discerning whether interventions made more difference than chance alone.

SOS, another school-based program, aimed to prevent suicide by raising awareness of it.[14] School staff delivered the two-lesson program to high-school students in Grades 9 to 12. The first lesson covered markers for depression and suicide and ways to respond, including acknowledging the signs, expressing care and telling a responsible adult. (Markers for depression were addressed given that depression is a significant risk factor for suicide.)[14, 17] The second lesson involved students anonymously completing and scoring a depression screening tool. Those with elevated scores were encouraged to seek help immediately from a teacher, counsellor or trusted adult from outside of school. Participating youth were randomized to receive either SOS or the control intervention, which involved regular health or social studies curricula.[14]

The third school-based program, YAM, aimed to raise awareness about risk and protective factors associated with suicide and to enhance students' skills for dealing with adverse events and stress.[15, 18] Trained instructors delivered the program to youth aged 14 to 16 years. YAM included two lectures, three role-play sessions and a booklet.[15] Participating youth were randomized to receive either YAM, two other non-universal interventions (see sidebar) or the control condition. (For the control condition, most youth received no intervention, while some viewed educational posters that YAM participants also viewed.)

Approaching higher-risk students

In addition to the YAM program itself, youth participating in this study could be randomized to one of two other interventions. However, these other interventions were delivered only to students deemed to be at risk for suicide.[15] One intervention was Question, Persuade and Refer, which trained school personnel to recognize suicide risks and taught communication skills to enhance their ability to encourage at-risk students to seek professional care. The other program was Screening by Professionals, which encouraged youth with elevated scores on a mental health screening measure to participate in an assessment, including referral to clinical services if needed. Despite trying to reach youth with greater needs, neither intervention significantly reduced suicide attempts or ideation.[15]

Supporting youth in community

The Apache Youth Entrepreneurship Program aimed to prevent suicide, violence and substance use using strengths-based education.[16, 19] Focused on youth aged 13 to 16 years, the 16-lesson, eight-month community-based program taught business development and life skills and promoted a positive Apache identity. Of note, although content included problem-solving and coping skills, suicide prevention was not directly addressed.[16] Rather, the program focused on protective factors, such as a positive attachment to school.[16, 20] Two community members facilitated the program, incorporating presentations by Apache

business leaders and Elders. Participating youth were randomized to receive either the program or the control intervention, which involved art and recreational activities.[16, 19] Table 1 summarizes these four RCTs.

Table 1. Universal Suicide Prevention Programs

Intervention	Components	Sample size	Child ages/grades (country)
Aussie Optimism[13]	*Regular:* 10 group lessons on social skills + 10 group lessons on effective thinking skills with accompanying booklets for students + parents — delivered over 2 school years *Enhanced:* as above + up to 5 teacher coaching sessions — delivered over 2 school years	2,288	Grade 6 (Australia)
Signs of Suicide (SOS)[14]	2 group lessons on risk factors for suicide + depression, an action plan for responding to suicidal individuals + completion of depression screening tool — delivered over 2 days	4,133	Grades 9–12 (United States)
Youth Aware of Mental Health (YAM) Programme[15,18]	2 group lectures, 3 group role-play sessions with accompanying booklet to increase awareness of suicide + enhance coping skills — delivered over 1 month	11,110*	14–16 years (10 European countries)
Apache Youth Entrepreneurship Program[19]	16 group lessons on business development skills, life skills + positive Apache identity — delivered over 8 months	394	13–16 years (United States/ Apache Nation)

* Total number reflects all participants, including those randomized to the 2 non-universal programs (see sidebar page 6).

Which students benefited?

Given our focus, we report suicide-related outcomes for all follow-up periods of three months or longer. But we report all other mental health outcomes for final follow-up only.

For Aussie Optimism, self-reported suicidal ideation was assessed one year after students completed the program.[13] There was no difference between youth who received the regular version of the program and those in the control group. However, when the program was enhanced with teacher coaching, youth were significantly less likely to experience any suicidal ideation at one-year follow-up compared with those in the control group (3.3% vs. 19.3%). There were no group differences for any other relevant outcomes, including anxiety and depression diagnoses, mental health symptoms or prosocial behaviours.[13]

YAM showed the most promise — reducing suicide attempts as well as reducing serious suicidal ideation by one-year follow-up in a large study spanning 10 countries.

For SOS, self-reported suicide-related outcomes were assessed three months after students completed the program.[14] Significantly fewer youth who participated in SOS made suicide attempts compared with those in the control group (3.0% vs. 4.6%), although there was no difference in the percentage who seriously considered attempting suicide. Youth who participated in SOS also had better knowledge and more adaptive attitudes about depression and suicide. (An example of an adaptive attitude is believing that one can take positive action when someone is suicidal.) However, the program made no significant difference in students seeking help for depression or suicide from mental health professionals or other adults, or in students reaching out to an adult when a friend was depressed or suicidal.[14] (Other mental health outcomes were not reported.)

For YAM, self-reported suicide-related outcomes were assessed three and 12 months after students completed the program.[15] At three-month follow-up, there was no significant difference between youth who received YAM and those in the control group regarding suicide attempts (0.9% vs. 1.1%) or severe suicidal ideation in the prior two weeks (1.5% for both groups). However, statistically significant differences did emerge later. By one-year follow-up, 0.7% of youth who participated in YAM had made a suicide attempt compared with 1.5% of youth in the control group. As well, 0.8% of youth who received YAM had experienced severe suicidal ideation in the two weeks prior to the one-year assessment, compared with 1.4% of youth in the control group.[15] (Other mental health outcomes were not assessed.)

Life skills program reduced cannabis use among Native American teens

For the Apache Youth Entrepreneurship Program, no significant differences in self-reported suicide attempts were found for youth who received the intervention versus those in the control group, at either one- or two-year follow-up.[16] The proportion attempting suicide in the first year was 9.4% for youth who participated in the program versus 10.5% for those in the control group. Comparable figures for the second year were 8.8% and 9.3%.[16]

Efforts to reduce suicide should ideally involve reaching as many young people as possible using effective universal interventions.

Regarding other mental health concerns, violence and safety outcomes were also similar for youth who participated in the Apache program compared to those in the control group at two-year follow-up.[16] Specifically, the two groups did not significantly differ regarding rates of carrying weapons in the past month (9.2% vs. 7.6%), fighting in the past year (12.2% vs. 15.7%), or missing school due to feeling unsafe (5.4% vs. 4.7%). Likewise, most substance use outcomes were similar across the intervention and control groups at two-year follow-up, including the proportion who smoked cigarettes (14.3% vs. 15.8%), drank alcohol (18.0% vs. 19.1%) or

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Family members can play a vital role in supporting young people who struggle with thoughts of suicide.

engaged in binge drinking (13.0% vs. 16.7%) in the past month. However, the Apache Program did lead to significantly lower rates of past month cannabis use at two-year follow-up (24.1% for intervention vs. 31.4% for control).[16] Table 2 summarizes the outcomes for all four programs.

Table 2. Universal Suicide Prevention Program Outcomes

Intervention	Outcomes at Follow-up	
	Suicide-Related	**Other**
Aussie Optimism[13]	**1 year** *Regular* vs control NS Suicidal ideation* *Enhanced* vs control ↓ Suicidal ideation* *Enhanced* vs *Regular* NS Suicidal ideation*	**1 year** *For all group comparisons* NS Depression and/or anxiety diagnoses NS Mental health symptoms (2 of 2) NS Prosocial behaviours (2 of 2)
Signs of Suicide (SOS)[14]	**3 months** ↓ Suicide attempts in past 3 months NS Suicidal ideation in past 3 months	**3 months** ↑ Knowledge about depression/suicide ↑ Adaptive attitudes about depression/suicide NS Sought treatment for depression/suicide NS Talked to adult if depressed/suicidal NS Talked to adult about a friend who was depressed/suicidal
Youth Aware of Mental Health (YAM) Programme[15,18,21]	**1 year** ↓ Suicide attempts in past 9 months ↓ Severe suicidal ideation in past 2 weeks **3 months** NS Suicide attempts in past 3 months NS Severe suicidal ideation in past 2 weeks	None assessed
Apache Youth Entrepreneurship Program[16]	**2 years** NS Suicide attempts in past year **1 year** NS Suicide attempts in past year	**2 years**** NS Carried a weapon NS Involved in physical fight NS Missed school due to feeling unsafe NS Tobacco use NS Alcohol use NS Binge drinking ↓ Cannabis use

NS No significant differences between intervention and control groups or between the two intervention groups.
↓ or ↑ Statistically significant improvements for intervention versus control group.
* Time frame for suicidal ideation was not reported.
** Time frame for assessing all listed outcomes was past month, other than fighting, which was past year.

Implications for policy and practice

Our results highlight the potential for school-based, universal prevention programs to reduce the number of young people making suicide attempts and experiencing suicidal ideation. The brief program YAM led to decreases in suicide attempts and in serious suicidal ideation by one-year follow-up. SOS, another brief program, also reduced suicide attempts by three-month follow-up, but not suicidal ideation. The more intensive Aussie Optimism was delivered over two years, but only the enhanced version reduced suicidal ideation by one-year follow-up (suicide attempts were not measured). The Apache Youth Entrepreneurship Program, meanwhile, did not make a difference in suicide attempts by two-year follow-up — but did significantly reduce cannabis use.

These results are tempered by the fact that for each program, we found only one RCT that met our inclusion criteria. So rigorous replication RCTs are needed. Replication studies that assess both suicidal thoughts and attempts would be particularly helpful. Still, all studies that we reviewed used RCT designs, enhancing the likelihood of discerning whether interventions made more difference than chance alone. As well, three of the four studies had large sample sizes — with the YAM study sample exceeding 11,000 young people, across 10 countries.

Our findings suggest several implications for policy and practice.

- *Support more research on promising school-based suicide prevention programs.* Of the programs reviewed here, YAM showed the most promise — reducing suicide attempts as well as reducing serious suicidal ideation by one-year follow-up in a large study spanning 10 countries. However, before considering implementation of this program, replication evaluations are needed, ideally in BC student populations. Policy-makers and practitioners can support researchers in these efforts.
- *Recognize that effective programs can be brief, using limited resources.* YAM was delivered in one month, with facilitators delivering two lectures and supporting three role-play sessions. Given the demands on schools, the brevity of this program makes it compelling and worth further evaluation.
- *Build on the collaborative relationships between practitioners and school personnel.* BC has invested in bringing more mental health practitioners into schools.[22] Forging these collaborations can help facilitate suicide prevention programs in BC schools.
- *Consider delivery in settings beyond schools.* Effective suicide prevention programs could be delivered outside of schools, for example, in after-school programs, which often reach large numbers of children. New evaluations in these settings would also improve the knowledge base, informing new options to help young people.
- *Understand the importance of directly teaching suicide prevention skills.* The only program that did not produce any suicide-related benefits was the Apache Youth Entrepreneurship Program. Notably, this program focused on teaching youth business development and life skills and did not directly address risk factors for suicide. Prevention programs sometimes do produce unexpected positive gains. For example, the Good Behavior Game, which was designed to decrease aggression among first graders, was found to reduce suicide attempts by adulthood.[23] But unrelated positive gains for prevention programs need to be recognized as the exception rather than the norm.

Investing in new research with BC children is an important step toward reducing the impact of suicide in this province.

Efforts to reduce suicide should ideally involve reaching as many young people as possible using effective universal interventions. Yet the high-quality research evidence on these interventions is still limited. More research is therefore needed.[24–26] Nevertheless, programs such as YAM can be a helpful starting point. For example, policy-makers and practitioners could collaborate with researchers to conduct new evaluations of this promising program. Doing so can add to the evidence that would benefit young people in BC. Investing in new research with BC children is an important step toward reducing the impact of suicide in this province.

METHODS

We use systematic review methods adapted from the *Cochrane Collaboration*. 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 meet additional quality indicators. For this review, we searched for RCTs on universal prevention programs that aimed to reduce suicide among populations of young people regardless of risk levels. Table 3 outlines our database search strategy.

Table 3. Search Strategy

Systematic Reviews	
Sources	• Campbell Systematic Reviews, Cochrane Database of Systematic Reviews, CINAHL, ERIC, Medline and PsycINFO
Search Terms	• Suicide *and* intervention, prevention or treatment
Limits	• Published between 2009 and 2022 in a peer-reviewed journal • Reported on children aged 18 years or younger • Used systematic review, meta-analysis or RCT methods

To identify additional RCTs, we also hand-searched the reference lists from relevant systematic reviews and a previous issue of the *Quarterly*. Using this approach, we identified 109 articles describing 82 studies. Two team members then independently assessed each article, applying the inclusion criteria outlined in Table 4.

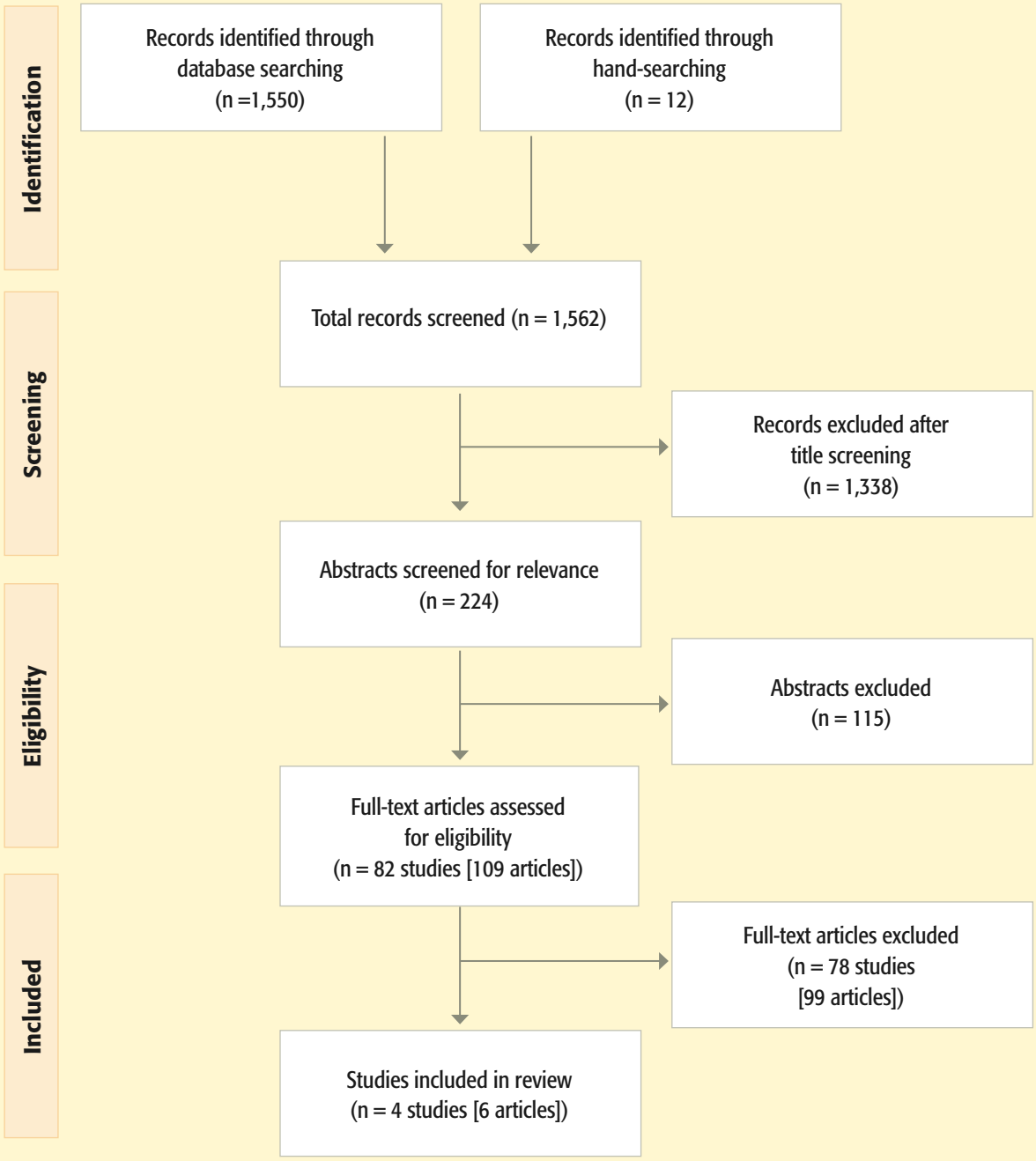
Table 4. Inclusion Criteria for RCTs

- Participants were randomly assigned to intervention and comparison groups (i.e., no-treatment, treatment-as-usual or active control) at study outset
- Study authors provided clear descriptions of participant characteristics, settings and interventions
- Interventions were evaluated in settings comparable to Canada
- Interventions were delivered universally and aimed to prevent suicidal thoughts or attempts*
- Follow-up was three 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 suicidal thoughts or attempts
- Reliability and validity were documented for primary outcome measures
- Statistical significance was reported for primary outcome measures
- Studies were excluded when authors stated there was insufficient power to detect differences between groups or did not correct for multiple comparisons

* We excluded interventions that only addressed risk factors for suicide (e.g., substance use, depression, self-harming behaviours without suicidal intentions).

Four RCTs met all the inclusion criteria. Figure 1 depicts our search process, adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyses.[27] Data from these studies were then extracted, summarized and verified by two or more team members. Throughout our process, any differences among team members were resolved by consensus.

Figure 1. Search Process for RCTs



For more information on our research methods, please contact
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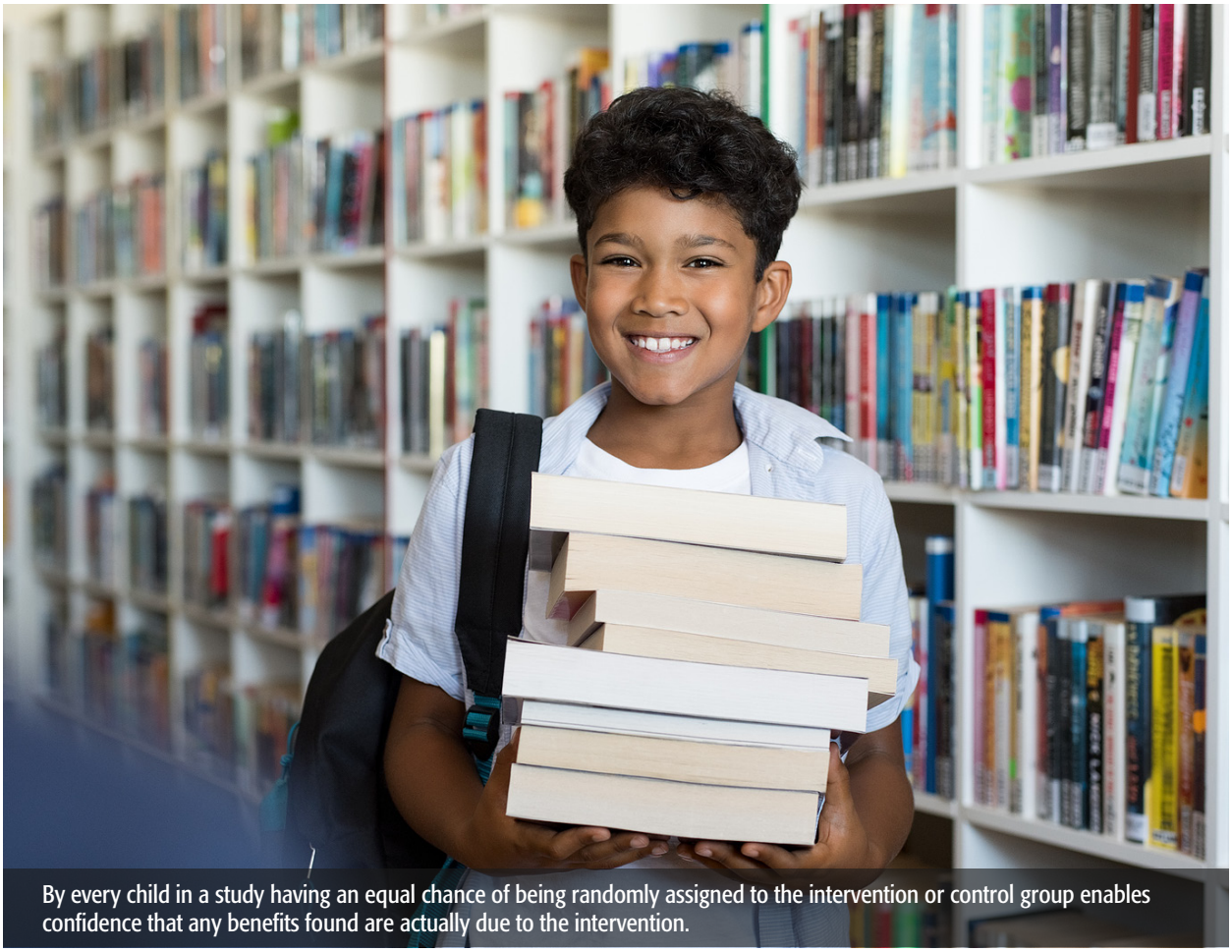
RESEARCH TERMS EXPLAINED

Practitioners and policy-makers need good evidence about whether a given intervention works to best help children. **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 control group. By randomizing participants — that is, by giving every young person 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 any benefits found are due to the intervention rather than to chance or other factors.

To determine whether the intervention provides benefits, researchers analyze relevant outcomes. If an outcome is found to be **statistically significant,** it helps provide certainty the intervention was effective rather than results appearing that way due to chance. In the studies we reviewed, researchers used the typical convention of having at least 95% confidence that the observed results reflected the treatment's real impact.



By every child in a study having an equal chance of being randomly assigned to the intervention or control group enables confidence that any benefits found are actually due to the intervention.

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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 For more information about these programs, please contact study authors.

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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.

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