

Vol. 4, No. 1 2010

The Mental Health Implications of Childhood Obesity



Overview

Linking mental and physical health



Review

Can we prevent childhood obesity?



Next Issue

Our Spring 2010 issue will address preventing substance abuse in children and youth.



Feature

Above all, do no harm



Letters

Helping chronically suicidal youth

About the Children's Health Policy Centre

As an interdisciplinary research group in the Faculty of Health Sciences at Simon Fraser University, we aim to connect research and policy to improve children's social and emotional well-being, or children's mental health. We advocate the following public health strategy for children's mental health: addressing the determinants of health; preventing disorders in children at risk; promoting effective treatments for children with disorders; and monitoring outcomes for all children. To learn more about our work, please see www.childhealthpolicy.sfu.ca



**Children's
Health Policy
Centre**
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About the Quarterly

The *Quarterly* is a resource for policy-makers, practitioners, families and community members. Its goal is to communicate new research to inform policy and practice in children's mental health. The publication is funded by the British Columbia Ministry of Children and Family Development, and topics are chosen in consultation with policy-makers in the Ministry's Child and Youth Mental Health Branch.

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THINKING OF THE WORLD

Quarterly

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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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Overview

Linking mental and physical health

“When I was little I got mocked so much I know more fat jokes than anybody else going. I’m better at it than they are. I spent just such a long time being bothered by it and I got so low on so many occasions.”

—Seventeen-year-old girl¹

“I’m a single parent. I work two jobs ... the health thing is always an issue. Having a child that’s overweight, having him get picked on is just such a big thing. Yet, trying to have him eat healthier ... nothing has really worked. I don’t know if I haven’t tried hard enough. But just to get some feedback, and maybe some resources that can help me with our lifestyle today, [would help me] with getting on track.”

—Parent of an overweight child²



The emotional and social costs of obesity

As these quotes document, obesity can create tremendous social and emotional adversity for children and families. Peer rejection is a leading concern. Peers rank obese children among the least desirable playmates.³ As many as one-third of obese children have no reciprocated friendships.⁴ Obese youngsters themselves report being less socially accepted.⁵ The research literature also documents many damaging stereotypes. For instance, one study found that eight- to sixteen-year-olds viewed obese young people as less attractive, less athletically skilled and more aggressive than their peers.⁴ Similarly, when six- to ten-year-olds were asked to respond to pictures of an overweight body shape, they ascribed characteristics such as “lazy,” “dirty,” “stupid” and “mean.”⁶ Strikingly, children as young as five have been found to engage in such negative stereotyping.⁷ These concerns make obesity one of the most stigmatized public health problems, particularly in childhood.⁴

Given the negative stereotyping and peer rejection, it is not surprising that many obese children develop poor self-perceptions. Many struggle with low self-esteem,⁸ a negative body image³ and dissatisfaction with physical appearance.⁵ These experiences can have lasting consequences, in that being teased about weight and shape in childhood frequently leads to body dissatisfaction in adulthood.³

Obesity also appears to be a contributing factor in the development of mental health problems in children; studies have found significantly higher prevalence rates for psychiatric diagnoses in obese children and youth

Most Canadian children maintain a healthy body weight.

compared both to children in the general population and to children with other chronic health conditions.⁹ Higher than average rates of depression, anxiety, eating disorders, social withdrawal and behavioural problems have been found among obese children and youth in other studies as well.^{3,6}

Girls may be particularly vulnerable to the emotional costs of obesity.⁸ A review of gender differences found that overweight girls were stigmatized significantly more often than boys.¹⁰ These girls typically faced more teasing, bullying and social marginalization in both friendships and romantic relationships.¹⁰ (For general information on ways to prevent bullying, please see our previous issue *Addressing Bullying Behaviour in Children*.)¹¹

When is weight a concern?

To address the mental and physical health consequences of obesity, it is helpful to have a common standard for identifying healthy and unhealthy body weights. Body mass index (BMI) is one such standard.³ BMI is easily calculated by dividing a child's weight in kilograms by his or her height in metres squared.

For adults, BMI interpretation is consistent. Adults with BMIs of 30 or greater are classified as obese, while those with BMIs between 25 and 30 are classified as overweight.¹² These standards are set based on known health risks associated with higher weights,¹² such as increased risk of elevated blood pressure.³ However, because children's BMIs change substantially as they grow and develop, cut-off points for obesity vary markedly by age (and gender).¹³ For example, BMI cut-offs for obesity range from a low of 19.1 for four-year-old girls to a high of 29.8 for 17.5-year-old girls.¹² If an individual child's weight is a concern, the child's primary care practitioner should be consulted.

Although many children struggle with being overweight, others have issues with being underweight. For children who are extremely underweight, eating disorders can be a concern. Please refer to our previous report *Preventing and Treating Eating Disorders in Children and Youth*¹⁴ for further information on this topic.

Most Canadian children maintain a healthy body weight.¹² However, the prevalence of overweight young people has tripled over the past three decades in Canada and internationally.^{12, 15} Obesity is particularly prevalent in wealthy countries in North America and Western Europe.¹⁶ Among 34 countries providing self-reported data for 10- to 16-year olds, Canada ranked fifth worst, with 19.3% of young people — or one in five —

“Higher than average rates of depression, anxiety, eating disorders, social withdrawal and behavioural problems have been found among obese children and youth.”

classified as overweight.¹⁶ Even higher rates are found when researchers measure BMI, rather than relying on self-reports. For example, in a study of 8,661 2- to 17-year-old Canadians, 26% were classified as overweight, with 8% of those classified as obese.¹²

Why is obesity increasing?

Obesity is caused by an imbalance between calories (energy) consumed and calories (energy) expended.¹⁷ Both these factors, in turn, are influenced by complex gene-environment interactions as children grow and develop in the different contexts. Regarding the environment in particular, profound global shifts in activity levels and diet have been identified as key determinants in increasing childhood obesity rates.¹⁷

Reductions in activity levels have resulted from other social changes. High levels of “screen time,” such as watching television, playing video games and using computers, are one issue. Canadian children who log more than two hours per day of screen time are twice as likely to be overweight or obese compared to those who spend one hour or less in front of a screen.¹² Reduced physical education in schools also affects children’s activity levels. The World Health Organization (WHO) recently expressed concern over reduced physical education budgets in many Canadian schools.¹⁸

Furthermore, Health Canada recently reported that more than half of Canadian children are not being active enough for optimal growth.¹⁹

Besides activity levels, significant changes have also occurred in children’s diets. Energy-dense foods — predominantly snack foods like cookies, potato chips and donuts — are increasingly available and increasingly consumed in Canada and globally.¹⁷ These foods are high in fat and sugar but low in nutrients. Because even small portions contain many calories, these foods create limited sensations of fullness, in turn encouraging children to eat more.²⁰

Exacerbating matters, young people are the target of intense food marketing campaigns.²¹ Many children are exposed to advertising and sales of unhealthy foods in schools, which in turn generates school revenues.²¹ Advertising *does* affect children’s consumption. Research has consistently shown that advertising leads children to choose advertised foods and request these from their parents significantly more often than when there is no advertising.²¹



Profound global shifts in activity levels and diet have been identified as key determinants in increasing childhood obesity rates.

In addition to *what* they eat, many children are also being served *too much* to eat. Portion sizes for many foods began to increase in the 1970s and have continued to increase.²² Pop sales are the most notable example of this trend. For instance, the 64-ounce “double gulp” sold by one international retailer is now 10 times larger than the servings when pop was first sold in the early 1900s.²²

All of these changes have resulted in many children and families being exposed to “obesogenic environments,” where physical activity is discouraged and unhealthy food consumption is encouraged.²³ Homes, neighbourhoods, schools and communities can all become environments that encourage obesity.

The economics of obesity

Economic factors play a role in children’s consumption of unhealthy foods. Families with limited budgets often purchase energy-dense foods because they are typically less expensive than healthier foods.²⁰ For instance, one dollar can purchase 1,200 kcal of cookies compared to only 250 kcal of fresh carrots.²⁰ Not surprisingly, several studies have identified food costs as a particular barrier to dietary change for low-income families.²⁰ Conversely, higher-income households typically have better-quality diets and fewer overweight family members.^{15, 20}

Economics also affects food availability. In many disadvantaged neighbourhoods, healthy products are not readily available in local grocery stores.²⁴ Lower-income Canadian neighbourhoods are often dominated by variety stores that charge high prices for the few healthy foods they sell.²⁵ Low-income neighbourhoods also have 2.5 times as many fast-food outlets — which tend to purvey high-calorie, low-nutrient foods — compared to wealthier neighbourhoods, further increasing the risk for children in poorer neighbourhoods.²³

Opportunities for physical activity are also affected by economics. For example, a Canadian study found that disadvantaged neighbourhoods lacked safe playgrounds and parks; they also afforded fewer children the chance to participate in organized physical activity, compared to affluent neighbourhoods.²⁶

Given these findings, it is not surprising that researchers have found strong links between socio-economic disadvantage and obesity.²³ One large Canadian survey (representative of the entire population) found poorer neighbourhoods had significantly higher rates of childhood obesity — 16%, compared to 7% in more affluent neighbourhoods. The same trend applied to children who were overweight — 35% among poorer neighbourhoods,

How families can encourage healthy eating

Because parents and extended families provide the main environments where children learn their eating habits,¹⁵ families can do much to encourage children to eat well. Do you want to positively influence your child’s diet but need some strategies to help? Are you seeking better ideas for school lunches and meal planning? Are you looking to learn how to read a nutrition label? A variety of tools to help families are available on the [Dietitians of Canada website](#).

compared to 24% among wealthier neighbourhoods.²⁶ This relationship was found to exist even after individual child and family characteristics such as age, gender, family income and education were taken into account.²⁶ In other words, poorer neighbourhoods have social and physical environments that do not support healthy body weights. The findings from this and other, international studies provide strong evidence of the importance of living environments as determinants of obesity.²⁶

Legislating the way to healthy eating

Many jurisdictions have passed laws limiting access to unhealthy foods in the general population. For example, in September 2009, British Columbia became the first Canadian province to enact legislation restricting trans fats in restaurants and schools.²⁷ (Trans fats, typically used to improve the shelf life and texture of foods, have been linked to increased cholesterol levels and heart disease.)²⁸

Some regions have gone further. In addition to restricting trans fats in eating establishments, New York City also now legally requires large restaurant chains to post the caloric content of all foods in their menus.²⁹ Such food labelling initiatives can greatly assist parents in making healthier selections for their children.

Many governments have also adopted policies directly aimed at children. For example, the provincial government's [guidelines for food and beverage sales in BC schools](#) prohibit the sale of particularly unhealthy items, such as pop, in which sugar is the first ingredient and nutrients such as iron and calcium are very low.³⁰ Similarly, in a move that counters the proven impact of advertising on children's food consumption, Sweden has banned television and radio ads targeting children under 12 since 1991.²¹

On a global level, the WHO³¹ has identified additional large-scale policy approaches to promote healthy eating (see Table 1). These approaches have

How to reduce the perils of eating out

American adults and children consume an average *one-third* of their calories from eating out according to the American Center for Science in the Public Interest. For this reason, it makes sense for parents and caregivers to pay close attention to the foods children get when eating outside of the home. You can check the [searchable database](#) of nutritional information on thousands of menu items in B.C. made available by the *Vancouver Sun*.

Table 1: Strategies to promote healthy eating³¹

Restrict food and beverage advertisements that exploit children's inexperience
Offer healthy food choices at schools, including limiting foods high in salt, sugar and fat
Provide standardized and easily understandable nutrition labelling
Supply consumers with food information that is sensitive to literacy levels and local culture
Provide incentives to promote the development, production and marketing of foods that contribute to a healthy diet
Implement fiscal policies that reduce the costs of healthy foods
Adopt food and nutritional policies that protect public health by addressing food safety and security

tremendous potential to alter obesogenic environments for large populations of children and families. For example, since Canada passed regulations mandating the labelling of trans fats, an evaluation of 92 foods found that 9% of products were discontinued and most of the reassessed products still being sold contained reduced trans fats.³²

Creating physically active neighbourhoods

Just as communities have worked to overcome barriers to healthy eating, many have also created opportunities for children to safely engage in physical activities. For example, many Canadian communities have organized walking school buses, which promote children walking to and from school by establishing safe routes chaperoned by adults. An evaluation of this program in disadvantaged elementary schools in Seattle found that significantly more children walked to school following participation in the initiative.³³

Opportunities for children to engage in physical activities can have benefits beyond physical health.

Studies have linked aerobic fitness to cognitive gains for children, including more efficient executive processes.^{34,35} Given the many benefits of physical fitness, it is essential that young people be provided with opportunities to engage in these activities. Such investment *can* be cost-effective. For example, a study of single Canadian parents receiving social assistance found that those receiving subsidized recreational programming used approximately \$1,000 less in health and social services after a two-year period.³⁶

There are many additional ways to boost children's activity levels. The WHO,³¹ as part of its global strategy on diet, physical activity and health, has outlined many such strategies, summarized in Table 2. These large-scale initiatives have the potential to increase healthy activities for many children, population-wide.



■ **Childhood is the optimal time to prevent obesity *and* to help children develop healthy lifelong approaches to eating and exercise.**

What parents can do to get kids moving

Families are very influential in shaping children's physical activity levels.⁶ Because of this, families have many opportunities to encourage children to be active. If you are looking for some new ideas, the Public Health Agency of Canada provides a series of helpful guides for families, youth and children.

Table 2: Strategies to promote physical activity³¹

Provide children with daily physical education in school
Ensure that schools have appropriate facilities and equipment to support physical activities
Offer children and families programs that enhance knowledge about physical activity
Adopt policies that support health care providers to offer practical guidance on the benefits of physical activity
Create communities where physical activities, such as walking and cycling, are safe and accessible
Provide an infrastructure that increases access to facilities that support physical activities
Implement national guidelines for health-enhancing physical activities

Helping communities and parents raise healthy children

Childhood is the optimal time to prevent obesity *and* to help children develop healthy lifelong approaches to eating and exercise. To identify which child, family and school-based interventions are most helpful in achieving these goals, we systematically examine the research evidence in our [Review](#) article.

While it is important to promote positive food choices and healthy activity levels, community-level determinants of obesity also need to be addressed. If children reside in neighbourhoods where healthy foods are not readily available or are beyond their families' budgets, there is little "choice" in their diets. Similarly, if children reside in neighbourhoods with limited opportunities for physical activity or no safe places to play outside, even the most effective exercise program is likely to be of limited value. For these reasons, social policies and community-based initiatives need to be part of our collective efforts to curb childhood obesity. 🖐️

Can we prevent childhood obesity?

The mainstays in preventing childhood obesity have been programs that promote healthy eating and physical activity. But how effective are these programs? To answer this question, we looked at the evidence from a recent high-quality systematic review. (Our criteria for selecting this review are described in the [Appendix](#).)

What 32,000 children can teach us

Kamath and colleagues³⁷ recently published a systematic review of 34 randomized controlled trials (RCTs) evaluating various programs designed to prevent childhood obesity. The focus was primary prevention, or reducing the incidence (or new cases) of obesity. Therefore, although many RCTs included at least some children who were already overweight, the authors specifically excluded RCTs that included *only* obese children. In total, outcomes for more than 32,000 children were evaluated in these 34 RCTs.

The programs included in the review varied greatly in terms of components, comprehensiveness and duration. For example, program components ranged from child education to parent support to environmental modifications. Some programs included only a single component; others were multi-faceted. Table 3 summarizes the essential components of the various programs. Children were typically the main intervention focus, although many programs also included parents and schools. Program providers also varied, from health care professionals to teachers and community members. Settings included homes, schools, clinics and community venues.



To best support children’s healthy development, a comprehensive strategy to prevent obesity is needed.

Table 3: Essential components of obesity prevention programs

Program Approach	Essential Components
Child behavioural training	Providing directed healthy snack preparation Guiding play during recess
Child cognitive training	Recognizing triggers for unhealthy eating Setting goals for reduced television watching
Child and parent education	Listing low-fat lunch suggestions in a newsletter Teaching the healthy food guide pyramid
Parent training and social support	Completing activity packages with parent collaboration Participating in family fun night at school
Environmental modification	Installing equipment to limit television and video game use in homes Modifying school cafeteria recipes

Where prevention failed to make a difference

When the review's authors pooled outcomes in a meta-analysis, they found that prevention programs did not make a significant difference overall in body mass index (BMI). In other words, program participants did *not* achieve significantly lower body weights (measured using BMI) than comparison children. However, one factor *did* make a significant difference — program duration. Programs lasting longer than six months demonstrated significantly better outcomes than briefer ones.

Programs that stand out

To identify particularly promising programs, we examined each study in the review to see which specific programs reduced BMI. (Such findings are not always captured or reported when findings are pooled in a meta-analysis, as with the review used here.) Three such programs were found. Two were comprehensive programs focusing on both healthy eating and exercise (i.e., *Hip-Hop to Health Junior* for younger children³⁸ and *The Middle-School Physical Activity and Nutrition Study* for older children).³⁹ The other (unnamed) program aimed to decrease children's screen time, including television watching and video game playing.⁴⁰ Children in all three programs had significantly better BMI outcomes than comparison children. Details of the *Hip-Hop to Health Junior*³⁸ program are highlighted in the sidebar.

What improvements were found?

Although most of the prevention programs failed to reduce BMIs, additional meta-analyses identified three significant benefits for program participants: increased physical activity levels, decreased sedentary behaviour and decreased unhealthy eating. These are important accomplishments, given that both diet and physical activity influence health separately and interactively.³¹ Physical activity has also been recognized as a fundamental means of improving young people's physical and mental health.³¹ Of note: programs that aimed to decrease sedentary behaviours were significantly more effective with children than with adolescents.

Putting research into practice

To best support children's healthy development, a comprehensive strategy to prevent obesity is needed. Prevention programs targeted at children, families and schools should be central to this effort. Current evidence suggests that longer programs and programs that are used early in children's lives will likely have the best outcomes. When such programs are delivered within a system that has effective large-scale social policies, such as those identified in our [Overview](#) article, communities and families will be better positioned to create conditions that foster children's health. 🖐️

Hip-hopping to health

Given concerns about the high prevalence of overweight minority children, a group of researchers evaluated the effectiveness of a comprehensive eating and exercise program — *Hip-Hop to Health Junior*. The 14-week program targeted 409 preschool children attending 12 *Head Start* programs in Chicago. The 40-minute lessons, delivered three times per week, included topics such as eating healthy foods, exercising and reducing television viewing. Each lesson also included 20 minutes of physical activity. Program foods were specifically chosen for their affordability. Parents also received weekly newsletters with homework assignments, such as writing down specific ways they could increase their family's fruit and vegetable consumption.

Although children in both groups had BMI increases after two years, children in the control group had significantly greater BMI increases than children in *Hip-Hop to Health Junior*. These results show that obesity prevention programs can be effective, especially when they start in early childhood and are tailored to children's developmental, cultural and economic circumstances.

Above all, do no harm

Far too many children, including those with good health, are dissatisfied with their weight and shape. Troubling numbers include findings that 40% of young girls worry about being fat⁴¹ and 50% of adolescent girls have used unhealthy weight control behaviours.⁴² Girls' particular vulnerability to these concerns speaks to gender-specific cultural pressures to be thin.⁴²

These alarming numbers raise the question of whether obesity prevention programs could cause unintended harm, such as increasing children's dissatisfaction with their bodies or increasing the incidence of eating disorders.⁴¹ To help answer this question, two researchers set out to examine whether obesity prevention programs have these unintended social and emotional consequences.

Carter and Bulik⁴³ conducted a systematic review of the impact of obesity prevention programs on psychological well-being and disordered eating. Their review included 22 controlled studies of obesity prevention programs. Most programs included both eating and physical activity interventions, while six focused only on physical activity and two focused only on nutrition education. Of the 22 programs, 19 were delivered to children in school-based settings. Of the remaining three, two were family-based programs targeting children with overweight parents, and one was a community-based program targeting low-income families.⁴⁴ Programs varied considerably in length, with 10 lasting more than one year and 12 lasting between 12 weeks and one year.⁴⁴ Programs were delivered in North American, Europe, Asia and South America.

Are there unintended risks?

For most of the assessed variables, including body satisfaction and self-esteem, no significant differences were found between program participants and controls (see Table 4). When differences *were* found, all but one favoured young people in the intervention programs. For example, young people who participated in some of the prevention programs had reduced concern with weight and shape, increased intentions to eat healthy foods and enhanced self-worth. Only one negative outcome was found, for one program only. African-American girls who participated in an after-school obesity prevention program were more likely to engage in unhealthy weight control behaviours, including skipping meals and fasting, than girls in



Fifty percent of adolescent girls have used unhealthy weight control behaviours.

“When differences were found, all but one favoured young people in the intervention programs.”

the control group.⁴⁵ However, the program also produced some positive benefits, including increasing girls’ intentions to eat healthy foods and their enjoyment of physical activity.⁴⁵

Table 4: Outcome differences between intervention and control groups

No Significant Differences	Positive Outcome for Intervention Participants	Negative Outcome for Intervention Participants
Positive self-perceptions (5) Unhealthy body image ideals (1) Binge eating (1) Unhealthy weight control behaviours (2) Self-efficacy for healthy eating (2) Positive physical activity attitudes (5)	Positive self-perceptions (1) Over concern with weight/shape (2) Healthy eating intentions (2) Positive physical activity attitudes (1)	Unhealthy weight control behaviours (1)
Numbers in parentheses indicate the number of studies with such findings.		

Unfortunately, many studies failed to measure important mental health outcomes. For example, none assessed whether program participation was associated with the onset of mental disorders or excessive weight loss. As well, some studies had few participants and therefore may have been unable to detect important differences between intervention and control groups (e.g., Story et al., 2003).⁴⁵

Gathering further evidence

Since this review was conducted, additional program evaluations with mental health–related data have been published. For example, two randomized controlled trials with middle-school-age girls found that prevention program participants were significantly less likely to engage in negative weight-related behaviours, such as self-induced vomiting and laxative or diet pill abuse.^{46, 47}

Prospective program evaluation data can also provide important clues about the successes (and failures) of the “natural experiments” that certain well-planned large-scale policy interventions can constitute. In one such case, Arkansas passed an act in 2003 that aimed to reduce childhood obesity using an array of statewide interventions. Children’s outcomes were then tracked. Evaluations found that BMIs “leveled off,” with no concomitant increase in diet pill consumption, excessive exercising or weight-based bullying.⁴¹ Similarly, researchers who examined data from the US Centers for Disease Control found no increases in unhealthy weight-related behaviours (including the use of laxatives, diet pills and vomiting) in American youth over 10 years beginning in 1995, a time when many obesity prevention programs were initiated across the United States.⁴¹ These data provide additional supporting evidence that obesity prevention programs can be delivered without causing adverse effects. 🖐️

“Obesity prevention programs can be delivered without causing adverse effects.”

Helping chronically suicidal youth

To the Editors:

In the previous issue of the *Quarterly*, you reviewed interventions to address suicidality. However, Dialectical Behaviour Therapy (DBT) was not among them. What have evaluations of DBT found?

Vanessa Saayman
Victoria, BC

Originally developed as a treatment for chronically suicidal women with borderline personality disorder, DBT teaches emotional regulation, distress tolerance and interpersonal skills using problem-solving and behavioural skills training.⁴⁸ Because of its documented effectiveness in adults,⁴⁸ DBT is now being adapted for suicidal adolescents.

What do we know about the effectiveness of DBT?

No studies of DBT have met the inclusion criteria for any of our systematic reviews to date. Nevertheless, we did uncover three non-randomized controlled trials of DBT with suicidal adolescents.⁴⁹⁻⁵¹ However, none focused exclusively on *chronically* suicidal adolescents or reported separate outcomes for them. As well, because the studies either failed to randomize participants^{50, 51} or to use adequate randomization methods,⁴⁹ we do not know whether positive findings were simply due to chance.

The one Canadian study showed a reduction in self-reported suicidality at one-year follow-up for youth receiving DBT *and* for youth receiving treatment as usual, with no significant differences between treatments.⁵¹ In one of the two American studies, suicide attempts were 2.5 times higher among youth receiving treatment as usual (8.6%) compared to those receiving DBT (3.4%).⁵⁰ However, statistical analyses were not conducted to determine whether DBT was significantly more effective than the comparison treatment. In the other American study, scores on a suicide inventory were reduced for youth receiving DBT and for the comparison treatment. However, the authors did not report on statistical significance, so differences between the groups could not be evaluated.⁴⁹

These preliminary findings suggest that DBT in youth needs to be evaluated using more rigorous research designs and larger samples before widespread implementation is warranted. As well, when components of DBT developed with adults are adapted for youth, a developmental perspective rather than a personality disorder focus should be taken. In other words, developmental changes need to be recognized in adapting DBT and assessing its effectiveness for youth. 🖐️



Research methods

To find the highest-quality research, we used systematic methods adapted from the *Cochrane Collaboration*.⁵² Since our scoping of the literature generated a tremendous number of recent publications, we limited our search to systematic reviews published in peer-reviewed scientific journals.

To identify high-quality reviews, we first applied the following search strategy:

Sources	<ul style="list-style-type: none"> • Medline, PsycINFO, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects & The Campbell Collaboration Library of Systematic Reviews
Search Terms	<ul style="list-style-type: none"> • Obesity <i>and</i> prevention, treatment <i>or</i> intervention
Limits	<ul style="list-style-type: none"> • English-language articles published from 2004 through July 2009 • Child participants (age 0–18 years)

Next, we applied the following criteria in assessing the 77 retrieved reviews:

Review

- Clear descriptions of methods, inclusion and exclusion criteria, sources (including database names) and search years

Individual studies within the review

- Interventions specifically aimed at preventing childhood obesity
- Random assignment of participants to intervention and control/ comparison groups at study outset
- Majority of the studies had maximum attrition rates of 20% *or* use of intention-to-treat analysis
- Outcome measures included body mass index (BMI)
- Levels of statistical significance reported for BMI outcomes based on intervention assignment

One team member assessed each retrieved review. Only the selected review³⁷ met all the aforementioned criteria, which was then verified by a second team member. 🖐️

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BC government staff can access original articles from BC's [Health and Human Services Library](#).

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