

## Addressing childhood obesity: Evidence and implications for public health

### Review on which this evidence summary is based:

Booth, M., O'Brodovich, H., & Rinegood, D. (2004). *Addressing childhood obesity: The evidence for action*. Ottawa, ON: Canadian Institutes of Health Research, Institution of Nutrition, Metabolism and Diabetes.

### Review Focus

- P** Children aged 0–18 years  
**I** Prevention and/or treatment of obesity  
**C** Usual practice  
**O** Adiposity (e.g. BMI or % overweight) or a measure of dietary intake and/or physical activity

**Review Quality Rating:** 9 (strong) *Details on the methodological quality are available [here](#).*

### Considerations for Public Health Practice

| Conclusions from Health Evidence   | General Implications  |
|--|---|
| <p>This well-done review of reviews incorporates evidence from systematic reviews including meta-analyses and narrative reviews, indicating quality for included reviews and overlap of primary studies.</p> <p>Interventions that showed improvement in obesity outcomes promoted :</p> <ul style="list-style-type: none"> <li>consumption of a healthier diet + exercise (vs. diet only)</li> <li>increased physical activity in and out-of-school</li> <li>healthier diet among school-aged children</li> <li>behaviour modification strategies alongside strategies to improve diet and physical activity</li> </ul> <p>Evidence is not conclusive enough to support:</p> <ul style="list-style-type: none"> <li>dietary interventions</li> <li>dietary change interventions for preschool-aged children or minorities</li> <li>reinforcement after obesity treatment</li> <li>modifying factors (age, setting, duration, initial weight)</li> </ul> <p>No impact on obesity outcomes were observed for:</p> <ul style="list-style-type: none"> <li>cardiovascular risk factor reduction interventions</li> <li>primary prevention programs for obesity</li> <li>lifestyle exercise strategies</li> <li>interventions that included parental involvement</li> </ul> <p>No review-level evidence was identified to address treatment of obesity in minority groups.</p> | <p>Based on this review, public health should support:</p> <ul style="list-style-type: none"> <li>programs that focus on diet and exercise together</li> <li>physical activity behavior change interventions and dietary change interventions for school children</li> <li>behavior modification with both diet and physical activity strategies</li> </ul> <p>Due to a current lack of evidence, public health programs should not include:</p> <ul style="list-style-type: none"> <li>a focus on specific elements of dietary interventions</li> <li>dietary interventions for pre-school aged children or minorities</li> <li>reinforcement after obesity treatment</li> <li>a focus on modifying factors including age, setting, duration, or initial weight, as a way to modify obesity outcomes</li> </ul> <p>Due to a lack of effectiveness being demonstrated in the current evidence, public health should also avoid focus on:</p> <ul style="list-style-type: none"> <li>cardiovascular risk factor interventions as a way to modify obesity outcomes</li> <li>primary prevention programs for obesity</li> <li>lifestyle exercise programs</li> </ul> <p>There was no current evidence to inform how public health should address obesity treatment in minority groups, and programs for these groups should be evaluated and evaluations shared.</p> |

### Evidence and Implications

| What's the evidence?   | Implications for practice and policy |
|--|--------------------------------------|
| <i>Primary Prevention of Obesity</i>                           |                                      |
| <b>1. Prevention of obesity (6 SR including 34 studies + 6</b> | <b>1. Prevention of obesity</b>      |

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|---|--|
| <p><b>narrative reviews; mostly low to moderate quality)</b><br/> <u>No impact</u> of obesity OR cardiovascular prevention interventions on adiposity.</p> <ul style="list-style-type: none"> <li>• <u>Systematic review evidence</u> (4 reviews for which citation analysis was possible): does not support obesity prevention programs (several of which were school-based) for the reduction of adiposity. (7 of 26 unique studies included identified a reduction in adiposity, with 19 studies identifying no benefit)</li> <li>• <u>Systematic review evidence</u> (1 review – 16 studies): Cardiovascular prevention programs were not effective in decreasing adiposity (only 7 of 77 interventions demonstrated a positive impact).</li> <li>• <u>Narrative review evidence</u> (6 reviews): insufficient supporting evidence for obesity prevention as an adiposity reduction measure.</li> </ul> | <ul style="list-style-type: none"> <li>• Public health decision makers should not rely on either obesity prevention or cardiovascular prevention programs for decreasing adiposity, given the current evidence from both systematic and narrative reviews.</li> </ul>  |
| <b>Secondary Prevention/Treatment of Obesity</b>  |  |
| <p><b>2. Diet vs. Diet and Exercise (5 reviews)</b></p> <ul style="list-style-type: none"> <li>• Exercise programs combined with a dietary intervention offered some improvement in adiposity (6 of 10 studies); however the extent to which benefits are sustained in long term is unclear.</li> </ul>   | <p><b>2. Diet vs. Diet and Exercise</b></p> <ul style="list-style-type: none"> <li>• Public Health decision makers should promote diet and exercise together (as opposed to diet alone) for the secondary prevention of obesity, and evaluate whether long-term benefits are realized.</li> </ul>  |
| <p><b>3. Dietary Interventions (1 meta-analysis (17 studies) + 1 review of a single study)</b></p> <ul style="list-style-type: none"> <li>• <u>No impact</u> of specific elements of dietary interventions on weight loss.</li> </ul>   | <p><b>3. Dietary Interventions</b></p> <ul style="list-style-type: none"> <li>• Based on two SRs of fair quality, there is insufficient evidence to recommend any specific elements of dietary interventions for obesity reduction.</li> </ul>   |
| <p><b>4. Physical Activity (PA) Behaviour Change (8 reviews)</b></p> <ul style="list-style-type: none"> <li>• <b>PA during school hours</b> – high quality review evidence (4 reviews) shows that school-based interventions are effective in increasing PA during school hours.</li> <li>• <b>PA outside school hours</b> – there is some (mixed) evidence that school-based interventions increase PA outside school hours.</li> </ul>  | <p><b>4. Physical Activity Behaviour Change</b></p> <ul style="list-style-type: none"> <li>• Public health should promote PA behaviour change interventions to increase PA during school hours. Programs should be evaluated to determine whether PA outside school hours is increased.</li> <li>• Evaluations conducted by public health should ideally include long-term follow up into adulthood.</li> </ul>  |
| <p><b>5. Strategies to promote dietary change (7 SR + 5 narrative reviews; analysis according to behaviour change model)</b></p> <ul style="list-style-type: none"> <li>• <b>Preschool children:</b> 7/10 studies from 2 SRs offer insufficient evidence to support specific behavioural or knowledge-based strategies to change food-related behaviour (including chances to touch/smell/taste new foods, modeling, and repeated exposures).</li> <li>• <b>School-based:</b> 42/59 studies in 6 reviews demonstrated some improvement in dietary behaviour that was more closely attributed to behaviourally-based approaches rather than knowledge-based approaches. Descriptions of strategies are not provided.</li> <li>• <b>Minority Populations:</b> 1 low-quality review offered no definitive conclusions that dietary interventions are effective.</li> </ul>                                     | <p><b>5. Strategies to Promote Dietary Change</b></p> <ul style="list-style-type: none"> <li>• Public health should not rely on either behavioural or knowledge-based approaches to improve preschool childrens' dietary behaviour.</li> <li>• Public health should use and evaluate behaviourally-based approaches to improve dietary behaviour in school-based programs.</li> <li>• Public health should evaluate efforts to improve dietary behaviour in minority populations in order to contribute to the evidence base available.</li> </ul> |
| <p><b>6. Lifestyle Exercise Strategies (3 reviews citing the same 3 studies + 1 meta-analysis)</b></p> <ul style="list-style-type: none"> <li>• Lifestyle exercise was distinct from other exercise programs in that it (1) includes activities of daily living, (2) includes caloric expenditure in small increments throughout the day, and (3) no prescribed intensity.</li> <li>• <u>No impact</u> on childhood obesity compared to either no exercise or other exercise, based on the meta-analysis incorporating the widest range of evidence.</li> </ul>   | <p><b>6. Lifestyle Exercise Strategies</b></p> <ul style="list-style-type: none"> <li>• Public Health decision makers should not rely on lifestyle exercise to decrease childhood obesity. However, public health should consider other possible benefits to be derived from the promotion of lifestyle exercise.</li> </ul>   |
| <p><b>7. Parental Involvement (4 reviews of 13 studies + 1 meta-analysis)</b></p>   | <p><b>7. Parental Involvement</b></p> <ul style="list-style-type: none"> <li>• Public health should not focus on parental</li> </ul>   |

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| <ul style="list-style-type: none"> <li>• Parental involvement interventions varied, with only one study directed solely at parents. A range of interventions were aimed at both children and parents to varying degrees. Intervention elements are not well described; but tend to be family-oriented and include homework assignments, and parents motivating their children.</li> <li>• <u>No impact</u> on childhood obesity treatment, even though there is <u>good evidence</u> in this topic area.</li> </ul>   | <p>involvement strategies as a way to improve childhood obesity treatment.</p>  |
| <p><b>8. Behaviour Modification Strategies (2 reviews of 9 studies + 1 meta-analysis)</b></p> <ul style="list-style-type: none"> <li>• Little information provided regarding the nature of behaviour modification strategies used.</li> <li>• Improvement in obesity status when behaviour modification strategies were used with dietary and physical activity strategies in the short-term. Behaviour modification, dietary AND physical activity strategies together demonstrated greater treatment effect than behaviour modification and either dietary or PA.</li> <li>• <u>No impact</u> of additional or “add-on” self-control training on obesity status.</li> </ul> | <p><b>8. Behaviour Modification Strategies</b></p> <ul style="list-style-type: none"> <li>• Behaviour modification strategies should be considered for use with dietary and physical activity interventions, and ideally with all three strategies combined, in aiming to improve obesity status.</li> <li>• Public health should not focus on self-control training as an additional strategy for reducing obesity in children.</li> </ul> |
| <p><b>9. Reinforcement (1 review)</b></p> <ul style="list-style-type: none"> <li>• A single, small (15 subjects) study of fair quality in one review showed that periodic reinforcement after obesity treatment enhanced weight loss.</li> </ul>  | <p><b>9. Reinforcement</b></p> <ul style="list-style-type: none"> <li>• There is limited evidence at this time to support the provision of reinforcement following obesity treatment programs.</li> </ul>   |
| <p><b>10. Factors Influencing Obesity Prevention</b></p> <ul style="list-style-type: none"> <li>• There is very limited evidence examining the effect of setting, duration of treatment and initial weight status, upon which to assess the impact obesity outcomes. It is possible that relationships between these factors and obesity may exist; however, they are unclear at this time.</li> </ul>  | <p><b>10. Factors Influencing Obesity Prevention</b></p> <ul style="list-style-type: none"> <li>• Based on evidence available, public health should not focus on modifying factors such as setting, duration of treatment, age, and initial weight status to improve obesity outcomes. If these factors are considered in obesity prevention efforts, program evaluations are necessary to build on the evidence.</li> </ul>                |
| <p><b>Legend:</b> P – Population; I – Intervention; C – Comparison group; O – Outcomes; CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk<br/> **For definitions see the Health Evidence Glossary <a href="http://www.healthevidence.org/glossary.aspx">www.healthevidence.org/glossary.aspx</a></p>  |   |

### Why this issue is of interest to public health in Canada

The Canadian Population Health Initiative (CPHI) report on the health of Canadians recognized obesity as a widespread public health problem in Canada, as well as a major contributing factor to Canada's burden of disease.<sup>1</sup> Overweight and obesity is linked to cardiovascular disease, Type II diabetes, and certain cancers, as well as psychosocial consequences, particularly among children. Morbidity and quality-of-life effects of obesity are similar to those caused by smoking, poverty, and problem drinking.<sup>2</sup> Additionally, the health care costs associated with obesity-related mortality and morbidity is significant and increasing. Based on effectiveness evidence related to the prevention of obesity among children and youth, CPHI recommends breastfeeding, regular school-based physical education, comprehensive school health programs, reduced television viewing time, and community-wide interventions as effective solutions to the problem of obesity.<sup>1</sup>

1. Canadian Population Health Initiative. (2004). *Improving the health of Canadians*. Canadian Institute for Health Information [CIHI], Ottawa, Ontario.
2. Canadian Institute of Health Information. (2003). *Obesity in Canada: Identifying Policy Priorities: Proceedings of a roundtable*. CIHI, Ottawa, ON. [www.cihr-irsc.gc.ca/e/documents/CPHI\\_proceed\\_e.pdf](http://www.cihr-irsc.gc.ca/e/documents/CPHI_proceed_e.pdf)
3. Raine, K.D. (2004) *Overweight and obesity in Canada: A population health perspective*. Canadian Institute for Health Information. Ottawa, Ontario. [http://www.cihi.ca/cihiweb/dispPage.jsp?cw\\_page=GR\\_1130\\_E](http://www.cihi.ca/cihiweb/dispPage.jsp?cw_page=GR_1130_E)

Other quality reviews on this topic are available on [www.healthevidence.org](http://www.healthevidence.org)

### Suggested citation

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*This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.*

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