

School-based physical activity programs for children and adolescents (aged 6 to 18 years): Evidence and implications for public health

Review on which this evidence summary is based:

Dobbins, M., Husson, H., DeCorby, K., & LaRocca, R.L. (2013). **School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6-18.** *Cochrane Database of Systematic Reviews*, 2013(2), Art. No.: CD007651.

Review Focus

- P** Children and adolescents aged 6 to 18 years
- I** Strategies focused on promotion of physical activity & fitness including educational, health promotion, counseling, and management
- C** Standard, currently existing physical education programs in schools
- O** *Primary Outcomes:* television (TV) viewing, physical activity rates, and physical activity duration
Secondary Outcomes: mean systolic/diastolic blood pressure, mean blood cholesterol level, body mass index (BMI), Maximal Oxygen consumption (VO₂max), and pulse rate

Review Quality Rating:

10 (strong) *Details on the methodological quality are available [here](#).*

Considerations for Public Health Practice

Conclusions from Health Evidence

This well-done review is based on 44 randomized controlled trials (RCTs), with the majority of studies at moderate risk of bias. Intervention duration ranged from 12 weeks to 6 years. In total data were collected on 36, 593 children and adolescents.

School-based physical activity had positive effects on duration of moderate to vigorous physical activity (MVPA), physical activity rates, TV viewing, & VO₂Max.

No effect was observed on the following physical health status measures: blood pressure, cholesterol, BMI, & pulse rate.

Printed education materials plus changes to school curriculum that increased MVPA during school hours were intervention components present whenever statistically significant changes MVPA duration, physical activity rates, TV viewing rates and VO₂Max were observed.

Education sessions, physical activity specific sessions, and community-based initiatives in combination with printed educational materials and curriculum changes are also likely effective, although the evidence is limited.

General Implications

Overall findings suggest that school-based interventions should be implemented, supported and/or advocated for by the public health sector, to increase MVPA duration, increase physical activity rates, improve VO₂Max, and reduce TV viewing among children.

Generally, evidence does not indicate school-based interventions are effective for improving physical health status measures in either children or adolescents, or behavioural measures among adolescents.

At minimum, school based interventions should include printed educational materials and curriculum changes that promote increased MVPA during school hours. It may also be useful to combine additional components such as educational sessions, physical activity specific sessions and community-based initiatives, although if implemented, these programs should undergo further rigorous evaluation.

Interventions should be implemented for a minimum of 12 weeks. Impact in the long term requires additional evaluation.

Evidence and Implications

What's the evidence?	Implications for practice and policy
<p>1. Outcomes Related to Behaviour</p> <p>1.1 Physical Activity Rates (5 studies) 2 of 5 studies OR 2.74 (2.01 – 3.75), led to statistically significant increases in physical activity rates among grade school children. Intervention components included: school curriculum changes, printed educational materials, community-based strategies, audio-visual materials, and play equipment.</p> <p><u>No impact</u> in all other studies.</p> <p>1.2 Duration of Physical Activity (23 studies) 12 of 17 studies led to statistically significant increases in physical activity duration among grade school children (increases in duration ranged from approx 5 min to 45 minutes more per week of MVPA, with CIs ranging from 1.4 min to approximately 90 min more per week of MVPA). Intervention components consistent across studies included: changes to school curricula and printed educational materials. One study reported a statistically significant effect in favour of the control group.</p> <p><u>No impact</u> in remaining studies.</p> <p>1.3 Time Spent Watching Television (17 studies) 7 of 16 studies reported statistically significant effects on TV viewing (reduction in TV viewing ranged from 5 min less per day to 60 min less per day). Intervention components consistent across studies included: changes to curricula, printed education materials, education sessions, and community-based strategies. One study reported a statistically significant effect in favour of the control group.</p> <p><u>No impact</u> in all remaining studies.</p>	<p>1. Outcomes Related to Behaviour</p> <p>1.1 Physical Activity Rates A small amount of evidence supports school-based interventions to increase physical activity rates among grade school children, but not for adolescents. Interventions should include a combination of: curriculum change, printed educational materials, community-based strategies, audio-visuals materials and play equipment.</p> <p>1.2 Duration of Physical Activity The public health sector should implement, support, and advocate for school-based interventions to increase duration of MVPA among grade school children. Intervention components that should be considered include: school curricula changes and printed educational materials.</p> <p>School-based intervention studies to date are not effective among adolescents and should be given careful consideration prior to implementation in secondary schools.</p> <p>1.3 Time Spent Watching Television The public health sector should implement, support and advocate for school-based interventions to reduce television viewing among grade school children.</p> <p>School-based interventions should include changes to school curricula, printed education materials, education sessions and community-based strategies.</p>
<p>2. Outcomes Related to Physical Health Status</p> <p>2.5 Maximal Oxygen Consumption (VO₂max) (6 studies) 4 of 6 studies reported statistically significant effects on VO₂max (ranging from 1.6 to 3.7mL/kg per min; 95% CI: 0.2 to 7.2 mL/kg per min) among grade school children. Interventions components consistent across studies included changes to school curricula, printed educational materials, and education sessions.</p> <p><u>No impact</u> in remaining studies.</p> <p><u>No Impact</u>: blood pressure, cholesterol, BMI, & pulse rate.</p>	<p>2. Outcomes Related to Physical Health Status</p> <p>2.5 Maximal Oxygen Consumption The public health sector should implement, support and advocate for school-based interventions to improve VO₂Max among grade school children. School-based interventions should include: school curricula, printed educational materials, and education session.</p> <p>Generally, school-based interventions do not have a positive effect on physical health status measures at current levels of implementation. If implemented, school-based interventions should aim to change behaviour, rather than physical health status.</p>

Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk
**For definitions see the [healthevidence.org](http://www.healthevidence.org/glossary.aspx) glossary at <http://www.healthevidence.org/glossary.aspx>

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

According to the World Health Organization, physical inactivity has been identified as the fourth leading risk factor for global mortality, increasing the risk of developing many diseases including cardiovascular disease, obesity and diabetes.¹ Being physically active has many health benefits and plays an important role in helping Canadians have a healthier lifestyle.² Childhood obesity is on the rise in Canada where 1 in 4 Canadian children and youth are either overweight or obese.³ Only about 7% of young Canadians, in 2007 to 2009, were meeting the recommended 60 minutes of moderate to vigorous-intensity physical activity each day.⁴ Based on the 2013 Active Healthy Kids Canada report card, a D- grade was given to children ages 3 to 17 for meeting the Canadian Physical Activity Guideline. Although an improvement from the 2012 report card, where an F grade was given, the report indicated no improvement in the physical activity levels of 5 to 17 year olds.⁵ Schools have been shown to be a key setting for implementation of interventions that support healthy behaviours among children.⁶ The 2013 Active Healthy Kids Canada report card gave a C grade for physical education and physical activity participation at school and in childcare settings,⁵ indicating room for improvement in such settings.

1. The World Health Organization.(2013). Physical Activity. Retrieved from <http://www.who.int/dietphysicalactivity/pa/en/>
2. Public Health Agency of Canada. (2013). Physical Activity. Retrieved from <http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/pa-ap/index-eng.php>
3. Public Health Agency of Canada. (2013). Childhood Obesity. Retrieved from <http://www.phac-aspc.gc.ca/hp-ps/hl-mvs/framework-cadre/2011/>
4. Statistic Canada. (2011). Physical activity levels of Canadian children and youth, 2007 to 2009. Retrieved from <http://www.statcan.gc.ca/pub/82-625-x/2011001/article/11553-eng.htm>
5. The Active Healthy Kids Canada. (2013). Report Card on Physical Activity for Children and Youth. Canada. Retrieved from <http://www.activehealthykids.ca/2013ReportCard/en/>
6. Cook-Cottone C, Casey C, and Feeley TH.(2009). A meta-analytic review of obesity prevention in the schools: 1997-2008. *Psychology in the Schools*, 46(8):695-719

Other quality reviews on this topic are available on <http://www.healthevidence.org>.

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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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