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Community wide interventions for increasing physical activity: Evidence and implications for public health

Review on which this evidence summary is based:
Baker, P.R.A., Francis, D.P., Soares, J., Weightman, A.L. & Foster, C. (2011). **Community wide interventions for increasing physical activity.** *Cochrane Database of Systematic Reviews, Issue 4.* Art. No.:CD008366. DOI: 10.1002/14651858.CD008366.pub2.

Review Focus

P General population, i.e. rural / urban settings.

I Community wide, multi-strategic interventions with *at least two strategies* aimed at promoting physical activity. (*Strategies may include:* building partnerships; individual counseling; mass media campaigns; other communication strategies; work in specific settings; and/or environmental change strategies.)

C Usual practice.

O ***Primary Outcomes:*** Population level of physical activity (dichotomous and continuous measurements). *Secondary Outcomes:* Health outcomes and risk factor status (e.g. cardiovascular disease, BMI, energy expenditure); health behaviours (e.g. sedentary behaviour, dietary patterns, smoking); intermediate outcomes (e.g. knowledge, attitudes); adverse outcomes (e.g. unintended changes in risk factors, opportunity cost, injuries)

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

Considerations for Public Health Practice

Conclusions from Health Evidence	General Implications
This high quality review is based on primary studies of low to moderate methodological quality, of which only one study was randomized. Limited evidence indicates *mixed* impact with interventions of: • **High intensity** (e.g. targeting multiple levels within a community via multiple strategies). • **Medium intensity** (e.g. targeting specific behaviours with multiple strategies and a moderate budget). • **Low intensity** (e.g. limited amount of activity with limited reach and small budget). Studies varied in: size and location (rural/urban) of setting; outcomes measured; and number of strategies and intensity. Many studies used building partnerships, individual counseling, mass media, and/or other forms of communication strategies in their multi-strategic interventions. Some studies with medium and high intensity interventions reported positive effects for subgroups (e.g. gender) of the population, but with no significant impact overall. For example, of the eight studies reporting physical activity attainment at a pre-defined amount, only one demonstrated effectiveness.	This review provides conflicting findings for the use of multi-component, community wide interventions to increase physical activity levels across the whole population, although some sectors may benefit. Results should be interpreted cautiously due to the poor quality of studies. Simply combining interventions does not necessarily result in increased physical activity as many studies, including some long term programs, failed to demonstrate efficacy. Attention should be given to ensure individual components included in combination are themselves evidence-based and reach targeted groups. More does not mean better. Interventions need to be implemented with continuous outcome measures sensitive to change and measured repeatedly over a period of years. Interventions which had an environmental change component seemed to be a promising direction. Those interventions which were essentially a mass media campaign were less likely to be successful. Public Health should also consider that community-wide interventions may impact and “speak to” population subgroups differently and could potentially broaden or narrow inequalities

Evidence and Implications *Evidence points are not in order of the strength of the evidence.*	
What's the evidence?**	**Implications for practice and policy**
1. High intensity interventions (7 studies) • Increase in regular physical activity (**RR 1.20, 95% CI 1.09-1.31**) in intervention emphasizing individual counseling to prevent/control hypertension in urban setting. (1 study, China) • Control more active than intervention group at baseline (**OR 0.77, 95% CI 0.65-0.93**) but *no difference* at 2-year follow-up in intervention emphasizing community approach to promoting physical activity in urban setting. (1 study) • Reduced proportion of *control* group who were physically active (**p<0.05**), but *no difference* in intervention group, in intervention emphasizing individual counseling / screening to reduce diabetes risk factors in urban setting. (1 study) • Subgroup effects**:** ➢ *Less reduction* in leisure time physical activity (**p<0.05**) and in walking (hours/week; **p≤0.05**) in *women* (compared to control) in intervention emphasizing community participation to improve lifestyle factors in urban setting. No impact on men (or overall). (1 study) ➢ Increase in physical activity (≥ 4 hours/week; **p=0.047**) for *men* (compared to control) in intervention emphasizing working with community organizations to reduce cardiovascular risk factors in regional village setting. No impact on women (or overall). (1 study) • No impact on physical activity for interventions with strong, multi-level media campaigns in urban (1 study) or rural (1 study) settings.	**1. High intensity interventions** • High intensity interventions involving individual counseling and community involvement may have *limited* effects on physical activity levels, but interventions focusing on mass media campaigns did not appear to be effective. • Public Health should consider the impact on different subsets of the population (e.g. gender) when implementing a community-wide intervention. • Communities in western countries may find the methods of the intense Chinese studies intrusive and culturally unacceptable.
2. Medium intensity interventions (9 studies) • *Greater decrease* in leisure time physical activity (from baseline to follow-up) in control group (**p≤0.05**) in intervention emphasizing multiple strategies to promote physical activity in urban setting. *Increase* in pedometer-measured walking (steps/day; **adjusted change 10.8%; p<0.01**) and self-reported walking (minutes/week; **adjusted change 17.34%; p<0.01**) in intervention group. (1 study) • In intervention emphasizing community engagement to prevent cardiovascular disease in urban setting *control* and *intervention groups* increased leisure time physical activity (MET), but were different at final evaluation (**adjusted change 12.26%; p<0.01**). *Greater decrease* in total daily physical activity in control group (**-114 vs. -68 MET-m/week; p<0.05**). (1 study) • Net reduction (**8.1%**) in percentage of intervention group respondents *not* achieving "heavy physical activity" (**95% CI 2.4-13.8; p=0.005**) in intervention emphasizing working with organizations to promote physical activity in urban setting. ***Result complicated because communities were different at baseline.* (1 study) • Subgroup effect: ➢ Increase in percentage of *men* regularly engaged in ≥1 vigorous activity (**p<0.004**) during a risk reduction educational program in urban setting. No impact on cohort or on women. (1 study)	**2. Medium intensity interventions** • Public Health should consider multi-strategy community wide approaches to promote walking and leisure time physical activity in urban settings; *however,* results from medium intensity interventions were highly *inconsistent* and difficult to interpret given group differences at baseline. Of the 9 studies reported here, 5 showed no effect and 1 showed a statistically significant effect for a subgroup of the population, not overall. • Again, Public Health should consider the impact on different subsets of the population (e.g. gender) when implementing a community-wide intervention.

• No impact on physical activity for interventions emphasizing: working with community organizations (1 study), promoting walking/achieving moderate physical activity (1 study), or improving healthy lifestyles (1 study) in rural settings; mass media (1 study) or preventing heart disease (1 study) in urban settings.	
3. Low intensity interventions (6 studies) • Adjusted change in supervised leisure time physical activity (**43%**) and adjusted mean difference **1.1** (**95% CI 0.56 – 1.63**) in leisure time physical activity at 4-yrs post-baseline (**p<0.0001**) for public school students in intervention emphasizing work in school settings to prevent overweight through physical activity. (1 study) • No impact on physical activity for interventions emphasizing: multiple strategies (1 study), environmental interventions (1 study), or chronic/cardiovascular disease prevention (2 studies) in urban settings; mass media in rural setting (1 study).	**3. Low intensity interventions** • Multi-strategy community wide interventions may be effective in particular *settings*. Public Health should consider low intensity school-focused interventions to improve physical activity of public school students.
Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; RR – Relative Risk; BMI – Body Mass Index; MET-m/week – metabolic equivalent of task in minutes per week; **For definitions please see the healthevidence.org glossary* www.healthevidence.org/glossary.aspx	
**** Note: Only the primary outcomes from each study are addressed in this evidence table.**	

Why this issue is of interest to public health in Canada

Based on 2007-2009 measures of height and weight, it is estimated that approximately one in four Canadian adults and 8.6% of children and youth age 6-17 years are obese.[1] Obesity is influenced by factors such as physical activity, diet, socioeconomic status, and ethnicity. The strongest association with obesity at a population level is physical inactivity.[1] If inactive populations were to become active, it is estimated that over 600,000 cases of obesity in women and over 400,000 cases in men could be prevented.[1] Changes in society, work, and leisure time, with a shift towards increased screen-time, inactive commuting, and less physically demanding work have influenced activity levels and contributed to the rising prevalence of obesity in Canada.[2] Obesity increases a person's risk for developing other chronic health conditions such as cardiovascular diseases, type 2 diabetes, cancer and osteoarthritis, which affect an estimated 1.8 million Canadians.[1,2] In 2008, the economic costs of chronic health conditions associated with obesity were an estimated $4.6 billion.[1] The Public Health Agency of Canada and the Canadian Institute for Health Information identify the potential for action to address obesity through community-level interventions in key settings and broad educational outreach interventions with the intent to influence behavior.[1] Since it is unlikely a single solution will solve the rising prevalence of obesity in Canada, there is a need for a comprehensive, multi-sectoral approach to addressing the contributing factors, such as physical inactivity.[1]

1. Canadian Institute for Health Information & Public Health Agency of Canada. (2011). *Obesity in Canada: A joint report from the Public Health Agency of Canada and the Canadian Institute of Health Information.* Retrieved from https://secure.cihi.ca/free_products/Obesity_in_canada_2011_en.pdf
2. Health Canada & Public Health Agency of Canada. (2006). *Obesity: It's your health*. Retrieved from http://www.hc-sc.gc.ca/hl-vs/alt_formats/pacrb-dgapcr/pdf/iyh-vsv/life-vie/obes-eng.pdf

Other quality reviews on this topic are available on www.healthevidence.org

Suggested citation

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