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Inclusive research for healthier decisions

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. (2015). **Community wide interventions for increasing physical activity.** *Cochrane Database of Systematic Reviews, 2015*(1), Art. No.: CD008366.

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 high methodological quality, of which only five studies were 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). Thirty three studies of 267 communities varied in: size (500 to 1.9 million) and location (rural/urban) of setting; outcomes measured; and, number and intensity of strategies. 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	This review provides findings of an absence of benefit of multi-component, community wide interventions to increase physical activity levels across the whole population, although some sectors may benefit. Caution should be made in making a broad conclusion that community-wide interventions lack efficacy as many of the studies identified reasons for failure. 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. There is still a need for communities to promote physical activity and evaluate their impact using optimal designs and measures. Public Health should consider exploring different approaches than those which have failed. When evaluating new programs, the comparison should be fair, the intervention assigned by randomisation, and physical activity outcomes measured with robust measures. Interventions with an environmental change component seemed to be a promising direction, as more people were seen walking. Interventions that were essentially a mass media campaign were

reported positive effects for subgroups (e.g. gender) of the population, but with no significant impact overall. For example, of the thirteen studies reporting physical activity attainment at a pre-defined amount, only one demonstrated effectiveness.	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 (10 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) • 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 in average daily minutes of moderate to vigorous PA for the population measured by accelometery (7-day) for interventions that emphasised environmental changes and social-marketing. However, more people were observed walking in the community. • 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 (14 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) • Using a multi-component, social-ecological approach including environmental changes, post-mean increase of 176 MET min/week obtained for the intervention at 2 years (1 study, China). The comparison community had no capacity for the program. • 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)	**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 14 studies reported here, 5 showed no effect, 2 significantly decreased physical activity for the intervention community, 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, and consider its appropriateness. Including an environmental component may be worthwhile.

• 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) • 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 (4 study) in rural settings; mass media (1 study) or preventing heart disease (1 study) in urban settings.	
3. Low intensity interventions (9 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 (2 studies), environmental interventions (1 study), partnership (2 studies) 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 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 Australia

Insufficient exercise is a risk factor for chronic health conditions such as heart disease, stroke and high blood pressure. In Australia, the recommended minimum level of activity for Adults is 150 minutes per week of walking or other moderate or vigorous activity, over at least 5 sessions. In 2011–12, only 2 in 5 adults (43%) were sufficiently active to meet the recommended guidelines, and sufficient activity levels decreased with age and among those experiencing social and economic disadvantage[1]. Independent of the health-related impacts of physical inactivity, physical activity is a strong contributor to obesity prevalence at the population level. Based on 2007-2008 measures of height and weight it is estimated that 25% of Australian adults (aged 18 and over) and 8% of children (aged 5–17) are obese[1]. This equates to almost 3 million people. State-based and Local Governments across Australia, together with key NGOs such as the National Heart Foundation, all acknowledge the importance of acting to increase physical activity levels in the population, shown by a range of strategic and local public health plans, advocacy and local interventions being implemented at the population level. The Australian Government identifies and promotes the importance of physical activity through the recently-updated Australia's Physical Activity and Sedentary Behaviour Guidelines (2014).

[1] Australia's health 2014, AIHW (http://www.aihw.gov.au/australias-health/2014/health-behaviours/#t2)

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

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