

Evidence summary Title:

Worksite nutrition and physical activity interventions for controlling employee overweight and obesity: Evidence and implications for public health

Review Quality Rating: 10 (strong)

Review on which this evidence summary is based:

Anderson, L.M., Quinn, T.A., Glanz, K., Ramirez, G., Kahwati, L.C., Johnson, D.B., Buchanan, L.R., Archer, W.R., Chattopadhyay, S., Kalra, G.P., Katz, D.L., Task Force on Community Services. (2009). **The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: A systematic review.** *American Journal of Preventive Medicine*, 37(4), 340 - 357.

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This is an evidence summary written to condense the work of the authors of this systematic review, referenced above. 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.

Review content summary

This report described the results of a systematic review of 47 studies determining the effectiveness of health promotion programs delivered in the workplace for weight control or weight loss through physical activity and/or nutrition. Half the included studies were conducted in the United States. Participants studied were current, adult employees aged at least 18 years, of any weight status, with or without identified risk or factors or chronic conditions (e.g., diabetes). The occupation of participants varied, and included both blue-collar (e.g. manufacturing plant) and white-collar (e.g. corporate executives) settings. To be included, studies had to provide data on at least one weight-related outcome [e.g., Body Mass Index (BMI)] measured at least 6 months from the intervention start date. Eligible studies compared their intervention arm(s) to an untreated comparison group, or to another intervention arm(s). Time-series studies were also eligible. Interventions described in this review included informational and behavioural skills program components; among these, four included an environmental or policy component. Outcomes measured include change in weight (lbs/kg), BMI, and percentage body fat (most often measured via skinfold thickness). Review authors report that worksite nutrition and physical activity programs achieve modest improvements in employee weight status at the 6–12-month follow-up. They, however, caution against drawing any firm conclusions given the lack of transparency and limited quality of the primary studies under review. Only two-thirds of the included randomized controlled trials provided sufficient statistical information to allow pooling of effects, and there were discrepancies in the statistical significance of some of the studies' findings.

Comments on this review's methodology

This is a methodologically strong review. A focused clinical question was clearly identified. Appropriate inclusion criteria were used to guide the search. A comprehensive search was employed using health, social, and psychological databases; reviewing reference lists of primary studies; hand searching key relevant journals (e.g. *Occupational Medicine*); and contacting key informants. The search was limited by language to English. Primary studies were assessed for methodological quality based on population and intervention descriptions, sampling, exposure and outcome measurement(s), data analysis, interpretation of results, and other biases. The methods were described in sufficient detail so as to allow replication and two reviewers were involved in quality appraisal. Any discrepancies in appraisal results were rectified by consensus discussion. Only studies with greatest or moderate design suitability and good or fair quality of execution were included in this review. The results of this review were transparent. Results were clearly presented in tables and forest plots to allow for comparisons across studies. Heterogeneity was assessed using the Q statistic. Appropriate analytical methods (random effects model) were employed to enable the synthesis of results from nine randomized controlled trials. The economic efficiency of interventions was also assessed by review authors.

Why this issue is of interest to public health

Across Canada, public health decision-makers recognize a concerning increase in obesity rates across children, youth and adults.¹ Obesity (defined as a BMI of >30 kg/m²) is an important individual and population health issue, as it is a contributor to a wide variety of chronic diseases, including diabetes, hypertension and liver disease, as well as breast, colon and prostate cancer.¹ In 2005, overweight-related chronic conditions accounted for \$4.3 billion in direct (\$1.8 billion) and indirect (\$2.5 billion) costs. This is likely an underestimation of the total costs of excess weight in Canada, given that it does not include obese individuals.¹ The most recent Canadian Health Measures Survey demonstrated that during the 2007-to-2009 period, just under 38% of adults were at a healthy weight, while about 1% were underweight, 37% were overweight and 24% were obese.² Notably, between 1981 and 2009, a decline in fitness levels was particularly apparent with young adults aged 20 to 39. Within this group, the percentage with a waist circumference that placed them at a high risk for health problems more than quadrupled, from 5%

to 21% among men, and from 6% to 31% among women.² Workplaces are an important intervention setting, given that worksites are sedentary for many workers and, often a place where access to energy-dense food and beverages is common.³

Evidence and implications

Evidence points are not in order of the strength of evidence

What's the evidence?	Implications for practice and policy:
<p>1. Summary effects by study design</p> <p>1.1. RCTs</p> <p>1.1.1. Weight change (9 studies)</p> <p>1.1.1.1. Individuals exposed to worksite nutrition and / or physical activity interventions lost 2.8 lbs more than the controls at 6-12 months follow-up. The true weight loss ranges from 0.96 to 4.63 lbs. (95% CI -4.63 to -0.96).</p> <p>1.1.1.2. Individuals exposed to worksite physical activity interventions were no more or less likely to experience weight loss than controls(95% CI, -6.49 to 2.0) (3 RCTs)</p> <p>1.1.1.3. Individuals exposed to worksite nutrition- and physical activity interventions lost 3.18 lbs more than the controls The true weight loss ranges from 0.50 lbs to 5.88 lbs. (95% CI -5.88 to -0.50) (5 RCTs)</p> <p>1.1.1.4. Individuals exposed to worksite nutrition interventions were no more or less likely to have lost weight than controls (95% CI -8.38 to 4.95). (1 RCT)</p> <p>1.1.2. BMI (6 studies)</p> <p>1.1.2.1. At 6-12 months follow-up, individuals exposed to worksite nutrition and / or physical activity interventions decreased their BMI 0.47 units more than controls. The true reduction in BMI ranged from 0.19 to 0.75 (95% CI -0.75 to -0.19).</p> <p>1.2. Cluster RCTs</p> <p>1.2.1. BMI (4 studies)</p> <p>1.2.1.1. Individuals exposed to worksite nutrition and / or physical activity interventions decreased their BMI 0.25 more than controls. The true reduction in BMI ranged from 0.14 to 0.64(95% CI -0.64 to -0.14).</p>	<p>1. Summary effects by study design</p> <p>1.1. The results from the strongest study designs suggest that</p> <p>1.1.1. Public health organizations should work with employers to advocate for and implement workplace weight control or reduction programs focused on a combination of physical activity and healthy eating promotion (rather than just physical activity or just nutrition).</p> <p>1.1.2. Public health organizations should implement workplace weight control or reduction programs focusing on physical activity and nutrition for their own staff.</p>
<p>2. Summary effects including all study designs</p> <p>To broadly assess program effects using all study designs (RCTs, cluster RCTs, non-randomized designs) and including studies regardless of availability of variance statistics, the difference between groups was computed and weighted according to sample size.</p> <p>2.1. Weight change (pounds) (15 studies)</p> <p>Individuals exposed to worksite nutrition and / or physical activity interventions generally lost more weight than controls at 6, 12, 18, 30 and 60 months follow-up.</p> <p>2.2. BMI (15 studies)</p> <p>2.2.1. Individuals exposed to worksite nutrition and / or physical activity interventions decreased their BMI more than controls at 6-9, 12, 18-24, and 36 months follow-up.</p> <p>2.2.2. Individuals exposed to worksite nutrition and / or physical activity interventions increased their BMI 0.08 units more than controls at 48 months follow-up. The effect range was 0.4 to- 1.7 units (6 data points).</p> <p>2.3. Body fat (12 studies)</p> <p>2.3.1. Individuals exposed to worksite nutrition and / or physical activity interventions experienced greater reductions in body fat than controls at 6-9, 12, 30 and</p>	<p>2. Summary effects including all study designs</p> <p>2.1. When the results of all study designs are considered, the evidence suggests that nutrition and / or physical activity interventions in workplace settings are effective in promoting reductions in weight, BMI and body fat</p> <p>2.2. Public health organizations should implement workplace weight control or reduction programs focusing on physical activity and/or nutrition for their own staff.</p> <p>2.3. Public health organizations should work with employers to advocate for and implement workplace weight control or reduction programs focused on physical activity and/or healthy eating promotion.</p> <p>2.4. Public health professionals should interpret the findings of systematic reviews that combine the effects of different study designs with caution, as this approach is weak in comparison to meta-analysis.</p>

60 months follow-up.	
<p>3. Other sub-group analyses</p> <p>3.1. Program focus</p> <p>3.1.1. No association was found between program effectiveness and focus of the program (e.g., CVD risk reduction, weight loss, physical fitness) or behavioural focus (diet or physical activity).</p> <p>3.2. More or more intensive program components</p> <p>3.2.1. Individuals exposed to structured programs (i.e., scheduled individual or group sessions) for behavioural skills development or physical activity achieved greater benefit than individuals exposed to unstructured (i.e., self-directed) programs.</p> <p>3.2.2. Individuals exposed to informational or educational program components alone achieved less benefit than individuals also exposed to behavioural counselling.</p> <p>3.3. Programs offered by professional versus lay leaders</p> <p>3.3.1. Individuals exposed to worksite nutrition and / or physical activity interventions offered by professionals had no more or less effects than interventions offered by lay leaders.</p>	<p>3. Other sub-group analysis</p> <p>3.1. There is insufficient evidence to draw conclusions about differential effects by program focus (nutrition and/or physical activity), program components (information, behavioural skills and/or environmental and policy) or program facilitator (professional vs. lay).</p>
<p>4. Methodological Issues with the Primary Studies in the Review</p> <p>4.1. Sub-group analyses</p> <p>4.1.1. The effectiveness of worksite health promotion programs on weight outcomes for specific subgroups was not possible due to limited reporting of important study population characteristics (e.g., ethnicity, age, socioeconomic data, job type).</p> <p>4.2. Reporting</p> <p>4.2.1. The primary studies did not always report prevalence rates of obesity in the workplace or sufficient detail about the settings in which the interventions took place (e.g., worksite size).</p> <p>4.3. Measurement</p> <p>4.3.1. Weight change was usually presented as group mean change in BMI, pounds, kilograms, or percentage body fat. Thus, it could not be determined if those at greatest risk (i.e., overweight or obese) benefited more or less, or if effects were due to a few employees that lost a large amount of weight or many employees that lost small amounts.</p> <p>4.3.2. Insufficient statistical information was provided which prevented meta-analytic pooling of effects.</p>	<p>4. Implications for Future Research</p> <p>4.1. Public health professionals should use the findings from this review to provide direction for further research in this area.</p> <p>4.1.1. The findings from this review suggest that future research should address</p> <p>4.1.2. The relative effectiveness of different intervention arms</p> <p>4.1.3. Environmental approaches to improving worker weight status</p> <p>4.1.4. Multi-component programs that include policy and environmental changes in conjunction with instructional or behavioural approaches</p> <p>4.1.5. Weight-related outcomes along with other physical and mental health effects</p> <p>4.1.6. Benefits related to productivity or absenteeism</p> <p>4.1.7. Program effects at the population level</p> <p>4.2. Future research should also report findings according to established guidelines (e.g., CONSORT, TREND)</p>
<p>5. Cost-effectiveness</p> <p>5.1. Three studies reported cost-effectiveness estimates from \$1.44 to \$4.16 per pound of loss in body weight</p> <p>5.2. One study reported a return of \$1.59 for every dollar invested in the program resulting in a net saving of \$0.59 per \$1.00.</p>	<p>5. Cost-effectiveness</p> <p>5.1. Public health professionals should interpret the findings related to economic efficiency with caution given until more detail is available about how a pound of weight loss translates into a final health outcome of reduced incidence of a disease and increased quantity and quality of life-years.</p> <p>5.2. More cost-effectiveness studies are needed to:</p> <p>5.2.1. Make stronger conclusions about the economic efficiency of worksite weight loss programs;</p> <p>5.2.2. Disentangle the effectiveness of multiple strategies that comprise comprehensive health promotion programs where obesity is one of many targeted health risk factors.</p>
<p>General Implications</p> <ul style="list-style-type: none"> Public health organizations should implement a combination of nutrition and physical activity interventions to promote weight loss in workplace settings. 	
<p>Legend: CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk</p> <p><i>**for definitions please see the thehealthvidence.org glossary</i></p>	

References used to outline issue

1. Public Health Agency of Canada. (2009). *Obesity in Canada: Snapshot*. Retrieved from <http://www.phac-aspc.gc.ca/publicat/2009/oc/pdf/oc-eng.pdf>
2. Statistics Canada. (2009). *Canadian Health Measures Survey, 2007 to 2009*. Retrieved from <http://www.statcan.gc.ca/daily-quotidien/100113/dq100113a-eng.htm>
3. Anderson, L.M., Quinn, T.A., Glanz, K., Ramirez, G., Kahwati, L.C., Johnson, D.B., Buchanan, L.R., Archer, W.R., Chattopadhyay, S., Kalra, G.P., Katz, D.L., Task Force on Community Services. (2009). The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: A systematic review. *American Journal of Preventive Medicine*, 37(4), 340-357.

Other quality reviews on this topic

- Benedict, M.A., & Arterburn, D. (2008). Worksite-based weight loss programs: A systematic review of recent literature. *American Journal of Health Promotion*, 6, 408 – 416.
- Faith, M.S., Fontaine, K.R., Baskin, M.L., & Allison, D.B. (2007). Toward the reduction of population obesity: Macrolevel environmental approaches to the problems of food, eating, and obesity. *Psychological Bulletin*, 133(2), 205-226.
- Galani, C., & Schneider, H. (2007). Prevention and treatment of obesity with lifestyle interventions: Review and meta-analysis. *International Journal of Public Health*, 52(6): 348-359.
- Parks, K.M., & Stelman, L.A. (2008). Organizational wellness programs: A meta-analysis. *Journal of Occupational Health Psychology*, 1, 58-68.

Related links

- Canadian Obesity Network <http://www.obesitynetwork.ca/>
- Canadian Institute of Health Information. (2004). *Overweight and obesity in Canada: A Population health perspective* http://secure.cihi.ca/cihiweb/products/CPHIOverweightandObesityAugust2004_e.pdf
- Statistics Canada, Adult obesity in Canada: Measured height and weight <http://www.statcan.gc.ca/pub/82-620-m/2005001/pdf/4224906-eng.pdf>
- Health Canada. Eating Well with Canada's Food Guide to Healthy Eating <http://www.healthcanada.gc.ca/foodguide>
- Health Canada. Dietary Reference Intake tables <http://www.hc-sc.gc.ca/fn-an/nutrition/reference/index-eng.php>
- Dietitians of Canada <http://www.dietitians.ca>

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