

INTERVENTIONS ON DIET AND PHYSICAL ACTIVITY: WHAT WORKS

EVIDENCE TABLES



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Introduction

Recognizing the heavy and growing burden of chronic noncommunicable diseases (NCDs), the Global Strategy on Diet, Physical Activity and Health (DPAS) was endorsed by the World Health Assembly in 2004 (1). DPAS describes the responsibilities of many stakeholders to take action to improve diet and promote physical activity. One of the responsibilities of the World Health Organization (WHO) is to "*identify and disseminate information on evidence-based interventions, policies and structures*" (1). This priority is further underlined in the NCD Action Plan that was endorsed by the World Health Assembly in May 2008.

Interventions on diet and physical activity: what works (What Works) addresses this responsibility, and is presented in three independent parts. The first document provides policy-makers and other stakeholders with a summary of tried and tested diet and physical activity interventions aimed at reducing the risk of chronic NCDs. A second document, *Methodology*, provides researchers and other interested parties with detailed information on the five stages of the methodology used for the review.

This, the third part of *What Works*, provides the detailed results of the review of the evidence evaluating the effectiveness of diet and physical activity interventions.

All documents can be accessed via the DPAS web site at www.who.int/dietphysicalactivity/whatworks.

Description of the evidence tables

All 395 peer-reviewed publications that met the inclusion criteria, as well as the grey literature included, were summarized and rated in evidence tables. In order to assist the reader to find interventions of relevance, the evidence is presented under the eight categories listed below.

- policy and environment
- mass media
- school settings
- the workplace
- the community
- primary health care
- older adults
- religious settings.

Information was extracted on the components of the intervention, on three primary outcome measures, and on other criteria that may be useful for policy-makers seeking a diet or physical activity intervention.

Intervention components

Each intervention is briefly described in the first column of the evidence tables. Generally this includes information on where the intervention took place, the target population, the intervention size, the goal of the intervention and its key components.

Outcome measures

The following outcome measures were considered in the evaluation of the various interventions:

- Psychosocial changes, including knowledge and attitudes related to diet and physical activity, self-efficacy, and stage of change.
- Behavioural changes, including changes in dietary, physical activity, and sedentary behaviour.
- Physical and clinical changes, including blood pressure, body mass index, cholesterol and weight.

Each intervention was assigned three quality rankings, one for each of these outcome measures. The quality rankings are described below.

- *Effective*: These interventions were based on a formative assessment, with a generally robust experimental design or sufficient sample size, and with significant effects on specified outcome variables. They generally met all or most of the planned objectives and would probably be applicable in other settings (disadvantaged communities and low- and middle-income countries),
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and demonstrated feasibility and sustainability in their current category. These interventions were most often considered the “example intervention” for the category and specific outcome.

- *Moderately effective*: These interventions lacked one or more of the critical components listed above, but were sufficiently robust to warrant consideration for application in specific settings or groups and met some, if not all of the planned objectives.
- *Promising/Insufficient evidence*: These interventions demonstrated an important trend or a significant effect, but may not have been sufficiently robust in terms of experimental design or sample size, and may therefore benefit from further testing and research.
- *Minimally effective*: Interventions in this ranking had significant, but perhaps not clinically relevant effects in at least one of the outcome areas. The study designs were sufficiently robust and therefore unlikely to yield different or better results through additional testing or in other settings.
- *Insufficient evidence/not shown to be effective*: Here, the study design of the interventions was not robust, and the results sufficiently unremarkable or negative that no further testing or research application are warranted.
- *Not reported/not measured*. The outcomes of these interventions were either not measured, or measured but not reported.

Policy/process implications

Process and policy implications are also highlighted for each intervention. In addition, factors such as intervention fidelity, sustainability, feasibility and cost-effectiveness are considered, where data were available, or where evaluated. Particular attention is drawn to programmes that could be effective in a broader context, or specifically in under-resourced settings.

References

The last column provides the reference(s) for the intervention described. The complete list of references of What Works can be found in Annex 1.

Policy and environment (diet)

Intervention components	Outcomes			Policy/process implications	References
	Psychosocial changes	Behavioural changes	Physical and clinical changes		
<p>Changing fatty acid composition of cooking oil</p> <ul style="list-style-type: none"> - Mauritius - Adults (n=2059) - Baseline survey in 1987 and follow-up in 1992 - Aimed at decreasing saturated fats in cooking oil. <p>Activities</p> <ul style="list-style-type: none"> - Government regulatory policy. 	Not reported/not measured	Not reported/not measured	<p>Effective</p> <p>Total cholesterol fell by 0.79 and 0.82 mmol/l in men women respectively ($P < 0.001$). Estimated intake of saturated fats decreased by 3.5% and 3.6% in men and women respectively.</p>	A cost-effective and sustainable way of reducing saturated fat intake.	<i>Uusitalo et al. 1996 (28)</i>
<p>Vending machine pricing strategy</p> <ul style="list-style-type: none"> - USA - 4 pricing levels: equal price, 10%, 25% and 50% reduction; and - 3 promotional conditions (none, low-fat label, low-fat label plus promotional sign). Low-fat=3 g or less per package. <p>Activities</p> <ul style="list-style-type: none"> - Reduced prices of low-fat snacks - Price-of-purchase messages regarding fat content (< 3 g) 	Not reported/not measured	<p>Effective</p> <p>Price reductions of 10%, 25% and 50% were associated with increases in low-fat snack sales. Low-fat snack sales increased by 9%, 39% and 93% respectively. Promotional signage was poorly associated with increases in sales of low-fat snack sales. Overall proportion of low-fat snack purchases increased from 25.7% to 45.8% and returned to 22.8% post-intervention.</p>	Not reported/not measured	Average profits per machine were not affected by the intervention. Pricing and promotion had similar effects for adolescent and adult populations. There may be some confusion with respect to public health messages about diet: low-fat message may be interpreted to mean that the portion size is not important. Pricing strategies may be most effective in disadvantaged communities with less disposable income. Policy implications exist with	<i>French et al. 2001 (14)</i> <i>French et al. 1997 (13)</i>

underneath each low-fat item in bright orange.

Sales of regular snacks declined during the intervention from 74.3% to 54.2% and increased post-intervention to 77.2%.

respect to taxation and price supports for foods of differing fat content.

<p>BEST Study (Budget-friendly, Energising, Sensory/Taste and Time Efficient/ Convenient Properties of Food)</p> <ul style="list-style-type: none"> - Canada - University students (n=2280 received the intervention and 72 were evaluated) - Two 4-week interventions - Aimed at examining the point-of-purchase effects of advertising on specific food items. <p>Activities</p> <ul style="list-style-type: none"> - Point-of-purchase advertising of fruit, vegetables, pretzels and yoghurt (study 1) - Point-of-purchase advertising of yoghurt only (study 2) in the cafeteria - 1 message for each food including at least 1 BEST food choice stimulus 	<p>Not reported/not measured</p>	<p>Moderately effective</p> <p><u>Study 1:</u> Significant increases in sales of pretzels, yoghurt and whole fruits (not fruit and vegetable baskets).</p> <p><u>Study 2:</u> Yoghurt sales increased significantly.</p>	<p>Not reported/not measured</p>	<p>Using the BEST properties in point-of-purchase interventions may be beneficial in promoting the consumption of healthy foods among university students, particularly when the price of the targeted foods are comparable to less healthy foods.</p>	<p><i>Buscher et al. 2001 (7)</i></p>
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g/insufficient	Promising/insufficient evidence	Not reported/not measured	This could be a cost-effective way of increasing F&V intake and should be further evaluated.	<i>Kristal et al. 1997 (17)</i>
significant in the action phase stage in the IG.	At follow-up, 43% of the IG recalled seeing flyers compared with 6.5% of the CG. 36% of the IG had used a 50¢ coupon and 18% had taken a recipe. However, neither group noted any difference in the amount of F&V bought.			
ted/not d	Minimally effective	Not reported/not measured	Price decreases and subsidies may be more powerful than health messages to increase consumption of healthy foods. More research is needed in disadvantaged communities.	<i>Horgen & Brownell 2002 (16)</i>
	Price decreases alone resulted in increased purchases of certain healthy items. For all food items, the price intervention had more positive outcomes than the health message			