Lifestyle-focused interventions at the workplace to reduce the risk of cardiovascular disease: a systematic review

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CRD summary
This generally well-conducted review found strong evidence for the effectiveness of workplace lifestyle interventions on body fat and (in populations at risk of cardiovascular disease) on body weight. No information was available on lifestyle change and detailed analysis of intervention components. The authors’ conclusions were supported by the data presented, but data-related limitations should be considered when interpreting the findings.

Authors' objectives
To assess the effects of workplace interventions targeting lifestyle changes on the main biological risk factors for cardiovascular disease.

Searching
EMBASE, PubMed, PsycINFO, SPORTDiscus and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for studies published in English between 1987 and December 2008. Reference lists of relevant reviews were screened and personal databases of the first two authors of this review were searched for additional publications. Search terms were not indicated.

Study selection
Studies were eligible if they were randomised controlled trials (RCTs) or controlled trials of work site lifestyle or health-promoting interventions (such as individual counselling, group education and self help) that aimed to promote physical activity and/or a healthy diet. Non-randomised trials were included only in the absence of sufficient evidence from randomised controlled trials. The target workplace population included blue-collar and white-collar workers. Outcome assessment had to include biological risk factors for coronary heart disease (such as body weight, body mass index, lipid parameters, blood pressure and body fat).

About one third of the studies included more than one intervention group. The most frequently used interventions were individual counselling (58%), group education (48%) and supervised exercise (35%). Infrequently used methods included general written advice, prescribed diet, self-help materials, environmental changes and monetary incentives. Populations at risk for cardiovascular disease were targeted in 39% of studies and mixed populations in 61%. The duration of interventions was not always clear; follow-up times ranged from six weeks to three years.

Two reviewers independently screened studies for inclusion. Any disagreements were resolved by referring to the full paper or by consulting a third reviewer.

Assessment of study quality
Quality assessment of the included studies was based on an adjusted version of the Delphi list (Verhagen et al. 1998) to assess randomisation procedure, comparability of groups at baseline, specification of inclusion and exclusion criteria, drop-outs, blinding of outcome assessment, adherence, follow-up six months or longer, intention-to-treat analysis and control of confounders. Study quality was classified as high if more than 50% of the nine quality criteria were met; otherwise, quality was rated as low.

Study quality was independently assessed by two reviewers; a third reviewer was consulted in cases of disagreement.

Data extraction
One reviewer carried out data extraction. No further methodology for data extraction was described.

Methods of synthesis
Assessment of effectiveness was based on a best-evidence synthesis that classified each outcome into four levels of evidence (strong, moderate, limited or no evidence). Results were considered consistent if at least 75% of relevant studies had results in the same direction. Where there were two or more high-quality RCTs, the conclusion was based on these RCTs only; otherwise, results from low-quality RCTs were taken into account.

Best-evidence synthesis was applied to all studies taken together and to studies aimed at populations at risk for cardiovascular disease only (studies in which the inclusion criterion was one or more cardiovascular risk factors) and to studies in mixed populations only (without inclusion criteria related to cardiovascular risk factors). The evidence was evaluated separately for the three main intervention types: individual counselling, groups education and supervised exercise.

Results of the review
Thirty-one RCTs (n=16,301) were included. Eighteen studies were rated high quality and 13 rated low quality. All of the included trials were RCTs. Individual trials included between 37 and 2,791 participants.

Body weight or body mass index (BMI) were reported in 20 studies, 14 of which were high quality and reported mixed findings. The reviewers concluded that there was no overall effect of the interventions on weight/BMI. Twelve studies reported weight/BMI in populations at risk and there was a strong evidence of an effect: six of seven high-quality RCTs showed a positive effect of interventions on body weight. There was no evidence of an effect of the interventions on weight/BMI among mixed populations. There was no evidence of an effect on weight/BMI for the three main types of intervention.

There was evidence for a positive effect on overall body fat (three high quality RCTs) and no evidence for an effect on central body fat, peripheral body fat (three high-quality RCTs) and hip circumference (two high-quality RCTs). There was limited evidence with respect to populations at risk for cardiovascular disease (one study). In mixed populations there was no evidence of an effect on central body fat (four high-quality RCTs) and hip circumference (two high-quality RCTs). Studies that included individual counselling (n=18) or group education (n=15) appeared to have more of an effect on peripheral body fat. Studies that evaluated exercise interventions (n=11) appeared to have more of an effect on overall body fat.

There was no evidence of a positive effect of the interventions on systolic or diastolic blood pressure overall and for any population or intervention subgroups.

Authors' conclusions
There was strong evidence for the effectiveness of workplace lifestyle interventions on body fat and, in populations at risk of cardiovascular disease, on body weight/BMI. Populations at risk of cardiovascular disease seemed to benefit most from lifestyle interventions. Supervised exercise interventions seemed to be the least effective strategy.

CRD commentary
This review addressed a clearly stated research question. Appropriate inclusion criteria were defined. Measures were taken to avoid the introduction of error and bias during the review process, but it was unclear whether data extraction was checked by a second reviewer. The literature search included a variety of relevant databases. Search terms were not indicated. Only studies in English were included and relevant non-English studies may have been omitted. Methodological quality was assessed and high quality ratings were received by 58% of the included studies. The reviewers rated the available evidence based on study quality; this was a justifiable approach, but it would have been useful if other factors related to the interventions (such as intervention intensity, complexity and theory base) had been taken into account. The authors did not state whether outcomes were reported at the end of the interventions or at the end of a post-intervention follow-up period. The authors stated that in many cases the exact contents of the intervention was incompletely described. The authors pointed out that most studies did not report on actual lifestyle/behaviour changes achieved or on participants’ adherence to the interventions. These factors could be regarded as essential prerequisites in the reporting of studies aiming to influence behaviour.

The authors’ conclusions followed from the data presented, but limitations should be taken into account when interpreting the findings.
Implications of the review for practice and research
The authors made no specific recommendations for practice.

Research: The authors stated that future studies should report participants' adherence to interventions as well as the actual behaviour/lifestyle change achieved.

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