



Review

The effectiveness of workplace dietary modification interventions: A systematic review



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ABSTRACT

Objective. To evaluate the effectiveness of workplace dietary modification interventions alone or in combination with nutrition education on employees' dietary behaviour, health status, self-efficacy, perceived health, determinants of food choice, nutrition knowledge, co-worker support, job satisfaction, economic cost and food-purchasing patterns.

Method. Data sources included PubMed, Medline, Embase, Psych Info., Web of Knowledge and Cochrane Library (November 2011). This review was guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement. Studies were randomised controlled trials and controlled studies. Interventions were implemented for at least three months. Cochrane Collaboration's risk of bias tool measured potential biases. Heterogeneity precluded meta-analysis. Results were presented in a narrative summary.

Results. Six studies conducted in Brazil, the USA, Netherlands and Belgium met the inclusion criteria. Four studies reported small increases in fruit and vegetable consumption (\leq half serving/day). These studies involved workplace dietary modifications and three incorporated nutrition education. Other outcomes reported included health status, co-worker support, job satisfaction, perceived health, self-efficacy and food-purchasing patterns. All studies had methodological limitations that weakened confidence in the results.

Conclusion. Limited evidence suggests that workplace dietary modification interventions alone and in combination with nutrition education increase fruit and vegetable intakes. These interventions should be developed with recommended guidelines, workplace characteristics, long-term follow-up and objective outcomes for diet, health and cost.

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Introduction

The increasing prevalence of diet-related diseases including obesity and cardiovascular disease is largely driven by the interlinked problems of poor diet, calorie excess and physical inactivity. This global epidemic continues to endanger population health and the sustainability of healthcare systems worldwide (WHO, 2003). Obesity in adults accounts for up to 6% of direct health costs in the EU and more than 12% in indirect costs including shortened lives, reduced productivity and lowered incomes (WHO, 2006). Cardiovascular disease (CVD) accounts for nearly half of all deaths in Europe and 35% of all premature deaths (before the age of 65). CVD costs the EU economy €192 billion representing a per capita annual cost of €391 (Allender et al., 2008).

There is a need to develop and evaluate dietary interventions in suitable environments to investigate if these interventions can improve dietary behaviours and reduce diet-related disease risk (Craig et al., 2008; National Institute of Health and Clinical Excellence, 2007). The workplace is regarded as an ideal environment to promote healthy dietary behaviours because most individuals spend two-thirds of their waking hours at work (Chu et al., 2000; WHO, 1991, 2003, 2008). Uncertainty remains regarding the effectiveness and cost-effectiveness of workplace dietary interventions.

Employees depend on their workplace to provide many of their daily meals (Lachat et al., 2009; Roos et al., 2004). Individual, environmental and societal factors can affect food choices (WHO, 2003). Dietary interventions focused on improving employees' dietary patterns need to surpass individual nutrition education and intervene at multiple levels of the workplace environment including food choice modifications and nutrition education (Mhurchu et al., 2010). Effective workplace health promotion is complex and multi-dimensional. Each workplace is uniquely defined by its employee organisation and structure; history and culture; and social, economic and political circumstances (Kreuter et al., 2004). The effectiveness of complex dietary interventions may be enhanced if they incorporate environmental modifications, are designed using established guidelines, take into account the needs and characteristics of the workplace and its employees and have the support of all relevant stakeholders (Kreuter et al., 2004).

Previous reviews have reported that workplace environmental and education interventions including diet, physical activity and other lifestyle factors modestly improve dietary quality (Maes et al., 2012; Mhurchu et al., 2010). This review differs from previous reviews because it focuses on dietary modification interventions only or in conjunction with nutrition education where the food choice offered has changed in the work environment during the intervention. There is some evidence to suggest that such interventions influence and may improve dietary behaviour (Engbers et al., 2006; Mhurchu et al., 2010; Seymour et al., 2004). The objective of this review is to evaluate the effectiveness of workplace dietary modification interventions alone or in combination with nutrition education on employees' dietary behaviour, clinical health status, self-efficacy, perceived health, determinants of food choice, nutrition knowledge, co-worker support, job satisfaction, economic cost and food-purchasing patterns.

Methods

Data sources and searches

This systematic review was guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (Moher et al.,

2009). Following an initial scoping search (4th November 2011, Appendix A), a full search strategy was developed for PubMed which included a Cochrane highly sensitive search filter for controlled trials (Robinson and Dickersin, 2002). This search strategy was modified for all databases including Medline (1951–November 2011), Embase (1974–November 2011), Psych Info. (1967–November 2011), Web of Knowledge (1900–November 2011) and the Cochrane Library (1972–November 2011), all of which were searched for English language publications (16th–17th November 2011, Appendix B). Reference lists of all included studies were hand searched. An advanced search was conducted in Google Scholar and the WHO website.

Study outcomes

Studies were included in the review if they reported the effects of workplace dietary modification interventions on any of the primary and secondary outcomes that were specified in the protocol for the review. The primary outcome of interest was a change in dietary behaviour. It was assessed using 24-h dietary recall measures, food diaries, weighed food records, food frequency questionnaires (FFQs) or other dietary assessment methods.

Secondary outcomes considered in this review included:

1. Clinical health status outcomes such as body mass index (BMI), waist and hip ratio measures, and serum cholesterol levels (individual/employee level outcomes)
2. Self-efficacy (individual/employee level outcome)
3. Perceived health (individual/employee level outcome)
4. Nutrition knowledge (individual/employee level outcome)
5. Determinants of food choice outcomes including attitudes to food and food habits (individual/employee level outcomes)
6. Co-worker support (individual/employee level outcome)
7. Job satisfaction (individual/employee level outcome)
8. Economic cost outcomes including absenteeism, productivity, healthcare costs and profit margins (wider employer/worksite level outcomes)
9. Food purchasing patterns (wider employer/worksite level outcomes).

These outcome measures were selected to show the impact of these interventions on the employees and the workplace. The primary outcome was a change in dietary behaviour as these interventions were focused on dietary modification. The secondary outcomes measured the effectiveness of these interventions at the individual/employee level and the employer/worksite level. The mediating mechanisms affecting the impact of the intervention were also of interest (i.e. co-worker support and job satisfaction).

Study selection

All published articles from each database were imported into Endnote X3 2009 and any duplicates were removed. The titles and abstracts of the remaining studies were reviewed. Any full text articles retrieved were independently screened for eligibility by three review authors who were not blinded to authors' names, journal title or publication date. Any disagreements regarding study inclusion were resolved by discussion and consensus (Table C.1, Appendix C).

Stronger study designs including randomisation, controlled studies and comparable control groups were selected for this review to ensure in so far as is possible that the reported effects were attributed to the interventions. Randomised controlled trials (RCTs) with full and quasi-randomisation, by individual and workplace clusters, were included. Controlled trials that did not use appropriate randomisation strategies and controlled before and after studies were also included. A controlled before and after study was defined as a non-randomised study design where a control population of similar characteristics and performance as the intervention group was identified and where data were collected before and after the intervention in both the control and intervention groups (Higgins et al., 2008). Participants were adults (<18 years) in paid employment in public, voluntary or private organisations. Studies including selected groups of employees with pre-existing medical

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