

Scoping paper: Workplace interventions to increase physical activity and improve dietary choices



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1. Background to topic

Of the Australian population aged 15 years and over, approximately 60% are engaged in employment [1]. It has been estimated that around 70% of people who are employed are sedentary or participate in low levels of physical activity [2]. In addition, increased sitting time at work is associated with an increased risk of being overweight or obese [3]. Obesity has been identified as a major driver of costs in the workplace and is associated with absenteeism, injuries and disability [4]. It is estimated that in Australia the cost of lost productivity through absenteeism due to obesity related ill health is in the order of \$6.4 billion [5]. Individuals working longer hours, shift workers and male blue collar workers are most at risk of being obese [6].

This scoping paper is based on evidence that improving the work environment through workplace wellness programs can lead to improvements in behavioural risk factors for chronic diseases and obesity [7]. In addition, there are benefits of these programs for employers with reports of increased employee productivity, reduced absenteeism¹ and presenteeism², and reduced staff turnover [10].

The workplace environment has been recognised as a valuable intervention site for several reasons:

- A large percentage of adults are employed and therefore interventions in this setting have a large target audience [11].
- People who work spend two thirds of their waking hours at work [12-15].
- The workplace setting is conducive to multilevel interventions (intrapersonal, interpersonal, organizational, and environmental) [16-19].
- It offers the opportunity to utilise peer networks and employee incentives [20,21].

2. Intended policy impact

Policies to encourage or mandate healthy work environments which encourage increased physical activity (PA) levels and improved dietary choices, are expected to result in positive health outcomes amongst employees, including reductions in bodyweight and body mass index (BMI). In addition to these health related outcomes for employees, there are also potential benefits for the employer with potential cost savings or returns on investment (ROI) related to improvements in work place performance.

¹ *Absenteeism* is an employee's time away from the workplace due to illness or disability [8]

² *Presenteeism* is the limitations experienced by employees in some aspects of their job performance but who are present at work. This is often associated with a hidden costs for employers [9]

3. Current policy status

a. Australia³

In Australia, the 'Healthy Workers' initiative was introduced in 2008. The initiative is providing approximately \$222 million in funding. State and territory governments have access to \$217 million to support health promotion activities in workplaces that aim to decrease rates of overweight and obesity, increase PA levels, increase intake of fruit and vegetables, and decrease both the rates of smoking and alcohol consumption.

State and territory specific Healthy Workers initiatives are outlined in Appendix A.

b. International

Recommendations and guidelines have been developed by the World Health Organisation (WHO) and the United Nations (UN) for the implementation of workplace wellness programs to reduce the rate of non-communicable diseases around the world. There are also examples of how mandated healthy workplace policies and voluntary programs have been applied in the USA and Europe respectively.

- UN recommends [22]:
 - The provision of incentives for work-site healthy-lifestyle programs.
 - Encourages the private sector to 'promote and create an enabling environment for healthy behaviours among workers'
- WHO recommends [23]:
 - Policy options to promote the availability and provision of healthy food in the workplace; and the use of workplaces as a way to create health and nutrition promoting environments.
 - Policy options to promote PA including the creation and preservation of built and natural environments, which support PA in workplaces.
- USA
 - Health promotion policies have been mandated and implemented at several federal workplaces [24]. These policies aim to assist employees to make healthy PA and nutritional choices at work. The policies/programs include alternative transportation options which encourage active transport to work; wellness program interventions; and changes to the work site built environment.
- EU
 - The European Network for Workplace Health Promotion (ENWH) is an informal network of national occupational health and safety, public health, health promotion and statutory social insurance organisations. It includes 28 EU member states, and other countries of the European Economic Area. The ENWH has developed and implemented good practice criteria for work place health promotion.
 - The ENWHP facilitated the 'Move Europe – Healthy Lifestyles in the Working Environment', which took place between 2006-2009 [25]. Over 3000 companies of various sizes from 25 member countries took part in the initiative aimed at the dissemination of good workplace health promotion practices, including increasing PA levels and healthy diets. The program was based on an intensive review of existing literature and other quality models.

³ In Australia, several state and territory governments have implemented mandated policy regarding the provision and promotion of healthy foods and drinks in government run health facilities. These studies have been identified within the 'food provision' scoping paper and not further discussed here.

4. Evidence of efficacy/effectiveness

a. Overview of evidence

There have been several reviews of workplace wellness and health promotion programs and policies. The evidence section reviews the evidence of the effectiveness of different types of interventions and makes recommendations on the key success factors for the efficacious implementation of these programs.

See Appendix B for details of the individual studies reviewed and summarised below.

Evidence of effectiveness of specific interventions

Policy interventions

Although there is a scarcity of evidence on the effectiveness of policy interventions to support increased PA and healthy eating; these policy approaches have been emphasised as key elements of a successful workplace health promotion program [32]. Examples of policy interventions in the workplace to support healthy eating and PA include healthy canteen and catering policies, flexible time for employees to engage in PA, encouraging breaks from prolonged sitting, providing active transport options, subsidies for PA opportunities outside work and the provision of after-hours childcare [32].

Environmental changes to encourage physical activity (PA)

A systematic review of workplace PA interventions undertaken in 2013 [26] identified that while 60% of studies reported improvement in PA levels, steps or BMI; over half of the RCTs examined did not demonstrate a positive intervention effect on any outcome. Studies with less rigorous research designs using internet-based interventions, pedometers, and social and environmental level changes demonstrated the greatest improvement in measured outcomes.

Other studies have reported that site facilities such as walking paths, secure bike storage and change rooms with showers have all been shown to support PA amongst workers [32].

Walking programs and pedometers

There is evidence from RCTs that 'walking route' interventions are effective in significantly increasing daily step counts in employees. In 2 separate 10 week RCTs, the intervention group had significantly increased step counts compared to those in the control group ((+ 968 steps/day in the intervention group compared to - 391 steps/day in the control group) [33], similar results were seen in a previous study [34]). There is limited evidence that pedometers used in workplaces successfully increase steps per day ((+ 1475 steps/day in the intervention group [35]). However an evidence review of workplace pedometer programs [36] concluded that there was a lack of sufficient evidence to evaluate the efficacy of pedometer interventions in the workplace.

Stair prompts

Longitudinal and observational studies have shown the use of 'point of choice' stair prompts, along with signs and stairwell aesthetics encourage stair use in the workplace. These interventions are effective in increasing PA levels (increased stair use ranged from 9% [37] to 50% [38]), and decreasing BMI (3 months post intervention BMI decreased by $0.7 \pm 2.6\%$ ($P = 0.038$) [39]. These interventions appear to be low cost and easy to implement across workplaces however there is limited evidence that these interventions increase stair use in the long term [32].

Treadmill, sit-stand and active workstations

There is strong evidence that interventions utilising treadmill workstations and sit-stand desks are efficacious in significantly increasing PA levels (expending an additional 74 calories per day ($p < 0.01$) when using the treadmill [40]) and reducing sitting time (143 min/day vs the control group ($p < 0.001$) [41, 42]).

PA breaks and enhanced access to PA opportunities

There is limited evidence that increased opportunity to exercise in the workplace leads to increased levels of PA amongst employees. One study found that fifteen minute breaks where workers participated in group PA sessions were effective in achieving weight loss [32].

Studies have found that free gym membership, PA education and time to exercise during the day were all effective in increasing PA levels [43]. Individualized exercise prescription is also an effective strategy to increase PA levels [32].

Environmental changes to encourage healthy eating

Systematic reviews have found that improvements in the food environment can be relatively low cost to implement and can have positive effects on dietary intake [32]. Individual studies have shown that the promotion of fruit and vegetables in workplace cafeterias; provision of free fruit, and the promotion of low fat food products in vending machines all increase the consumption of healthy foods. A review [28] of workplace food environment interventions reports that workplace wellness programs have the ability to reduce fat intake by 1-10% and increase fruit and vegetable intake by 0.3-0.5 servings/day. However another systematic review of workplace dietary interventions [27] identified that these interventions are associated with only moderate improvements in dietary intake (fruit and vegetables and total fat intake) of employees and concluded that the accurate estimation of both effectiveness and cost-effectiveness were unable to be reliably determined due to the lack of well-designed research studies.

Promotion of healthy foods in cafeterias

A 2 year RCT [44] found a significant intervention effect of increased daily serves of fruit and vegetables (0.3 serves/day ($p < 0.05$)) as a result of environmental changes made to the worksite cafeteria. Increasing the quantity and making fruit and vegetable options more palatable were also found to increase the consumption of fruit and vegetables amongst employees (increase of 95g per customer per day, maintained over a 5 year period [45]). Studies have also found that changing the worksite canteen can significantly decrease the percentage of energy from fat consumed by employees [32].

Provision of free fruit

The free provision of fruit has been investigated in several studies and has been shown to have a significant effect on daily fruit and vegetable consumption (increase of 112g of fruit ($p = 0.002$)) [46]. There was also significant reductions in the daily consumption of added sugars (10.7 g ($p = 0.019$)).

Healthy vending machines

The promotion of low fat snacks in vending machines with lower prices and point of sale promotion has been shown to be effective in significantly increasing the purchase of low fat snacks whilst profits remain unchanged (French et al. 2001).

Evidence of effectiveness of multicomponent (MC) programs

There is strong evidence from RCTs and systematic reviews that MC programs implemented with organizational support are effective in improving dietary intake, increasing PA and improving anthropometric measures. A meta-analysis in 2012 [29] examining PA and nutrition interventions in the workplace found modest effects for most of the approaches used (e.g. education, cognitive-behavioural, social influence, exercise). Larger effect sizes were seen in interventions which used motivational incentives. Other systematic reviews and meta-analyses have demonstrated that there is moderate quality evidence that workplace PA and dietary interventions produce modest reductions in body weight [30], BMI [31] and body fat percentage [10]. The effectiveness of programs improved when the intervention components were more intensive.

However there aren't consistent findings on which components are most effective when combined. One review concluded that the greatest evidence was for MC programs with environmental interventions combined with PA and nutrition focused interventions [47]. Another study found that MC dietary interventions combined with an educational component was more effective than nutrition interventions combined with PA interventions [32]. An Australian based review concluded that the strongest evidence was for MC programs which incorporated both nutrition and PA interventions, provided places/opportunities for PA, included employee education and peer support, and used prompts to encourage stair use [48].

The WHO [49] recommends that MC workplace interventions should include individualised behaviour change strategies, employee involvement in program planning and implementation, the provision of sufficient space for PA at the workplace, offer more healthful food and beverage options, and involve the families of the workers.

The Centre for Disease Control and Prevention advise that a MC workplace program should include 3-5 interventions which includes a mix of educational interventions together with policy and environmental support [32].

Studies have found that MC programs with an element of individually focused interventions such as health risk assessments and personal health coaching/counselling were more effective in improving fruit and vegetable intake, increasing PA, inducing weight loss and decreasing sitting time compared to interventions focused only on environmental change [50-56].

As a component of a MC workplace program, health lectures, workshops and peer education implemented within the workplace have been shown in several RCTs to positively impact dietary intake, anthropometric measures and PA levels in employees [57-60].

Several RCTs and a systematic review of internet/email-based interventions have shown that these interventions can be effective in changing the health behaviours of employees [61-68]. These interventions are likely to be cost-effective and easy to implement in the work place. However there is uncertain evidence of the effectiveness of web based interventions alone [32].

Incentives such as increased pay and corporate challenges/competitions have been shown to be effective components of MC workplace programs and can be effective in incentivizing those most at risk [32].

The return on investment (ROI) of workplace interventions

It is proposed that workplace interventions which increase PA levels and improve nutritional intake of employees could produce positive ROI for employers. However the evidence for this is inconclusive. A systematic review found that overall, mean weighted ROI was positive (\$1.38), however smaller financial returns were found in studies of higher methodological quality, with RCTs demonstrating a negative ROI [69]. Other studies have found a range of positive ROI ranging from \$1.40 [71] to US\$15.60 [72-75]. The study design, methodological quality and the quality and effectiveness of the interventions are all likely to impact ROI [69, 70].

Absenteeism & Presenteeism

There is strong evidence from 2 RCTs and several quasi-experimental studies that workplace interventions reduce levels of absenteeism, presenteeism and staff turnover. Studies report a range of reductions in absenteeism rates (20% [76], 25% [74], 28% [77], 0.36 days monthly [78]). Reduced presenteeism which is often measured by the employees' ability to concentrate and accomplish work tasks was also reported in several studies [76] [78, 79] [80].

b. Potential to use evidence as the basis for an intervention

There is evidence from high quality individual studies, systematic reviews and meta-analyses that can be used to model this intervention. The challenge will be in the selection of the most appropriate studies to inform the model.

c. Description of potential interventions

The defined policy for evaluation will need to specify the following:

- The types of interventions that should be included. The strongest evidence exists for MC workplace programs that include policy/environmental interventions to change both the PA and nutrition environment. In addition there should be an individualised component.
- Mandatory versus voluntary implementation. If the policy is defined as mandatory implementation, there needs to be consideration of which companies the regulations will apply to e.g. which industries, the size of the company etc.
- The inclusion and method of incentivising companies to implement these policies – e.g. tax incentives, funding assistance, implementation resources etc.
- Method of regulation enforcement

5. Feasibility of intervention's implementation in the Australian context

Given the leadership and funding available for workplace interventions from all levels of government, this intervention is likely to be feasible to implement widely across Australia. The resources provided by the Healthy Workers initiative and the potential for ROI may also encourage employers to embrace such programs.

The feasibility of implementation across the full range of workplaces needs to be further investigated. The importance of context has been emphasised, and each MC workplace wellness program needs to be tailored to the specific work setting.

Other success factors for intervention implementation include management buy-in, employee ownership of the program and effective evaluation with program improvements being made based on the results of the evaluation.

6. Stakeholders

a. Policy makers/regulators

- Australian Government Department of Health and Aging
- State government department of health
- Australian Government Department of Employment
- State/local government health promotion officers working on workplace initiatives

b. Industry

- OH&S representatives, company executives from businesses of all sizes
- Employees
- Trade Unions

c. Advocates

- Heart Foundation Australia

d. Academics

- Professor Tony LaMontagne – Work, Health and Wellbeing, Population Health SRC, Deakin University

7. Issues specific to this intervention

a. Modelling

There is high quality quantitative data that can be used to inform the modelling of these interventions. However choosing the effect size of interventions may be difficult as subtle differences in program implementation may result in different effect sizes. A range of effect sizes needs to be tested in the sensitivity analysis.

Interventions need to be tailored to the workplace, and therefore the specifics of the intervention and therefore the effect size will differ according to the type, size and location of the workplace.

b. Other issues

- Equity
 - This intervention is limited to those in employment.
 - There is evidence that MC workplace interventions can be implemented across various industries and workplaces including schools, universities, large office complexes, factories and fire stations. However the uptake of programs as part of the Healthy Workers initiative by different businesses may provide some useful information of the uptake of voluntary schemes and therefore the distribution of benefits of a workplace wellness policy which is voluntary based.

8. Intervention's potential to meet intervention selection criteria

a. Potential impact of addressing the problem of obesity

Approximately 60% of Australians aged 15 years and over are employees, and with many of those individuals being largely sedentary at work and making dietary choices at the workplace, the workplace is a potentially effective setting to address obesity prevalence in the Australian population.

b. Relevance to current policy decision making

The Healthy Workers initiative is currently being implemented in each state and territory, and therefore the evaluation of the economic credentials of this initiative or a variation of it is highly relevant to decision making.

An economic evaluation from the perspective of the employer will also be a useful tool to encourage uptake of this intervention by employers.

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