

Review

A systematic review of the impact of work environment on smoking cessation, relapse and amount smoked

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Abstract

Background. Smoking is an important issue for the majority of the world's working population. It is important to explore in which ways the workplace might contribute to changes in smoking status and smoking behavior. The present article provides a systematic review and quality assessment of studies that have addressed the impact of factors in the work environment on smoking behavior.

Methods. An evaluation of the methodological quality of 22 prospective studies was based on 14 explicit criteria, which included features of study design, statistical analysis, sampling issues and measurement. The level of scientific evidence was evaluated for each study.

Results. There was strong evidence for an effect of the work environment on the amount smoked, but insufficient or mixed evidence regarding cessation and relapse. Summarizing the results, high job demands were associated with higher amount smoked and with increased likelihood of cessation. Resources at work and social support were positively associated with cessation and negatively associated with relapse and the amount smoked.

Conclusions. The results supported the overall hypothesis that the work environment influences aspects of smoking behavior. Recommendations are made for more intervention studies where changes in work environment are carried out in combination with health promotion interventions.

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Introduction

Work and smoking are interconnected in many different ways. It is well documented that smoking seriously damages health and predicts outcomes such as disability pension (Krokstad et al., 2002), early retirement (Lund et al., 2001) and sickness absence (Wooden and Bush, 1995). Many workplaces in developed countries have now almost completely prohibited smoking in the workplace or, at least, introduced some smoking policies, often in association with smoking cessation programs. Smoking prevalence rates have been reduced significantly in many developed countries as a result of these measures and a range of other community-wide initiatives (Osler et al., 2001). However, smoking is still an important issue for a majority of the world's working population. And therefore it is still important to identify the ways in which the workplace, the work environment and the organization of work might contribute – positively or negatively – to changes in smoking status and smoking behavior. The work environment might be hypothesized to influence changes in smoking in the following ways: the work environment might influence (1) the probability of smoking cessation; (2) the probability of relapse following initial cessation; and (3) the amount of cigarettes smoked. Of course, these three relationships might not necessarily operate independently of one another, and furthermore, different mechanisms might contribute each. Firstly, stressors in the work environment might contribute to increased smoking or make it harder to quit (Cohen and Lichtenstein, 1990; Serxner et al., 1991; Steptoe et al., 1996, 1998; Westman et al., 1985). Secondly, resources in the work environment, e.g. decision latitude or rewards, might strengthen the individual resources and make it easier to reduce smoking, to quit or to avoid relapse (Pucci and Haglund, 1993). Thirdly, a discrepancy between demands and decision latitude (job strain) can contribute to increased smoking, difficulties with cessation and relapse (Cohen et al., 1991). Fourthly, social support can influence changes in smoking. Social support to quit can make cessation easier. Conversely, the presence of smoking co-workers can contribute to increased smoking and counteract cessation (Westman et al., 1985).

Critical analyses of these possible associations and the underpinning explanations are important for two reasons. Firstly, this might contribute to our understanding of socioeconomic health disparities as they are mediated through key health behaviors like smoking and, secondly, this might provide a firmer evidence base for integrated health promotion and work environment interventions at the worksite. The relationships have been investigated in a range of different studies, but so far, there has been no attempt to review and synthesize all the relevant findings.

The present article provides a systematic review and assessment of the quality of studies dealing with the impact of factors in the work environment on the amount smoked, the likelihood of quitting and the likelihood of relapsing after cessation.

Methods

Search methods

Articles from 1980 to 2004 written in English, German or Scandinavian languages were searched in the bibliographic databases PubMed and PsycINFO. The search terms included in the first screening were: work environment OR workplace OR occupation OR job AND smoking OR tobacco. Abstracts from these articles were reviewed, and all articles covering the following topics were included in a database: (1) smoking and work environment; (2) smoking and type of job; and (3) health promotion programs at the worksite including smoking (i.e. smoking cessation programs, lifestyle interventions, smoking ban). This database was compiled using the Reference Manager software (ISI ResearchSoft, 2000). Articles fulfilling each of the following three criteria were selected for this review: prospective study design, at least two assessments of smoking status and assessment of at least one work environment factor. Both interventions and observational studies were included. Studies that only included measures of intentions to quit smoking but not changes in smoking habits were excluded. As the questions being addressed are questions of causation, only prospective and longitudinal studies were included. Many cross-sectional studies exist in the field, but from these it is not possible to distinguish selection of smokers into specific work environments from the influence of work environment on changes in smoking behavior. Retrospective studies were also excluded because of the difficulty in making causal inferences from such studies. Studies of the effect of smoking policy or smoking bans at the worksite, not including specific work environmental factors, were excluded because good reviews of this issue already exist (Eriksen and Gottlieb, 1998; Heaney and Goetzel, 1997; Pelletier, 1993). Individual factors such as self-efficacy and social factors in the family or outside the workplace might also play a role for changes in smoking (Ockene et al., 2000); but studies of these associations were not included in this review unless these variables were examined in combination with work environment factors.

A literature search on the terms used generated 3265 references from PubMed and 700 references from PsycINFO. Abstracts of all articles were read on screen, and 293 articles were identified as dealing with both the fields of smoking and the work environment. Of these 293 articles, twenty-two separate studies were identified from 24 publications using the relevant selection criteria. Two of these studies were stratified by gender (Shields, 1999; Swan et al., 1988; Swan and Denk, 1987), and one publication covered two different samples (Mermelstein et al., 1986), resulting in three extra sub-studies (marked with “two samples” in Table 1 and the results with “s1” and “s2” respectively in Table 2). The quality assessment was based on information from all the publications.

Methodological quality assessment

In order to decide how much weight should be attributed to the results from each of the studies, an assessment of the quality of the studies was performed by two reviewers. The criteria used were derived from previous systematic reviews (Hoogendoorn et al., 2000) (see Fig. 1). The criteria differed slightly for studies of different design types. Each study was rated as positive, negative, unknown or irrelevant on each criterion. In order to keep the evaluation clear and specific, we did not graduate the allocation of points (for instance from one to ten on each of the criteria). The ratio of positive points out of possible was calculated. A study was evaluated as of high quality, if the ratio was 60% or above, and of low quality if it was below 60%. This limit is of course arbitrary, and therefore sensitivity analyses were performed where a limit of 75% positive out of possible was imposed.

Any disagreements between the two reviewers were identified and discussed. With eleven to fourteen different criteria, the evaluation becomes rather robust and single shortcomings are not decisive for the result.

Assessment of evidence

The outcomes were divided into three broad groups: (1) cessation; (2) relapse after cessation; and (3) smoking amount. The predictor variables were also

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