

Psychosocial work factors and diabetes: what is known and what is left to know?

Abstract

The 'International Federation of Diabetes' stress that efforts to prevent and manage the alarmingly increasing burden of diabetes are crucial. These efforts now need to be deployed beyond the prevention of traditional risk factors, by identifying new social and environmental modifiable risk factors, including psychosocial work factors. Over the past decade, a growing body of research has evaluated the effect of psychosocial work factors on diabetes incidence. This paper briefly presents what is known on this topic. Then, key areas where research needs to expand to provide a more comprehensive and more valid quantification of the effect of these psychosocial factors on diabetes are presented. We aim to stimulate high quality future research on psychosocial work factors and diabetes, a promising avenue for primary prevention.

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Diabetes is one of the leading cause of death worldwide, in addition to being a major risk factors of several other chronic diseases such as cardiovascular diseases, renal disease and neuropathy.¹ By 2030, approximately 439 million adults will live with diabetes worldwide (7.7%), which represents a 50% increase from 2010.² Such a rapid increase is even more alarming as it is also occurring in countries where large-scale prevention programs and initiatives have been implemented.³ Influential public health organizations such as the 'International Federation of Diabetes' recently stated that prevention efforts now need to be deployed beyond the prevention of traditional risk factors, by identifying new social and environmental modifiable risk factors.^{3,4} A growing body of evidence suggests that psychosocial work factors may contribute to the development of diabetes. The goals of this short communication are to briefly present what is known and what is left to know on the effect of these psychosocial factors on diabetes incidence.

Two well-defined and internationally recognized theoretical models were generally used to measure psychosocial work factors: the demand-control,⁵ and effort-reward imbalance (ERI) models.⁶ The demand-control model suggests that workers simultaneously experiencing high psychological demands and low job control, i.e. job strain, are more likely to develop stress related health problems. Low social support at work, as indicated by a lack of help and cooperation from coworkers and supervisor constitute the third component of this model. For its part, the effort-reward imbalance model proposes that workers are in a state of detrimental imbalance when high efforts at work are accompanied by low rewards (e.g. low respect and esteem, few promotion prospects, forced job changes).

In 2016, a meta-analysis by Sui et al. concluded that psychosocial work factor only had an adverse effect on diabetes in women (HR: 1.22, 95% confidence intervals (CI): 1.01-1.46).⁷ However, this meta-analysis examined only two of the four most recognized psychosocial

work factors: high psychological demand and low job control. The effect of the other two factors, low reward and low social support, was overlooked. Previous evidence on cardiovascular diseases suggests that the four constraints of the effort-reward imbalance and demand-control models may have independent adverse effects,⁸⁻¹⁰ as they can prevent fulfilling different needs, leading to the occurrence of different deleterious biological responses. Indeed, the effort-reward imbalance model is based on the notion of social reciprocity that is at the heart of the employment contract, where social actors expect positive actions and attitudes in exchange for the efforts made. Its action is mostly located in the brain's reward system. For its part, the job strain of the demand-control model refers to the quantity and characteristics of work tasks. It may act as a 'threat' to our need for personal autonomy triggering a harmful mechanism of stress response. Social support, on the other hand, is based on positive relationships and interactions with others that partly fulfill the basic need for belonging.

In order to further extend our understanding of the relationship between psychosocial work factors and diabetes, the effect of ERI needs to be investigate, i.e. the effect of combining of high efforts (which strongly correlates to the high psychological demands construct) and low reward. Only two previous prospective studies evaluated the effect of ERI on diabetes. Kumari et al.,¹¹ observed a marginally significant higher incidence of DB2 in men exposed to both high efforts and low reward (HR:1.65, 95% CI:1.00-2.80). However, in this study, the scales used to measure efforts and reward were not the recommended validated scales. For example, the scale used to measure efforts referred to competitiveness, work-related overcommitment and hostility instead of referring to the workload as recommended. The second study by Garbarino et al.,¹² showed a higher risk of developing diabetes in workers exposed to ERI and / or job strain. In this study, led among young adult men (mean of 35 years-old), only 10 cases of diabetes occurred during follow-up, which explains the imprecision of the risk (HR: 7.9, 95% CI: 0.64-98.30).

Given the theoretical and the empirical evidence of a complementarity between psychosocial factors from the two models,^{8–10} combining exposures from both models could increase the risk of diabetes. Previous evidence on coronary heart disease supports this hypothesis. As summarized in a recent meta-analysis, a combined exposure to ERI and job strain leads to a 25% higher risk of coronary heart disease than an exposure to either ERI or job strain separately (HR: 1.41 vs. 1.16, respectively).¹³ Moreover, as suggested by the demand-control model, low social support could amplify the adverse effect of job strain, as observed in the two studies examining the effect of this combination of stressors (iso-strain) on the incidence of diabetes.⁷ A first assessment of the combined effect of all four psychosocial work factors is required to provide an evaluation of the 'total' effect of these factors. This advance would allow to calculate the proportion of the risk of diabetes attributable to these stressors. For cardiovascular diseases and mental health problems, up to one in five cases could be avoided in the absence of these work stressors.¹⁴ Documenting this fraction for diabetes would provide primary prevention stakeholders with a convincing and concrete argument to promote the reduction of psychosocial work factors.

There are also other key areas where research on the psychosocial work environment and diabetes needs to expand. 1) Little is known about the potential differences in the impact of the psychosocial work environment and diabetes between men and women. More research is needed to understand if this difference is due to biological (sex) or social (gender) differences between men and women, or a combination of factors. 2) Psychosocial work characteristics need to be measured at multiple time points – as opposed to only one. Previous evidence on cardiovascular diseases has shown that prolonged exposure was associated with a stronger adverse effect than punctual exposure. While non-included in the meta-analysis on diabetes, one recent study by Chandola et al.,¹⁵ used two measurement points of job strain and showed a higher risk of DB2 in workers having a prolonged exposure to iso-strain (job strain and low social support) (HR: 1.43, 95% CI: 1.10–1.85). 3) Studies should attempt to measure multiple characteristics of the psychosocial work environment (e.g. both job strain and ERI) in the same model to understand their independent and combined effects 4) We need to understand if the measurement of the outcome (diabetes) impacts the relationship, with current studies using blood tests (mainly blood glucose and glycated hemoglobin), administrative health care data, and self-reported outcomes, which likely differ in their ability to correctly classify diabetes cases. 5) We need to know more about the relationship between psychosocial work characteristics and diabetes in various countries. More than half of the workers included in the most recent meta-analysis came from young populations of adults from Europe and Japan, where the prevalence of diabetes is lower than in several other industrialized countries. In addition to these specific areas we would also recommend future studies employ longitudinal designs and carefully adjust for relevant confounding factors to better estimate the effect of the psychosocial work environment on risk of diabetes.

This short communication pinpointed several key areas where research on psychosocial work factors and diabetes needs to expand to provide a more valid and precise quantification of the adverse effect. By complementing the current efforts deployed toward traditional risk factors, such research might be a promising new avenue for primary prevention.

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Conflict of interest

The author declares that there is no conflict interest.

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