

Does lifestyle matter for sickness absence?

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Sickness absence mesmerises many researchers, in view of the large number of publications on risk factors for sickness absence. Most studies have focused on work-related risk factors but, with a rapidly ageing workforce in many countries, health behaviours as causes of chronic diseases and subsequent sickness absence increasingly receive attention. A study¹ suggested that lifestyle behaviours and obesity might account for up to 10% of all sickness absence days. A longitudinal study² published in 2018, with detailed salary information at individual level, reported that lifestyle factors might be responsible for up to 30% of the costs incurred by the employer from short-term sickness absence (lasting less than 15 days). Our meta-analysis³ showed that unhealthy behaviours and obesity are also risk factors for loss of paid employment, through disability benefits and unemployment. Available studies present evidence that unhealthy lifestyles could decrease workers' productivity, but the overall picture is still scattered because most studies focus on single lifestyle factors, sickness absence of one specific disease, and have small study populations.

In *The Lancet Public Health*, Marianna Virtanen and colleagues⁴ combined four large cohorts to study the relative contribution of health behaviours and obesity to sickness absence, thereby addressing many of the shortcomings in existing studies. This multicohort study has unique features, such as the inclusion of four different factors (obesity, low physical activity, smoking, and alcohol consumption), diagnosis-specific sickness absence for six common conditions (musculoskeletal diseases, depressive disorders, external causes [eg, injuries and poisonings], circulatory diseases, respiratory diseases, and digestive diseases), long follow-up periods, and large study populations from different countries. Obesity was consistently associated with higher sickness absence rates for all six conditions (rate ratio [RR] 1.38–1.82), low physical activity with five conditions (1.23–1.67), smoking with five conditions (1.27–1.70), and high alcohol consumption with three conditions (1.10–1.27). High alcohol consumption, defined as drinking more than 112 g of alcohol per week, was compared with moderate alcohol use, thus excluding alcohol abstainers. The consistency of these associations across the four cohorts was good, therefore

providing compelling evidence that lifestyle matters for sickness absence.

Associations do not tell us anything about how important a particular lifestyle factor is for sickness absence, because this depends also on the proportion of people with a specific unhealthy behaviour. To address this issue, Virtanen and colleagues have presented population attributable fractions (PAF) to express the reduction in sickness absence rates that would occur if the unhealthy behaviour was eliminated in the population. For all lifestyle factors across the six groups of diagnostic-specific sickness absence, PAF values are presented. This is valuable information, but one should be aware that PAF values cannot simply be added up within a condition group. On the basis of available formulas for a combined PAF (PAF_{combined}; with no multiplicative interaction), the joint contribution of lifestyle factors and obesity can be estimated for sickness absence due to depressive disorders (PAF_{combined} 0.31), circulatory diseases (0.25), musculoskeletal diseases (0.24), respiratory diseases (0.18), digestive diseases (0.15), and external causes (0.15). Given that these six groups comprise the most common causes of sickness absence, the study of Virtanen and colleagues suggests that 15–31% of sickness absence days due to common diseases might be attributed to lifestyle factors and obesity.

The conclusion of Virtanen and colleagues that cost-effectiveness of lifestyle interventions for sickness absence reduction should be assessed seems reasonable. It is tempting to conclude that the study underpins the need for large-scale implementation of workplace health promotion programmes. Alas, this is a too big leap from problem to solution. From a theoretical perspective, the PAF shows the maximum reduction in sickness absence achievable by complete elimination of unhealthy behaviours in the population of interest. For appreciation of potential benefits in workers' health, one should consider the potential impact fraction: the proportional change in sickness absence after a change in the prevalence of unhealthy behaviour.⁵ Rongen and colleagues' meta-analysis⁶ on 21 primary preventive interventions on lifestyle factors among workers showed modest changes in lifestyle (effect size 0.24). Not surprisingly, the 12 studies with sickness absence

as primary outcome measure showed a similarly modest effect size of 0.21. The available evidence can be summarised as the following: yes, lifestyle certainly matters for sickness absence, but the ability of available interventions to modify lifestyle is modest and, thus, high expectations of cost-effectiveness of workplace health promotion programmes should be tempered.

How can we reduce sickness absence through improvement of workers' health? In the past decade, several promising directions have been suggested. First, preventive interventions that integrate management of strenuous working conditions and unsafe workplaces with unhealthy behaviours of the workforce seem more beneficial than interventions in separate domains, both in terms of reach⁷ and effectiveness.^{8,9} Second, interventions that target high-risk populations might have a better balance between benefits and costs.¹⁰ Third, most health promotion interventions are based on cognitive strategies that are more effective among better educated people, thereby widening rather than narrowing health inequalities. New interventions must be better attuned to those with lower education and with the highest prevalence of unhealthy behaviours and obesity.¹¹ There is certainly room for improvement in health promotion programmes to reduce socioeconomic inequalities in health and sickness absence in the workforce.

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We declare no competing interests.

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- 1 Robroek SJW, Van den Berg TJJ, Plat J, Burdorf A. The role of obesity and lifestyle behaviours in a productive workforce. *Occup Environ Med* 2011; **68**: 134–39.
- 2 Kanerva N, Pietiläinen O, Lallukka T, Rahkonen O, Lahti J. Unhealthy lifestyle and sleep problems as risk factors for increased direct employers' cost of short-term sickness absence. *Scand J Work Environ Health* 2018; **44**: 192–201.
- 3 Robroek SJW, Reeuwijk KG, Hillier FC, Bamba CL, Rijn van RM, Burdorf A. The contribution of overweight, obesity, and lack of physical activity to exit from paid employment: a meta-analysis. *Scand J Work Environ Health* 2013; **39**: 233–40.
- 4 Virtanen M, Ervasti J, Head J, et al. Lifestyle factors and risk of sickness absence from work: a multicohort study. *Lancet Public Health* 2018; **3**: e545–54.
- 5 Barendregt JJ, Veerman JL. Categorical versus continuous risk factors and the calculation of potential impact fractions. *J Epidemiol Community Health* 2010; **64**: 209–12.
- 6 Rongen A, Robroek SJ, van Lenthe FJ, Burdorf A. Workplace health promotion: a meta-analysis of effectiveness. *Am J Prev Med* 2013; **44**: 406–15.
- 7 Hunt MK, Lederman R, Stoddard AM, et al. Process evaluation of an integrated health promotion/occupational health model in WellWorks-2. *Health Educ Behav* 2005; **32**: 10–26.
- 8 Anger WK, Elliot DL, Bodner T, et al. Effectiveness of total worker health. *J Occup Health Psychol* 2015; **20**: 226–47.
- 9 Feltner C, Peterson K, Palmieri Weber R, et al. The effectiveness of total worker health interventions: a systematic review for a national institutes of health pathways to prevention workshop. *Ann Intern Med* 2016; **165**: 262–69.
- 10 Pelletier KR. A review and analysis of the clinical- and cost-effectiveness studies of comprehensive health promotion and disease management programs at the worksite: 1998–2000 update. *Am J Health Promot* 2001; **16**: 107–16.
- 11 Cairns J-M, Bamba C, Hillier-Brown FC, Moore HJ, Summerbell CD. Weighing up the evidence: a systematic review of the effectiveness of workplace interventions to tackle socio-economic inequalities in obesity. *J Public Health* 2015; **37**: 659–70.