

Work stress and cardiovascular disease

To the Editor: Work-related stress is the result of an imbalance between the constraints imposed by a job (the work requirements) and the strain experienced (the perception that the employee has of his or her own resources to face them).^[1] Among the criteria that could indicate a causal link between job stress and its associated factors and cardiovascular disease (CVD) are: exposure time (exposure before illness); specificity of the link (association observed in a specific set of diseases); the importance of the effects of stress (higher risk for an exposed than an unexposed group); reversibility (reducing stress reduces the risk of CVD); and consistency with the results of different studies. These are not absolute criteria, but rather a set of guidelines for assessing a causal link. The lack of specificity does not exclude a possible association between the risk factor and occurrence of the disease.

Experimental and observational studies have provided evidence of the link between work-related stress and CVD, including coronary artery disease.^[2-5] A review of data from more than 600 000 men and women from 27 cohort studies conducted in Europe, the USA and Japan suggested that work-related stressors such as work demands and long working hours are associated with a moderately high risk of coronary events and stroke.^[3] Those working more than 48 or 55 hours a week have a significantly higher risk of CVD than those with normal working hours (more than 40 hours per week).^[3] Long working hours are strongly associated with an increased risk of stroke in all socioeconomic groups, men and women, and younger and older employees.^[3] The risk of coronary disease is 1.34 times higher for employees who are under stress than for those not suffering from stress.^[6] Job insecurity, one of the main factors contributing to work stress, is associated with higher risk of coronary events, but not at a statistically significant level.^[3] This association is explained in part by the potentially unfavourable socioeconomic conditions and CVD risk factors of a person affected by job insecurity. A link has been reported between work stress and metabolic syndrome, which is defined by the presence of at least three of the following criteria: obesity, hypertension, hyperglycaemia and dyslipidaemia (elevated triglycerides and lower high-density lipoprotein cholesterol).^[3,7] A recent study found that among employees at a low socioeconomic level, there is a link between the occurrence of type 2 diabetes and long working hours.^[8] According to Nyberg *et al.*,^[7] a worker exposed to occupational stress is likely to develop diabetes and a sedentary lifestyle, to smoke and to have a high Framingham score. In Japan, an inverse association between working hours and hypertension and type 2 diabetes has been demonstrated.^[5] In industrialised countries, cardiovascular mortality is inversely related to socioeconomic status and socio-professional category. In low- and middle-income countries, CVDs are gaining momentum in the general population

and also in the workplace, and constitute a major public health problem.^[9-11] Work-related stress can lead to a change in lifestyle, and therefore result in sedentary habits and excess weight, smoking, alcohol consumption and poor diet, constituting cardiovascular risk factors.

In conclusion, work stress (and its concomitant factors) is a major risk factor for CVD. The constraints of the working environment play a role in the development and evolution of CVD. In addition to the standard prevention measures for risk factors for CVD that are taken in companies, it is essential to design a collective prevention programme that is able to take into account additional factors associated with CVD, particularly the psychosocial.

A S Mohamed

HLM Health Center, Dakar, Senegal
azhar1er@gmail.com

1. World Health Organization. Institute of work, health and organisations. Work organisation and stress. Protecting workers' health series No. 3. Geneva: WHO, 2004:1-27. https://www.who.int/occupational_health/publications/en/oehstress.pdf (accessed 17 May 2019).
2. Belkic KL, Landsbergis PA, Schnall PL, Baker D. Is job strain a major source of cardiovascular disease risk? *Scand J Work Environ Health* 2004;30(2):85-128.
3. Kivimäki M, Kawachi I. Work stress as a risk factor for cardiovascular disease. *Curr Cardiol Rep* 2015;17(9):630. <https://doi.org/10.1007%2Fs11886-015-0630-8>
4. Melin B, Lundberg U, Soderlund J, Granqvist M. Psychological and physiological stress reactions of male and female assembly workers: A comparison between two different forms of work organisation. *J Organiz Beh* 1999;20(1):47-61. [https://doi.org/10.1002/\(SICI\)1099-1379\(199901\)20:1%3C47::AID-JOB871%3E3.0.CO;2-F](https://doi.org/10.1002/(SICI)1099-1379(199901)20:1%3C47::AID-JOB871%3E3.0.CO;2-F)
5. Yamaguchi M, Eguchi M, Akter S, et al. The association of work-related stressors and their changes over time with the development of metabolic syndrome: The Furukawa Nutrition and Health Study. *J Occup Health* 2018;60(6):485-493. <https://doi.org/10.1539%2Fjoh.2017-0298-OA>
6. Kivimäki M, Batty GD, Ferrie JE, Kawachi I. Cumulative meta-analysis of job strain and CHD. *Epidemiology* 2014;25(3):464-465. <https://doi.org/10.1097/EDE.0000000000000087>
7. Nyberg S, Fransson EI, Heikkilä K, et al. Job strain and cardiovascular disease risk factors: An individual-participant data meta-analysis of 47 000 men and women. *PLOS ONE* 2013;8(6):e67323. <https://doi.org/10.1371/journal.pone.0067323>
8. Kivimäki M, Virtanen M, Kawachi I, et al. Long working hours, socioeconomic status and the risk of incident of type 2 diabetes: A meta-analysis of published and unpublished data from 222 120 individuals. *Lancet Diab Endocrinol* 2015;3(1):27-34. [https://doi.org/10.1016/S2213-8587\(14\)70178-0](https://doi.org/10.1016/S2213-8587(14)70178-0)
9. Mohamed AS, Dia SA, Ndoye EO, et al. Screening of cardiovascular risk factors among workers of a construction company in a developing country, Senegal. *Med J Zambia* 2017;44(2):75-77.
10. Mbaye A, Ndiaye MB, Kane AD, et al. Dépistage des facteurs de risque cardiovasculaire chez les travailleurs d'une société privée de télécommunications au Sénégal. *Arch Mal Prof Environ* 2011;72(1):96-99. <https://doi.org/10.1016/j.admp.2010.10.001>
11. Capingana DP, Magalhães P, Silva AB, et al. Prevalence of cardiovascular risk factors and socioeconomic level among public-sector workers in Angola. *BMC Public Health* 2013;13(1):732. <https://doi.org/10.1186/1471-2458-13-732>

South Afr J Pub Health 2019;3(3):43. DOI:10.7196/SHS.2019.v3.i3.93