Research:
Mika Kivimäki, Solja T. Nyberg, Eleonor I. Fransson, Katriina Heikkilä, Lars Alfredsson, Annalisa Casini, Els Clays, Dirk De Bacquer, Nico Dragano, Jane E. Ferrie, Marcel Goldberg, Mark Hamer, Markus Jokela, Robert Karasek, France Kittel, Anders Knutsson, Markku Koskenvuo, Maria Nordin, Tuula Oksanen, Jaana Pentti, Reiner Rugulies, Paula Salo, Johannes Siegrist, Sakari B. Suominen, Töres Theorell, Jussi Vahtera, Marianna Virtanen, Peter J.M. Westerholm, Hugo Westerlund, Marie Zins, Andrew Steptoe, Archana Singh-Manoux, and G. David Batty , for the IPD-Work Consortium

Associations of job strain and lifestyle risk factors with risk of coronary artery disease: a meta-analysis of individual participant data
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Only for workers having job strain jobs and also two or more of four risk factors

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We read with interest the paper by Kivimaki et al [1] on the association of job strain and lifestyle risk factors with risk of coronary artery disease (CAD) using data from seven European cohort studies. We believe that the paper includes several significant methodological and interpretational errors. First, the authors should have excluded obesity from their definition of an unhealthy lifestyle in the paper. The authors defined an unhealthy lifestyle arbitrarily as a combination of the following four CAD risk factors: smoking, heavy drinking, leisure-time physical inactivity, and obesity. While the first three risk factors may be called lifestyle risk factors, obesity cannot be called a lifestyle risk factor because lifestyle can be defined as "the way individuals live their lives and how they handle problems and inter-personal relations." [2]. Obesity is defined as an abnormal or excessive fat accumulation that presents a risk to health [3], not a "lifestyle." Obesity cannot be a proxy measure of an unhealthy diet because of the multifaceted etiology of obesity, only one factor of which is diet. Therefore, the results based on the inaccurate definition of an "unhealthy lifestyle" in the paper likely overestimate the effect of an unhealthy lifestyle on CAD and also make it harder to assess effect modification due to an unhealthy lifestyle (only with smoking, heavy drinking, and leisure-time physical inactivity) on the association between job strain and CAD.

Second, the authors should have made clear that two of the three health-related behavioral risk factors (heavy drinking and leisure-time physical inactivity) did not offset the impact of job strain on CAD. Figure 1 [1] indicates that there would be no significant reduction in the risk of CAD from changing heavy drinking behavior among workers having job strain plus heavy drinking behavior or from changing physical inactivity among workers with job strain plus physical inactivity. Rather, it indicates the

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importance of addressing both job strain and unhealthy behavioral risk factors for prevention of CAD among workers. There is emerging evidence [4-6] that organizational- or task-level interventions for increasing job control and decreasing high job demands can be beneficial for the health of workers and organizations.

Third, the conclusion of the authors ("a healthy life-style may substantially reduce disease risk among people with job strain") is misleading. This may be true for workers having job strain and two or more of the four risk factors (smoking, heavy drinking, leisure-time physical inactivity, and obesity). However, 84.3% of workers with job strain had none or only one of the four risk factors and in this group there was no significant effect modification of any one of the four risk factors on the association between job strain and CAD. Therefore, the conclusion of the authors is irrelevant for the majority of the workers with job strain. In addition, the authors are unrealistically optimistic about the possibility that the workers having job strain and two or more of the four risk factors (smoking, heavy drinking, leisure-time physical inactivity, and obesity) could change two or more of the four risk factors only with the help of clinicians. The same research group [7, 8] reported elsewhere that job strain was associated with three cardiovascular risk factors (smoking, leisure-time physical inactivity, and obesity) in the same European cohort data (IPD-Work consortium data). It implies that job strain, an adverse working condition, may be a strong structural barrier that keeps workers from adopting and maintaining healthy behaviors.

Lastly, we would like to point out some additional errors in the paper. The authors reported that job strain across the seven European cohorts was measured using a Likert-style five-point item response scale (1=never or very seldom to 5=almost always or very often). However, in fact, job strain was measured based on a four-point Likert item response scale (strongly disagree to strongly agree) using the Job Content Questionnaire items (JCQ) in four cohort data or a four-point Likert-style item scale (1=never to 4=often) using Demand-Control Questionnaire (DCQ) items in three cohorts [9]. Correctly reporting this information about the job strain instrument is important because the association between job strain and cardiovascular disease was reported to be stronger when an instrument somewhat different than the original JCQ like the DCQ was used for assessing job strain [10].

Additionally, the authors equate job strain with perceived work stress or work stressors in general throughout the article. For example, in the INTERHEART study, the effect of perceived stress at work ("How often they had felt stress at work") [11] on myocardial infarction was examined, while in the paper by Kivimaki et al [1], an effect of job strain (a work stressor) on CAD was examined. Nonetheless, the authors compared the two incomparable effects (perceived work stress vs. a work stressor) between the INTERHEART study and their study. Job strain is an important work stressor, but cannot be equated with all work stressors in general [12-14]. Equating job strain as the only work stressor, ignores other important work stressors such as poor social support at work, job insecurity, long work hours, and effort-reward imbalance that have been reported to be associated with cardiovascular disease.

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Conflict of Interest:

None declared

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Importance of Methodological criteria and sensitivity analysis for Meta-analysis

Pankaj B Shah, Professor, Dept. of Community Medidicine, SRMC & RI, SRU,Chennai

At the outset, I would like to congratulate CMAJ and authors for excellent work. This is probably the first study to assess the effect of job strain and healthy life style together and results indicate the risk in case one is present and other is absent. Since this is a individual patient meta-analysis of multiple studies, I am not sure if all

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Published May 22, 2013

If only we could just get those stressed people to behave properly

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We read with interest the recent study by Kivimaki and colleagues examining the longitudinal relationship between job strain and health behaviours on coronary heart disease using a pooled sample of several European and British Civil Servant cohorts [1]. We commend the authors on their ability to aggregate such and impressive data resource that

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