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Perceived job insecurity as a risk factor for incident coronary heart disease: systematic review and meta-analysis

The IPD-Work Consortium

EDITORIAL by Cooper and Faragher

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STUDY QUESTION

Is self reported job insecurity associated with an increased risk of coronary heart disease?

SUMMARY ANSWER

Summary estimates across four published and 13 unpublished studies suggest a modest association between perceived job insecurity and incident coronary heart disease.

WHAT iS KNOWN AND WHAT THIS PAPER ADDS

Although job insecurity has been linked to self reported symptoms of poor health, the relation between job insecurity and incident coronary heart disease has remained unclear. This systematic review and meta-analysis has shown a modest association between self reported job insecurity and coronary heart disease, which is partly attributable to poor socioeconomic circumstances and less favourable risk factor profiles among people reporting high job insecurity.

Selection criteria for studies

We obtained individual level data from 13 cohort studies participating in the Individual-Participant-Data Meta-analysis in Working Populations (IPD-Work) Consortium. Four published prospective cohort studies were identified by searches in Medline (to August 2012) and Embase databases (to October 2012), supplemented by manual searches. We included all independent, prospective cohort studies that reported risk estimates for clinically verified, incident events of coronary heart disease by the level of self reported job insecurity.

Primary outcome

Incident coronary heart disease.

Main results and role of chance

Age adjusted relative risk of high versus low job insecurity was 1.32 (95% confidence interval 1.09 to 1.59). Socio-demographic and risk factors included age, sex, socio-economic status, smoking, alcohol use, physical activity, body mass index, hypertension, hypercholesterolaemia, and diabetes. The relative risk of job insecurity adjusted for these factors was 1.19 (95% confidence interval 1.00 to 1.42; adjusted covariates varied between different studies). Apart from one study, all studies provided data for multivariable analysis.

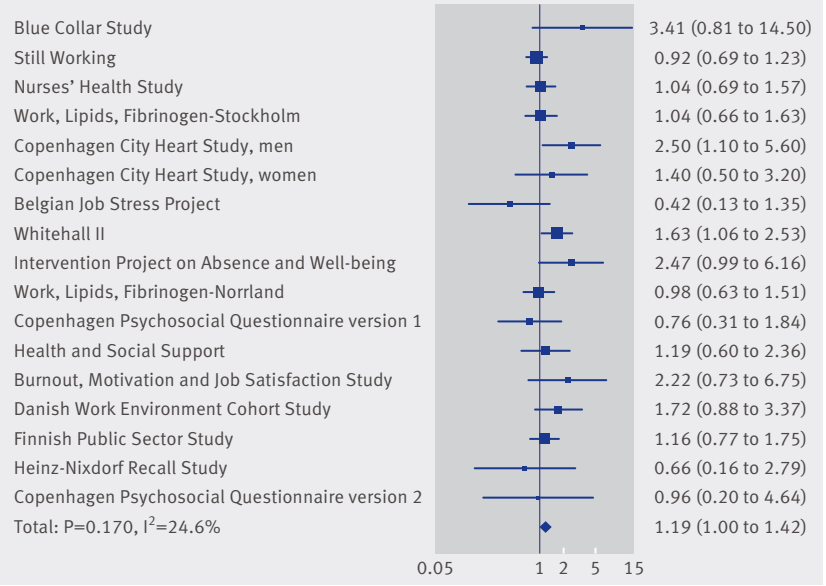
Bias, confounding, and other reasons for caution

The observed association is not necessarily causal. In observational data such as these, residual confounding and reverse causation remain an alternative explanation for the association. Because our data were based on US and European working populations, the generalisability of the findings to other contexts such as Asia or Africa is unclear. Our measurement of job insecurity was obtained at a single point in time and did not include assessment of the severity or the expected consequences of a potential job loss. The number and content of the covariates in the fully adjusted models differed between studies, which could have caused some imprecision in the effect estimates. Finally, our systematic review was limited to English language publications, and we did not attempt to include all unpublished studies.

Study funding/potential competing interests

The IPD-Work Consortium is supported by the EU New OSH ERA Research Program (funded by the Finnish Work Environment Fund; Swedish Research Council for Working Life and Social Research; German Social Accident Insurance; and Danish Work Environment Research Fund), Academy of Finland (grants 132944 and 258598), and BUPA Foundation (grant 22094477). MKi is supported by the Medical Research Council (grant K013351) and the Economic and Social Research Council, UK, and the US National Institutes of Health (grants R01HL036310 and R01AG034454). AS is a British Heart Foundation professor and GDB is a Wellcome Trust Fellow. Funding bodies for each participating cohort study are listed on their websites. We declare no other interests.

Job insecurity and incident coronary heart disease



Maternal obesity during pregnancy and premature mortality from cardiovascular event in adult offspring: follow-up of 1 323 275 person years

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Watch the authors discuss the findings at http://bit.ly/1cGZQ8x

STUDY QUESTION

Is maternal obesity associated with an increased risk of premature death and cardiovascular disease in adult offspring?

SUMMARY ANSWER

Yes, maternal obesity is associated with an increased risk of both outcomes in offspring followed up at ages 36-62.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Adult offspring of women who were obese in pregnancy have increased cardiometabolic risk factors and increased risk of premature death and hospital admissions for cardiovascular events. Offspring of overweight women also have higher risk of adverse events in later life.

Participants and setting

Birth records of 37 709 children from 1950-2012 from the Aberdeen Maternity and Neonatal Databank linked to the General Register of Deaths, Scotland, and the Scottish Morbidity Record Systems, Scotland. All women who delivered a live singleton birth at term (>37 weeks' gestation) between 1950 and 1976 and were overweight or obese according to BMI at first antenatal visit were included.

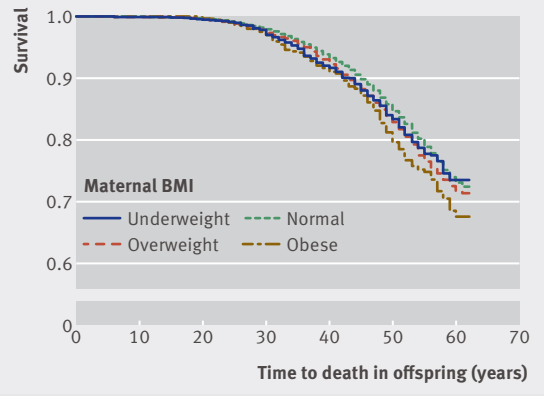
Design

Record linkage cohort analysis.

Primary outcomes

All cause mortality and hospital admissions for cardiovascular events in adult offspring who were born between 1950 and 1976 and were followed up till January 2012.

Death rates in adult offspring according to maternal BMI category



Main results and the role of chance

All cause premature mortality was increased in offspring of obese mothers (BMI >30) compared with offspring of mothers of normal BMI after adjustment for maternal age at delivery, socioeconomic status, sex of offspring, birth weight, gestation at delivery, and length of gestation at measurement of BMI (hazard ratio 1.35, 95% confidence interval 1.17 to 1.55). In adjusted models, offspring of obese mothers also had increased risks of hospital admission for a cardiovascular event (1.29, 1.06 to 1.57) compared with offspring of mothers with normal BMI. The offspring of overweight mothers also had a higher risk of adverse outcomes.

Bias, confounding, and other reasons for caution

We could not capture events in offspring who had moved away from Scotland. Provided that the loss of information was unconnected with either maternal weight and death or cardiovascular disease in the offspring, the effect of the loss will have been to reduce study power rather than introduce systematic bias. As we looked only at hospital admissions, we will have examined only more severe cardiovascular disease. We were also unable to determine whether differing patterns of gestational weight gain could influence outcomes.

Generalisability to other populations

Only 4% of mothers in our cohort (who had their babies between 1950 and 1976) were obese, far smaller than current levels in the United States and United Kingdom. We assume that the link between maternal obesity and adverse outcome in offspring will persist as rates of maternal obesity rise. As one in five women in the UK is currently obese at antenatal booking, strategies to optimise weight before pregnancy are urgently required.

Study funding/potential competing interests

This work was supported by grants from the chief scientist office, Scotland, and Chest, Heart and Stroke, Scotland, and from Tommy's and the British Heart Foundation. NS has worked for Pfizer since 2011. JEN has received research grants from (non-commercial) funding agencies for pregnancy related conditions; funding from UK government agencies for providing reports on maternal deaths; honorariums for book chapters and books on obstetrics and gynaecology; and fees for consultancy to a small drug company (Preglem) with an interest in obstetric/gynaecological drugs and is an unpaid consultant to Hologic.

Predictors of severe H1N1 infection in children presenting within Pediatric Emergency Research Networks (PERN): retrospective case-control study

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STUDY QUESTION

To identify historical and clinical factors at emergency department presentation associated with severe outcomes in pandemic H1N1 infection in children with influenza-like illness in 12 countries.

SUMMARY ANSWER

Six factors were associated with severe outcomes in children presenting with influenza-like illness, including two chronic disease factors (chronic lung disease, cerebral palsy/developmental delay) and four physiological/physical examination factors (requirement for oxygen or low oxygen saturation, tachycardia relative to age, signs of chest retractions, and dehydration).

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

During the 2009 H1N1 pandemic, paediatric emergency departments worldwide experienced a surge in patient volumes owing to children presenting with influenza-like illness. This global study identified six independent risk factors that may alert clinicians to children at risk of severe outcomes when presenting during future pandemics.

Participants and setting

PERN comprises representative hospitals from the five major paediatric emergency medicine research networks located in Europe, the Middle East, North America, and Australasia. We included 265 children (<16 years) presenting to 79 emergency departments in 12 countries who fulfilled Centers for Disease Control and Prevention criteria for influenza-like illness and who developed severe outcomes due to laboratory confirmed pandemic H1N1 (pH1N1) infection. For each case, we selected two controls presenting with influenza-like illness but without severe outcomes: one random control and one age matched control.

Design, size, and duration

This was a multicentre retrospective case-control study between 16 April and 31 December 2009. We compared cases with controls by using multivariable conditional logistic regression, with effect sizes measured as adjusted odds ratios.

Primary outcome(s), risks, exposures

Severe outcomes included death or admission to intensive care for assisted ventilation, inotropic support, or both.

Main results and the role of chance

One hundred and fifty one (57%) cases were male, the median age was 6 (interquartile range 2.3-10.0) years, and 27 (10%) died. Six factors were associated with severe outcomes in children presenting with influenza-like illness: history of chronic lung disease (odds ratio 10.3, 95% confidence interval 1.5 to 69.8), history of cerebral palsy/developmental delay (10.2, 2.0 to 51.4), signs of chest retractions (9.6, 3.2 to 29.0), signs of dehydration (8.8, 1.6 to 49.3), requirement for oxygen (5.8, 2.0 to 16.2), and tachycardia relative to age.

Bias, confounding, and other reasons for caution

The study was retrospective, but the scope for bias and confounding was low as data were abstracted at each site by senior physicians, two controls for each case limited selection bias, and imputation minimised the effect of missing data. The final multivariable models included only predictors with prevalence of more than 2% in the cases and controls, so the clinical importance of some predictors may have been overlooked: history of renal disease, presentation following apnoea or seizure, presenting already intubated, and presence of prolonged capillary refill time/shock or altered mental status. We found very low prevalence of pregnancy, diabetes, and malignancy/immunosuppression, so the findings must be interpreted with caution in these patients.

Generalisability to other populations

The results are particularly generalisable to high income countries, as we included data from four of the six World Health Organization regions, with a wide range of annual paediatric visits, in emergency departments that are both paediatric and mixed paediatric/adult and are located in both secondary and tertiary hospitals. The study did not include sites from low income countries, where most childhood respiratory mortality occurs.

Study funding/potential competing interests

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Comparison of factors at emergency department presentation associated with development of severe outcomes from pH1N1 infection in children presenting with influenza-like illness

		Random controls	
Predictor	Cases—No (%)	No (%)	Odds ratio* (95% CI)
Chronic lung disease	50/265 (19)	4/265 (2)	10.3 (1.5 to 69.8)
Cerebral palsy/developmental delay	72/265 (27)	7/265 (3)	10.2 (2.0 to 51.4)
Chest retractions	149/240 (62)	22/250 (9)	9.6 (3.2 to 29.0)
On oxygen or saturation <93%	151/247 (61)	13/220 (6)	5.8 (2.0 to 16.2)
Signs of dehydration	43/214 (20)	5/244 (2)	8.8 (1.6 to 49.3)
Heart rate* (linear)	—	—	0.72 (0.0074 to 1.44)
Heart rate* (quadratic)	—	—	−0.0055 (−0.011 to −0.0003)
Heart rate* (cubic)	—	—	0.000013 (0.0000006 to 0.000025)

*Odds ratios from final multivariable conditional logistic regression; heart rate (adjusted for age) was modelled as continuous cubic term owing to non-linearity and to maximise power, with effect reported as parameter estimates (95% CI) for linear, quadratic, and cubic terms.

Overlapping meta-analyses on the same topic: survey of published studies

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Response on bmj.com

"We strongly support…making it mandatory to register proposed meta-analysis and systematic reviews before actively undertaking such 'herculean' academic feats. This can help save duplication of such research and allow for better use of the resources for advancement in patient-care." Jagjit Singh, pharmacologist, Government Medical College and Hospital, Chandigarh.
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STUDY QUESTION

How common is it to have overlapping meta-analyses of randomized trials published on the same topic?

SUMMARY ANSWER

Two thirds of the evaluated topics had at least two overlapping meta-analyses.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Systematic reviews and meta-analyses are popular study designs and the number of meta-analyses published annually increases steadily, but the degree of redundancy among published meta-analyses is unknown. Our study suggests that two thirds of published meta-analyses have at least one partially or fully overlapping meta-analysis that in most cases does not represent an update.

Rationale, design, data collection method

Though an increasing number of systematic reviews and meta-analyses are published annually, we do not know whether there is some overlap between published meta-analyses. We searched PubMed for meta-analyses of randomized controlled trials pertaining to effectiveness of interventions published in 2010 and randomly sampled 5% of them. For each eligible index meta-analysis we performed targeted PubMed searches without year restriction looking for potentially overlapping ones.

Data analysis method

We described characteristics of the evaluated meta-analyses, compared index meta-analyses with and without overlapping meta-analyses, and examined in depth the topic with the largest number of meta-analyses. For a randomly selected sample of 20 topics we examined the full range of evaluated outcomes to further illustrate the degree of overlap.

Main findings

Of 73 eligible index meta-analyses, 49 (67%) had at least one other overlapping meta-analysis. In 17 topics there was at least one author who was involved in at least two of the overlapping meta-analyses. No specific characteristics of the index meta-analyses were associated with the potential for overlapping meta-analyses. Among pairs of overlapping meta-analyses in 20 randomly selected topics, in 13 cases the more recent meta-analysis did not include any additional outcomes. In three of the four topics with eight or more published meta-analyses, many meta-analyses examined only a subset of the eligible interventions or indications/settings covered by the index meta-analysis. Conversely, for statins in the prevention of atrial fibrillation after cardiac surgery, 11 meta-analyses were published that had similar eligibility criteria for interventions and settings: there was still variability on which studies were included, but the results were always similar or even identical across meta-analyses.

Implications

There might be some redundancy in published meta-analyses and waste of effort. Better coordination between meta-analysis teams and registration of protocols might improve efficiency.

Bias, limitations, generalisability

Overlap was not always complete as some meta-analyses examined additional non-overlapping outcomes or interventions.

Study funding/potential competing interests

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Topics with 10 or more overlapping meta-analyses*

Topic	No of meta-analyses	Journal (No of studies included)
Chemoprevention of colorectal neoplasia	13	1 *Nutr Hosp* 2012 (n=7); 2 *Clin Ther* 2010 (n=6); 3 *Health Technol Assess* 2010 (n=44)†; 4 *Pak J Pharm Sci* 2010 (n=4); 5 *Aliment Pharmacol Ther* 2010 (n=6); 6 *Med Oncol* (2010 (n=5); 7 *J Natl Cancer Inst* 2009 (n=4); 8 *Colorectal Dis* 2009 (n=3); 9 *CDSR* 2008 (n=2); 10 *Zhonghua Yi Xue Za Zhi* 2007 (n=6); 11 *Aliment Pharmacol Ther* 2006 (n=8); 12 *Am J Gastroenterol* 2005 (n=3); 13 *Lancet* 2004 (n=14)
Pharmacotherapy in fibromyalgia	12	1 *CNS Drugs* 2012 (n=35); 2 *CDSR* 2012 (n=5); 3 *Rheumatology* 2011 (n=19); 4 *J Clin Pharm Ther* 2010 (n=3); 5 *BMC Musculoskelet Disord* 2010 (n=4); 6 *J Pain* 2010 (n=8)†; 7 *Rheumatology* 2010 (n=4); 8 *CDSR* 2009 (n=3); 9 *CDSR* 2009 (n=5); 10 *Pain* 2009 (n=5); 11 *Clin Rheumatol* 2009 (n=5); 12 *J Womens Health* 2007 (n=2)
Statins for prevention of atrial fibrillation after cardiac surgery	11	1 *Br J Clin Pharmacol* 2012 (n=8); 2 *CDSR* 2012 (n=8); 3 *Arch Surg* 2012 (n=9); 4 *Ann Med* 2011 (n=8); 5 *J Am Coll Cardiol* 2010 (n=6); 6 *J Thorac Cardiovasc Surg* 2010 (n=6)†; 7 *Tex Heart Inst J* 2009 (n=10); 8 *J Thorac Cardiovasc Surg* 2009 (n=13); 9 *Ann Thorac Surg* 2009 (n=2); 10 *Eur Heart J* 2008 (n=7); 11 *J Am Coll Cardiol* 2008 (n=3)

CDSR=Cochrane Database of Systematic Reviews.
*In some topics not all meta-analyses are overlapping with each other, but they overlap to a lesser or greater degree with index meta-analysis.
†Index meta-analysis.