

# **Biopsychosocial determinants of cardiovascular and dementia risk: An examination of differentials in a representative study of the English population**

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## **Background:**

Growing evidence supports a strong and likely causal association between cardiovascular disease (CVD) and dementia incidence. Several cardiometabolic risk factors including smoking, sedentary behaviour, hypertension, and diabetes are common to both conditions, but less clear is the predictive value of inflammatory markers, alcohol consumption or depression. We investigated the congruity and difference across 10 CVD and dementia risk factors in a representative cohort of the English population.

## **Methods:**

Data come from the English Longitudinal Study of Ageing, an ongoing, open, prospective cohort study. CVD was defined as the fatal and non-fatal myocardial infarction (MI), Angina and stroke. Dementia was determined using doctor-diagnosis combined with a score above the threshold of 3.38 on the Informant Questionnaire on Cognitive Decline in the Elderly. A triangulation method was also used to derive these outcomes using the Hospital Episode Statistics (HES) records. We investigated 10 risk factors: alcohol, smoking, sedentary behaviour, hypertension, diabetes, depressive symptoms, obesity (defined as  $\geq 30$  body mass index (BMI)), HDL/total cholesterol and inflammatory markers (serum fibrinogen and C-reactive protein [CRP]) in 3,981 men and women, free of CVD or dementia and aged 50+ at baseline (2008–09). Multinomial logistic regression models were fitted to estimate the relationship (relative risk ratios [RRR] and 95% confidence intervals [CI]) between each factor, and the risk of CVD, dementia or both.

## **Results:**

From the analytical sample, 13% developed CVD, 4% dementia and 1.5 % both CVD and dementia during the eight-year follow-up period. After controlling for sociodemographic factors (age, sex, education and wealth), we found that hypertension (RRR=1.66, 95% CI 1.35-2.04), depressive symptoms (RRR=1.55, 95% CI 1.15-2.08), and obesity (RRR=1.37, 95% CI 1.03-1.83) were predictive of an increased risk of CVD; smoking (RRR=2.04, 95% CI 1.14-3.65) associated with a higher risk of dementia; while smoking (RRR=2.34, 95% CI 1.03-5.27) and depressive symptoms (RRR=4.03, 95% CI 2.12-7.66) were predictive of developing both CVD and dementia. We found no associations between inflammatory markers, alcohol consumption or sedentary behaviour with these outcomes.

## **Conclusions:**

Our findings indicate that smoking and depressive symptoms are associated with an increased risk of developing both CVD and dementia in later life, while obesity and hypertension are specific to CVD. There is relatively limited congruity across the predictive values of the 10 biopsychosocial risk factors investigated for these conditions. However, larger studies with longer periods of follow-up are necessary to validate these findings.

Keywords: Cardiovascular Disease, Dementia, cardiometabolic risk factors