

Cardiovascular risk and incidence of depression in young and older adults: evidence from the SUN cohort study

Cardiovascular disease (CVD) and depression are two leading causes of disability worldwide¹ and frequently co-occur. A higher load of cardiovascular risk factors without the presence of CVD may imply a higher risk of depression. To assess this hypothesis we evaluated the relationship between the predicted absolute cardiovascular risk and the subsequent observed incidence of depression. In a cohort of university graduates, the Seguimiento Universidad de Navarra (SUN) Project², we followed 16,739 participants (mean age: 38 years), initially free of depression and CVD, up to 14 years (mean follow-up 9 years).

Cardiovascular risk was estimated using a logistic regression model in which the incidence of CVD (myocardial infarction, stroke, and death from cardiovascular causes) during follow-up was the dependent variable, and age (linear and quadratic terms), sex, body mass index (linear and quadratic terms), smoking (never, current, former), type 2 diabetes, hypertension, hypercholesterolemia and hypertriglyceridemia were the independent variables. Once we had obtained the predicted probabilities of CVD (theoretically ranging from 0% to 100%), we categorized these estimated probabilities into sex-specific quintiles. We assessed incident depression through the self-report of a medical diagnosis during follow-up. This definition had been previously validated³.

We estimated hazard ratios (HRs) and 95% confidence intervals (95% CIs) of depression across sex-specific quintiles of predicted CVD risk. Models were adjusted for age, adherence to the Mediterranean dietary pattern (low/moderate/high), physical activity (quintiles), total energy intake (quintiles), menopause due to natural causes (yes/no), living alone (yes/no), employment status (employed, unemployed, retired), marital status (married or not), and personality traits (competitiveness, relaxation, dependence).

Over 151,125 person-years of follow-up, we identified 927 incident cases of depression. A higher predicted cardiovascular risk at baseline was significantly associated with higher risk of depression. Young adult participants (<40 years) in the highest quintile of CVD risk (mean risk: 0.30%) presented an adjusted HR of 1.47 (95% CI: 1.08-2.00) compared to those in the lowest quintile (mean risk: 0.05%). The second, third and fourth quintiles presented non-significant HRs of 1.05, 1.21, and 1.16, respectively. This association was even stronger for older participants (≥40 years): 1.65 (1.17-2.34) for the second quintile (mean risk: 0.54%), 1.68 (1.16-2.42) for the third quintile (mean risk: 0.85%), 1.85 (1.24-2.75) for the fourth quintile (mean risk: 1.43%), and 2.17 (1.33-3.54) for the fifth quintile (mean risk: 4.31%), all of them compared to the first quintile (mean risk: 0.31%).

So, a higher predicted CVD risk was strongly associated with a higher future incidence of depression, both in younger and older adults. This finding may support the hypothesis that CVD and depression share common pathophysiological mechanisms⁴⁻⁶. As an alternative, depression and CVD may share risk factors but not the mechanisms through which these risk factors act. Actually, there is a growing body of research on the bi-directional relationship between depression and metabolic syndrome⁷, obesity⁸ or type 2 diabetes⁹.

The clinical implications of our findings are of great importance for public health and clinical practice. First, public health agencies may consider sharing efforts for the primary prevention of both depression and CVD, which may be synergic. Both CVD and depression are associated with a set of known and modifiable risk factors that it is worth to target from a public health perspective. Secondly, general practitioners should consider that both older and younger patients at higher risk of CVD may also be at higher risk of depression. Physicians can calculate the predicted cardiovascular risk using the Framingham risk score or other similar equations which are available in charts and user-friendly versions. Their interventions addressed to obtain improvement in these equations through changes in lifestyle are likely to also be an appropriate approach for the prevention of depression.

Finally, the knowledge that lifestyle factors are not only increasing the risk of CVD but also that of depression, even at younger ages, needs to reach the general public. This take-home message may be useful to achieve greater changes in unhealthy habits throughout the life cycle in the population at large.

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