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Advancing understanding of depression and cardiovascular disease risk within the social milieu

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In the past 30 years, depression disorders and symptoms have emerged as widely accepted risk factors for the development of cardiovascular disease (CVD).^{1,2} Depression is associated with an approximately 90% increase in risk for acute myocardial infarction or coronary revascularization.³ The association between depression and incident CVD is independent of traditional CVD risk factors such as hypertension, dyslipidemia, diabetes, and obesity. However, depression is merely one of several interrelated psychosocial risk factors implicated in the development of CVD. Aside from depression, further psychosocial risk factors include other negative emotional states such as anxiety and hostility, while others fall within the broader social milieu, such as low social position, access to and attained education, stress at work or in the family, and perceived social support.^{1,2}

An important step towards improved CVD prevention strategies is recognizing that psychosocial risk factors do not function independently or occur in isolation, but rather, they cluster together within individuals or groups.⁴ This line of thought has traditionally been sorely lacking in empirical support specific to CVD, with the recognition of psychosocial risk-factor clustering largely based on narrative review papers. The study by Kozela et al⁵ in this issue of *Kardiologia Polska (Kardiol Pol)* provides an important longitudinal perspective on the cumulative effects of clustered risk factors such as low level of education, material deprivation, low perceived control, and depressive symptoms in relation to incident CVD.

Using a representative sample of 10 012 permanent residents of Kraków, Poland, included in the HAPIEE study (Health, Alcohol and Psychosocial Factors in Eastern Europe), Kozela et

al⁵ were among the first to prospectively study the cumulative effect of psychosocial factors on CVD incidence in Central and Eastern Europe. Specifically, the authors took the approach of tallying whether a person has 0, 1, 2, 3, or all 4 psychosocial risk factors. Upon examining incident CVD risks over 11 years of follow-up, they found a linear trend for an increasing number of psychosocial risk factors and CVD risk. However, as the authors acknowledge, this analytical approach assumes equal weighting of psychosocial risk factors, and precludes identification of risk factor combinations that are most cardiotoxic. This could be important given that low perceived control and depressive symptoms shared more variance with each other (ρ , -0.47 and -0.49 in men and women, respectively), while deprivation was associated with low perceived control and depressive symptoms, but to a lesser extent (ρ range, -0.30 to -0.33).⁵ Accordingly, examining linear and categorical interaction terms between depression and other psychosocial risk factors could be a fruitful avenue of epidemiological investigation to inform concerted efforts to improve CVD prevention strategies and depression treatment access within specific population strata or underresourced communities.⁶

Importantly, Kozela et al⁵ stratified all analyses by sex and confirmed a discrepancy in CVD outcomes, with population attributable risks (PARs) for women ranging from 4.1% for 4 risk factors up to 12.1% for 3 risk factors. The associated PARs in men ranged from 0% for 1 risk factor up to 3.7% for 3 risk factors. The divergence in PARs by sex lies in the fact that women, compared with men, were more susceptible to all 4 psychosocial risk factors studied. These findings⁵ provide an important replication of other studies. The Million Women Study in the United Kingdom

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found not only that lower levels of education and greater geographical deprivation were associated with higher risks of incident CVD in women, but also that associations for education were found within every level of deprivation, and associations for deprivation were found within every level of education.⁷ Previous research also identified an impact of interactions between sex, depression, and lower level of education on CVD risk factors,⁴ as well as of interactions between sex and depression on CVD outcomes.^{8,9} More generally, Kozela et al⁵ also replicate the INTERHEART findings, which demonstrated that severe financial stress was associated with 33% increased odds for acute myocardial infarction.¹⁰

The study by Kozela et al⁵ has certain limitations. Surprisingly, although the HAPIEE study bears alcohol in its title, alcohol use was not investigated.⁵ This is an important limitation to reconcile in subsequent analyses for several reasons. Firstly, the socioeconomic status is negatively associated with alcohol misuse because low status reduces people's sense of personal control,¹¹ and perceived control was 1 of the 4 psychosocial risk factors in HAPIEE. Secondly, the Million Women Study concluded that the association of education and deprivation with incident CVD was mostly attributable to health-related behaviors including alcohol consumption.⁷ Also, depression disorders are frequently comorbid with alcohol abuse or dependence, both concurrently and longitudinally.¹² Moreover, depression and alcohol use disorders were the strongest psychiatric risk factors for earlier-onset CVD in the World Mental Health Surveys.¹³ The HAPIEE study may have included earlier-onset CVD cases, given that participants were enrolled from the age of 45 years with only 11 years of follow-up.

Nonetheless, investigation of the nexus between psychological symptoms such as depression, our vulnerability to them, and the broader social context within which we live affords novel insights into CVD mechanisms and prevention strategies. Indeed, intervention with social risk factors lies largely outside the purview of health-care clinicians, with policymakers most likely to shift broader social, political, and economic factors pertinent to CVD risk.¹⁴ Such strategies can be costly and time consuming, although the declining rates of percutaneous coronary revascularization in Poland might indirectly signify recent advances in CVD prevention.¹⁵

ARTICLE INFORMATION

DISCLAIMER The opinions expressed by the author are not necessarily those of the journal editors, Polish Cardiac Society, or publisher.

CONFLICT OF INTEREST None declared.

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