The whole is greater than its parts

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This editorial refers to ‘Psychological distress and cardiovascular disease: results from the 2002 National Health Interview Survey’ by A.K. Ferketich et al., on page 1923

Many psychosocial factors have been identified as potential risk factors for ischaemic heart disease, and strong evidence has been put forward for several personality factors such as Type A behavioural pattern, hostility, depression, or social factors such as low socioeconomic status and lack of social support. (Table 1) Psychosocial stressors per se increase cardiac vulnerability by altering autonomic tone, and induce increased catecholamines spillover, baroreceptor reflexes inhibition, clotting formation, and angiotensin-II stimulation. All these responses have detrimental effects on the cardiovascular system and may explain the high incidence of adverse cardiac events during follow-up. Associations between depressive symptoms and mortality have been reported in patients without known coronary artery disease, but these reported associations were, in general, weaker than those observed in studies of patients with cardiac disease.

On citing how psychosocial factors may impact the development of cardiac disease, it is clear that such factors are not unitary in nature, but rather multifactorial in their own right. Thus, we must consider age, sex, diet, exercise and smoking pattern, obesity, family history, hypertension, and other factors as potential covariates with psychosocial factors at the individual, interpersonal, and environmental levels.

The impact that psychological distress may exert on the clinical outcome after a cardiac event is also a complex task, because several factors may interact and have a confounding effect. For instance, patients with cardiovascular symptoms and poor general health are more likely to have depressive symptoms, which reduce the perception of well-being and cause distress. This interaction is particularly stronger in patients with chronic conditions, such as those with chronic heart failure or those who underwent several invasive procedures like coronary angiography, percutaneous transluminal coronary angioplasty (PTCA) after PTCA, or coronary artery bypass grafting (CABG) after PTCA and after a previous CABG. Other contributing factors are left ventricular function, age, sex, and cardiovascular risk profile. A depressed ejection fraction, age >65, male sex, and multiple cardiovascular risk factors may contribute to aggravate psychological distress and make difficult the interpretation of its role in the clinical outcome.

Another important issue is the time when cardiovascular risk is assessed. In most of the previous studies, depressive symptoms were assessed during or shortly after hospitalization for myocardial infarction (MI), unstable angina, heart failure, cardiac investigations, or cardiac surgery. However, when patients are in hospital, the severity of cardiac disease, available treatment options, and prognosis are likely to have a significant impact on mood. Thus, the administration of a questionnaire to determine the impact of psychosocial profile on outcome should be performed after >5 months from hospital discharge, when the patient has hopefully reached a stable condition.

In their study, Ferketich and Binkley examined the burden of psychological distress among individuals with different forms of heart disease. Subjects were screened in the United States with the National Health Interview Survey (NHIS), a yearly interviewer-administered survey performed on an annual basis since 1957 and currently, the primary source of information on health and illness in the United States. Because heart disease primarily affects older populations, the present analysis is limited to the adults ≥40 years of age.

Three self-reported heart disease diagnoses were examined: CHD, MI, and CHF. For each condition, participants who reported having the condition were compared with those participants who reported having no cardiovascular condition (CHD, MI, CHF, plus angina pectoris, and stroke). The self-administered K6 questionnaire was used to assess how often during the past 30 days the participant felt sad, nervous, restless, hopeless, everything was an effort, and worthless. The responses were scored from 0–4 on a Likert scale with ratings from ‘None of the time’ to ‘All of the time’. The total scores therefore ranged from 0–24 and a score of 13 has been suggested as a cut-point for classifying individuals as having a ‘serious mental illness’. The psychometric properties of the K6 have been examined in men and women who were sampled from the
telephone directory in Boston, Massachusetts and were found to be well within the desirable range of such an instrument.

A total of 18,336 NHIS participants were aged 40 or older. However, only 17,541 (96%) respondents had complete data for the K6 and other covariates of interest. When compared with the participants with complete data, those with missing data were slightly older (59 ± 14 vs. 58 ± 13 years), more likely to have less than a high school education (29 vs. 20%), be male (46 vs. 43%), non-Hispanic black or other race/ethnicity (22 vs. 16%), a never smoker (57 vs. 50%), obese (49 vs. 29%), never married (12 vs. 9%), and sedentary (69 vs. 47%). Among respondents with an elevated K6 score, there were more females, individuals with less than a high school education, Hispanics and non-Hispanic blacks, K6 score, there were more females, individuals with less than a high school education, Hispanics and non-Hispanic blacks, obese individuals, non-drinkers, current smokers, sedentary individuals, and individuals with hypertension or diabetes.

In the US population aged >40 and with no CVD, the estimated prevalence of psychological distress, defined by an elevated K6 score, is 2.8%. Although no statistical comparisons were made, as this was not the objective of the analysis, we do note that the greatest proportion of psychological distress was estimated among participants with CHF (10%) followed by MI (6.4%) and CHD (4.1%). Finally, the prevalence estimates of seeing a mental health professional within the past year were 4 and 31% for CHD patients without and with psychological distress, respectively. For participants with MI, the estimates were 5 and 34%, respectively. Among those participants with CHF, the respective prevalence estimates were 5 and 35%.

In summary, the most significant information from the paper by Ferketich and Binkley is that CHF patients have greater psychological distress than patients with AMI or CHD. In CHF, a low ejection fraction predicts major depression events and the presence of major depression predicts increased mortality. Moreover, the severity of depressed mood is associated with both functional capacity and CHF symptoms, even though there is no relationship between the latter two factors. Social support seems to buffer the effect of depression on mortality, and both exercise training and cognitive behavioural therapy reduce depressed mood in cardiac patients. Another important information deriving from the paper is that only 31–35% of patients with psychological distress and CVD have seen a mental health professional within the past year. We recommend that clinicians make screening for psychological distress a component of the routine evaluation of the patient with CVD. The screening tool should be used as a means to alert the clinician that the patient may have a need for psychological care and serve as a basis for referral to mental health professionals. Because >60% of such patients are not routinely referred to health professionals, it should be recommended a wider and comprehensive clinical care, targeted to cardiac rehabilitation guidelines. The intervention should be focused into the screening of psychosocial risk factors and into specific behavioural and pharmacological interventions. A comprehensive cardiac rehabilitation programme combining pharmacological optimization, nutrition recommendations, exercise therapy, lifestyle improvement, and psychological intervention may be used to reduce emotional distress and improve prognosis in coronary heart disease patients. More prospective investigations are needed to determine the role of strategies to manage psychosocial distress in clinical practice.

### Table 1  Impact of psychosocial factors on clinical and prognostic outcome

<table>
<thead>
<tr>
<th>Parameters</th>
<th>References</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>Depression</td>
<td>Rozanski et al.¹</td>
<td>Cardiac mortality</td>
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<tr>
<td>Anger</td>
<td>Matsumoto et al.²</td>
<td>Carotid atherosclerosis</td>
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<tr>
<td>Hostility</td>
<td>Julkunen et al.³</td>
<td>Carotid atherosclerosis, coronary atherosclerosis progression</td>
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<tr>
<td>Poor support</td>
<td>Williams et al.⁴</td>
<td>Cardiac mortality</td>
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<tr>
<td>Low emotional support</td>
<td>Ruberman et al.⁵</td>
<td>Cardiac mortality</td>
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<td>Low socioeconomic status</td>
<td>Marmot et al.⁶</td>
<td>Coronary artery disease incidence, visceral obesity</td>
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<tr>
<td>Work stress</td>
<td>Kivimaki et al.⁷</td>
<td>Cardiovascular mortality, early atherosclerosis</td>
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<td>Martial stress</td>
<td>Orth-Gomez et al.⁸</td>
<td>Atherosclerotic progression, adverse prognosis (women)</td>
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<td>Caregiving strain</td>
<td>Lee et al.⁹</td>
<td>Coronary artery disease and mortality (women)</td>
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### References