Type D personality and three-month psychosocial outcomes among patients post-myocardial infarction

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ABSTRACT

Objective: Type D personality has been proposed as a risk factor for poor prognosis in cardiac patients. Recent studies which have adopted a dimensional approach to Type D (negative affectivity × social inhibition) found no effect of Type D on mortality, after controlling for its constituent elements. To-date, no study has determined if Type D is associated with psychosocial outcomes in post-myocardial infarction (MI) patients when conceptualised as a dimensional variable.
Methods: Participants were 192 MI patients (138 males, 54 females, mean age 66.0 years) who provided demographic and clinical information, and completed measures of Type D one-week post-MI. Three months later, 131 of these MI patients completed measures of disability and quality of life.
Results: Using regression analyses, adjusted for demographic and clinical data, Type D emerged as a significant predictor of disability and quality of life in MI patients, when analysed using the traditional categorical approach. However, Type D did not predict disability and quality of life when it was analysed using the interaction of negative affectivity and social inhibition. Negative affect emerged as a significant predictor of both disability ($\beta=.433$, t(130) = 3.53, $p<.01$), and quality of life ($\beta= -.624$, t(130) = -5.68, $p<.001$).
Conclusions: The results suggest that Type D is not associated with short-term psychosocial outcome in MI patients, after controlling for its constituent elements. However, negative affect was significantly associated with both disability and quality of life. Future research should conceptualise Type D as the interaction between negative affectivity and social inhibition, rather than as a typology.

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Introduction

The Type D construct describes individuals who simultaneously experience high levels of negative affectivity and high levels of social inhibition [1]. Type D individuals are, therefore, thought to experience negative emotions (such as anxiety, sadness, anger etc.) across time and situations and inhibit the expression of these emotions in social interactions due to fears of how others may react. Crucially, it is the synergistic effect of high scores on both stable personality traits, negative affectivity and social inhibition, which has been proposed as the key feature of the Type D construct, suggesting that it is not merely the presence of negative emotions that should be considered as a risk factor but also how an individual copes with these negative emotions [2].

The first studies carried out on the Type D construct [1,3,4] demonstrated that Type D is associated with a four-fold increased risk of mortality in coronary heart disease (CHD) patients, independent of traditional biomedical risk factors. In addition, a further study

demonstrated that Type D CHD patients had a four-fold risk of major cardiac events over five years, independent of disease severity [5]. Similar findings were demonstrated in recent studies which demonstrated a comparable relationship between Type D and mortality in patients with chronic heart failure (CHF) [6] and peripheral arterial disease (PAD) [7]. A further study found that Type D predicts death and recurrent MI in patients with acute MI after controlling for both disease and depression severity [8]. However, these studies have recently been criticised [9] on the basis of their small sample sizes and over fitted regression equations (given the relatively small number of deaths). Three recent studies have failed to find an association between the Type D typology and outcome [10–12]. However, these studies are also limited by small sample sizes, and the number of deaths being predicted.

The vast majority of research on Type D has utilised Type D as a dichotomous typology. Traditionally, individuals have been defined as Type D if they score ≥10 on both the NA and SI subscales of Type D [13]. Recently, a taxometric analysis of Type D [14] has suggested that Type D is better represented as a continuous rather than dichotomous construct. Accordingly, the most appropriate test of the predictive utility of Type D is to determine if the multiplicative interaction

of negative affectivity and social inhibition predicts outcome after controlling for the main effects of the negative affectivity and social inhibition constituent elements in a regression analysis. Denollet has proposed that the Type D construct is more than just the presence of negative emotions and that social inhibition is a moderator of the effects of negative affectivity on clinical outcome [1]. Accordingly, analysing Type D as the interaction of negative affectivity × social inhibition is arguably the most appropriate analytic method for the construct, and provides the most stringent test of its predictive utility.

Several studies have now examined the utility of the multiplicative term (i.e., negative affectivity × social inhibition) in predicting outcome, after controlling for the main effects of the individual components. In doing so, two large-scale studies [15,16] failed to find an association between Type D and mortality in cardiac patients. Coyne et al. [15] investigated the prognostic value of Type D on mortality in a large sample of Chronic Heart Failure (CHF) patients, and found that Type D did not predict mortality at 18-month follow-up. Similarly, Grande et al. [16] found no association between Type D and all-cause-mortality in a large sample of German cardiac patients at 6-year follow-up. These studies have the advantage over previous research on Type D in terms of their large samples. However, Coyne et al.'s study is based on a relatively short follow-up period in terms of mortality, and the sample consists of an unusually low prevalence of Type D (13%, compared to rates of 25–30% that are typically observed). In addition, the study by Grande et al. only uses all-cause-mortality as an outcome (as opposed to cardiac mortality with which Type D has been most closely related). However, these studies have cast doubt on the association between Type D and mortality in cardiac patients. Furthermore, a recent meta-analysis [17] has suggested that the early studies on Type D may have overestimated the prognostic effect of Type D. Although the authors identified a significant association between Type D and mortality and non-fatal MI, they found that the identified odds ratios have decreased over time.

A large body of evidence has suggested a link between Type D and subjective health (including impaired physical health, increased symptoms of depression and anxiety, and lower quality of life) in CHF patients and those with peripheral arterial disease (PAD) [18–22]. Studies have also demonstrated the usefulness of the Type D construct in predicting subjective outcomes in post-MI patients. One study investigated whether Type D predicted disease-specific health status 18 months post-MI [23]. It found that Type D patients had significantly more physical limitations, and less angina stability than non-Type D patients. Thus far, only one study has failed to find an association between Type D and health status [10].

Evidence therefore suggests that Type D may be an important risk factor for poor subjective outcomes in MI patients. However, to-date all previous research on Type D and psychosocial outcomes has analysed Type D status using a categorical typology. Therefore, in line with recent findings [15,16] it is important to examine if Type D is associated with subjective outcome when treated as a dimensional variable in standard regression analyses, after controlling for the main effects of negative affectivity and social inhibition. Accordingly, we analysed the data from this study using two methods, first using the traditional method of classifying individuals as Type D if they scored above the recommended cut-off (≥10) on both NA and SI. Second, we treated both NA and SI as continuous variables and performed traditional regression analyses, testing whether the multiplicative term of SI × NA explained additional variance in disability and quality of life, after the entry of SI and NA individually.

Methods

Participants and procedure

Patients were invited to participate if they met the following broad inclusion criteria: they had been admitted to hospital for a MI, and they had a satisfactory level of English to complete the questionnaires. The response rate at baseline was 97.5%, with five potential participants refusing to take part. A non-consecutive sample of 192 MI patients, who were admitted to Edinburgh Royal Infirmary (ERI) in Scotland, participated in the study. The mean age of the participants was 66.0 (10.8) years (range 40–88 years). Women comprised 28.1% of the sample (n = 54). With informed consent and approval of the National Health Service (NHS) Ethical Committee, the patients were asked to complete a research questionnaire while they were in hospital and 3 months later. At the 3-month follow-up, 131 (63%) of the original 192 participants completed the follow-up questionnaire. The mean age of the participants at follow-up was 65.89 (SD = 10.76) years, and comprised of 39 females and 92 males. At baseline, patients completed measures of Type D personality, and provided demographic information. At 3 months, patients completed measures of quality of life and disability.

Measures

Demographic and clinical variables

Socio-demographic variables included sex, age and socioeconomic status. Socioeconomic status was measured by the deprivation scores attached to an individual's postal code [24]. Baseline clinical variables, including history of previous MI, and left ventricular function (LVF) were measured. LVF was measured by means of echocardiography.

Type D personality

The Type D Personality Scale (DS14) [13] is a 14-item scale comprising of two subscales; a seven-item subscale which measures negative affectivity (e.g. 'I often feel unhappy'), and a seven-item subscale measuring social inhibition (e.g. 'I often feel inhibited in social interactions'). Respondents rate their personality on a five-point Likert-type scale which ranges from zero = false to four = true (items one and three were reverse scored). The negative affectivity and social inhibition scales can be scored as continuous variables (range 0–28) to assess these personality traits independently. Traditionally, participants who scored highly on both negative affectivity and social inhibition using a cut-off point of ≥10 on both scales have been classified as having a Type D personality [13]. However, more recently taxometric analyses have suggested that Type D may be better represented as a dimensional construct, as the interaction of continuous negative affectivity and social inhibition [14]. Cronbach's $\alpha = 0.88$ and 0.86, respectively, for negative affectivity and social inhibition indicating excellent internal consistency in the current sample.

Disability

The Functional Limitations Profile (FLP) [25] is the British version of the American Sickness Impact Profile (SIP) [26]. The British version translated the SIP into British English, renamed and rescored it to use British item weights. The aim of the scale is to assess changes in function due to ill-health. The scale consists of 136 items within 12 categories of activity. Four categories were selected for use in the current study, with a total of 49 items. These were ambulation, mobility, recreation and social interaction. Each category contains items which describe a restriction in activity (e.g. I walk more slowly) and the respondents are required to indicate whether the item applied to them today and if it is due to their health. Administration of the FLP was modified for use in the current study. Participants were asked whether they agreed or disagreed with each statement. If they agreed, they were asked; 'Is this due to your health?' If the participant answered yes then they moved on to the next category of items. Cronbach's $\alpha = 0.81$ for the composite score from the 4 abbreviated FLP scales indicating good internal consistency in the current sample.