

## Validating the Type D personality construct in Chinese patients with coronary heart disease

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### Abstract

**Objective:** Type D personality predicts poor prognosis in coronary heart disease (CHD) but little is known about Type D in non-Western cultures. We examined the (a) validity of the Type D construct and its assessment with the DS14 scale in the Chinese culture, (b) prevalence of Type D, and (c) gender vs. Type D discrepancies in depression/anxiety, among Chinese patients with CHD. **Method:** Patients with CHD ( $N=326$ ) completed the Chinese version of the DS14. The NEO Five Factor Inventory (NEO-FFI), Hospital Anxiety and Depression Scale (HADS), and Stress Symptom Checklist (SSC) were administered to subsamples to establish construct and discriminant validity. Administration of the DS14, HADS, and SSC was repeated at 1 month after hospital discharge in 66 patients, and stability of the DS14 was examined in another subsample of 100 patients. **Results:** The theoretical structure of the Type D construct in the Chinese culture was supported ( $\chi^2/df=2.89$ , root mean square error of approxima-

tion=0.08, normal fit index=0.91, non-normal fit index=0.91, comparative fit index=0.93). The Negative Affectivity (NA) and Social Inhibition (SI) subscales of the DS14 in the entire sample were internally consistent (Cronbach's alpha=0.89/0.81), measured stable traits (3-month test–retest ICC=0.76/0.74), and correlated significantly with the neuroticism (NA/neuroticism,  $r=-0.78$ ,  $P<.001$ ) and extraversion subscales (SI/extraversion,  $r=-0.64$ ,  $P<.001$ ) of the NEO-FFI, respectively. The prevalence of Type D personality was 31%. Type D was not related to transient emotional states. However, Chinese patients with a Type D personality were at increased concurrent risk of anxiety ( $P=.002$ ) and depression ( $P=.016$ ). **Conclusion:** Type D personality is a cross-culturally valid construct, is associated with an increased risk of anxiety and depression, and deserves prompt attention in estimating the prognostic risk of Chinese CHD patients.

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**Keywords:** Type D personality; DS14 scale; Psychometric evaluation; Coronary heart disease; Anxiety; Depression

### Introduction

The potentially deleterious effects of psychological distress on the etiology and prognosis of coronary heart disease (CHD) are well recognized [1–3]. Independent of disease severity, a high level of psychological distress is a risk factor for recurrent cardiac events, prolonged recovery, and increased mortality. Attention has also been given to the role of personality in predicting health outcomes in CHD patients, although this became less fashionable following inconsistent findings related to the prognostic role of the

Type A Behavior Pattern [4,5]. Hence, cardiovascular research tends to focus more on gender to explain individual differences in health status [6–8]. With the introduction of the “distressed” or Type D personality [9], the role of personality factors in explaining individual differences in psychological sequelae, morbidity, and mortality in CHD may see a revival.

Type D personality, derived from existing personality theory, and representing a normal personality disposition rather than psychopathology [9], comprises two primary traits: negative affectivity (NA) and social inhibition (SI). The former refers to the tendency to experience negative emotions in day-to-day circumstances [10], whereas the latter refers to a proneness to inhibit one's own emotional and behavioral expression in interacting with others so as to prevent disapproval by them [11]. CHD patients with Type

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D personality are at a significantly increased risk of (recurrent) myocardial infarction and mortality than their non-Type D counterparts [9,11–15]. Furthermore, research on mediating mechanisms has indicated that Type D individuals are characterized by higher levels of cortisol [16], excessive sympathetic activity [17], and a dysfunctional pro- to anti-inflammatory cytokine balance [18,19]. In addition, individuals with Type D personality are more likely to have a cluster of psychological risk factors for CHD including anxiety, depression, irritability, and low levels of self-esteem [20]. Type D personality is also a moderator of the protective effect of social support on CAD morbidity and mortality. Theoretically, this may operate through increased social alienation and impeded positive social interaction [21,22]. Indeed, Type D personality has been found to play a more prominent role than gender in explaining discrepancies in anxiety and depression among patients with CHD [20,23].

Hence, there is strong evidence attesting to the deleterious effects of Type D personality on CHD psychosocial status, morbidity, and mortality. However, all of the research to date has been carried out in Western countries and populations [9,11–15]. Although both classic and contemporary trait theories state that personality is an endogenous disposition in the individual, its expression is heavily determined by culture, and this is concretely manifested in attitudes, patterns of interpersonal interaction, motives, and interest, for example [24].

The Type D Scale (DS14) was specifically developed to assess NA, SI, and Type D personality [23]. The scale is reliable, valid, and stable, and imposes little burden on respondents. It has been translated into a variety of languages, including German, Danish, and Italian, and has been used to examine the cross-cultural generalizability of the Type D construct [25–27]. Recently, the DS14 has been translated to Mandarin Chinese. The psychometric properties of this translated version were examined in mainland Chinese patients with CHD who were treated with percutaneous coronary intervention in Ref. [28]. The translated version exhibited the two-factor structure of the original DS14 and had high internal consistency. It also correlated significantly with mood status, social support, and social avoidance in the predicted directions. However, the use of a cross-sectional design limited the scope of the study to differentiate Type D personality trait from a more transient mood status. It also provided no evidence on the temporal stability of Type D personality in a Chinese population. Indeed, although the culture of Hong Kong can be described as having its foundation in China, it is more influenced by British colonialism. This results in a unique culture in Hong Kong which is well reflected in the lifestyle pattern, social interaction, and even linguistic style, for example, of the population [29].

Thus, the aim of this study was to examine the construct of Type D in a Hong Kong Chinese population and to develop a version of the DS14 which is culturally, contextually, and linguistically suited to the context of

Hong Kong. In this study, we examined (1) the validity of the Type D construct and its assessment with the DS14 scale in Hong Kong Chinese culture; (2) the prevalence of Type D personality in Chinese patients with CHD; and (3) the role of gender vs. Type D discrepancies in depression and anxiety in this population.

## Methods

### *Setting and sample*

A convenience sample of 326 patients with CHD admitted to the cardiac unit of a university-affiliated hospital (Hong Kong) for an index event of angina, myocardial infarction, or ischemic heart failure, or to receive a percutaneous coronary intervention were recruited from November 2006 to October 2007. Eligible patients were Chinese speaking, able to communicate, and not suffering from any other life-threatening disease. The response rate was 91.2%, and there were no significant differences in age and gender between the respondents and nonrespondents ( $P>.05$ ). The reasons for refusal included lack of interest and feeling too tired to respond to the questionnaires.

### *Instruments*

#### *Type D Scale (DS14)*

Type D personality was assessed with the DS14 [23]. The DS14 is a 14-item questionnaire, with the items evenly divided to measure the subconstructs of NA and SI. A five-point Likert scale is used with a higher subscale score indicating a greater intensity of the corresponding personality trait. A standardized cut-off of  $\geq 10$  on both subscales indicates the presence of Type D personality in an individual, with this cut-off having been shown to be the most optimal using item response theory [30]. The DS14 is an internally consistent (Cronbach's alpha: NA/SI=0.88/0.86) and stable (3-month test-retest reliability: NA/SI=0.72/0.82) measure. Convergent validity was established by significant correlations between the NA subscale and neuroticism ( $r=0.86$ ), as well as between the SI subscale and extraversion ( $r=-0.65$ ) [23]. Discriminant validity was indicated by the stable NA and SI subscale scores as reported by CHD patients who had significant improvement in mood status after participating in a cardiac rehabilitation program [23]. The proposed two-factor structure of the DS14 was supported by factor analysis [23].

For the current study, Brislin's [31] model of translation was used to translate the original English version into Chinese. The back-translated version was endorsed by the author of the original version [23]. A panel of six health care professionals including a psychiatrist, clinical psychologist, and cardiologist rated the DS14 for cultural relevancy and conceptual adequacy on a 1–4 point Likert scale. The content validity index was 0.90, indicating the items were culturally relevant and adequate for measuring NA and SI [32].

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