Psychological hardiness is related to baseline high-density lipoprotein (HDL) cholesterol levels

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Abstract

Many people -- but not all -- experience diminished health and performance as a function of stress exposure. More research is needed to understand highly resilient people and the underlying psychobiological processes involved. This study examines psychological hardiness and cholesterol in N=321 healthy adults working in demanding national security occupations. Results show that psychological hardiness is associated with increased levels of high-density (good) cholesterol, suggesting a psychobiological resilience process that may be especially salient for cardiovascular health outcomes.

Hardiness and cholesterol

Cardiovascular disease remains the leading cause of death in the world (Barter, 2005). Among recognized risk factors for cardiovascular disease are psychosocial stress (NHLBI Working Group, 2004) and high cholesterol levels (Singh & Mori,1992). While LDL- low density lipoprotein is generally seen as the culprit in coronary heard disease (CHD), more attention lately is going to the possible protective role of HDL – high density lipoprotein (Barter, 2005). Type A behavior pattern is also an identified risk factor for CHD (Contrada, 1989). Contrada also found that hardiness was associated with reduced (diastolic) blood pressure responsiveness to stress, while Type A behavior style was linked to increased systolic and diastolic reactivity. Howard, Cunningham & Rechnitzer (1985) likewise found a link between Type A pattern and elevated triglycerides, and that hardiness moderated this effect. While these studies are suggestive of underlying biophysical processes associated with hardiness, they are limited by their reliance on early, weak measures of hardiness. The lack of a good hardness measure may also account for the shortage of studies into the underlying biomarkers of hardiness. The present study avoids this problem by using a proven, valid and reliable hardiness measure, the DRS-15(r). Also, we examine hardiness levels against a full lipid profile including HDL-high density lipoprotein. Theoretically, since HDL appears to function as a protective (resilience) factor at the biochemical level (Ridker, Stampfer & Rifai, 2001), it may be tied to the hardy-resilient style in some way.

Background

When exposed to stress of various kinds, many people experience degraded health and performance. But others display more resilient, healthy response patterns. While resiliency has become a fashionable topic in recent years, good science is lacking in this area. Careful research and sound theory are needed in order to advance understanding as to what constitutes and influences resilient response patterns. Scientifically-based knowledge in this area will permit the design of training programs and policies that really work to increase resilient outcomes in high-stress populations, such as the military.

Psychological hardiness

One set of features that consistently distinguishes healthy, resilient people from unhealthy ones has been summarized as the hardy-resilient style (Bartone et al, 1989). Based on earlier work by Kobasa (1979) and Maddi & Kobasa, 1984), the hardy-resilient style is a generalized mode of functioning that incorporates a strong sense of commitment and meaning in life, an expectation that one can control or influence outcomes, and an adventurous, exploring approach to living, a sense of challenge. Beyond this core set of facets – commitment, control and challenge – the hardy-resilient response style may also include sense of humor, readiness to forgive and look to the future, and a readiness to learn from experience. People high in hardiness are more likely to use active, problem-focused coping strategies in dealing with stress, rather than avoidance or regressive coping approaches (Kobasa & Puccetti, 1983).

Despite considerable evidence for a health-protective function of the hardy-resilient response pattern, relatively few studies have explored the underlying biophysiological processes involved. The present study examines possible links between hardiness-resilience and some well-established biochemical indicators of cardiovascular health.

Measuring hardness

To measure hardiness, this study used the DRS-15R (Dispositional Resilience Scale), a short, valid and reliable instrument that has been developed and refined over 25 years (Bartone, 1989; Bartone, 1995). The DRS has been used extensively in U.S. military and non-military samples, with excellent results (eg., Bartone, Ursano, Wright & Ingraham, 1989; Britt, Adler & Bartone, 2000).

In a critical review of hardiness theory and research, Funk (1992) recommended the DRS as the best available instrument to measure hardiness. Also using the DRS, Sinclair & Tetrick (2000) confirmed a factor structure of three facets, commitment control and challenge, nested under a more general hardiness construct. The DRS-15R is available to researchers at http://www.hardiness-resilience.com
Psychological hardiness is related to baseline high-density lipoprotein (HDL) cholesterol levels (cont.)

**Methods**

National Defense University students are offered free cholesterol screens, in addition to a range of other health services provided by the NDU Health and Fitness Center. Volunteer participants from a recent entering class (N=373) completed the short hardiness scale – DRS-15, and allowed access to their cholesterol lab results. Participants were approximately 70% military (all services) and 30% civilian workers, 22% women and 78% men. Average age was 44 years (s.d. = 4.5). Blood draw and lipid panels were performed by A and G HealthWatch LLC of Upper Marlboro, MD. After a 12 hour fast, blood was collected in SST (serum separator tubes) and, after a 20 minute wait to allow for some clotting, specimens were centrifuged at 3400 RPM for 15 minutes at room temp. Total Cholesterol, HDL, LDL, and triglycerides were assayed on a Beckman CX7 analyzer, using reagents from Beckman. Data were compiled and analyzed using SPSS. The relation of total hardiness and its facets (commitment, control and challenge) to cholesterol levels was assessed with Pearson correlations. Logistic regression was used to test the effect of hardiness (dichotomized) on HDL (upper & lower quartiles).

**Results and Discussion**

Correlational findings (Table 1) show that hardiness is most strongly associated with HDL – high-density lipoprotein. Hardiness is also (negatively) correlated with weight and BMI (Body Mass Index). Logistic regression results (Table 2) indicate those in the high hardiness group are over twice as likely to also have high levels of HDL – good cholesterol. It thus appears that the resilience effects of the hardy-resilient style have a parallel at the level of blood lipid activity.

This is the first study of its kind to examine psychological hardiness against cholesterol levels, as part of a program to identify underlying biomarkers for resilient stress response patterns. More work is needed to clarify these effects and their relation to stress. It may be that the kinds of positive coping expectations and behaviors that mark high hardy persons have a direct effect on HDL production, which in turn serves to protect against cardiovascular disease by more efficiently disposing of excess lipids. Further analyses also need to address possible age and sex differences, as well as other factors known to influence cholesterol levels such as diet and exercise.

### Table 1: Correlations of total hardiness and facets with cholesterol variables

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**References**


