



Self-esteem and Mortality: Prospective Evidence from a Population-based Study

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OBJECTIVE: Self-esteem is considered to be importantly associated with both psychosocial states such as depression as well as physical health. There are no population-based studies that examine the association between self-esteem and mortality. The objective of this study was to assess whether low self-esteem was prospectively associated with increased risk of death in a population-based sample of Finnish men.

METHODS: A sample of 2682 male residents of Kuopio, Finland were interviewed and followed prospectively as part of the Kuopio Ischemic Heart Disease Risk Factor Study (KIHD). Characteristics of the KIHD sample at baseline included self-esteem, measured by the Rosenberg ten-item scale, socioeconomic factors, behavioral risk factors, other psychosocial characteristics, and prevalent diseases. Mortality was ascertained through linkage to the Finnish national death registry. We assessed the relationship between self-esteem and all-cause mortality using Cox proportional hazards models.

RESULTS: Low self-esteem was associated with a two-fold [hazard ratio (HR) = 2.0, 95% confidence interval (CI) = 1.3–3.2] increase in age-adjusted mortality. This relationship was partially explained by behavioral and socioeconomic factors, and prevalent diseases, and fully explained by other psychosocial characteristics (hopelessness, depression, cynical hostility, and sullenness). When adjusted for hopelessness alone there was no increased risk associated with low self-esteem (HR = 1.3, 95% CI = 0.8–2.2).

CONCLUSIONS: This study found no association between self-esteem and all-cause mortality after adjustment for other psychosocial characteristics, primarily hopelessness. Our understanding of the observed relationships between some psychosocial factors and mortality may be improved by simultaneous measurement of multiple psychosocial domains, thus diminishing the potential for residual confounding. *Ann Epidemiol* 2004;14:58–65. © 2003 Elsevier Inc. All rights reserved.

KEY WORDS: Self-esteem, Mortality, Psychosocial Factors, Socioeconomic Factors.

INTRODUCTION

While there has been increasing evidence that various psychosocial factors are related to disease risk, the role of self-esteem has been frequently mentioned as a candidate risk factor but has not been widely studied. In 1965, Morris Rosenberg wrote *Society and the Adolescent Self-image*, in which he defined self-esteem as “the evaluation which the individual makes and customarily maintains with regard

to himself or herself: it expresses an attitude of approval or disapproval toward oneself” (1). Rosenberg created a ten-item scale to measure self-esteem, which reflects his description of a person with low self-esteem as someone who “lacks respect for himself, considers himself unworthy, inadequate, or otherwise seriously deficient as a person” (2).

Most studies have conceptualized self-esteem in a similar manner, with the use of the Rosenberg scale as the prevailing method for assessing the trait. In health studies, self-esteem has most commonly been investigated in relation to other psychosocial states, such as suicidal ideation, depression, and bipolar disorder (3–5). Self-esteem has also been used in investigations of adolescent health, particularly in relation to eating disorders (6, 7). Some have suggested that low self-esteem is a core feature of health inequalities (8). On the other hand, studies of adolescents suggest that the pursuit of self-esteem can be deleterious to health (9).

There has been little epidemiologic research linking self-esteem to physical health outcomes, although there is evidence to suggest that it may play a role in the survival of dialysis patients (10) and in the functional ability of

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Received July 12, 2002; accepted March 26, 2003.

Selected Abbreviations and Acronyms

KIHD = Kuopio Ischemic Heart Disease Risk Factor Study
SEP = socioeconomic position
BMI = body mass index
GLM = general linear models
HR = hazard ratio
CI = confidence interval

patients following stroke (11). However, there are no prospective epidemiologic studies that have examined the association between self-esteem and risk of death. The objective of this study was to examine the prospective association between self-esteem and 10-year mortality in a population-based sample of Finnish men in which substantial data were collected on behavioral, psychosocial, and socioeconomic variables.

METHODS

Study Population

The Kuopio Ischemic Heart Disease Risk Factor Study (KIHD) is a population-based, cohort study that was designed to identify a wide range of biological, behavioral, socioeconomic, and psychosocial risk factors for cardiovascular disease, diabetes, and other outcomes in a sample of middle-aged men in Kuopio, Finland (12). Baseline data were collected between March 1984 and December 1989 from male residents aged 42, 48, 54, and 60 years old, with a total of 2682 participants (82.9% of eligible men, after 198 were excluded due to death, serious disease, or migration). The first group recruited, of the two-wave recruitment, was comprised of 1166 men 54 years old. The second group was an age-stratified sample of 1516 men aged 42, 48, 54, and 60 years old (13).

Self-esteem Measure

Self-esteem was measured using the standard scale developed by Rosenberg (2) from a self-administered questionnaire administered at baseline. The ten-item scale was comprised of the following statements: "I have a positive attitude toward myself", "I am able to take care of things as well as other people", "I am generally satisfied with myself", "In my opinion, I am at least as valuable as others as a person", "In my opinion, I have a great deal of good qualities", "In my opinion, I have no reason whatsoever to be proud of myself", "Sometimes I really feel useless", "I wish I could respect myself more", "On the whole, I tend to consider myself a failure", and "Sometimes I think I'm not good for anything." Respondents indicated their level of agreement with each statement on a four-point scale: 0

(completely true), 1 (fairly true), 2 (not very true), and 3 (not true at all). Positive statements were reverse-coded so that low scores reflected low self-esteem. The overall score was constructed by adding the scores for each of the ten items, and weighted by the average of non-missing items for individuals who had no more than two missing items. The self-esteem scale ranged from 3 to 30, and scores were grouped into categories of the lowest 10% (score < 14), middle range (score 14-24), and the highest 10% (score \geq 25).

Measures of Other Risk Factors

Socioeconomic Characteristics. We used measures of socioeconomic position that included income, which was coded into quintiles, and education, which was coded into three categories based on years of education (<6, 7-11, and 12 or more years). Occupation was reported as one of three categories: farmer, blue collar, or white collar worker. Level of material living conditions was assessed by a composite measure created by summing responses indicating ownership of twelve material goods, which included items such as a dishwasher, television, car, and summer cottage. Childhood socioeconomic position (SEP) was assessed by a composite measure based on the retrospective report of parents' education, occupation, number of rooms in the childhood home, size of the parents' farm and perception of wealth of the childhood household. This indicator of childhood SEP has been used in previous studies (14, 15).

Behavioral Risk Factors. Behavioral risk factors included smoking, alcohol consumption, body mass index (BMI), and physical activity. Smoking was classified according to status as a current smoker, former smoker, or never having smoked. Alcohol consumption was measured as the frequency of intake and usual dose of alcohol per sitting for different types of beverages (beer, strong beer, wine, fortified wine, spirits). Using these frequency and dose measures we categorized subjects according to the amount of alcohol they consumed [light (<3 times per week), moderate (3-13 times per week), and heavy drinkers (2 + times per day)] and the pattern of consumption (abstaining, non-bingeing, occasional bingeing, and weekly bingeing) (16). BMI was calculated as the ratio of weight (kg) to height squared (m^2), and categorized into obese (BMI > 30), overweight (BMI 25-29.9), and normal/under weight (BMI < 25). Physical activity was assessed by using a 12-month leisure-time history based on self-reported information about frequency per month over the preceding year, average duration per occasion, and intensity level. Metabolic units were assigned for each activity according to intensity, which were then categorized into quartiles (17). These variables have been applied similarly in other studies using KIHD data (18, 19).

Psychosocial Characteristics. In addition to self-esteem, other psychosocial characteristics included in the analysis were hopelessness, depression, cynical hostility, and sullenness. Hopelessness was measured by two items: "I feel that it is impossible to reach the goals I would like to strive for" and "The future seems to me to be hopeless, and I can't believe that things are changing for the better." Responses were on a five-point Likert scale, ranging from 0 = absolutely agree to 4 = absolutely disagree, and were reverse-coded so that a higher score reflected more hopelessness. The hopelessness score was split into three groups, to represent low, moderate, and high hopelessness, based on the meaning of the scores in terms of response options (20). Depression was measured using the 18-item Human Population Laboratory Depression Scale, developed by Roberts and colleagues (21-23), which assesses mood disturbances, negative self-concept, loss of energy, problems with eating and sleeping, and psychomotor retardation or agitation. Each item was scored one point for every response that corresponded to a depressed state which was summed over the 18 items. A score of four or higher was indicative of being in a depressed mood, corresponding to a score of one standard deviation or greater above the mean depression score for the total sample. Cynical hostility was measured by the eight-item Cynical Distrust Scale (24, 25), which was based on results from a factor analysis of the Cook-Medley Hostility Scale (26). Response options ranged from 0 = completely agree to 3 = completely disagree and were reverse-coded and summed to produce the final score, which was split into quartiles for the purpose of this analysis. Our sullenness construct was based on the measure of "anger-in" from the Spielberger Anger Expression Scale (27), which was slightly modified in accordance with results from a factor analysis of the scale using KIHD data (28). The final score was a sum of the responses from each item in the scale, which ranged from 1 = hardly ever to 4 = almost always, and was subsequently categorized into tertiles (29).

Prevalent Diseases. Measures of pre-existing health conditions were also assessed at baseline. These involved both clinical and self-reported measures and have been described elsewhere (30). Prevalent conditions included both symptomatic and asymptomatic coronary heart disease, diabetes, hypertension, ischemic heart disease, and other cardiovascular disease, and were modeled as dichotomous variables according to the presence or absence of each disease grouping.

Outcomes

All-cause mortality. We ascertained death from all causes for individuals in our sample via linkage to the Finnish national death registry. We included deaths that occurred between the time of study entry through December 1998. There was a total of 303 deaths from all causes, with a mean follow-up time of 9.8 years.

Data Analysis

The first step in our analysis was to examine the distribution of self-esteem across categories of socioeconomic characteristics, behavioral risk factors, psychosocial characteristics, and prevalent diseases. We calculated the least-square means of self-esteem scores, adjusted for age, across categories of each risk factor using the SAS general linear models (GLM) procedure (31). Statistical tests for differences in self-esteem scores across categories of these covariates (either overall F-test or test-for-trend, depending on whether dummy or linear forms of the variable were modeled) were calculated according to the procedure recommended by Neter et al. (32). The second step of the analysis assessed the association between self-esteem and all-cause mortality using the Cox proportional hazards model (33). We estimated the age-adjusted relative hazard of mortality for low and mid-range self-esteem compared with high self-esteem and then, in four separate models, adjusted for socioeconomic characteristics, behavioral risk factors, psychosocial characteristics, and prevalent diseases. Due to differential missing responses for the variables in the separate models, the number of cases in each model differed. A comparison of four age-adjusted models, restricting the analysis to the *n* from each of the separate models, indicated only trivial differences in the association between self-esteem and mortality.

RESULTS

Table 1 presents the distribution of mean self-esteem scores across characteristics of the study population. Lower self-esteem was found to be associated with many socioeconomic, behavioral, psychosocial, and disease characteristics. There was a difference of at least one-half of a standard deviation in self-esteem scores ($\sigma = 4.3$) between the lowest and highest categories of income, education, material living conditions, depression, cynical hostility, and sullenness. There was a difference of at least one standard deviation in self-esteem scores across categories of hopelessness.

Table 2 presents the results of the proportional hazards models that were used to calculate relative hazards of all-cause mortality according to self-esteem score, adjusted for age and then separately for groups of baseline risk factors defined as socioeconomic characteristics, behavioral risk factors, psychosocial characteristics, and prevalent diseases. The results of the age-adjusted model, Model 1, indicate a two-fold increase in relative hazard for those in the lowest self-esteem group compared with the highest (HR = 2.0, 95% CI = 1.3-3.2). The mid-level self-esteem group was not at higher risk than the high self-esteem group

TABLE 1. Age-adjusted mean self-esteem score by study population characteristics: KIID baseline data

Variable	Frequency	%	Self-esteem score (mean)	SE	p-value*
Self esteem					
Lowest decile	287	12.6	11.7	0.139	N/A
Middle eight deciles	1729	75.9	19.3	0.056	
Highest decile	263	11.5	26.6	0.145	
Socioeconomic position					
Income					
1 st quintile (lowest)	518	19.7	18.0	0.207	.0001 ^F
2 nd quintile	527	20.0	18.6	0.202	
3 rd quintile	528	20.0	18.7	0.195	
4 th quintile	536	20.3	19.8	0.197	
5 th quintile	527	20.0	20.9	0.197	
Education					
1-6 years	802	30.0	18.4	0.176	.0001 ^F
7-11 years	1441	53.9	19.1	0.122	
12 or more years	432	16.1	20.9	0.221	
Occupation					
Farmer	427	16.2	18.7	0.229	.0001 ^F
Blue collar	1170	44.3	18.6	0.138	
White collar	1044	39.5	20.0	0.141	
Material living conditions					
1 st quartile (lowest)	428	16.0	17.6	0.236	.0001 ^F
2 nd quartile	1099	41.1	19.0	0.140	
3 rd quartile	618	23.1	19.8	0.182	
4 th quartile	529	19.8	19.9	0.202	
Childhood SEP					
1 st tertile (lowest)	866	33.1	18.7	0.161	.0004 ^t
2 nd tertile	904	34.5	19.4	0.156	
3 rd tertile	849	32.4	19.5	0.160	
			$\beta = 0.37$	0.114	
Behavioral risk factors					
Smoking					
Never	698	26.0	19.9	0.174	.0001 ^F
Former	1070	39.9	19.2	0.142	
Current	912	34.0	18.7	0.159	
Pattern of alcohol consumption					
Abstain	366	13.7	18.8	0.244	.0001 ^F
Non-binger	1785	66.7	19.6	0.109	
Occasional binger	240	9.0	18.1	0.307	
Weekly binger	287	10.7	17.9	0.285	
Amount of alcohol consumption					
Abstain	366	13.7	18.8	0.246	.004 ^F
Light drinker (< 3/week)	1103	41.2	19.4	0.140	
Moderate drinker (3-13/week)	888	33.2	19.4	0.159	
Heavy drinker (2 +/day)	321	12.0	18.4	0.265	
BMI					
Non-obese (BMI < 25)	843	31.5	19.2	0.162	.741 ^t
Pre-obese (BMI 25-29.9)	1370	51.3	19.2	0.126	
Obese (BMI > 30)	459	17.2	19.2	0.226	
			$\beta = -0.01$	0.135	
Physical activity: hrs/yr					
1 st quartile (lowest 25%)	664	25.0	18.6	0.187	.0001 ^F
2 nd quartile	665	25.0	19.0	0.179	
3 rd quartile	663	25.0	19.8	0.178	
4 th quartile	664	25.0	19.4	0.182	
Psychosocial factors					
Depression					
Low depression score	2148	81.8	19.9	0.095	.0001 ^F
High depression score	478	18.2	16.2	0.205	

TABLE 1. Continued

Variable	Frequency	%	Self-esteem score (mean)	SE	p-value*
Hopelessness					.0001 ^F
Low	1363	52.7	20.7	0.117	
Medium	937	36.2	17.8	0.143	
High	287	11.1	16.2	0.255	
Cynical hostility					.0001 ^t
1 st quartile (lowest 25%)	542	23.7	20.9	0.181	
2 nd quartile	589	25.7	19.5	0.174	
3 rd quartile	601	26.3	18.6	0.172	
4 th quartile	557	24.3	17.9	0.179	
			$\beta = -0.98$	0.080	
Sullenness					.0001 ^t
1 st tertile (lowest 33%)	730	33.0	20.8	0.154	
2 nd tertile	852	38.6	19.1	0.143	
3 rd tertile	628	28.4	17.5	0.166	
			$\beta = -1.64$	0.113	
Prevalent diseases/conditions					
Asymptomatic CHD					.001 ^F
Yes	421	15.7	19.1	.228	
No	2261	84.3	19.2	.099	
Symptomatic CHD					.0001 ^F
Yes	714	26.6	18.3	.180	
No	1968	73.4	19.5	.105	
Diabetes					.001 ^F
Yes	143	5.3	19.0	.418	
No	2539	94.7	19.2	.093	
Hypertension					.001 ^F
Yes	1114	41.7	19.1	.143	
No	1555	58.3	19.3	.119	
Other cardiovascular					.0001 ^F
Yes	441	16.4	18.3	.227	
No	2241	83.6	19.4	.099	
History of IHD					.0001 ^F
Yes	677	25.2	18.4	.186	
No	2005	74.8	19.5	.104	

*F indicates an overall F-test was conducted, t indicates a test-for-trend was conducted. For variables where a test-for-trend was conducted, the associated β -coefficient and standard error are also presented.

(HR = 1.2, 95% CI = 0.8-1.8). The relative hazard associated with low self-esteem dropped to 1.5 (95% CI = 0.9-2.5) when socioeconomic characteristics (Model 2) were included in the model. Likewise, the relative hazard of

having low self-esteem was attenuated when behavioral risk factors, Model 3 (HR = 1.6, 95% CI = 1.0-2.6), and prevalent diseases, Model 5 (HR = 1.7, 95% CI = 1.1-2.8), were separately added to the model. When psychosocial factors,

TABLE 2. Mortality hazard ratios for low and mid-level vs. high self-esteem, adjusted for age, socioeconomic characteristics, behavioral risk factors, psychosocial characteristics, and prevalent disease: KIHD 1984-1998

Model 1: Age-adjusted ^a		Model 2: Socioeconomic characteristics ^b		Model 3: Behavioral risk factors ^c		Model 4: Psychosocial characteristics ^d		Model 5: Prevalent diseases ^e	
Self esteem		Self esteem		Self esteem		Self esteem		Self esteem	
High	ref	High	ref	High	ref	High	ref	High	ref
Mid	1.2 (0.8, 1.8)	Mid	1.0 (0.6, 1.5)	Mid	1.1 (0.7, 1.6)	Mid	0.9 (0.6, 1.4)	Mid	1.1 (0.8, 1.7)
Low	2.0 (1.3, 3.2)	Low	1.5 (0.9, 2.5)	Low	1.6 (1.0, 2.6)	Low	1.0 (0.6, 1.8)	Low	1.7 (1.1, 2.8)

^aModel 1 includes self-esteem and age.

^bModel 2 includes self-esteem, age, income, education, occupation, material living conditions and childhood SEP.

^cModel 3 includes self-esteem, age, smoking status, amount of alcohol consumed (g/wk), pattern of alcohol consumption, physical activity, and BMI.

^dModel 4 includes self-esteem, age, depression, hopelessness, cynical hostility, and sullenness.

^eModel 5 includes self-esteem, age, asymptomatic and symptomatic CHD, diabetes, hypertension, ischemic heart disease, and other cardiovascular disease.

TABLE 3. Mortality hazard ratios for psychosocial characteristics, adjusted for age and self-esteem: KIID 1984-1998

Variables	Age-adjusted	Bivariate models ^a			
		1	2	3	4
Self esteem					
High	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Mid	1.2 (0.8, 1.8)	1.0 (0.6, 1.5)	1.1 (0.7, 1.7)	1.1 (0.7, 1.7)	1.2 (0.8, 1.8)
Low	2.0 (1.3, 3.2)	1.3 (0.8, 2.2)	1.6 (1.0, 2.6)	1.7 (1.0, 2.7)	1.9 (1.1, 3.0)
Hopelessness					
Low	<i>ref</i>	<i>ref</i>			
Medium	1.7 (1.3, 2.1)	1.6 (1.2, 2.1)			
High	2.5 (1.9, 3.4)	2.4 (1.7, 3.4)			
Depression					
Low	<i>ref</i>		<i>ref</i>		
High	1.8 (1.4, 2.2)		1.6 (1.2, 2.1)		
Cynical Hostility					
1 st quartile	<i>ref</i>			<i>ref</i>	
2 nd quartile	1.3 (0.9, 1.9)			1.2 (0.8, 1.8)	
3 rd quartile	1.4 (1.0, 2.0)			1.3 (0.9, 1.9)	
4 th quartile	2.3 (1.6, 3.2)			2.1 (1.5, 2.9)	
Sullenness					
1 st tertile	<i>ref</i>				<i>ref</i>
2 nd tertile	1.2 (0.9, 1.6)				1.1 (0.8, 1.5)
3 rd tertile	1.4 (1.0, 1.9)				1.2 (0.9, 1.7)

^aModel 1 includes self-esteem and hopelessness, Model 2 includes self-esteem and depression, Model 3 includes self-esteem and cynical hostility, and Model 4 includes self-esteem and sullenness; all four models were age-adjusted.

Model 4, were added to the model with self-esteem, there was no relationship between self-esteem and mortality (HR = 1.0, 95% CI = 0.6-1.8).

To further explore the impact of individual psychosocial factors on the relation between self-esteem and mortality, we conducted a series of analyses in which each psychosocial factor was considered separately (Table 3). Model 1 included hopelessness, Model 2 included depression, Model 3 included cynical hostility, and Model 4 included sullenness. Hopelessness diminished the association between self-esteem and mortality more than any other single psychosocial factor (HR = 1.3, 95% CI = 0.8-2.2). However, self-esteem did not importantly reduce the age-adjusted associations between the other four psychosocial factors and mortality. For example, the age-adjusted hazard ratio for the highest hopelessness tertile vs. the lowest hopelessness tertile was 2.5 (95% CI = 1.9-3.4), and after adding self-esteem to the model there was no substantial change (HR = 2.4, 95% CI = 1.7-3.4).

DISCUSSION

The results of our analyses indicate that while self-esteem was strongly related to many risk factors, it was not robustly associated with all-cause mortality. Specifically, when other psychosocial characteristics, particularly hopelessness, were

included in the model, the two-fold increased risk of death associated with low self-esteem disappeared.

In results not reported, we considered different categorizations of the self-esteem scale. Generally speaking, the only consistently elevated risks were found when we contrasted the top and bottom decile groups. While this may be consistent with a threshold effect, the fact that a consistently graded risk could not be found across quintile, quartile, or tertile cuts of the self-esteem score also suggests fragility in the association between self-esteem and mortality. In any event, the substantial age-adjusted relationship (HR = 2.0, 95% CI = 1.3-3.2) between self-esteem and mortality revealed in the extreme comparison of the top and bottom deciles, was greatly reduced to HR = 1.3 (95% CI = 0.8-2.2) after adjusting for hopelessness.

Hopelessness has been identified as an important independent predictor of mortality, as well as cardiovascular disease-related morbidity (20, 34). The relationship between hopelessness and mortality has been found in other populations, such as in another recent longitudinal study of older Mexican and European Americans (35). In our analysis, we found that hopelessness was more strongly related to mortality than any other psychosocial factor, and that it was the strongest confounder of the association between self-esteem and mortality. Importantly, self-esteem did not confound the association between hopelessness and risk of death.

This study includes a sample of Eastern Finnish men and these results may not apply to other groups, such as

women and other race/ethnicity groups. It is also important to keep in mind that concepts such as self-esteem, depression, and cynical hostility may have different meanings in different cultures and over different age cohorts, which may affect the generalizability of these findings.

Our sample had an average mortality follow-up time of 9.8 years and self-esteem, hopelessness, and other factors in our analysis may have changed over time. With regard to the stability of self-esteem over time, a recent review suggests that self-esteem is relatively constant over the lifespan, particularly as it is measured using the Rosenberg scale (36). There is some evidence that among adolescents, self-esteem is moderately predictive of the onset of major depressive disorder (37). Thus, if extended to adults, it is possible that low self-esteem may lead to depression and hopelessness over time, and through these psychosocial characteristics have an indirect influence on mortality risk. In our analyses, the lack of confounding by self-esteem of the association between hopelessness and risk of death (Table 3) suggests that if self-esteem does play any role in increasing the risk of mortality, it is unlikely that it would have any important effect outside of other psychosocial factors, such as hopelessness, for which evidence suggests a more robust relationship with mortality risk.

There may be many factors involved in the genesis of low self-esteem, but it is worth highlighting the strong association between low socioeconomic position and low self-esteem. The strong associations often seen between low socioeconomic position and psychosocial characteristics such as self-esteem and hopelessness emphasize the need to understand the environments, experiences, and lack of opportunity associated with low socioeconomic position as fundamental in the development of adverse psychosocial risk factors (18, 38). However, while a psychosocial risk factor may be socioeconomically patterned, that does not necessarily mean that it will be causally associated with mortality risk. Clearly, prospective studies which examine socioeconomic position, self-esteem, hopelessness, and depression over time will be needed to clarify the causal pathways.

In conclusion, our study finds little association between self-esteem and all-cause mortality, after adjusting for hopelessness. There may be other health outcomes for which self-esteem influences risk and, likewise, it may be an important construct in influencing health-related outcomes for other age groups, particularly among adolescents. While self-esteem is clearly associated with other measures of psychosocial well-being, such as hopelessness and depression, it does not appear to be a strong etiologic factor for mortality. These analyses show that caution should be exercised when considering the "independent association" of one psychosocial characteristic with a health outcome in the absence of data on related psychosocial constructs.

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