ORIGINAL INVESTIGATION

Optimism and Rehospitalization After Coronary Artery Bypass Graft Surgery

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Objective: To determine whether optimism predicts lower rates of rehospitalization after coronary artery bypass graft surgery for the 6 months after surgery

Methods: A prospective, inception cohort design was used. The sample consisted of all consenting patients (N = 309) from a consecutive series of patients scheduled for elective coronary artery bypass graft surgery at a large, metropolitan hospital in Pittsburgh, Pa. To be eligible, patients could not be scheduled for any other coincidental surgery (eg, valve replacement) and could not be in the cardiac intensive care unit or experiencing angina at the time of the referral. Participants were predominantly men (69.9%) and married (80.3%), and averaged 62.8 years of age. Recruitment occurred between January 1992 and January 1994.

Results: Compared with pessimistic persons, optimistic persons were significantly less likely to be rehospitalized for a broad range of aggregated problems (including postsurgical sternal wound infection, angina, myocardial infarction, and the need for another bypass surgery or percutaneous transluminal coronary angioplasty) generally indicative of a poor response to the initial surgery (odds ratio = 0.50, 95% confidence interval = 0.33-0.76; P = .001). The effect of optimism was independent of traditional sociodemographic and medical control variables, as well as independent of the effects of self-esteem, depression, and neuroticism. All-cause rehospitalization also tended to be less frequent for optimistic than for pessimistic persons (odds ratio = 0.77, 95% confidence interval = 0.57-1.05; P = .07).

Conclusions: Optimism predicts a lower rate of rehospitalization after coronary artery bypass graft surgery. Fostering positive expectations may promote better recovery.

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REHOSPITALIZATION after major surgery represents an important outcome measure.[1-5] Not only does rehospitalization impact negatively on the quality of life of the patients and families involved, it also has substantial adverse economic effects on the health care delivery system. For example, 24% of total hospital expenditures under Medicare have been estimated to be caused by rehospitalization.[6] Given the personal and economic costs involved, it becomes important to identify risk factors for rehospitalization so that effective intervention procedures might eventually be implemented. It is particularly important to identify risk factors for rehospitalization after coronary revascularization procedures because rates of rehospitalization after revascularization surgery are particularly high, compared with other types of surgery.[2,7]

The primary aim of the present study was to evaluate the trait of optimism as a predictor of rehospitalization after coronary artery bypass graft (CABG) surgery. Optimism is defined as the generalized and stable expectation that good rather than bad outcomes will occur in one's life.[8] Accumulating evidence[9-11] suggests that differences between people in their levels of optimism and pessimism can have important physical health consequences, including those related to recovery from hospitalization for myocardial infarction (MI) and heart surgery.

In this regard, Agarwal et al[12] showed that positive expectations and a positive life orientation on the part of patients are concurrently related to physician ratings of good recovery after hospitalization for MI. In longitudinal research, Leedham et al[13] found that positive expectations assessed before surgery were related to good postsurgical adherence to prescribed medical regimens and medical staff ratings of good physical health after surgery for heart transplantation. Finally, Scheier et al[14] found in a small sample of men that trait

PATIENTS AND METHODS

PROTOCOL AND PATIENT CHARACTERISTICS

Participants were recruited from a consecutive series of 528 patients scheduled for elective CABG surgery at Allegheny General Hospital in Pittsburgh, Pa, between January 1992 and January 1994. Eligibility criteria included (1) first-time bypass surgery because of CAD, with no additional surgical repair (eg, valve replacement); (2) no chest pain at the time of the interview; (3) 1 day minimum between the time that the surgery was scheduled and the time that the surgery occurred (to allow time for patient interview before surgery); (4) not admitted to the intensive care unit (because of logistical factors affecting access to patients in that unit, eg, inability to interview participants without interfering with the care of other patients in the unit); (5) English speaking; and (6) residence within 125 miles of Allegheny General Hospital (for the convenience of the follow-up home interviews).

Of the 528 eligible patients asked to participate, 309 (215 men and 94 women) initially agreed. Of the 309 patients who initially agreed, 283 (91.6%) were available for the 6-month follow-up (7 patients [2.3%] died, 6 patients [1.9%] could not be located, and 13 patients [4.2%] did not want to participate in the study further). **Table 1** presents baseline characteristics of the sample. Participants averaged 63 years of age, and were predominantly men (69.9%), white (99.4%), and married (80.3%). Most patients (62.5%) had a high school education or less. Figures reflecting coronary heart disease (CHD) risk, extensiveness of CAD, and extensiveness of surgery are comparable to those typically reported for other similar groups of patients having elective surgery.

Of the patients who were initially approached, 41.5% refused to participate in the project (139 men and 80 women). Compared with nonparticipants, participants were younger and better educated ($P < .001$ for both). Participants also had a fewer number of vessels occluded 50% or more ($P < .001$), but a higher average level of serum cholesterol ($P < .02$). For the other characteristics that were assessed, participants and nonparticipants did not differ (Table 1). Taken together, these data suggest that participants in the study were younger, better educated, and perhaps less diseased than those who declined participation.

PROCEDURE

Prospective participants were approached in the hospital or were called at home about being in the study, and a face-to-face baseline interview was scheduled. Baseline interviews were conducted by trained interviewers between 1 and 20 days before the patient's operation. These interviews occurred in the hospital, in the patient's home, or at some other mutually agreed on location. Informed consent was provided before obtaining the baseline information. At 6 months, patients were contacted by letter and a subsequent telephone call, and a follow-up face-to-face interview was scheduled. The institutional review boards of Carnegie Mellon University, the University of Pittsburgh, and Allegheny General Hospital, all in Pittsburgh, approved the project and the manner in which informed consent was obtained from participants.

PSYCHOSOCIAL MEASURES

Measures of dispositional optimism, depression, self-esteem, and neuroticism were obtained at baseline. Optimism was measured with the 10-item Revised Life Orientation Test,[16] with higher scores reflecting greater optimism (Cronbach $\alpha = .75$ in the present sample). Depression was assessed with a 10-item version of the Center for Epidemiologic Studies Depression Scale[24] (Cronbach $\alpha = .79$ in the present sample). The abbreviated scale correlates highly ($r = 0.96$) with the full scale[25] and exhibits similar psychometric properties.[26] Self-esteem was assessed using 4 items from the Rosenberg Self-Esteem Scale,[27] with higher scores indicating greater self-esteem (Cronbach $\alpha = .65$ in the present sample). Neuroticism was assessed with a 10-item version of the Neuroticism scale of the Eysenck Personality Questionnaire,[28,29] with higher scores representing greater neuroticism (Cronbach $\alpha = .75$ in the present sample).

MEDICAL INFORMATION

There were several sources of medical information: cardiac catheterization reports, operative reports, inpatient medical records, and private physician reports at follow-up. The catheterization reports yielded the following information: occlusion of 50% or more in the left main coronary artery, degree of occlusion in each of the other coronary arteries (summarized as the number of vessels occluded 50% or more), and ejection fraction less than 40%. Hospital medical records were abstracted for the following: smoking history (current smoker or not), body mass index (calculated as weight in kilograms divided by the square of height in meters) greater or less than 30, history of hypertension, and CAD. A separate record contained information about New York Heart Association classification of cardiac function. The operative report was abstracted for length of time on bypass machine, length of cross-clamp time, number of vein and internal mammary artery grafts, and postoperative complications.

CATEGORIZATION AND ASCERTAINMENT OF REHOSPITALIZATION

At the 6-month interview, patients were asked if they had been rehospitalized since their surgery and (if so) to indicate the cause or causes for their rehospitalization. Primary analyses centered on those rehospitalizations that related to CHD or a poor response to the patient's initial operation. Included in this primary category of surgery- and CHD-related rehospitalizations were rehospitalizations caused by postsurgical sternal wound infection ($n = 5$, 1.6% of the sample), angina ($n = 16$, 5.2% of the sample), and a category of rehospitalizations due to MI, or the need

optimism was negatively associated with perioperative MI and positively associated with rate and extent of lifestyle normalization after CABG surgery. Thus, there are some data to suggest that optimism is associated with better recovery after hospitalization for cardiac-related events and procedures. To the extent that rehospitalization is a marker of poor recovery, persons who are more optimistic should be less likely

to undergo either a second bypass operation or percutaneous transluminal coronary angioplasty (n = 8 for this latter CAD-related cluster, 2.6% of the sample). In all, 23 patients (7.4% of the sample) were rehospitalized for 1 or more of the preceding reasons. An additional category was also constructed reflecting total, all-cause rehospitalization. A total of 79 patients (25.6% of the sample) were rehospitalized at least once for some reason during the 6 months after surgery.

Physicians of all patients reporting rehospitalization for postoperative sternal wound infection or CAD were contacted to verify the hospitalizations. Physicians of an age- and sex-matched sample of patients who reported not being rehospitalized for these problems were also contacted to verify that no rehospitalization had in fact occurred. In no case did a patient report that a hospitalization occurred when the physician did not and vice versa. One patient reported being hospitalized for an MI when in fact it was for a pulmonary embolism, and it was categorized consistent with the physician's records. Causes for the remaining cases of rehospitalization were not confirmed.

CONTROL VARIABLES

Demographic control variables included age, sex, employment status, marital status, and educational level. Medical control variables were selected as a means of characterizing the patient's risk factors for CHD, the degree of underlying CAD, or the extensiveness of the patient's surgery, and included hypertensive status, smoking status, diabetic status, serum cholesterol level, number of vessels occluded 50% or greater, ejection fraction, New York Heart Association classification, and number of grafts performed. A measure of comorbidity was also obtained by asking patients to indicate if they had sought medical care for a broad range of different conditions. These individual conditions were grouped into 7 a priori categories, reflecting cardiac and circulatory disease, pulmonary disease, renal and metabolic disease, gastrointestinal tract disorders, cancer, psychiatric disorders, and miscellaneous diseases and conditions not covered by the other 6 categories.

Marital status was dichotomized into currently married vs not currently married. Employment status was dichotomized into those working full-time or part-time vs those not working. Educational levels were classified on a 7-point scale ranging from 1, 8 years or less, to 7, graduate or professional training. Hypertensive status, smoking status, and diabetic status represented dichotomized variables in which those with a documented history of hypertension, current smoking, or diabetes were coded affirmatively. Ejection fractions less than 40% were coded as abnormal. Serum cholesterol level, New York Heart Association classification, number of surgical grafts performed, and number of vessels occluded 50% or more were analyzed as continuous variables. Patients were assigned a comorbidity score ranging from 0 to 7, reflecting the number of disease categories for which they had sought treatment.

Univariate correlations were computed between the demographic and medical control variables and the outcome variables of interest to determine possible confounding (correlations between dichotomous and continuous variables reflect point-biserial coefficients; correlations between dichotomous variables reflect ϕ coefficients). Surgery- and CHD-related rehospitalization had 2 significant predictors: sex ($r = -0.14$; $P < .05$) and serum cholesterol level ($r = -0.14$; $P < .05$). Coronary artery disease–related rehospitalization had 3 significant predictors: serum cholesterol level ($r = -0.13$; $P < .05$), age ($r = -0.17$; $P < .01$), and educational level ($r = 0.13$; $P < .05$). The only control variable that was significantly related to rehospitalization caused by postsurgical sternal wound infection was diabetes ($r = 0.17$; $P < .01$). Serum cholesterol level was the only significant predictor of angina ($r = -0.14$; $P < .05$). The only control variable to predict all-cause rehospitalization was comorbidity ($r = 0.13$; $P < .05$).

STATISTICAL ANALYSES

To test whether optimism, self-esteem, depression, or neuroticism was associated with a higher incidence of rehospitalization, we conducted a series of analyses using logistic regression to predict each of the rehospitalization categories.[30] In the first series of analyses, each personality factor was individually entered as a predictor of rehospitalization. Personality factors identified as statistically significant in the first series of analyses were then subjected to the following additional analyses. In the second series, we entered all demographic and medical control variables that were significantly related to rehospitalization and then tested whether there was a significant association between rehospitalization and the personality variable in a second step. In the final series of analyses, we evaluated whether the effect of optimism was independent of the other personality factors. To do this, we entered appropriate control variables in the first step of the regression and then simultaneously entered all personality variables in a second step to determine which personality factors were uniquely related to the prediction of rehospitalization.

In describing the analyses, we report the raw regression coefficients (b) and their SEs because the personality factors are continuous in nature.[30] To provide an estimate of the effect size, we also report an odds ratio (OR) and a 95% confidence interval (CI) for each significant effect. The ORs were calculated to represent the difference in the odds of being rehospitalized for a person scoring at the 75th percentile relative to a person scoring at the 25th percentile of the personality factor in question (see Wright[31] for details about the computational procedures). $P \leq .05$ was considered statistically significant throughout.

To maximize power, primary analyses included all participants for whom data were available. Because of missing data, this created unequal total numbers from analysis to analysis. To evaluate the effect of using unequal total numbers across analyses, ancillary analyses were conducted using only those participants for whom complete data were available for all variables analyzed (n = 239). These analyses yielded a pattern of significance levels identical to the primary analyses reported.

to be rehospitalized after CABG surgery than should persons who are more pessimistic.

In addition to optimism, the present study evaluated the effects of self-esteem, depression, and neuroticism. These variables were included because they are correlated with individual differences in optimism,[15-17] and we wanted to determine the effects of optimism independent of these other factors. Moreover, self-esteem has

Table 1. Sample Characteristics and Comparisons Between Participants and Nonparticipants*

Characteristics	Participants	Nonparticipants	P
Demographics			
Age, mean ± SD, y	62.8 ± 10.4	65.9 ± 9.0	<.001
Men, %	69.9	63.5	.14
White, %	99.4	...	...
Married, %	80.3	...	...
Post–high school education, %	37.5	17.1	<.001
Reporting primary support person, %	92.9	96.6	.14
CHD risk factors			
Hypertensive, %	55.3	63.2	.21
Diabetic, %	24.6	27.6	.59
Smoking, %	24.3	17.2	.16
Serum cholesterol level, mean ± SD, mmol/L†	5.75 ± 1.29	5.42 ± 1.08	<.02
Severity of underlying disease			
Vessels occluded ≥50%, mean ± SD, No.	2.3 ± 0.8	2.6 ± 0.7	<.001
NYHAC, ±SD	3.1 ± 1.0	...	...
Ejection fraction <40, %	15.1	17.1	.66
Extensiveness of surgical procedure			
Grafts performed, mean ± SD, No.	2.4 ± 0.9	2.5 ± 0.9	.23
Cross-clamp time, mean ± SD, min	41.1 ± 15.9	...	...
Bypass time, mean ± SD, min	78.7 ± 28.2	...	...
Enrolled in cardiac rehabilitation, %	28.5	...	...

*Ellipses indicate variables for which data from nonparticipants were not available; CHD, coronary heart disease; and NYHAC, New York Heart Association classification.

†To convert cholesterol from millimoles per liter to milligrams per deciliter, divide millimoles per liter by 0.02586.

been linked to recovery after hospitalization for open heart surgery[18] and depression has been linked to recovery after MI.[19-21] Neuroticism has been associated with reports of angina and chest pain, although it may not be related to underlying coronary artery disease (CAD).[22,23]

RESULTS

SURGERY- AND CHD-RELATED REHOSPITALIZATION

Optimism was a significant predictor of surgery- and CHD-related rehospitalization (b = −.17 ± .05; $P < .01$; n = 263; OR = 0.50 for the comparison of a score at the 75th percentile relative to a score at the 25th percentile, 95% CI = 0.33-0.76) (**Table 2**). As expected, optimistic persons were less likely to require rehospitalization for surgery- and CHD-related causes than were persons who were less optimistic in outlook (**Figure**). Significant effects also emerged for depression and neuroticism. Persons who were more depressed were more likely to be rehospitalized than persons who were less depressed (b = .08 ± .04; $P < .05$; n = 255; OR = 1.80, 95% CI = 1.07-3.05). Persons who were neurotic were also more likely to be rehospitalized compared with those who were less neurotic (b = .22 ± .09; $P < .05$; n = 257; OR = 2.38, 95% CI = 1.20-4.74). Adjusting for sex and serum cholesterol level had little effect on the magnitude of the associations with optimism (b = −.16 ± .06; $P < .01$; n = 255; OR = 0.53, 95% CI = 0.33-0.83) or neuroticism (b = .21 ± .10; $P < .05$; n = 249; OR = 2.28, 95% CI = 1.05-4.95). Adjusting for sex and serum cholesterol level caused the association between depression and surgery- and CHD-related rehospitalization to become marginal (b = .08 ± .05; $P < .10$; n = 247; OR = 1.78, 95% CI = 0.96-3.30).

To determine the independent effects of optimism, all of the personality variables were entered into a model simultaneously after first adjusting for sex and serum cholesterol level. Optimism emerged from this analysis as the only significant predictor of surgery- and CHD-related rehospitalization (b = −.14 ± .07; $P < .05$; n = 240; OR = 0.58, 95% CI = 0.34-0.99). Thus, when the effects of optimism were taken into account, the independent contributions of depression and neuroticism became nonsignificant.

SUBSIDIARY ANALYSES

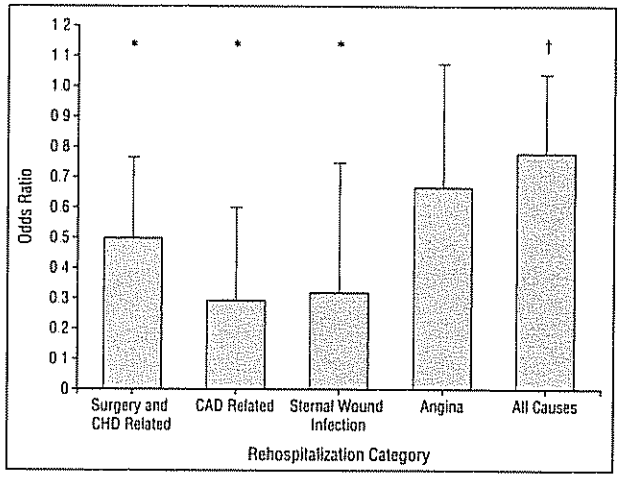
The primary category of surgery- and CHD-related rehospitalization was subdivided into 3 nonmutually exclusive subcategories to determine the specific rehospitalization outcomes that optimism affected. Optimistic persons were significantly less likely than pessimistic persons to be rehospitalized for reasons related specifically to underlying CAD (b = −.31 ± .09; $P < .001$; n = 262; OR = 0.29, 95% CI = 0.14-0.60) (Table 2 and the Figure). The association between optimism and CAD-related rehospitalization remained significant when adjusted for age, educational level, and serum cholesterol level (b = −.37 ± .13; $P < .01$; n = 254; OR = 0.23, 95% CI = 0.08-0.65).

Self-esteem and neuroticism were also significantly associated with CAD-related rehospitalization (Table 2). Persons higher in self-esteem were less likely to be rehospitalized than persons lower in self-esteem (b = −.37 ± .15; $P < .05$; n = 261; OR = 0.33, 95% CI = 0.13-0.81), whereas persons higher in neuroticism were more

Table 2. Univariate and Adjusted Associations Between Psychological Characteristics and Rehospitalization Categories

		Unadjusted		Adjusted		
Reason for Hospitalization	Predictor	b*	SE	Covariate(s)	b	SE
Surgery and coronary heart disease related	Optimism	−.17†	.05	Sex and cholesterol level	−.16†	.06
	Self-esteem	−.16‡	.09		−.13	.10
	Depression	.08§	.04		.08‡	.05
	Neuroticism	.22§	.09		.21§	.10
Coronary artery disease related	Optimism	.31†	.09	Age, education, and cholesterol level	−.37†	.13
	Self-esteem	−.37§	.15		−.46§	.20
	Depression	.07	.06		.05	.09
	Neuroticism	.41†	.15		.41§	.19
Sternal wound infection	Optimism	−.29†	.11	Diabetes	−.27§	.12
	Self-esteem	−.16	.20		−.17	.22
	Depression	.24†	.09		.27†	.10
	Neuroticism	.31	.19		.30	.20
Angina	Optimism	−.10	.06	Cholesterol level	−.08	.07
	Self-esteem	−.13	.11		−.11	.11
	Depression	.04	.05		.05	.05
	Neuroticism	.17‡	.10		.14	.11
All causes	Optimism	−.06‡	.03	Comorbidity	−.07‡	.04
	Self-esteem	−.00	.06		−.01	.06
	Depression	.02	.03		.02	.03
	Neuroticism	−.00	.06		.00	.06

**b indicates Raw Regression coefficients*
†P< *.01*
‡P< *.10*
§P< *.05*



Odds ratios for 75th vs 25th percentile scores on optimism according to rehospitalization category. Asterisk indicates P< *.01; dagger,* P< *.10; CHD, coronary heart disease, and CAD, coronary artery disease. Error bars represent 95% confidence intervals*

likely to be rehospitalized than persons lower in neuroticism (b = .41 ± .15; *P*< .01; n = 256; OR = 5.08, 95% CI = 1.51-17.10). The association between self-esteem and rehospitalization remained significant when adjusted for age, educational level, and serum cholesterol level (b = −.46 ± .20; *P*< .05; n = 253; OR = 0.25, 95% CI = 0.08-0.82), as did the association between neuroticism and CAD-related hospitalization (b = .41 ± .19; *P*< .05; n = 248; OR = 5.10, 95% CI = 1.19-21.93).

To determine the independent effects of optimism, self-esteem, and neuroticism on CAD-related rehospitalization, all of the predictors were entered into a model simultaneously, after first adjusting for age, educational level, and serum cholesterol level. Optimism emerged from this analysis as the only significant predictor of CAD-related rehospitalization (b = −.28 ± .14; *P*< .05; n = 239; OR = 0.32, 95% CI = 0.12-0.96).

Optimistic persons were also significantly less likely than those more pessimistic in orientation to be rehospitalized for postoperative sternal wound infection (b = −.29 ± .11; *P*< .01; n = 262; OR = 0.32, 95% CI = 0.13-0.75) (Table 2 and the Figure). This association remained significant after adjusting for diabetic status (b = −.27 ± .12; *P*< .05; n = 262; OR = 0.33, 95% CI = 0.14-0.83).

In addition to optimism, rehospitalization because of postoperative sternal wound infection was predicted by depression (Table 2). Depressed persons were more likely to be rehospitalized than were persons who were less depressed (b = .24 ± .09; *P*< .01; n = 254; OR = 5.38, 95% CI = 1.67-17.37). This effect remained significant when adjusted for diabetic status (b = .27 ± .10; *P*< .01; n = 254; OR = 6.63, 95% CI = 1.65-26.65).

To determine the independent contribution of optimism and depression to the prediction of infection-related rehospitalization, both predictor variables were entered into a model simultaneously, after first adjusting for diabetic status. Depression emerged from this analysis as the only independent predictor of infection-related rehospitalization (b = .24 ± .11; *P*< .05; n = 240; OR = 5.43, 95% CI = 1.18-24.95).

There were no significant predictors of angina-related rehospitalization, although a marginally significant association did emerge between rehospitalization and neuroticism (b = .17 ± .10; *P* = .10; n = 257; OR = 1.95, 95% CI = 0.88-4.29). Persons higher in neuroticism tended to be rehospitalized for angina more frequently than those lower in neuroticism. This effect became nonsignificant

when adjusted for serum cholesterol level. Moreover, no significant or marginally significant associations emerged when all the predictor variables were simultaneously entered into a regression model.

ALL-CAUSE (TOTAL) REHOSPITALIZATION

A total of 79 patients were hospitalized at least once for some reason within 6 months of initial surgery. Trait optimism was marginally related to all-cause rehospitalization ($b = -.06 \pm .03$; $P = .08$; $n = 262$; OR = 0.78, 95% CI = 0.59-1.03) (Table 2 and the Figure). Persons who were more optimistic in outlook tended to be rehospitalized less frequently than those who were less optimistic. The effect of optimism remained marginal when a control for comorbidity was introduced ($b = -.07 \pm .04$; $P = .07$; $n = 262$; OR = 0.77, 95% CI = 0.57-1.05). When all the personality variables and comorbidity were entered simultaneously, the effect of optimism became slightly stronger ($b = -.09 \pm .04$; $P < .05$; $n = 247$; OR = 0.70, 95% CI = 0.50-0.99), suggesting that the other individual difference characteristics were exerting a suppressor effect on optimism.[32] None of the other personality variables were associated with total rehospitalization.

COMMENT

The primary purpose of this study was to determine whether a generalized, positive outlook on life affects rehospitalization after CABG surgery. Optimistic persons were significantly less likely to be rehospitalized for a broad range of aggregated problems related to their initial surgery and underlying CHD disease than were persons who were less optimistic. Subsidiary analyses showed that optimistic persons were specifically less likely to be rehospitalized for complications arising from postoperative sternal wound infection and underlying CAD. Optimism was also marginally related to total (all-cause) rehospitalization. These findings add to the accumulating research literature[9,11,14,33] suggesting that optimism has important implications for physical well-being and recovery from illness.

A strength of this study is that several different personality variables were included in the same analysis. Previous research has tended to examine only 1 or 2 variables at a time, making it impossible to evaluate the unique contribution of each. Performing simultaneous analyses made it possible to determine whether the personality variables studied were having multiple independent effects on rehospitalization, or whether 1 or 2 variables were particularly important, subsuming the effects of the others.

In this regard, it is noteworthy that in univariate analyses, depression and neuroticism predicted surgery- and CHD-related rehospitalization, in addition to individual differences in optimism and pessimism. In a similar fashion, self-esteem and neuroticism joined optimism as predictors of CAD-related rehospitalization. When all these variables were evaluated simultaneously, however, only dispositional optimism emerged as a unique predictor from these 2 sets of analyses. This suggests that the effects of optimism subsume the effects of self-esteem, neuroticism, and depression in predicting surgery- and CHD-related and CAD-related rehospitalization. It is also worth mentioning that optimism also emerged as the only independent predictor of all-cause rehospitalization.

The results for rehospitalization caused by postoperative sternal wound infection were somewhat different. Both depression and optimism predicted this outcome. When the effects of these variables were analyzed together, it was depression and not optimism that emerged as a unique predictor. The fact that depression predicts certain types of rehospitalization after CABG surgery adds an important dimension to previous research[19-21] documenting the importance of depression in predicting recovery after MI. More generally, the fact that optimism and depression combined to predict different categories of rehospitalization also serves to underscore the fact that optimism, pessimism, and depression seem to be distinct factors with distinguishable effects.[9,34]

The precise mechanisms underlying the effects of optimism and depression remain unclear. Perhaps pessimistic or depressed persons become detached or disengaged from the recovery process, causing them not to take preventive action when such action might otherwise be beneficial.[35,36] Alternatively, perhaps pessimism and depression act directly to modulate neuroendocrine, cardiovascular, or immune responses.[37-39]

Regardless of the specific mechanism or mechanisms involved, the present findings have important clinical implications. Controlling for other factors, pessimistic persons are significantly more likely than optimistic persons to be rehospitalized after CABG surgery, for surgery- and CHD-related causes, for CAD-related causes, and for all causes combined. In addition, depressed persons are significantly more likely than nondepressed persons to be rehospitalized for sternal wound infection. Careful and early monitoring of patients possessing a high-risk personality profile may help countermand the effects of pessimism and depression. Such monitoring may promote the early detection of difficulties after an initial hospitalization. If so, corrective action might be taken before the problem progresses to a point at which rehospitalization is necessary. In this regard, the present findings also suggest that fostering positive expectations among patients may help to make them more resilient to any potential setbacks they encounter during the recovery process.

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