ORIGINAL ARTICLES

The Relation Between Health Status Changes and Patient Satisfaction in Older Hospitalized Medical Patients

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OBJECTIVE: To examine the relation between two patient outcome measures that can be used to assess the quality of hospital care: changes in health status between admission and discharge, and patient satisfaction.

DESIGN: Prospective cohort study.

SETTING AND PATIENTS: Subjects were 445 older medical patients (aged ≥ 70 years) hospitalized on the medical service of a teaching hospital.

MEASUREMENTS AND MAIN RESULTS: We interviewed patients at admission and discharge to obtain two measures of health status: global health and independence in five activities of daily living (ADLs). At discharge, we also administered a 5-item patient satisfaction questionnaire. We assessed the relation between changes in health status and patient satisfaction in two sets of analyses, that controlled for either admission or discharge health status. When controlling for admission health status, changes in health status between admission and discharge were positively associated with patient satisfaction (p values ranging from .01 to .08). However, when controlling for discharge health status, changes in health status were no longer associated with patient satisfaction. For example, among patients independent in ADLs at discharge, mean satisfaction scores were similar regardless of whether patients were dependent at admission (i.e., had improved) or independent at admission (i.e., remained stable) (79.6 vs 81.2, $p = .46$). Among patients dependent in ADLs at discharge, mean satisfaction scores were similar regardless of whether they were dependent at admission (i.e., remained stable) or independent at admission (i.e., had worsened) (74.0 vs 75.7, $p =$

.63). These findings were similar using the measure of global health and in multivariate analyses.

CONCLUSIONS: Patients with similar discharge health status have similar satisfaction regardless of whether that discharge health status represents stable health, improvement, or a decline in health status. The previously described positive association between patient satisfaction and health status more likely represents a tendency of healthier patients to report greater satisfaction with health care, rather than a tendency of patients who improve following an interaction with the health system to report greater satisfaction. This suggests that changes in health status and patient satisfaction are measuring different domains of hospital outcomes and quality. Comprehensive efforts to measure the outcomes and quality of hospital care will need to consider both patient satisfaction and changes in health status during hospitalization.

KEY WORDS: quality of healthcare; patient satisfaction; health status; outcome assessment; hospitals.

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Patient satisfaction and health outcomes have been suggested as two of three major domains of hospital quality (the third being appropriateness).¹ Although both patient satisfaction and health outcomes are considered critical markers of the quality of care patients receive in hospitals¹⁻⁹, little is known about the relation between these two outcomes. It may seem clinically sensible that patients who improve in health would be more satisfied and patients who decline in health less satisfied with their care than patients whose health status remains stable; however, there is little empiric evidence to support this belief.

Previous research, which has consisted of cross-sectional studies, mostly in community settings, has demonstrated that patients with better health status are more satisfied with their health care.¹⁰⁻¹⁴ These studies fail to distinguish between two possible reasons patients with better health status may report greater satisfaction with their care. First, there may be an independent relation be-

tween health status changes that occur during a health system encounter and the patient's satisfaction with the health system. Alternatively, there may be no independent relation between health status change and satisfaction. A person's current health status may simply be one characteristic that influences satisfaction ratings, regardless of whether that health status represents an improvement or decline in health. Differentiating between these two possibilities requires a longitudinal study that measures the relation between changes in health during a health system encounter and satisfaction with the encounter. Health status change is more likely to be related to quality of care than health status at discharge is, because health status change is more likely to be related to the process of care.

Therefore, we studied the relation between health status changes from admission to discharge and patients' satisfaction with their hospitalization at discharge in older patients with acute medical illnesses. This longitudinal study design allowed us to test several hypotheses (Fig. 1): (1) patient satisfaction at discharge is associated with health status at admission; (2) patient satisfaction at discharge is associated with health status at discharge; (3) patient satisfaction at discharge is associated with changes in health status between admission and discharge. In testing the third hypothesis, we measured the relation between changes in health status and patient satisfaction in two sets of analyses that controlled for either admission or discharge health status. Although controlling for admission (i.e., baseline) characteristics is typically used in assessing outcomes of hospitalization, it is not possible from this perspective to determine whether any association between health status change and patient satisfaction reflects an independent association with health status changes per se, or only represents a tendency of patients with better health status at discharge to report higher satisfaction at discharge. Therefore, we controlled

for discharge health status in our second set of analyses. If health status changes during hospitalization are directly associated with patient satisfaction, independent of a tendency for healthier patients to report greater satisfaction, one would expect, among patients with similar discharge health status, that satisfaction would be greater among patients in whom that status represents an improvement in health, and less among patients in whom it represents a decline in health.

METHODS

Patients were assembled in two serial, prospective studies of functional outcomes in older hospitalized patients on the general medical service of University Hospitals of Cleveland,¹⁵ between March 1990 and March 1992. The 592 patients who completed the admission interviews and survived to discharge during these two study periods were eligible for the patient satisfaction study. Patient satisfaction interviews were completed on 445 (75%) of these subjects at hospital discharge.

We surveyed patients at admission and at discharge. The admission interview asked patients about several measures of their health status on the day of admission including global health and independence in five activities of daily living (ADLs). The global health measure asked subjects, "How do you rate your health today?" Response categories were excellent, good, fair, and poor. The five ADLs, based on the scale of Katz et al., were dressing, bathing, toileting, transfer, and eating.¹⁶ For each ADL, patients were asked whether or not they could perform the activity without the assistance of another person. Patients performing each ADL without the assistance of another person were classified as independent, while patients needing assistance in one or more activities were classified as dependent. Patients were asked about their global health

FIGURE 1. Hypotheses tested in this study. This study tests the hypotheses that patient satisfaction at discharge is related to health status at admission (H1), health status at discharge (H2), and the change in health status between admission and discharge (H3). Two sets of analyses tested the relation between change in health status and patient satisfaction, one controlling for health status at admission (C1), and the other controlling for health status at discharge (C2).

and independence in ADLs on the day of discharge. Data collected from chart review included components of the APACHE II score¹⁷ and the Charlson Comorbidity Index.¹⁸

At discharge, patients were asked five questions about their satisfaction with the hospitalization using questions adapted from the scale of Ware and Hays.¹⁹ Patients rated the technical care provided by doctors, the attentiveness and kindness of doctors, the technical care provided by nurses, the attentiveness and kindness of nurses, and their overall satisfaction on a 5-point scale. The scale had a high level of internal consistency (Cronbach's $\alpha = 0.86$). Patients' total satisfaction scores were determined by summing the responses to the five items, and transforming the scores to a scale of 0 to 100. The mean total satisfaction score was 78.5 ± 18.2 . Analyses that considered only the response to the overall satisfaction item were similar to the presented analyses and are not reported separately.

Analysis

We did two sets of stratified analyses to assess the relation between the change in each health status measure from admission to discharge and patient satisfaction. In the first set of analyses, we determined whether changes in health status were associated with patient satisfaction after controlling for admission health status. These analyses address whether patients who start their admission with similar health will differ in their satisfaction with hospitalization depending on their discharge health status. We did analyses both for changes in global health and for changes in ADL function. For global health, we stratified patients according to whether they were in excellent or good health versus fair or poor health at admission. Within each stratum, we compared patient satisfaction according to global health at discharge, also classified as excellent or good versus fair or poor, using Student's *t* tests. For ADL function, we stratified patients according to whether they were independent in all five ADLs at admission, or dependent in one or more ADLs. Within each stratum, we compared patient satisfaction scores according to ADL function at discharge (classified as independent or dependent).

On average, patients who improve in health will have better discharge health and patients who decline in health will have worse discharge health than patients whose health remains stable. Therefore, it is not possible to determine from this first set of analyses whether any association between health status change and patient satisfaction reflects an association with health status change *per se*, or only represents a tendency of patients with better health status at discharge to report greater satisfaction at discharge. Therefore, in the second set of analyses, we determined whether patient satisfaction was associated with changes in health status after controlling for discharge health status. This set of analyses addressed the question

of whether patients with similar health status at discharge varied in patient satisfaction according to whether their discharge health status represented stable health status versus a decline or improvement in health status. We analyzed both for changes in global health and for changes in ADL function. For global health, we stratified patients according to whether they were in excellent or good health versus fair or poor health on discharge. Within each stratum, we compared patient satisfaction according to global health at admission, also classified as excellent or good versus fair or poor. For ADL function, we stratified patients according to whether they were independent in all five ADLs at discharge, or dependent in one or more ADLs. Within each stratum, we compared patient satisfaction scores according to ADL function at admission, classified as independent or dependent.

We used linear regression to determine whether there was an independent relation between change in health from admission to discharge and patient satisfaction. We again did two sets of analyses, which paralleled the bivariate analyses. In the first, we controlled for health status at admission. We developed two models, one in which change in global health (entered as the unit change in global health) was the independent variable of interest, the other in which change in ADL function (entered as the difference in number of independent ADLs between admission and discharge) was the independent variable of interest. Each model controlled for age, gender, race, APACHE II score, Charlson score, and living situation, as well as the admission value of the health outcome. The second set of models was similar, except we controlled for the discharge health status measure instead of the admission health status measure. Inspection of the residual plots for the linear regression models showed that assumptions of normality were met.

RESULTS

The mean age of the 445 patients was 79.6 years, 68% were women, and 38% were African American (Table 1). At admission, more than two thirds reported they were in fair or poor health, and nearly half reported they could not perform at least one of five ADLs without the assistance of another person. At discharge, about half of the patients reported they were in fair or poor global health, and approximately one third reported they could not perform at least one of five ADLs independently.

Relation Between Measures of Health Status and Patient Satisfaction

Better health status at admission, as indicated by patients' reports of global health and ability to perform five ADLs independently, was associated with greater satisfaction at discharge (Table 2). Better health status at discharge was also associated with greater satisfaction. Differences in satisfaction between patients with better and

worse health status were greater at discharge than at admission.

Relation Between Changes in Health Status and Patient Satisfaction

In groups of patients classified according to their health status at admission, changes in health status were associated with patient satisfaction at discharge (Table 3). Among patients reporting excellent or good global health at admission, those who remained in excellent or good global health at discharge reported greater satisfaction than those whose global health worsened to fair or poor. Among patients reporting fair or poor global health at admission, those who improved to excellent or good global health reported greater satisfaction than those whose global health remained fair or poor. Results were similar when health status was measured by the number of ADLs performed independently (Table 3).

Our next set of analyses stratified patients according to health status at discharge, in order to determine whether the association between health status change and patient satisfaction was explained by a direct association with health status change per se, or simply reflected a tendency of patients with better health status to report greater satisfaction. When patients were stratified according to their health status at discharge (Table 3), changes in health status were not associated with patient satisfaction. For example, among patients with excellent or good global health at discharge, satisfaction did not differ according to whether patients reached this state by improving from admission, or whether this health state was unchanged from admission. Similarly, among patients with fair or poor global health at discharge, satisfaction was similar regardless of whether this health state was similar to health at admission, or represented a decline in health from admission. Results were similar when health status was measured by the number of ADLs performed independently.

In a multivariate analysis controlling for potentially confounding factors, change in global health between admission and discharge was associated with patient satis-

Table 1. Characteristics of 445 Patients at Admission and Discharge from the Hospital

Variable	
Age, mean years $\pm$ SD	79.6 $\pm$ 6.5
Gender, n (%)	
Male	141 (32)
Female	304 (68)
Race, n (%)	
White	276 (62)
African American	169 (38)
Marital status, n (%)	
Married	179 (40)
Not married	266 (60)
Living situation, n (%)	
Lives alone	181 (41)
Lives with another person	259 (59)
APACHE II score, mean $\pm$ SD	12.3 $\pm$ 4.1
Charlson comorbidity score, mean $\pm$ SD	2.1 $\pm$ 2.1
ADL function at admission, n (%)	
Independent in all 5	232 (52)
Dependent in 1 or more	213 (48)
Global health at admission, n (%)	
Excellent	16 (4)
Good	116 (28)
Fair	171 (41)
Poor	117 (28)
ADL function at discharge, n (%)	
Independent in all 5	291 (65)
Dependent in 1 or more	154 (35)
Global health at discharge, n (%)	
Excellent	30 (8)
Good	158 (40)
Fair	167 (42)
Poor	42 (11)

faction when adjusting for global health at admission (Table 4). Similarly, change in the number of ADLs performed independently from admission to discharge was associated with patient satisfaction when adjusting for the number of ADLs performed independently at admission. However, when controlling for global health at discharge, change in

Table 2. Relation Between Health Measures at Admission and Discharge and Patient Satisfaction

Measure	Health Status	Mean Satisfaction Score	p Value
Admission			
Global health	Excellent/good	80.8	.04
	Fair/poor	76.8	
ADL function	Independent in all ADLs	80.3	.04
	Dependent in one or more ADLs	76.7	
Discharge			
Global health	Excellent/good	81.4	<.001
	Fair/poor	74.5	
ADL function	Independent in all ADLs	80.6	<.001
	Dependent in one or more ADLs	74.5	

Table 3. Relation Between Changes in Health Status Between Admission and Discharge and Patient Satisfaction

			Mean Satisfaction Score	p Value
Health Measure	Strata	Change in Health Status		
Stratified According to Health Status at Admission				
Global health	Subjects with excellent/good global health status at admission	Remained excellent/good at discharge	82.3	.08
		Declined to fair/poor at discharge	75.9	
ADL function	Subjects with fair/poor global health status at admission	Improved to excellent/good at discharge	80.2	.01
		Remained fair/poor at discharge	74.0	
	Subjects independent in ADLs at admission	Remained independent at discharge	81.2	.08
		Declined to dependent at discharge	75.7	
	Subjects dependent in ADLs at admission	Improved to independent at discharge	79.6	.03
		Remained dependent at discharge	74.0	
Stratified According to Health Status at Discharge				
Global health	Subjects with excellent/good global health status at discharge	Improved from fair/poor at admission	80.2	.40
		Unchanged from excellent/good at admission	82.3	
ADL function	Subjects with fair/poor global health status at discharge	Unchanged from fair/poor at admission	74.0	.63
		Declined from excellent/good at admission	75.9	
	Subjects independent in ADLs at discharge	Improved from dependent at admission	79.6	.46
		Unchanged from independent at admission	81.2	
	Subjects dependent in ADLs at discharge	Unchanged from dependent at admission	74.0	.63
		Declined from independent at admission	75.7	

global health was no longer associated with patient satisfaction. Similarly, when controlling for the number of independent ADLs at discharge, change in ADL function was no longer associated with patient satisfaction.

Table 4. Multivariate Models of the Relation Between Changes in Health Status During Hospitalization and Patient Satisfaction

Health Status Measure	β Coefficient (95% Confidence Interval)	
	Models Controlling for Health Status at Admission*	Models Controlling for Health Status at Discharge†
Change in global health from admission to discharge‡	3.36 (0.76, 5.96)	-1.52 (-3.89, 0.87)
Change in number of ADLs performed independently from admission to discharge§	2.14 (0.64, 3.64)	0.38 (-0.84, 1.60)

*Models control for age, gender, race, living alone, marital status, APACHE II score, Charlson score, and health status at admission. In each linear regression model, patient satisfaction is the dependent variable.

†Models control for age, gender, race, living alone, marital status, APACHE II score, Charlson score, and health status at discharge. In each linear regression model, patient satisfaction is the dependent variable.

‡Where change = (global health status at discharge) - (global health status at admission), excellent = 4, very good = 3, fair = 2, and poor = 1.

§Where change = (number of independent ADLs at discharge) - (number of independent ADLs at admission).

DISCUSSION

Health status changes and patient satisfaction are two different measures of hospital outcome, as well as potential measures of quality of hospital care for older patients.¹⁻⁹ We measured the relation between health status changes and patient satisfaction from two different perspectives. First, we controlled for admission health status in both stratified and multivariate analyses. These analyses demonstrated that among patients with similar admission health status, those who improved in health status had higher satisfaction and those who declined in health status had lower satisfaction than those whose health status remained stable.

In a second set of analyses, we measured the relation between patient satisfaction and health status changes controlling for health status at discharge. These analyses demonstrated that when controlling for discharge health status, change in health status was no longer independently associated with patient satisfaction. Patients with similar discharge health status had similar satisfaction regardless of whether the discharge health status represented stable health, an improvement, or a decline in health from admission.

Taken together, these findings suggest health status changes during hospitalization are associated with patient satisfaction only to the extent they affect discharge health status. Health status at the time one is asked about patient satisfaction is associated with patient satisfaction responses. However, change in health status during hospitalization is not an independent determinant of patient satisfaction after controlling for discharge health status. Although patients who improve in health during

hospitalization are more satisfied with their care, this relation is explained by the tendency of healthier patients to report greater satisfaction with health care, rather than an effect of the change in health status per se. Although hospitals that improve the health of their patients will on average have more satisfied patients than hospitals that make their patients' health worse (because health changes during hospitalization are a component of discharge health), hospitals could also achieve higher satisfaction ratings by admitting healthier patients. For example, our data suggest that a hospital that admits patients in excellent health and discharges patients in average health will have satisfaction ratings similar to those of a hospital that admits patients in poor health and discharges patients in average health.

Our results extend previous work demonstrating a positive association between health status and patient satisfaction at the time patient satisfaction is measured,¹⁰⁻¹⁴ and they suggest that this association is not explained by patients being more satisfied with care that results in improved outcomes. Rather, health status seems to be a patient characteristic that influences reports of satisfaction.

Previous research has demonstrated a cross-sectional relation between patient satisfaction and health status; however, few investigations have assessed the relation between changes in health during hospitalization and patient satisfaction. A few studies have shown that patients reporting their health as improved during their hospitalization are more satisfied than patients who report their health as unchanged or worse.²⁰ However, these results may only reflect the cross-sectional relation between health status at discharge and patient satisfaction because, on average, patients with improved health will have better health at discharge than patients with unchanged or worsened health. As far as we are aware, this is the first study to assess whether changes in health measured both at admission and at discharge are associated with patient satisfaction.

Our findings suggest that changes in health status during hospitalization and patient satisfaction are measuring different domains of hospital quality. Most likely, the processes affecting health status changes and patient satisfaction differ. For example, others have shown that factors such as the quality of doctor-patient communication, interpersonal interactions between patient and hospital staff, and waiting times are associated with patient satisfaction.²¹⁻²⁵ Although these factors may influence long-term health outcomes, it is unlikely they have much direct influence on health outcomes over the short course of a hospitalization. However, all of these factors are important to delivering care that is responsive to the needs of the individual patient. Their importance does not depend on whether or not they improve short-term health outcomes.

Some methodologic issues should be considered in interpreting our findings. First, it is possible that different associations between satisfaction and health status changes would have been observed if we had used different instruments to measure patient satisfaction or health

status. Also, our patient satisfaction measure has not been extensively validated in inpatients, though our findings were similar using a global measure of patient satisfaction. Finally, this study was limited to older general medical patients in a single center.

In conclusion, in this group of older hospitalized patients, there was no association between patient satisfaction at discharge and health status changes between admission and discharge, after accounting for the cross-sectional relation between patient satisfaction and health status at discharge. This suggests that health status changes and patient satisfaction measure different domains of hospital quality. Comprehensive efforts to fully measure the quality and outcomes of hospital care should consider both patient satisfaction and health status changes.

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