

Hospital Structure and Consumer Satisfaction

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This study examines the relationship between hospital structural characteristics and patient satisfaction with hospital care. Teaching hospitals and private hospitals were expected to receive higher ratings of patient satisfaction than were nonteaching and government-controlled hospitals, because they generally are reputed to be technologically superior. Results show that, in general, most patients are satisfied with their hospital stays, but they are clearly more dissatisfied with their stays in teaching hospitals. Although a number of other correlates of patient satisfaction with the hospital stay are identified, no measure succeeds in reducing to insignificance the strong relationship between teaching status and dissatisfaction. Some suggestions are made as to why teaching hospitals receive relatively poor evaluations from their patients.

In recent years consumer satisfaction has become increasingly important in the sociology and evaluation of medical care [1-14]. It has nonetheless been generally absent from consideration in the growing literature on the effects of hospital structure and process. Consumer satisfaction has been suggested as a legitimate measure of quality of care [15,16], yet research on the quality of care delivered by hospitals has concentrated almost exclusively on measures of outcome judged by professional or medical criteria [17-21]. Studies of patient satisfaction with care in general, short-term hospitals have been limited to surveys in single institutions, and therefore

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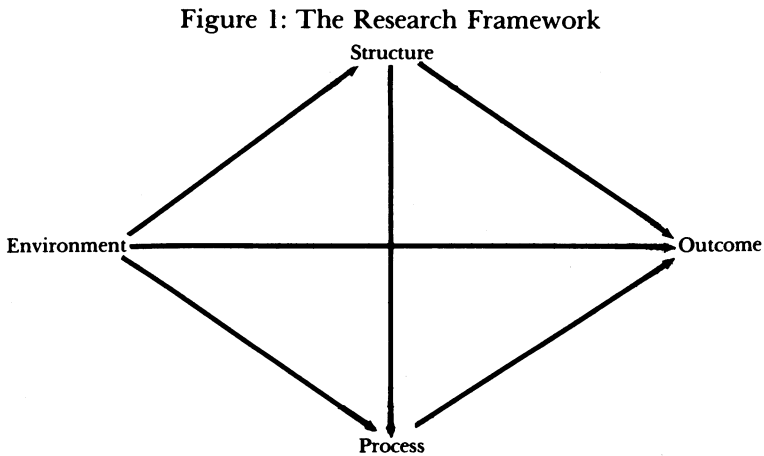
do not provide sufficiently generalizable data for relating hospital structural features to this evaluative measure [22-24].

Several years ago, Neuhauser and Andersen [25] presented a general framework for examining the relationships between four types of variables in the study of hospitals (see Fig. 1). Using this framework as a guide, this article examines the effects of hospital structural features on patient satisfaction with hospital care. The results suggest that structures that may be judged superior by a conventional quality-of-care measure may be less acceptable by another standard, patients' expressed satisfaction.

FRAMEWORK OF THE STUDY

The framework in Figure 1 was developed to review studies using hospitals as the unit of analysis. Although the relevant variables change slightly, this framework is equally applicable to the present study, drawn from a patient survey.

Environment includes measures that describe the location of the hospital or of the patients it serves. When measured in terms of region of the country, these are usually the same. When measured in terms of urban or rural, they are often but not always the same. In addition, the environment of the hospital is measured by demographic and social-structural characteristics of patients and initial health levels of patients. These are



From Duncan Neuhauser and Ronald Andersen, "Structural Comparative Studies of Hospitals," in Basil S. Georgopoulos (ed.), *Organization Research on Health Institutions*. Ann Arbor: Institute for Social Research, University of Michigan, 1972. Reprinted with the permission of the publisher.

immutable attributes of the situation as far as the hospital is concerned, at least in the short term; for the most part they cannot easily be changed by the patient. They are extrinsic variables for the health services system as a whole. Because the data for this study are based on a survey of patients, the hospital environment is measured principally through characteristics of the patients. *Structure* of the hospital includes the following: whether the hospital is operated by the government, controlled by a nonprofit but private group, or operated for profit; whether the hospital is a teaching institution; size of the hospital; whether the hospital is short- or long-term; and whether it is a general or specialized institution.

Using the hospital as a unit of analysis, *process* measures include the average length of stay, occupancy rate, intensity of care, growth, employee turnover, and similar characteristics. In social surveys, average length of stay has its counterpart in the number of days the patient was in the hospital. Other process characteristics are not easily obtained when the patient is the respondent. Process measures more relevant to the patient's experience would be, for instance, the number of physicians the patient saw in treatment and whether the patient had an operation while in the hospital. For either hospital- or patient-based studies, *outcomes* are measures of quality of care, efficiency, and satisfaction.

For the most part the environment sets certain constraints within which the hospital operates. By emphasizing certain programs or by relocating, hospitals can determine, to a certain extent, their patient mix; beyond these factors a hospital's ability to determine the mix is limited. Structural characteristics shape the processes within the hospital [26]; such characteristics as whether the hospital is a teaching institution, its size, and whether it is private or public determine the ways in which care is administered and the patterns of interprofessional and professional-patient interaction. The environment also influences these processes directly, since professionals and patients available to the hospital are part of its environment. Finally, all of these factors—environment, structure, and processes—influence the outcomes, such as the cost of care, the patient's recovery, and the patient's evaluation.

QUESTIONS ADDRESSED BY THE STUDY

How do hospital structural features affect patient satisfaction? It is generally believed, with some empirical support, that quality of care, measured by medical criteria, is higher for large hospitals and teaching hospitals than for small and nonteaching hospitals [25,27–29]. Yet it is known that patients with a choice prefer not to be used for teaching purposes [29]. Case studies demonstrate that patients admitted for care in

wards of teaching hospitals have more complaints about their interaction with professionals than do patients who are admitted and cared for by private physicians [30]. Because higher quality care is associated with teaching hospitals, and because patients are referred to teaching hospitals for care unavailable in nonteaching institutions, it was assumed in the present study that the data would show patients more satisfied with the quality of care in teaching than in nonteaching hospitals. It was also assumed that patients would be more satisfied with the quality of care in voluntary and religious hospitals than in government-operated hospitals, because the former are reputed to provide higher quality care. Urban, public hospitals have in recent years been facing serious economic problems, which should affect the quality of care [31]. In addition, government-operated hospitals are less likely to be accredited [32].

Through what processes do structural features of hospitals affect patient satisfaction? Because teaching hospitals (and probably government-operated hospitals) treat the more seriously ill patients [33], stays tend to be longer. If patients rate highly the quality of care at such hospitals, it could be because they are compensating for the time, expenditure, and emotions involved [34]. Similarly, the number of admissions a person had for the same condition during the last year and the trauma of being admitted to a hospital for a serious operation might lead to a higher evaluation. The number of physicians seen during the course of treatment, which would undoubtedly be greater in a teaching hospital (and probably in a government-operated hospital), should have a positive effect on patient satisfaction: the greater the number of doctors, the more attention the patient receives, and perhaps also the more kinds of expertise. On the other hand, the greater the number of doctors, the less the continuity of care, which is related to dissatisfaction with care [35]. It was clear that these variables—length of time in hospital, number of admissions for the same condition, and number of doctors seen—would have to be controlled in this analysis, for they could cause a spurious relationship between patient satisfaction and hospital structure, or they could possibly camouflage a true effect.

To what extent are structural effects on patient satisfaction the result of environmental characteristics? It is possible that relationships discovered between certain kinds of hospital structure and satisfaction may be explained by the types of patients hospitals serve. Blacks, the poor, and the seriously ill generally are more critical of medical care than are whites, the affluent, and the less seriously ill; they are also believed to comprise a larger than average proportion of the patients in teaching hospitals and government-operated hospitals [14,36, 37]. If our assumption that teaching and private hospitals receive better evaluations than nonteaching and public hospitals should prove false, it could be because of differences in

the social and health conditions of the patients rather than in the care received. Hence these variables had to be controlled. Region was also a variable that had to be controlled. People in the South are generally less satisfied with medical care than people in the North and West [14]. Admissions to teaching hospitals are disproportionately high in the North and low in the West and South [28]. On the other hand, government-operated hospitals constitute a much larger proportion of the hospitals in the South than in the other regions and a much lower proportion in the Northeast [39]. Other characteristics of the environment had to be controlled if they were related both to patient satisfaction and hospital structural features. Residence of patients (urban, rural, suburban) was one of these. It is related to certain measures of patient satisfaction [14] and also to ownership of hospitals (admissions to government-operated hospitals are much more common in rural areas [39]). Age, sex, and education of the patient and whether or not the patient has a regular source of care have consistently been correlated with patient satisfaction [3,14]. Insurance coverage is related to certain patient satisfaction measures [14] and is probably related to control of the hospital [36,37].

STUDY DESIGN

DATA BASE

The data for this study are from a national survey of access to medical care carried out in 1976 (see [14] for more detail on the study design), based on household interviews with an adult and a child (interviewed through a parent or other proxy) chosen at random from each family in the sample; the data are weighted to represent the national population. Questions focused on medical experiences during a year's recall period. In one portion of the interview the respondent was asked to describe the steps taken upon the occurrence of a new medical condition during the course of the year. This condition had to be one that caused the person to cut down on his or her usual activities three or more days in a row or one which caused the person significant pain or worry. The person was asked to identify all hospital stays and respond to a number of questions about the experience in the hospital as well as other care for the same condition. Out of the 7,787 persons in the total survey sample, 589 had been hospitalized during the year. The present analysis covers 83 percent of these people (N = 490). Those excluded from the analysis were hospitalized in nonaccredited or for-profit institutions; there were too few people in such institutions to analyze separately, and it was not clear

theoretically or empirically which other group they most nearly resembled. A few additional cases were not included because of missing information. At least 300 hospitals are represented in this sample.

MEASUREMENT OF THE DEPENDENT VARIABLE, PATIENT SATISFACTION

Table 1 gives the distribution of responses on a scale from "completely satisfied" to "not at all satisfied" for the eight items measuring patient satisfaction. The five items included in our analysis are indicated. Four of these five items (C, D, E, and H) had the highest loadings (between 0.64 and 0.87) on one factor in a preliminary factor analysis; they measure patients' overall evaluation of quality of care as well as their judgment of quality in terms of interaction with hospital personnel. (Earlier studies [3,9] indicated that patients' evaluations of quality tend to be highly correlated or even coterminous with the *humaneness* of the care, as manifested in, say, the courtesy and consideration of hospital personnel.) The fifth item, F, had a lower factor score than item B (0.42 vs. 0.56) but was included because other analyses have found this type of information to be linked with the quality-humaneness dimension [3,9]; also, preliminary analyses showed that its relationship to the hospital structure variables was much like that of the other items [40]. In the construction of the scale, all items were weighted equally.¹

RESULTS

Question 1: *How do hospital structural features affect patient satisfaction?*

Hospital structure data (control of the hospital, teaching status, and bed size) were obtained by locating, in the American Hospital Association Guide Book, the hospitals that the respondent reported visiting.² The Pearson correlation coefficients for the satisfaction scale with teaching status and with bed size were 0.12 and -0.11, respectively, which are significant at the 0.01 level. The correlation between control and satisfaction was 0.06, which is not quite significant at the 0.05 level. A cross-tabulation with a dichotomized version of the dependent variable (dividing the sample into those "mostly satisfied" and those "somewhat dissatisfied") is shown in Table 2. It indicates a substantial difference in evaluation of care for each of the structure variables. Contrary to our assumption, the groups that go to teaching hospitals and large hospitals are the most dissatisfied. Those that go to government-operated rather than private hospitals are, as anticipated, more dissatisfied.

Table 1: Items for which Patient Evaluations were Elicited, with Response Categories*

Item	Completely Satisfied	Mostly Satisfied	Moderately Satisfied	Slightly Satisfied	Not at All Satisfied
A. The time it took to be admitted to a room after arriving at the hospital	70%	18%	5%	4%	6%
B. The arrangements at the hospital for you to see your family	79	15	3	1	2
C. The courtesy and consideration shown you by interns and other doctors who worked at the hospital†	76	15	4	2	2
D. The courtesy and consideration shown you by the nurses at the hospital‡	75	13	5	5	3
E. The courtesy and consideration shown you by nurses' aides, orderlies and other hospital personnel‡	75	16	5	3	2
F. The willingness of hospital personnel to answer any questions about the hospital stay‡	70	15	8	3	4
G. The out-of-pocket cost to you of the care received	64	17	6	4	9
H. The overall quality of the care you felt you got at the hospital‡	69	20	6	2	2

*The question to which they responded was: "Please answer the following questions using the answers on this card. How satisfied were you with . . ."

†These percentages are not precise totals of the percentages in brackets because of rounding errors.

‡These items are included in the dependent variable, patient satisfaction.

Table 2: Dissatisfaction with Hospital Stay, by Hospital Structure

<i>Hospital Structure</i>	<i>Percentage Dissatisfied</i>	<i>Standard Error of Percentage</i>
Control		
Government operated	17	(2.4)
Private, nonprofit	9	(1.8)
Teaching Status		
Approved medical teaching programs	15	(2.4)
No medical teaching program	7	(1.7)
Bed Size		
Less than 300 beds	6	(1.3)
300 beds or more	16	(2.3)

Note: The dependent variable is dichotomized as indicated in text.

These results beg the question whether the three hospital structure variables are interrelated such that it is one rather than all of them that is affecting patient satisfaction. A cross-tabulation of each of these variables by the other two indicated that there is essentially no relationship in this sample between control over the hospital and either teaching status (Chi-square = 0.51) or bed size (Chi-square = 0.83); there is, however, a strong relationship between teaching status and bed size (Chi-square = 296.32).

A regression analysis was performed to determine whether, by including both teaching status and bed size, the effects of one on patient satisfaction would offset the effects of the other. With no guide for deciding which of the two variables is "really" the cause of patient dissatisfaction, it seemed appropriate to retain only the variable that explains the most variance, should each reduce to insignificance the effects of the other. Results of the stepwise regression are presented in Table 3. Given linear assumptions, teaching status has a greater effect on patient satisfaction than does bed size, since teaching status is entered into the equation first. In fact the *F* statistic for teaching status is significant at the 0.01 level. Control of the institution is entered next, with a weaker effect. Bed size is entered last, and its effect is insignificant with the simultaneous inclusion of teaching status. Moreover, although the effect of control of the institution remains, the effect of teaching status is reduced considerably, because of its correlation with bed size. As a result, bed size was eliminated from later regressions.

It appears, then, that at least two structural characteristics of hospitals affect patient satisfaction. One is the ownership or control of the hospital, with private organizations rated higher than those operated by government. The other is related to teaching status, with nonteaching

Table 3: Regression Effects of Hospital Structure Variables on Patient Satisfaction, Ordered from Strongest to Weakest upon Entry*

<i>Hospital Structure Variable†</i>	<i>F Statistic at</i>		<i>F Statistic at</i>		<i>F Statistic at</i>	
	<i>Beta at First Step</i>	<i>First Step</i>	<i>Beta at Second Step</i>	<i>Second Step</i>	<i>Beta at Third Step</i>	<i>Third Step</i>
Teaching Status	0.12	10.9§	0.13	11.4§	0.09	3.7
Control			0.07	3.9‡	0.07	3.8‡
Bed Size					-0.06	1.4
Multiple <i>R</i> = 0.15						

*The higher the score, the greater the satisfaction.

†Independent variables were coded as follows: teaching status: 1 = teaching, 2 = nonteaching; control: 1 = government, 2 = private; bed size: the larger the hospital the higher the category.

‡*p* < 0.05

§*p* < 0.01

institutions (which also tend to be smaller) being more satisfactory to patients than those with teaching programs (which also tend to be larger).

Question 2: Through what processes do structural features of hospitals affect patient satisfaction?

Pearson correlations served as a guide in choosing from the process measures hypothesized to affect patient satisfaction those that may be mediating the relationship between hospital structure and satisfaction. Among those suggested above, the number of doctors seen for the condition, the number of hospital admissions in the course of the year, and whether or not there was an operation were dropped from the analysis because they were found to have a negligible relationship to patient satisfaction. The number of days a person spent in the hospital during the year and days in the hospital for the most recent hospitalization appear to affect satisfaction. Correlations also indicated that those hospitalized in government institutions spend more days in the hospital than do those hospitalized in private institutions.

Table 4 presents results from regression equations with patient satisfaction, the hospital structure measures, and days in the hospital during the year (days in the hospital for the most recent hospitalization was omitted because of its high correlation with days in the hospital during the year). An outcome variable, improvement in condition, is also included in this table, since logically it exists prior to the respondent's present judgment of satisfaction with the hospital experience. Improvement in condition is significantly related to patient satisfaction. It is fairly highly correlated (0.05) with control but not with teaching status.

The results are shown at the end of each step. The structural variables were entered first with effects as described above. At the second step, days in the hospital was entered, showing a positive effect on patient satisfaction, significant at the 0.01 level. Days in the hospital does not reduce the relationship between teaching status or institutional control and patient satisfaction. At the third step, the extent to which the condition improved was introduced. This variable has a relatively strong positive relationship with satisfaction, with a beta of 0.13. Not surprisingly, the more improved the condition, the more satisfied people are with their hospital care. However, controlling on this variable does not change the relationship between hospital structure and patient satisfaction.

In answer to the question posed in this section, the processes and intermediate outcome identifiable in this data set do not explain the effects of hospital structure on patient satisfaction. The results, however, do demonstrate two variables, one process and one outcome, that have independent effects on patient satisfaction. They are the number of days the person spends in the hospital (the greater the number of days, the

Table 4: Regression Effects of Structure, Process, and Outcome Variables on Patient Satisfaction*

Independent Variables†	Beta After First Group Entered‡		F Statistic After First Group Entered‡		Beta After Second Group Entered		F Statistic After Second Group Entered		Beta After Third Group Entered		F Statistic After Third Group Entered	
	Beta	F	Beta	F	Beta	F	Beta	F	Beta	F	Beta	F
<i>Structure Variables</i>												
Teaching status	0.12	10.2	0.12	10.3	0.11	9.1	0.11	10.3	0.11	9.1	0.11	9.1
Control	0.07	3.3	0.08	4.2§	0.07	3.4	0.07	4.2§	0.07	3.4	0.07	3.4
<i>Process Variable</i>												
Days in the hospital			0.10	6.3	0.12	9.8	0.12	6.3	0.12	9.8	0.12	9.8
<i>Outcome Variable</i>												
Improvement in condition					0.13	12.4			0.13	12.4		
Multiple R (at given step)		0.14		0.18		0.22		0.18		0.22		0.22

*The higher the score, the greater the satisfaction.

†Statistics in these columns are not precisely the same as in Table 3 because of some additional missing cases for other variables in the equation for this table.

‡See Table 3 for coding of teaching status and control. The other two variables are coded as follows: days in the hospital, a continuous variable; improvement in condition: 1 = considerably worse, 2 = somewhat worse, 3 = about the same, 4 = somewhat improved, 5 = much improved, 6 = cured.

§ $p < 0.05$

|| $p < 0.01$

greater the satisfaction) and the amount of improvement in the condition (more improvement leads to more satisfaction).

Question 3: To what extent are structural effects on patient satisfaction the result of environmental characteristics?

The hospital structure variables and those describing the patients and the environment were regressed on the measure of satisfaction in a step-wise procedure. One of the measures of health status, a measure of the severity of the condition based on physicians' judgments, was eliminated because of a negligible zero-order correlation with patient satisfaction and hospital structure. Another health status variable, the patient's "worry" over the condition, was retained. Sex, ethnicity, income, and education of household head were found to have little or no relationship to patient satisfaction in a preliminary correlation matrix but were retained for the initial regression equations because they are usually found to be related to satisfaction with ambulatory care [3,4].

First the hospital structure variables and then the environment variables, in the order of their explanatory value, were introduced in the regression equations. The results are shown in Table 5. In the first step, teaching status is shown to have a strong relationship to patient dissatisfaction, as expected, whereas control over the hospital is weak. Because of differences in missing values on some of the variables included in each regression equation, the statistics presented fluctuate between tables.

At the second step, the environment variables were introduced in the order of their explanatory value. Of greatest importance is age of the patient, with older patients significantly less critical about their hospital stay than younger. This has been a common finding with other types of medical care.

Three dummy variables identifying the four regions of the country were included in this analysis. Next in order of explanatory value is whether or not patients live in the South. Those who live in the South are more likely to be dissatisfied with their hospital stay. (For the most part, the hospitals these patients go to are also in the South.) It is difficult to know whether the greater dissatisfaction of patients in the South is due to regional differences in facilities or to differences in the patients. However, as stated above, the greater dissatisfaction of people in the South is a result also found in patient evaluations of ambulatory care. There also appears to be a very slight decrease in the beta for teaching status as a result of the entry of this variable (southern region).

The next most important variable is suburban residence. Somewhat surprisingly, suburbanites are more critical than the inner-city population, other urban dwellers (non-SMSA), and rural inhabitants. Patient satisfaction data for ambulatory care often shows suburban people less

critical than others [2,14]. The residence variable describes the location of the household of the respondent rather than the location of the hospital; it may be that, for hospital care, suburbanites are more likely to use the same facilities as central-city dwellers, whereas for ambulatory care, they are more likely to use nearby facilities. A separate cross-tabulation of the residence variables with the dichotomized version of the patient satisfaction variable (not shown) indicated that similar proportions of suburbanites and inner-city inhabitants were critical of their hospital stays. People in smaller cities and rural areas are more likely to report high satisfaction with the hospital. Although the variable for central-city residence is not introduced until much later, this may be due to the statistical technique used; stepwise regression favors one variable of two that are fairly highly correlated with each other (the suburban and inner-city dummy variables) and makes the other appear much less important.

The next most important variable is whether the respondent has a regular source of care. This is also a common finding in studies of patient satisfaction with ambulatory care [3,14,41]. It seems that people who have an established link with the medical care system are more satisfied with *all* the care they receive.

Worry over the hospitalized condition, the next variable in order of explanatory power, has a negative relationship with satisfaction (more worry leads to less satisfaction).

The other environment variables (all listed in Table 5) that were introduced into this analysis each had an insignificant effect on the dependent variable. They include, in particular, ethnicity (white, black, and Spanish-speaking), which is usually a strong predictor of patient satisfaction with ambulatory care. For hospital care there appears to be a slight tendency for the minority groups to be less critical, which is the opposite of the relationship usually found between ethnicity and satisfaction. Income has no apparent effect.

Most important to the theme of this paper is that although control over the hospital is clearly reduced in importance, no combination of these variables succeeds in explaining the relationship between teaching status and patient satisfaction. The entry of the region variable seemed to diminish even more the already rather weak effect of control. It does not appear that teaching hospitals receive lower patient evaluations because of the kind of patients who go to them or their residential and regional location. In the absence of any "environmental" explanation, the conclusion is that there must be something about this kind of hospital itself that causes greater dissatisfaction among patients, something that was not identifiable in the process measures used in this study.

As a final summary step in the statistical analysis, structure, envi-

Table 5: Regression Effects of Structure and Environment Variables on Patient Satisfaction*

<i>Independent Variables†</i>	<i>Beta for Listed Variable upon Entry†</i>	<i>F Statistic upon Entry†</i>	<i>Beta for Variable Listed at Last Step</i>	<i>F Statistic at Last Step</i>	<i>Beta for Teaching Status upon Entry of Variable Listed</i>	<i>F Statistic for Teaching Status</i>
<i>Structure Variables</i>						
Teaching status	0.15	15.3	0.10	5.2§	—	—
Control	0.05	1.8	0.03	0.7	0.15	15.4
<i>Environment Variables</i>						
Age	0.15	14.8	0.12	9.2	0.14	14.6
Southern region	-0.12	9.5	-0.10	4.4§	0.12	9.1
Suburban residence	-0.08	4.5§	-0.09	4.3§	0.12	9.5
Regular source of care	-0.07	3.9§	-0.08	4.0§	0.11	8.5
Worry over hospitalized condition	0.07	3.0	0.05	1.9	0.11	7.6
Education of household head	-0.06	2.4	-0.05	1.3	0.11	7.6
Insurance coverage	-0.06	2.1	-0.06	2.1	0.11	8.4
Sex	-0.05	2.0	-0.05	1.9	0.11	8.4
Ethnicity	0.05	1.4	0.06	2.1	0.12	9.5
Central city	-0.07	2.4	-0.07	1.8	0.10	5.9§
Western region	-0.07	2.6	0.03	0.6	0.10	5.5§
Northeastern region	0.03	0.3	0.03	0.3	0.09	5.6§

Family income	-0.01	0.0	-0.01	0.0	0.10	5.5\$
Small urban area	0.01	0.0	-0.01	0.0	0.10	5.2\$
Rural farm area	0.00	0.0	-0.00	0.0	0.10	5.2\$

Multiple *R* at last step = 0.30

*The higher the score, the greater the satisfaction.

†Statistics in these columns are not precisely the same as in Tables 3 or 4 because of some change in missing cases for other variables in the equation for this table.

‡See Table 3 for coding of teaching status and control. The other variables are coded as follows: age: a continuous variable; all region and residence variables coded with 1 = area stated, 0 = all other areas; regular source of care: 1 = specific doctor, 2 = no specific doctor or no regular source at all; worry: 1 = great deal, 2 = some, 3 = hardly any, 4 = none; education: eight ordinal categories where the highest equals the most education; insurance: 1 = has insurance, 2 = does not have insurance; sex: 1 = male, 2 = female; ethnicity: 1 = majority, 2 = black and Spanish-speaking; family income: continuous variable.

\$p < 0.05

||p < 0.01

ronment, and process variables were introduced (in that order) in one stepwise regression equation to estimate the total contribution of these variables in explaining patient satisfaction. Within each group those with the most explanatory value were entered first, as in the regressions reported previously. The results are shown in Table 6. The five environment variables shown in Table 5 to have the least effect on the analysis were not included. Although some of the other variables were shown to have little impact, they were included because central city, the last of them, was the final variable to have noticeable effect on the importance of teaching status, although this effect is slight enough that it may simply be a statistical artifact.

Table 6: Regression Effects of Structure, Environment, and Process Variables on Patient Satisfaction, After All Variables Are Entered*

<i>Independent Variables†</i>	<i>Beta at Last Step</i>	<i>Multiple R</i>	<i>F Statistic</i>
<i>Structure Variables</i>			
Teaching Status	0.10	0.14	5.4‡
Control	0.03	0.15	0.5
<i>Environment Variables</i>			
Age	0.16	0.22	14.5§
Southern region	-0.10	0.24	6.5‡
Suburban residence	-0.09	0.25	5.7‡
Regular source of care	-0.08	0.27	4.2‡
Worry over hospital- ized condition	0.03	0.27	0.7
Ethnicity	0.09	0.28	4.1‡
Central city	-0.05	0.28	1.2
Sex	-0.06	0.29	2.2
Insurance coverage	-0.05	0.29	1.6
Education of household head	-0.03	0.29	0.7
<i>Process Variable</i>			
Days in the hospital	0.09	0.30	4.9‡
<i>Outcome Variable</i>			
Improvement in condition	0.17	0.34	19.0§

*The higher the score, the greater the satisfaction.

†See Tables 3, 4, and 5 for coding of independent variables.

‡ $p < 0.05$

§ $p < 0.01$

Table 6 confirms that, with all the process and environmental variables included, teaching status of the hospital still has an independent effect on patient satisfaction. None of the other variables previously found to have an effect changed in importance in this summary step. Of interest, however, is the fact that, with the introduction of improvement in condition, ethnicity is seen to have a slight but significant effect on patient satisfaction, the opposite of that found in research on ambulatory care. The minorities are less critical of hospital care than are the majority white group when level of perceived improvement in the condition is held constant; however, because they are more likely to have conditions that did not improve very much, this relationship is blurred somewhat in Table 5.

SUMMARY AND DISCUSSION

This paper has provided an addition to the growing literature on the effects of hospital structure on outcome measures. Using a framework that was developed to summarize the knowledge in this area [25], it has provided the first study relating hospital types to patient satisfaction. The most important finding is that although most respondents are satisfied with their care, teaching hospitals, which tend also to be large hospitals, are less favorably viewed by patients than are smaller, nonteaching hospitals. This is contrary to the expected relationship. Although patient satisfaction with quality and related attributes of medical care is considered by many to be as important an outcome as high technical quality of care, apparently the type of hospitals that yield most reliably the one are less likely to yield the other. There is also a tendency for people to favor private over government-owned institutions, but this is reduced to insignificance when certain environment variables, in particular, region, are introduced.

What is it about large or teaching hospitals that makes them less pleasant to a patient than small or nonteaching hospitals? There are a number of possible explanatory factors. The single most important variable in explaining satisfaction is improvement in the medical condition, as viewed by the survey respondent. Next is age, with older people generally more satisfied with their hospital care. People from the South are more likely than people from other regions to be dissatisfied with hospitalization, as are suburbanites relative to urban and rural dwellers. People with a regular source of care are more satisfied with their care than those without one, as are those who had spent *more* days in the hospital during the last year. Finally, blacks and Spanish-speaking minorities are

more satisfied with their care than are whites, once the effects of other variables in the analysis are controlled, a surprising finding in light of the usual relationship between ethnicity and patient satisfaction.

After all these variables are introduced, teaching status (and larger size) still has a negative effect on patient evaluation. Why is this so? A fair amount is known about the differences between teaching and non-teaching hospitals. Teaching hospitals have a greater variety of goals, of which the most important to them is the training function [26]. Teaching hospitals also appear to be less bureaucratic with respect to patient care, with more discretion over work at the lower levels of the nursing hierarchy [26]. One possible explanation, then, is that the priority of the training goal in teaching hospitals has led to patterns of behavior among the personnel that may offend some patients and be translated by them as poor quality of care. It is interesting to note that physicians working in teaching hospital pediatric clinics were found to be less satisfied with their work than were physicians working in pediatric clinics of community hospitals. The dissatisfaction of physicians in teaching hospitals was related to their preference for other goals besides patient care. Their dissatisfaction did not, however, result in lower performance ratings [42].

Why is it important to satisfy patients if they are receiving technically good care? The answer to this may rely on the answer to another question. Will technically good care provide the intended outcome, healthier patients, if it is produced in an unsatisfying environment? Some classic nursing studies [43] as well as much of the current discussion of stress [44] suggest that the answer to this may in many instances be negative.

These thoughts suggest some useful foci for further research. First, another study gathering data on patient satisfaction with hospital stays across different types of hospitals might include additional measures of the process of care, such as the amount and kinds of interaction with nurses and other health professionals. These would be relatively difficult to measure through a survey methodology unless the data were gathered soon after the hospital experience.

Second, it would be interesting to see how some of the objective measures of quality of care, such as those based on type of procedures and surgical error rates, are related to patient satisfaction, using the patient as the unit of observation. It may be that, especially within hospital types, there is a stronger relationship than that suggested above between quality of care and patient satisfaction. This suggests a third direction for analysis: to look within each type of hospital structure to see if the best predictors of patient satisfaction might vary, suggesting that there can be different guidelines for different types of hospitals to achieve high ratings from their patients.

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NOTES

1. Because of the very skewed results (typical of responses on patient satisfaction instruments, unless the instruments are made up only of questions yielding a normal distribution of answers), wherever this scale of items was used in a regression equation, it was used in log form (with the natural logarithm). High values reflect greater satisfaction, low values greater dissatisfaction with care. In cross-tabulations, the satisfaction scale was dichotomized at the scale point between average responses of "completely satisfied" or "mostly satisfied" and average responses of "moderately satisfied," "slightly satisfied," or "not at all satisfied." In other words, the scale responses were numbered 1 through 5, giving "completely satisfied" a score of 5 and "not at all satisfied" a score of 1. An individual was given a score by adding across items (all weighted equally) and dividing by 5. If the result was more than 3.5, the person was placed in the "mostly satisfied" group. If the score was less than 3.5, the person was placed in the "somewhat dissatisfied" group. (No one had a score of 3.5.)
2. Two variables available in the AHA Guide Book, describing hospitals in terms of whether they are short- or long-term, general or specialty institutions, were not used in the analysis because there was virtually no variation on these measures; almost all respondents were in short-stay, general hospitals.

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