Patients' Experiences With Care for Lung Cancer and Colorectal Cancer: Findings From the Cancer Care Outcomes Research and Surveillance Consortium

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ABSTRACT

Purpose

To assess patients' experiences with cancer care, ratings of their quality of care, and correlates of these assessments.

Patients and Methods

For 4,093 patients with lung cancer and 3,685 patients with colorectal cancer in multiple US regions and health care delivery systems, we conducted telephone surveys of patients or their surrogates in English, Spanish, or Chinese at 4 to 7 months after diagnosis. The surveys assessed ratings of the overall quality of cancer care and experiences with three domains of interpersonal care (physician communication, nursing care, and coordination and responsiveness of care).

Results

English-speaking Asian/Pacific Islander patients and Chinese-speaking patients and those in worse health reported significantly worse adjusted experiences with all three domains of interpersonal care, whereas white, black, and Hispanic patients reported generally similar experiences with interpersonal care. The overall quality of cancer care was rated as excellent by 44.4% of patients with lung cancer and 53.0% of patients with colorectal cancer, and these ratings were most strongly correlated with positive experiences with coordination and responsiveness of care (Spearman rank coefficients of 0.49 and 0.42 for lung and colorectal cancer, respectively). After multivariate adjustment, excellent ratings were less common for each cancer among black patients, English-speaking Asian/Pacific Islander patients, Chinese-speaking patients, and patients reporting worse health status (all $P \leq .05$).

Conclusion

Patients' reports and ratings of care differed significantly by race, language, and health status. Efforts to improve patients' experiences with cancer care should focus on problems affecting Asian and Pacific Islander patients and those in worse health.

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INTRODUCTION

Patient-centered care is an essential component of high-quality health care,¹ complementing more technical aspects of care such as the appropriate use of medications and procedures.² Patients with cancer require clear information about their disease and treatment options, timely attention to symptoms, and effective coordination of care across multiple clinical disciplines. In England, a national survey has been conducted to assess patients' satisfaction with cancer care,³ and in the United States, national surveys of patients' satisfaction with their hospital care have been launched.⁴ The Institute of Medicine and the President's Cancer Panel have highlighted deficiencies in patients' experiences with cancer care.^{5,6}

However, few studies have analyzed this topic in broadly representative cohorts of US patients with cancer.⁷

In a prior survey of patients with colorectal cancer in Northern California, problems with coordination of care were strongly associated with worse perceptions of the quality of care.⁸ African American, Hispanic, and Asian/Pacific Islander patients reported more problems with coordination of care and lower overall ratings of care than white patients. Non-English-speaking patients had particularly low ratings of care, with only half of these patients rating their care as excellent or very good compared with four fifths of English-speaking patients.

To build on this prior study of patients that included one type of cancer in a single region, we

assessed patients' perspectives on their quality of care for lung cancer and colorectal cancer in multiple regions and health systems. We were particularly interested in patients' reports of the interpersonal aspects of care, such as their physicians' communication with them and the coordination of their cancer care team. Based on prior research,⁸ we hypothesized that nonwhite and non-English speaking patients would rate their overall quality of care less highly than white and English-speaking patients, respectively, even after adjusting for socioeconomic factors and health status. We also hypothesized that patients' experiences with coordination of care would be most strongly associated with their overall ratings of care and would account statistically for a substantial proportion of observed differences in ratings of care by race, ethnicity, and language.

PATIENTS AND METHODS

Study Population

To evaluate and improve the care and outcomes of lung and colorectal cancer,^{9,10} the Cancer Care Outcomes Research and Surveillance (CanCORS) Consortium was established by the National Cancer Institute¹¹ to study these two leading causes of cancer mortality.¹² The Consortium includes five geographically defined regions (Alabama, Iowa, Los Angeles County, eight counties of Northern California, and 22 counties of central and eastern North Carolina), five integrated health care delivery systems in the Cancer Research Network,¹³ and 15 Veterans Health Administration hospitals (Appendix Table A1, online only). By design, only patients with lung cancer were enrolled in Iowa, and only patients with colorectal cancer were enrolled in North Carolina. In 2004, the study sites included nearly 30 million people, representing 10% of the US population. The study protocol was approved by institutional review boards of all participating research groups.

Patients age 21 years and older with newly diagnosed invasive lung or colorectal cancer were enrolled onto the CanCORS study from September 2003 through December 2005, and follow-up surveys were conducted through August 2007. Patients were identified within 3 months of diagnosis from population-based cancer registries at geographic sites and from pathology and cytology records at organizational sites.¹⁴ After a treating physician was notified of each patient's eligibility, a letter and brochure were mailed to eligible patients inviting them to participate, followed by at least 10 phone calls to enroll them onto the study. To enhance statistical power for analyses by race and ethnicity, African American, Hispanic, and Asian/Pacific Islander patients were oversampled at several sites. To encourage enrollment of non-English-speaking patients, recruitment materials and patient surveys were translated into Spanish and Chinese. Experienced bilingual interviewers recruited and interviewed patients in these languages (including Mandarin and Cantonese) in California where patients speaking these languages were concentrated. All patients or their surrogates provided informed consent.

The numbers of patients sampled, enrolled, and included in our study cohort are detailed in Figure 1. Response rates among all sampled patients were 49.1% for lung cancer and 53.2% for colorectal cancer based on a standard definition.¹⁵ The interviewed patients were representative of the demographic characteristics and cancer stage of all newly diagnosed patients in the study regions.¹⁶ The final cohort included 4,093 patients with lung cancer and 3,685 patients with colorectal cancer.

Data Collection

Primary data were collected from patients via computer-assisted telephone interviews at 4 to 7 months after diagnosis. For patients who had died or were too ill to be interviewed, a surrogate (relative or household member) familiar with their cancer care was interviewed. The surveys (available at <http://www.cancors.org/public>) assessed patients' sociodemographic characteristics (age, marital status, race/ethnicity, language spoken at home, education, and annual income), overall health status (patient survey or surrogate survey for living patients only), comorbid conditions, and experiences and

Fig 1. Derivation of study cohort.

ratings of care.¹⁷ Collaborative stage at diagnosis was obtained from medical records or participating cancer registries if medical records were unavailable.¹⁸

To assess patients' experiences with the interpersonal aspects of cancer care, 13 questions were adapted from 46 items used in the Consumer Assessment of Healthcare Providers and Systems¹⁹ survey and from prior research on patients' experiences with cancer care.^{8,20} In a principal factor analysis with promax rotation,²¹ examination of eigenvalues for these 13 questions in our cohort suggested a three-factor solution with clinical face validity (Table 1) that was highly consistent when stratified for patient or surrogate respondents. We grouped items by the factor on which they had the largest standardized regression coefficients (ranging from 0.45 to 0.84) and calculated a summed score for each factor, including physician communication (five items; Cronbach's α coefficient = 0.84 for lung cancer and 0.81 for colorectal cancer), nursing care (two items; α = 0.86 for lung cancer and 0.84 for colorectal cancer), and coordination and responsiveness of care (six items; α = 0.85 for lung cancer and 0.83 for colorectal cancer). We converted the scores in each domain to 100-point scales, with 0 representing the worst possible care and 100 representing optimal care. Patients or their surrogates also rated the overall quality of their health care since cancer was diagnosed on a 5-point scale ranging from excellent to poor (Table 1).

Statistical Analysis

For each cancer, we compared unadjusted proportions of patients or surrogates who rated cancer care as excellent and unadjusted mean scores for each scale of care experiences by patients' demographic and clinical characteristics. We also calculated Spearman rank correlations of experiences in the three domains of care with overall ratings of care.

In our primary analyses for each cancer, we used linear regression models to assess predictors of patients' experiences with physician communication, nursing care, and coordination and responsiveness of care and logistic regression models to assess predictors of excellent overall cancer care (v less than excellent care). These models adjusted for completion of surveys by surrogates for living patients, study site, sociodemographic characteristics (including Spanish and Chinese survey language), cancer stage, six comorbid conditions, and self-reported health status (a 5-point scale from excellent to poor for living patients and a sixth category for deceased patients). In secondary analyses, we assessed whether receipt of surgery, chemotherapy, or radiation therapy was associated with overall ratings of care or experiences in the three domains of patient-centered care; models predicting either excellent or very good care as a broader specification of high quality; and models that included the domains of interpersonal care as predictors of overall ratings of care. We also tested interactions of surrogate responses with race, ethnicity, language, and health status in predicting adjusted experiences and ratings of care, but only a few of several dozen interactions were statistically significant and with no consistent pattern (data not shown).

Table 1. Survey Items Related to Patients' Specific Experiences With Cancer Care and Overall Rating of Care

Survey Item
Physician communication*
How often did your doctors listen carefully to you?
How often did your doctors explain things in a way you could understand?
How often did your doctors give you as much information as you wanted about your cancer treatments, including potential benefits and side effects?
How often did your doctors encourage you to ask all the cancer-related questions you had?
How often did your doctors treat you with courtesy and respect?
Nursing care*
How often were your nurses as helpful as you thought they should be?
How often did your nurses treat you with courtesy and respect?
Coordination and responsiveness of care*
How often did you think that your health problems related to your cancer or its treatments were handled quickly enough?
How often were you able to see the specialists such as cancer doctors you wanted to see for your cancer?
How often did the doctors, nurses, and other medical staff providing your care seem to work well together as a team?
How often did your doctors seem to be aware of treatments for your cancer that other doctors recommended?
How often did you know who to ask when you had any questions related to your cancer or its treatments?
How often did you feel that your doctors, nurses, and other medical staff did everything they could to treat your health problems related to your cancer or its treatments?
Overall rating of care†
Overall, how would you rate the quality of your health care since your diagnosis of cancer?

*Response options for each item included always, usually, sometimes, or never.

†Response options included excellent, very good, good, fair, or poor.

Table 2. Demographic and Clinical Characteristics of Study Cohort

Characteristic	Lung Cancer (n = 4,093)		Colorectal Cancer (n = 3,685)	
	No. of Patients	%	No. of Patients	%
Type of survey				
Patient	2,331	57.0	2,897	78.6
Surrogate of living patient	473	11.6	482	13.1
Surrogate of deceased patient	1,289	31.5	306	8.3
Age, years				
21-54	483	11.8	809	22.0
55-64	1,019	24.9	823	22.3
65-74	1,368	33.4	945	25.6
≥ 75	1,223	29.9	1,108	30.1
Female sex	1,713	41.9	1,647	44.7
Race/ethnicity and language*				
White	2,996	73.2	2,372	64.4
Black	454	11.1	556	15.1
Hispanic/English speaking	177	4.3	215	5.8
Hispanic/Spanish speaking	62	1.5	112	3.0
Asian/Pacific Islander/English speaking	144	3.5	170	4.6
Asian/Chinese speaking	45	1.1	72	2.0
Other	200	4.9	177	4.8
Education				
Less than high school graduate	919	22.5	729	19.8
High school graduate	2,479	60.6	1,671	45.3
College graduate	695	17.0	1,285	34.9
Income				
< \$20,000	1,416	34.6	1,053	28.6
\$20,000-\$39,999	1,357	33.2	1,083	29.4
\$40,000-\$59,999	698	17.1	658	17.9
≥ \$60,000	622	15.2	891	24.2
Married	2,477	60.5	2,249	61.0
Stage				
I	926	22.6	835	22.7
II	338	8.3	1,057	28.7
III	1,147	28.0	1,112	30.2
IV	1,682	41.1	681	18.5
Study site				
Cancer Research Network	543	13.3	494	13.4
Northern California	829	20.3	843	22.9
Alabama	523	12.8	486	13.2
Los Angeles County	838	20.5	815	22.1
Iowa†	913	22.3	—	—
North Carolina†	—	—	734	19.9
Veterans hospitals	447	10.9	313	8.5
Health status				
Excellent	227	5.5	531	14.4
Very good	661	16.2	1,039	28.2
Good	959	23.4	1,093	29.7
Fair	668	16.3	556	15.1
Poor	289	7.1	160	4.3
Deceased	1,289	31.5	306	8.3
Comorbid conditions‡				
Myocardial infarction	659	16.1	377	10.2
Congestive heart failure	379	9.3	241	6.5
Stroke	535	13.1	358	9.7
Chronic lung disease	1,516	37.0	479	13.0
Diabetes	737	18.0	778	21.1
Depression	1,108	27.1	736	20.0

(continued on following page)

Analyses were conducted with CanCORS core data (version 1.10) and patient survey data (version 1.8) using SAS software (version 9.1.3; SAS Institute, Cary, NC). Missing data (< 3% of patients on all covariates) were multiply imputed, and adjusted analyses were performed using these imputed data.²² Two-tailed *P* values or 95% CIs are reported for all results.

RESULTS

Demographic and clinical characteristics of the cohort are listed by type of cancer in Table 2. A substantially larger proportion of surveys were completed by surrogates of deceased patients for those with lung cancer than with colorectal cancer (31.5% v 8.3%, respectively), reflecting the greater proportion of patients with lung cancer who had stage IV disease at diagnosis (41.1% v 18.5%, respectively). For each cancer, one third of black patients were from Alabama, and approximately 90% of Hispanic and Asian/Pacific Islander patients were from the two areas in California (data not shown).

Mean scores for physician communication, nursing care, and coordination and responsiveness of care ranged from 84 to 90 on these 100-point scales. For lung cancer, the mean scores were 85.4 (standard deviation [SD], 20.1), 89.9 (SD, 19.4), and 84.4 (SD, 19.5), respectively, and for colorectal cancer, they were 88.4 (SD, 17.6), 89.5 (SD, 18.9), and 87.9 (SD, 16.7), respectively. In unadjusted analyses, white (mean scores, 85 and 89 for lung and colorectal cancer, respectively)

Table 2. Demographic and Clinical Characteristics of Study Cohort (continued)

Characteristic	Lung Cancer (n = 4,093)		Colorectal Cancer (n = 3,685)	
	No. of Patients	%	No. of Patients	%
Cancer treatment				
Surgery	1,509	36.9	3,398	92.2
Chemotherapy	2,161	52.8	1,837	49.9
Radiation therapy	1,586	38.9	494	13.4

*All patients who were white, black, or of other race/ethnicity were English speaking. Self-reported race/ethnicity data were not available for 15 patients with lung cancer and 11 patients with colorectal cancer.

†Only patients with lung cancer were enrolled in Iowa, and only patients with colorectal cancer were enrolled in North Carolina.

‡Survey respondents reported whether each comorbid condition had been diagnosed by a physician.

and black patients (mean scores, 85 and 89, respectively) reported the most positive experiences with coordination and responsiveness of care, whereas Hispanic (mean scores, 81 and 84, respectively) and English-speaking Asian/Pacific Islander patients (mean scores, 79 and 87, respectively) reported somewhat worse experiences in this domain, and Chinese-speaking patients (mean scores, 67 and 73 respectively) reported much worse experiences. Similar patterns were evident in experiences with physician communication and nursing care (data not shown). Relative to white and black patients, Chinese-speaking patients reported experiences that were approximately 20 points lower for physician communication and 10 points lower for nursing care.

In adjusted analyses of both cancers, the most negative experiences in all domains of interpersonal care were reported for Chinese-speaking patients and patients in fair or poor health or who had died within 4 months of diagnosis (Table 3). Their scores were 4 to 22 points lower than white patients or those in excellent health, respectively. For both cancers, patients in Los Angeles County reported 4- to 7-point lower adjusted scores than patients in the Cancer Research Network, and patients with depression also reported scores that were significantly lower than other patients. In contrast, adjusted experiences with interpersonal care did not differ consistently by age, sex, black race, Hispanic ethnicity, education, income, marital status, or other comorbid conditions. In secondary analyses of patients' experiences with care, patients who received chemotherapy for lung cancer or colorectal cancer reported significantly better adjusted experiences with physician communication, nursing care, and coordination and responsiveness of care (all $P < .001$) of approximately 4 to 6 points on these 100-point scales.

Excellent overall ratings of cancer care were reported for 44.4% of patients with lung cancer and 53.0% of patients with colorectal cancer (Table 4). Lower proportions of patients with lung and colorectal cancer rated their care as very good (30.7% and 29.6%, respectively), good (15.5% and 12.3%, respectively), fair (5.8% and 3.7%, respectively), or poor (3.6% and 1.6%, respectively). For both cancers, excellent ratings of care were substantially less common among surrogates of living patients, nonwhite patients, Chinese-speaking patients, patients with low incomes or less education, unmarried pa-

tients, patients in less than excellent health, patients with stage IV cancers, and patients with a history of depression.

After multivariate adjustment (Table 5), excellent ratings of care remained significantly less common for both cancers among black patients, English- or Chinese-speaking Asian patients, and patients in less than excellent health (all $P < .05$). For lung cancer, excellent adjusted ratings of care were also significantly less common among patients younger than age 55 years and patients with depression. For colorectal cancer, excellent ratings of care were significantly more common in patients younger than age 65 years, patients in North Carolina, and patients with diabetes, and such ratings were less common among English-speaking Hispanic patients, lower income patients, and patients in Los Angeles County.

In secondary analyses with treatment indicators added to these models, care was rated as excellent more commonly among patients with colorectal cancer who received chemotherapy (adjusted odds ratio [OR], 1.49; 95% CI, 1.20 to 1.85), but no other treatments were significantly associated with ratings of care (data not shown). In secondary adjusted analyses predicting excellent or very good ratings of care, these ratings were less common among black patients ($P < .02$) and Chinese-speaking Asian patients ($P < .001$) for both cancers and among patients with annual incomes less than \$40,000 for colorectal cancer ($P < .05$). These ratings were also less common for both cancers for patients in less than very good health (all $P < .05$).

Patients' experiences in the three domains of physician communication, nursing care, and coordination and responsiveness of care were significantly correlated with ratings of the quality of care for lung cancer (Spearman rank correlation coefficients of 0.41, 0.29, and 0.49, respectively) and for colorectal cancer (Spearman rank correlation coefficients of 0.39, 0.28, and 0.42, respectively; all $P < .001$). After adjustment for demographic and clinical factors, a 10-point improvement (SD, 0.5 to 0.6) in patients' experiences with coordination and responsiveness of care was associated with a substantially greater likelihood of rating their cancer care as excellent overall for both lung cancer and colorectal cancer (adjusted OR, 1.83 for lung cancer and 1.63 for colorectal cancer; both $P < .001$). The likelihood of patients rating their cancer care as excellent was significantly but less strongly associated with 10-point improvements in experiences with physician communication (adjusted OR, 1.24 and 1.26 for lung and colorectal cancer, respectively) and nursing care (adjusted OR, 1.12 and 1.18 for lung and colorectal cancer respectively; all $P \leq .001$). However, adding these three scales to the adjusted analyses of overall ratings of care accounted for only a small proportion of the significant differences by race, language, and health status (data not shown).

DISCUSSION

To our knowledge, this study is the largest population-based survey to assess patients' experiences and ratings of cancer care in the United States. Patients' experiences with physician communication, nursing care, and coordination and responsiveness of care were generally good, ranging from 84 to 90 on a 100-point scale. Coordination and responsiveness of care was most strongly associated with patients' adjusted ratings of care.

Distinctive patterns emerged in the associations of patients' sociodemographic characteristics with their ratings and experiences with care. In contrast to our hypothesis, however, experiences with

Table 3. Adjusted Differences in Experiences With Care by Patient Demographic and Clinical Characteristics

Characteristic	Adjusted Difference in Score					
	Lung Cancer			Colorectal Cancer		
	Physician Communication	Nursing Care	Coordination and Responsiveness of Care	Physician Communication	Nursing Care	Coordination and Responsiveness of Care
Type of survey (surrogate of living patient v patient)	1.4	-2.7*	-1.2	-0.4	-4.2†	-3.5†
Patient age, years (v ≥ 75 years)						
21-54	-1.7	-3.7*	-3.6*	0.2	-3.5*	-1.6
55-64	0.5	-0.9	-0.4	0.8	-3.4†	0.5
65-74	0.4	-0.8	-0.4	1.3	-0.1	0.5
Patient sex (female v male)	1.3	-0.6	1.0	0.3	-2.5†	0.2
Race/ethnicity/language (v white)						
Black	1.0	0.2	0.0	0.1	2.1‡	0.2
Hispanic/English speaking	-1.1	-0.2	-1.6	-1.3	-1.3	-2.5‡
Hispanic/Spanish speaking	-0.6	1.3	-2.7	-1.3	-2.2	-0.3
Asian/Pacific Islander/English speaking	-5.1*	-3.6‡	-3.9‡	-2.0	0.6	-0.6
Asian/Chinese speaking	-21.6†	-10.5†	-17.4†	-18.3†	-6.3*	-13.8†
Other race/ethnicity	-0.6	1.4	1.2	-2.5	-0.2	-0.7
Education (v college graduate)						
Not a high school graduate	2.4‡	3.0*	2.3‡	-0.8	0.9	1.2
High school graduate	1.2	0.5	0.4	-0.0	1.4	1.8*
Income (v ≥ \$60,000)						
< \$20,000	-2.3‡	1.6	-0.1	-2.1‡	1.7	0.3
\$20,000-\$39,999	-0.9	1.5	0.2	-0.9	2.0	0.0
\$40,000-\$59,999	-1.6	1.5	0.3	-1.1	1.8	0.5
Marital status (married v unmarried)	1.7‡	2.1*	2.3*	0.8	1.8‡	1.3‡
Cancer stage (v stage I)						
II	-1.0	1.7	-0.8	0.4	-0.2	-0.6
III	-2.1‡	4.9†	-0.9	-0.2	1.2	-0.8
IV	-2.1‡	5.5†	-1.7‡	-0.3	1.8	0.5
Study site (v Cancer Research Network)						
Northern California	-2.0	-1.8	-1.0	-1.2	-1.4	-1.2
Alabama	2.4‡	1.2	4.4†	2.0	0.5	2.9‡
Los Angeles County	-4.5†	-6.5†	-4.4†	-4.4†	-4.3†	-4.4†
Iowa	1.4	0.1	3.6*	—	—	—
North Carolina	—	—	—	2.0‡	0.7	2.6*
Veterans hospitals	-0.7	-2.1	-1.0	-0.5	-4.2*	-2.5‡
Overall health status (v excellent)						
Very good	-0.3	-1.0	-2.1	-2.5*	-2.4‡	-2.7*
Good	-2.7	-2.1	-3.3*	-4.3†	-3.3*	-4.8†
Fair	-6.6†	-3.9	-6.9†	-9.0†	-6.1†	-9.2†
Poor	-9.2†	-4.5‡	-9.6†	-13.5†	-7.9†	-13.2†
Deceased	-10.8†	-10.8†	-16.2†	-15.2†	-14.4†	-20.1†
Comorbid conditions (v absence of condition)						
Myocardial infarction	0.3	-0.3	0.7	0.6	0.2	0.2
Congestive heart failure	0.9	0.8	-0.7	-1.1	-2.2	-0.6
Stroke	0.2	-0.7	-1.0	-2.0‡	0.2	-1.6
Chronic lung disease	-0.4	-1.4‡	-0.4	1.8‡	-0.1	1.8‡
Diabetes	-0.6	0.3	-0.5	1.3	-0.4	1.2
Depression	-2.5†	-3.2†	-3.4†	-3.1†	-1.2	-2.1*

NOTE. Linear regression was used to adjust for all listed variables. Only patients with lung cancer were enrolled in Iowa, and only patients with colorectal cancer were enrolled in North Carolina.

* $P < .01$.

† $P < .001$.

‡ $P < .05$.

coordination and responsiveness of care did not account for a substantial portion of the differences in ratings of quality of care by race, ethnicity, and language. Relative to white patients, black patients reported similar experiences with physician communication, nursing care, and coordination and responsiveness of care, but black patients

were significantly less likely to rate their cancer care as excellent. These seemingly paradoxical findings suggest the need to examine other aspects of cancer care, including interactions with other health care personnel, to understand why black patients rated their care less highly. In adjusted analyses, English-speaking Hispanic patients with

Table 4. Unadjusted Proportion of Patients Rating Care As Excellent by Demographic and Clinical Variables

Variable	Lung Cancer (n = 4,093)		Colorectal Cancer (n = 3,685)	
	% of Patients	P*	% of Patients	P*
All patients	44.4		53.0	
Type of survey		< .001		< .001
Patient	53.8		56.8	
Surrogate of living patient	42.9		43.5	
Age, years		.001		< .001
21-54	38.5		56.0	
55-64	47.0		57.2	
65-74	46.8		54.3	
≥ 75	42.0		46.5	
Sex		.30		.02
Male	43.8		54.7	
Female	45.4		50.9	
Race		< .001		< .001
White	47.5		57.3	
Black	36.2		47.8	
Hispanic	42.0		43.7	
Asian/Pacific Islander	25.3		36.8	
Other race	40.5		50.6	
Language of Hispanic patients		.25		.80
English	39.8		44.2	
Spanish	48.3		42.7	
Language of Asian/Pacific Islander patients		.002		< .001
English	30.8		47.7	
Chinese	7.0		11.1	
Education		.03		< .001
Not a high school graduate	41.8		43.8	
High school graduate	44.3		54.8	
College graduate	48.4		55.8	
Income		< .001		< .001
< \$20,000	40.4		45.8	
\$20,000-\$39,999	44.2		50.7	
\$40,000-\$59,999	47.1		54.1	
≥ \$60,000	51.2		63.4	
Marital status		.002		< .001
Not married	41.5		48.6	
Married	46.4		55.7	
Stage		< .001		.006
I	50.5		55.2	
II	50.0		53.7	
III	45.6		54.2	
IV	39.3		47.0	
Study site		.048		< .001
Cancer Research Network	46.5		55.4	
Northern California	40.7		50.4	
Alabama	45.8		49.4	
Los Angeles County	43.0		47.7	
Iowa†	44.9		—	
North Carolina†	—		62.8	
Veterans hospitals	49.3		52.1	
Health status		< .001		< .001
Excellent	69.3		80.8	
Very good	50.8		56.8	
Good	42.5		46.4	
Fair	36.9		39.4	
Poor	37.6		32.1	
Deceased	28.1		31.2	

(continued in next column)

Table 4. Unadjusted Proportion of Patients Rating Care As Excellent by Demographic and Clinical Variables (continued)

Variable	Lung Cancer (n = 4,093)		Colorectal Cancer (n = 3,685)	
	% of Patients	P*	% of Patients	P*
Comorbid conditions				
No myocardial infarction	44.6	.75	53.1	.69
Myocardial infarction	43.9		52.0	
No congestive heart failure	44.7	.33	53.4	.04
Congestive heart failure	42.1		46.7	
No stroke	44.7	.39	53.2	.46
Stroke	42.7		51.1	
No chronic lung disease	45.6	.047	53.2	.51
Chronic lung disease	42.4		51.6	
No diabetes	45.5	.005	53.6	.11
Diabetes	39.7		50.5	
No depression	46.0	.001	54.0	.009
Depression	40.2		48.6	

*Pearson's χ^2 test.

†Only patients with lung cancer were enrolled in Iowa, and only patients with colorectal cancer were enrolled in North Carolina.

colorectal cancer reported somewhat worse experiences with coordination and responsiveness of care, and they were also less likely than white patients to rate their cancer care as excellent. Ratings of quality of care were also significantly worse among lower income patients with colorectal cancer. These findings also merit further exploration to understand why these patients viewed their care less favorably.

Among Asian/Pacific Islander patients, those who spoke English reported moderately worse experiences with interpersonal care for lung cancer and were less likely to rate their care as excellent relative to white patients for both cancers. Those who spoke Chinese reported much worse experiences with all domains of interpersonal care for both cancers, and they were much less likely to rate their care as excellent. These suboptimal experiences and ratings of care among Asian/Pacific Islander patients, particularly Chinese-speaking patients, are consistent with prior surveys assessing Asian patients' views of primary and specialty care.^{23,24} For patients with limited English proficiency, language-concordant clinicians or well-qualified interpreters promote better interpersonal care and greater satisfaction.^{25,26} Systems to improve the coordination of care may also reduce racial, ethnic, and socioeconomic disparities in the quality of cancer care.²⁷

We focused on lung cancer and colorectal cancer as the two leading causes of cancer mortality in the United States with different rates of progression. For lung cancer, the inclusion of surrogate respondents was especially important because this cancer causes substantial early morbidity and mortality. Significantly worse ratings of care by surrogates of deceased patients may represent truly worse care or the effect of negative outcomes on the surrogates' perceptions of the quality of care.

For both lung and colorectal cancer, significantly worse adjusted experiences with interpersonal care were reported for patients with worse health status or who had died soon after diagnosis. More focused assessments of care among patients with advanced cancer or poor health status and their families may illuminate ways to improve care for these patients. Significantly higher adjusted scores on all three scales of interpersonal experiences with care were evident among

Table 5. Adjusted Odds Ratios for Excellent Care Ratings by Patient Demographics and Clinical Characteristics

Demographic or Clinical Characteristic	Lung Cancer		Colorectal Cancer	
	Adjusted Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
Type of survey (surrogate of living patient v patient)	0.81	0.64 to 1.01	0.89	0.70 to 1.12
Patient age, years (v ≥ 75 years)				
21-54	0.73*	0.57 to 0.93*	1.38*	1.10 to 1.73*
55-64	1.06	0.88 to 1.28	1.27*	1.02 to 1.58*
65-74	1.11	0.94 to 1.32	1.20	0.98 to 1.46
Patient sex (female v male)	1.05	0.90 to 1.22	0.94	0.80 to 1.10
Race/ethnicity/language (v white)				
Black	0.59*	0.47 to 0.74*	0.66*	0.54 to 0.82*
Hispanic/English speaking	0.78	0.55 to 1.11	0.68*	0.50 to 0.94*
Hispanic/Spanish speaking	1.26	0.72 to 2.21	0.74	0.47 to 1.16
Asian/Pacific Islander/ English speaking	0.49*	0.33 to 0.73*	0.60*	0.42 to 0.86*
Asian/Chinese speaking	0.07*	0.02 to 0.24*	0.07*	0.03 to 0.18*
Other	0.76	0.56 to 1.04	0.77	0.55 to 1.09
Education (v college graduate)				
Not a high school graduate	0.99	0.77 to 1.29	0.82	0.65 to 1.04
High school graduate	0.92	0.76 to 1.12	1.06	0.90 to 1.26
Income (v ≥ \$60,000)				
< \$20,000	0.82	0.64 to 1.07	0.78	0.59 to 1.01
\$20,000-\$39,999	0.84	0.67 to 1.06	0.74*	0.60 to 0.92*
\$40,000-\$59,999	0.93	0.73 to 1.19	0.71*	0.56 to 0.92*
Marital status (married v unmarried)	1.10	0.94 to 1.29	1.13	0.95 to 1.33
Cancer stage (v stage I)				
II	1.18	0.90 to 1.54	1.05	0.86 to 1.28
III	1.22	1.01 to 1.47	1.11	0.91 to 1.35
IV	1.20	0.99 to 1.44	1.06	0.84 to 1.34
Study site (v Cancer Research Network)				
Northern California	0.88	0.69 to 1.12	1.03	0.80 to 1.32
Alabama	1.08	0.82 to 1.42	0.94	0.71 to 1.24
Los Angeles County	0.87	0.69 to 1.11	0.77*	0.60 to 1.00*
Iowa†	0.94	0.75 to 1.19	—	—
North Carolina†	—	—	1.45*	1.12 to 1.87*
Veterans hospitals	1.22	0.92 to 1.63	0.92	0.66 to 1.27
Overall health status (v excellent)				
Very good	0.40*	0.27 to 0.57*	0.30*	0.23 to 0.39*
Good	0.26*	0.18 to 0.37*	0.18*	0.14 to 0.24*
Fair	0.19*	0.13 to 0.28*	0.14*	0.11 to 0.19*
Poor	0.17*	0.11 to 0.25*	0.10*	0.06 to 0.15*
Deceased	0.09*	0.06 to 0.13*	0.09*	0.06 to 0.13*
Comorbid conditions (v absence of condition)				
Myocardial infarction	1.01	0.83 to 1.22	1.07	0.83 to 1.37
Congestive heart failure	1.13	0.88 to 1.44	0.95	0.70 to 1.29
Stroke	1.07	0.86 to 1.33	1.21	0.94 to 1.56
Chronic lung disease	0.98	0.85 to 1.13	1.14	0.92 to 1.41
Diabetes	0.89	0.74 to 1.07	1.24*	1.04 to 1.49*
Depression	0.84*	0.72 to 0.99*	0.90	0.75 to 1.07

NOTE. Logistic regression was used to adjust for all listed variables.

*Statistically significant variables ($P < .05$).

†Only patients with lung cancer were enrolled in Iowa, and only patients with colorectal cancer were enrolled in North Carolina.

patients who received chemotherapy, suggesting that interpersonal care is better for patients who have more frequent contact with their cancer care providers during the initial months after diagnosis.

Important strengths of our study included the racial and ethnic diversity of our cohort and the use of translated survey instruments and bilingual interviewers to enroll Spanish-speaking and Chinese-speaking patients. In addition, our cohort reflected experiences with care in multiple geographic regions and health care systems, and we

interviewed patients or their surrogates within just a few months after diagnosis. Our study also had some limitations. First, we did not directly observe the interpersonal care experienced by patients. Second, because we did not simultaneously interview patients and their surrogates about the patients' experiences, we could not assess whether surrogates' ratings of care were consistent with ratings that patients would have provided. Third, our measures of patients' experiences and ratings of care may have been limited by ceiling effects for

approximately one half of our cohort who reported the highest possible responses on these measures.

Our study has important implications for clinical practice and health policy. Patients' experiences with the coordination and responsiveness of cancer care are closely related to their perceptions of the overall quality of care.^{8,28} Standardized assessments of patients' experiences with their cancer care may promote better patient-centered care as they live with cancer or recover from treatment.²⁹ Stratifying these assessments by patients' race, ethnicity, language, and health status may also help to identify disparities in these domains.³⁰ Future research should assess how the quality of patient-centered care is related to clinical measures such as the completeness of cancer staging and the use of appropriate curative and palliative therapies.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The author(s) indicated no potential conflicts of interest.

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