

Ethnic Differences in Satisfaction and Quality of Life in Veterans with Ischemic Heart Disease

Andrea Ohldin, MD, MS, MSHA; Bessie Young, MD, MPH; Ann Derleth, MSPH; Mary McDonnell, MS; Paula Diehr, PhD; Catarina Kiefe, PhD, MD; and Stephan Fihn, MD, MPH
Birmingham, Alabama and Seattle, Washington

Objective: To assess differences in self-reported health status and satisfaction between African-American and caucasian veterans with ischemic heart disease (IHD).

Data Sources/Study Setting: African-American and caucasian patients enrolled in General Internal Medicine clinics at six Veteran Affairs Medical Centers.

Study Design: We conducted a cross-sectional analysis of baseline survey data from the Ambulatory Care Quality Improvement Project (ACQUIP). Patients who responded to an initial health-screening questionnaire were sent follow-up surveys, which included the Medical Outcomes Study 36-item Health Survey (SF-36), the Seattle Outpatient Satisfaction Questionnaire (SOSQ), and the Seattle Angina Questionnaire (SAQ).

Principal Findings: Of the 44,965 patients approached, 27,977 (62%) returned the baseline survey, of which 10,385 patients reported IHD and were sent the SAQ. Of those, 7,985 patients (84% caucasian, 16% African-American) responded. Caucasian respondents tended to be older, married, nonsmokers, with annual incomes over \$10,000, and had higher educational attainment than African Americans. African-American patients reported significantly fewer cardiac procedures (33% vs. 52%, $p < 0.001$) but were more likely to have diabetes (37% vs. 28%, $p < 0.001$) and hypertension (81% vs. 68%, $p < 0.001$). After adjustment for demographic characteristics, comorbid conditions, clinic site, and site-ethnicity interactions, SF-36 scores for physical function, role physical, bodily pain, and vitality were greater for African Americans than caucasians, while adjusted scores were significantly lower for role emotional. However, because of the site-ethnicity interaction, scores varied significantly by site. For the SAQ, overall adjusted physi-

cal function summary scores and disease stability scores were significantly greater for African Americans than caucasians. Adjusted summary satisfaction scores for provider satisfaction were not significantly lower for African Americans overall but were significant at two of six sites. Similarly, on the SAQ, adjusted treatment satisfaction scores were significantly lower for African Americans at half of the sites and minimally but not clinically significant overall.

Conclusions: Despite a higher prevalence of cardiac risk factors, African-American patients with CAD who were treated in the VA system appeared to have a greater level of physical functioning, vitality, and angina stability. After adjustment for confounding demographic variables, however, these differences were not consistently significant at all geographic locations. This suggests that many other sociodemographic variables, in addition to ethnicity, influence apparent discrepancies in quality of life, satisfaction, and angina.

Key words: quality of life ■ health status ■ race ■ ethnicity ■ cardiovascular disease ■ satisfaction ■ disparities

INTRODUCTION

In several settings, African Americans appear to receive less intense management of ischemic heart disease compared with Caucasians.¹⁻⁵ Explanations of this disparity based on clinical risk factors, socioeconomic factors, geographic location, geographic complexity, health insurance status, and multifactorial provider/patient preferences have been explored.⁶⁻¹² Because health services are available to eligible veterans irrespective of whether they have health insurance, it would be expected that disparities related to socioeconomic factors would be less apparent in the Department of Veteran Affairs (VA) medical system compared with medical systems in which premiums, copayments, or deductibles are required. However, even after adjusting for health insurance, ethnic variations have been observed among veterans who utilize VA health services.^{13,14} Despite these observed ethnic differences, overall mortality following admission to a VA

© 2004. From Birmingham Veterans Affairs Medical Center (Ohldin, Kiefe); Department of Preventive Medicine, University of Alabama, Birmingham, AL (Ohldin, Kiefe); Health Services Research and Development Center of Excellence, Veterans Affairs Puget Sound Health Care System, Seattle, WA (Young, Derleth, McDonnell, Diehr, Fihn); Department of Medicine, University of Washington, Seattle, WA (Young, Fihn); and Department of Biostatistics, University of Washington, Seattle, WA (Diehr). Send correspondence and reprint requests for *J Natl Med Assoc.* 2004;96:799-808 to: Bessie Young, Health Services Research and Development (152-E), VA Puget Sound Health Care System, 1660 S. Columbian Way, Seattle, WA 98108; phone: (206) 277-3586; fax: (206) 764-2563; e-mail: youngb@u.washington.edu

facility is similar for African-American and Caucasian patients, including those admitted for cardiovascular problems.¹⁵

Although differences in the receipt of clinical services have been reported, little information is available about ethnic group disparities in patients' self-reported health and their satisfaction with healthcare. Using data that were collected as part of a larger study to evaluate an intervention intended to improve self-reported health status and satisfaction with care, we sought to determine whether there were ethnic differences among patients with ischemic heart disease with respect to general and condition-specific health status and satisfaction.

METHODS

Design

We performed a cross-sectional analysis of baseline data collected as part of the Ambulatory Care Quality Improvement Project (ACQUIP).¹⁶ ACQUIP was a multicenter, group-randomized trial designed to determine whether health outcomes and satisfaction with care could be improved by giving primary care providers access to regular, systematic assessments of their patients' health and functional status, combined with routine clinical data and information regarding practice guidelines.

Setting

ACQUIP was conducted in the General Internal Medicine (GIM) clinics at seven Department of Veterans Affairs (VA) medical centers throughout the United States. Participating facilities were: White River Junction, VT; Birmingham, AL; Little Rock, AR; Richmond, VA; San Francisco and West Los Angeles, CA; and Seattle, WA. We excluded White River Junction from these analyses because the number of African Americans with ischemic heart disease (IHD) who sought care there was small.

Subjects

Patients who were enrolled in the GIM clinic at each facility between February 1997 and July 1999 were identified using the VA's computerized medical information system, the Veterans Health Information Systems and Technology Architecture (VistA) database. Eligible participants included all patients who were assigned to a primary care provider between February 1997 and July 1999 and who made at least one visit during the prior year. VA employees and patients without a valid mailing address were ineligible.

Each subject was mailed an initial health-screening questionnaire with a postage-paid return envelope, followed by a reminder postcard and repeat

mailing to nonrespondents.

The self-administered screening questionnaire asked the patient to indicate whether a doctor or nurse had ever reported that he/she had any major chronic medical conditions.

Also included on the health-screening questionnaire were questions about sociodemographic characteristics, including marital status, ethnicity, sex, education, working status, income, and whether medical care was received outside the VA.

The Medical Outcomes Study 36-Item Health Survey (SF-36),¹⁷ an outpatient satisfaction questionnaire and relevant condition-specific health status questionnaires were mailed to each subject after receipt of their screening questionnaire. Questionnaires received through June 30, 2000 were included in the analyses. Analyses presented in this paper focus on 7,985 African-American and Caucasian veterans who reported ischemic heart disease and returned the Seattle Angina Questionnaire (SAQ).¹⁸

Measures

The SF-36 was used as the general measure of health-related quality of life.¹⁹ The SF-36 consists of eight domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. For each domain, a raw score is computed and transformed to a scale of 0 (worst) to 100 (best).¹⁹ We also computed the physical and mental component summary scores (PCS and MCS, respectively) as overall measures of physical and mental function, respectively. The PCS and MCS are normalized to a population mean of 50 with a range of 0–100 and a standard deviation of 10.²⁰

Subjects who reported having ischemic heart disease were mailed the SAQ, a condition-specific measure for which reliability, validity, and responsiveness have been demonstrated.¹⁸ Ischemic heart disease was defined as self-reported angina, history of myocardial infarction, coronary artery disease, or a coronary artery revascularization procedure (i.e., bypass grafting or angioplasty) on the screening questionnaire. In the veteran population, this definition has been shown to be 97% sensitive and 93% specific for IHD.²¹ The SAQ consists of 19 items that quantify five clinically relevant domains of ischemic heart disease: physical function, anginal frequency, anginal stability, disease perception, and satisfaction with care. Each domain produces a raw score that is transformed to a scale of 0 (worst) to 100 (best).¹⁸

In addition, the Seattle Outpatient Satisfaction Questionnaire (SOSQ) was sent to respondents of the screening questionnaire. The SOSQ consists of 21 items measuring two domains of satisfaction. Twelve items comprise the humanistic scale, which measures the interpersonal skills of the provider and

is derived from the American Board of Internal Medicine's Patient Satisfaction Questionnaire.²² The other nine items comprise the organizational scale and pertain to the system of care, for example, waiting time, ease of making appointments or refilling prescriptions, and overall quality of care and services. The organizational scale was adapted from the RAND Patient Satisfaction Questionnaire. For our study, both domains are scored from 0 (least satisfied) to 100 (most satisfied).

Statistical Methods

To identify potential response bias, we compared respondents to the screening questionnaire to nonrespondents with regard to age and ethnicity, using t-tests on the mean age, and Chi-square tests on the ethnicity categories. Because of the small number of other ethnic group respondents, we subsequently restricted analyses to African Americans and Caucasians, and compared respondents to the SAQ to nonrespondents with regard to age, ethnicity, sociodemographic characteristics, and self-reported chronic conditions on the screening questionnaire. Chi-square tests were used for the categorical variables and independent t-tests (two tailed) for continuous variables.

We further restricted the study sample to those with angina that had returned the SAQ. We computed unadjusted mean scores for each domain of the SF-36, the SAQ, and the SOSQ, and tested for significance of the difference in mean scores between African Americans and Caucasians using independent t-tests (Table 2).

Because differences in health status and satisfaction measures might have been confounded by patient characteristics, we created linear regression models using statistical software packages SPSS²³ and STATA.²⁴ Site, sociodemographic factors, and comorbid illnesses were each entered as blocks into the models based on *a priori* specification. Significance of the effects was assessed using t-tests for individual variables and partial F tests for blocks of like variables. Sociodemographic factors included age, age-squared, education (specified as high school degree or higher), marital status (specified as single or not), employment (currently working or not), income (under \$10,000/year or not), and whether or not the patient received medical care outside of the VA.

Comorbid conditions were entered as the total number of additional conditions reported on the screening questionnaire with a possible range of 0–21. To assess whether the effect of ethnicity depended on the value of another covariate, we added interaction terms between ethnicity and the covariate into specific regression models. We tested

for two interactions: 1) ethnicity and site and 2) ethnicity and depression. We then used the final regression model to examine differences between African-American and Caucasian respondents in adjusted mean scores for the domains of each survey.

Results

At enrollment into ACQUIP, the health-screening questionnaire was sent to 55,222 patients, of whom 32,149 were Caucasian and 12,816 were African-American. A total of 31,360 were returned, including 10,385 Caucasian and African-American patients, who reported ischemic heart disease and were sent the SAQ. Responses were received from 7,985 of these patients, of whom 6,704 (84.0%) were Caucasian and 1,281 (16.0%) were African-American (Figure 1). The percentage of African-American respondents at sites A, B, C, D, E, and F was 18% (of 1,377), 10% (of 2,429), 27% (of 1,289), 17% (of 548), 7% (of 1,715) and 37% (of 627), respectively.

Characteristics of Respondents and Nonrespondents

Compared with patients who did not respond to the SAQ questionnaire (Table 1), respondents were more likely to be older, married, to have an income greater than \$10,000, and were more likely to have answered the questionnaire themselves. Respondents were also more likely to report having undergone coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) and to have hypertension. Respondents reported lower current smoking and had lower CAGE scores, which is indicative of increased risk for alcohol abuse and dependence. Respondents were similar to nonrespondents with regard to educational level, receipt of healthcare outside of the VA, prevalence of self-reported diabetes, and depression.

Among respondents, African Americans were significantly more likely to be younger, single, current smokers, and to have lower educational attainment than Caucasians. African-American patients also reported fewer past cardiac procedures (32.5% vs. 52.0%, $p < 0.001$) and less medical care outside of the VA than Caucasians (31.2% vs. 40%, $p < 0.001$), but more comorbid conditions, such as diabetes mellitus (37.0% vs. 28.4%, $p < 0.001$) and hypertension (81.0% vs. 68.1%, $p < 0.001$).

Ethnic Differences in Health Status

Between African Americans and Caucasians, unadjusted scores of several domains of the SF-36 differed significantly for veterans with IHD (Table 2). Mean scores for physical function, role physical, and vitality domains were higher for African Ameri-

Table 1. Characteristics of Respondents and Nonrespondents

Participant Characteristics	Total		p-value	Respondents N=6,704
	Respondents N=7,985	Nonrespondents N=2,400		
Age, years (mean, SD)	65.9 ± 10.1	63.2 ± 11.8	<0.001	66.3 ± 9.8
Males (%)	98.4	97.9	0.11	98.3
CABG or PCI (%)	49.0	41.9	<0.001	52.0
Reported conditions (n)	5.4 ± 2.5	5.6 ± 2.7	0.01	5.4 ± 2.4
Number of target comorbidities* (n)	2.0 ± 1.1	2.0 ± 1.1	0.03	2.0 ± 1.1
Diabetes (%)	29.7	28.3	0.18	28.4
Hypertension (%)	70.2	64.9	<0.001	68.1
Depression (%)	41.6	43.1	0.19	41.7
CAGE (mean, SD)	1.06 ± 1.4	1.18 ± 1.5	<0.001	1.00 ± 1.4
Current smoker (%)	23.8	32.1	<0.001	23.0
Non-VA healthcare (%)	38.6	37.5	0.32	40.0
Income below \$10,000	27.5	34.7	<0.001	24.9
High-school graduate or greater (%)	67.6	67.3	0.76	68.7
Single (%)	35.4	45.4	<0.001	32.7
Unemployed (%)	14.2	16.0	0.03	14.4
Survey completed by proxy other than veteran	6.7	13.3	<0.001	5.6

* Target comorbid conditions include: diabetes, hypertension, chronic obstructive lung disease, alcohol abuse, and n = number, sd = standard deviation, CABG = coronary artery bypass graft, PCI = percutaneous coronary intervention,

cans. Scores for the role emotional and mental function domains were lower. Consistent with these findings, African Americans also had higher mean PCS and lower MCS scores. However, after adjustment for age, education, marital status, employment, income, comorbid conditions, smoking, site, and baseline IHD, African Americans maintained higher scores for physical function, role physical, bodily pain, general health, and vitality but had lower scores for role emotional.

A significant interaction occurred between ethnicity and site, such that the degree of ethnic difference in health status varied greatly according to geographic location (site), which necessitated that those results be reported separately by site (Table 3). Table 3 presents the difference in mean scores between African Americans and Caucasians overall and stratified by site. For each site, the first column (model 1) is the difference of the means based on a regression model, including site, ethnicity, and a site/ethnicity interaction term. The second column (model 2) represents the first model with the addition of the following sociodemographic and disease specific variables: age, education, marital status, employment, income, access to non-VA care, comorbidities, CABG or PCI, and smoking status. A positive difference indicated that African Americans had a higher

mean adjusted score, while a negative difference indicated that African Americans had a lower mean adjusted score than Caucasians.

For example, after adjusting the model for multiple sociodemographic variables, the overall difference in SF-36 Physical Function scores between African Americans and Caucasians was significant. However, differences by site ranged from -5.42 points at site D to +6.43 points at site A, but were significant for three of the six sites (A [6.43], B [5.45], C [5.78]). Similarly, these three sites showed significantly higher scores for African Americans on the PCS (A [2.76], B [2.55], C [3.64]). These three sites are located in the east/southeast area of the country. In contrast, for one west coast site, PCS scores were significantly lower (D [-2.76]). For all six sites, mean differences in adjusted SF-36 Vitality scores ranged from 3.1 to 12.9, also favoring African Americans. This difference was significant for five of the six sites (A, B, C, E, F). For all sites combined, the adjusted difference between African-American and Caucasian Vitality scores was significantly different (Table 3).

The SF-36 MCS was significantly higher for African Americans at only one of the six sites (C [1.86]) and significantly lower at one site (B [-1.93]). These differences, however, were less than two points

to the Seattle Angina Questionnaire (SAQ) by Ethnicity

Caucasian		p-value	African-American			
Nonrespondents N=1,801	Respondents N=1,281		Nonrespondents N=599	p-value		
63.9 ± 11.4		<0.001	64.0 ± 11.4		61.2 ± 12.8	<0.001
97.9		0.23	98.6		97.8	0.23
46.0		<0.001	32.5		28.9	0.14
5.5 ± 2.5		0.13	5.8 ±		5.9 ± 3.1	<0.001
1.9 ± 1.1		<0.001	2.3 ±		2.2 ± 1.1	0.25
26.8		0.19	37.0		32.9	0.08
60.6		<0.001	81.0		77.8	0.11
42.1		0.73	40.7		45.7	0.04
1.09 ± 1.4		0.02	1.38 ± 1.5		1.45 ± 1.5	0.41
31.3		<0.001	27.4		34.3	<0.001
40.3		0.83	31.2		28.7	0.29
30.7		<0.001	41.0		46.4	0.03
67.8		0.45	61.7		65.7	0.09
42.3		<0.001	49.3		54.6	0.03
16.0		0.10	12.9		16.0	0.07
11.4		<0.001	12.4		19.2	<0.001

depression. Definitions: CABG=coronary artery bypass graft, PCI=percutaneous coronary intervention. Definitions: CAGE=, VA= Veterans Affairs.

and may not be of clinical relevance. African Americans did score consistently lower on the SF-36 Role Emotional scale at all six sites, significantly so at four sites (A, B, E, F); mean adjusted differences ranged from -11.4 to -6.2. The mean adjusted difference between African Americans and Caucasians for all sites combined remained significant at -6.6.

Table 3 also reveals other significant differences in adjusted SF-36 domain scores across sites. Except for the Role Emotional scale, African Americans tended to have higher differences in scores on most of the other domains at the eastern/southeastern sites (A, B, C), most of which were significant for sites A and C. Within the western sites (D, E, F), most differences were not significant, except for the Vitality and Role Emotional domains. For all sites combined, mean adjusted differences between African Americans and Caucasians remained significant for physical function, role physical, bodily pain, and general health but not for social function or mental function.

In addition to general measures of health, disease-specific measures of quality of life were evaluated. With regard to SAQ scores, the disease-specific measure of quality of life for cardiovascular disease, summary scores indicated that African Americans had greater angina stability, reported less problems with angina frequency, and reported sig-

nificantly better physical functioning, although scores may not have been clinically significant.¹⁸ However, taking into account the significant site-ethnicity interaction, African Americans had significantly lower adjusted Disease Perception scores at sites D (-6.42) and E (-5.26) but not for the combined sites. Adjusted differences in SAQ Physical Function scores were significantly higher for African Americans at sites A (6.34) and C (6.58).

Ethnic Differences in Satisfaction

For the unadjusted SOSQ scores, African Americans reported lower satisfaction with their providers (66.0 vs. 71.8, $p<0.05$) and lower satisfaction with organizational aspects of their care (58.6 vs. 61.5, $p<0.05$) compared with Caucasians. Summary scores were not significantly different between African Americans and Caucasians after adjustment for sociodemographic variables. However, after adjustment for sociodemographic variables and ethnicity-site interactions, scores were significantly lower for only two of the six sites (D [-7.09] and F [-6.31]), both of which were located on the west coast. African Americans had lower mean adjusted scores for the organizational scale at only one of the six sites (D [-6.73]), but adjusted results from all sites combined were not statistically significant. Satisfac-

Table 2. Mean Unadjusted Scores for the SAQ, SF-36, and SOSQ

Questionnaire Domain		Caucasian (mean ± SD)	African-American (mean ± SD)	
SAQ	Stability	56.2 ± 27.6	57.6 ± 30.6	
	Disease Perception`	63.0 ± 25.7	58.5 ± 27.6	*
	Angina Frequency	76.5 ± 24.4	76.0 ± 24.9	
	Satisfaction	83.0 ± 21.1	77.6 ± 25.3	*
	Physical Functioning	50.8 ± 26.4	51.9 ± 26.1	
SF-36	SF-PCS (Physical Component)	30.6 ± 10.7	32.3 ± 10.1	*
	SF-MCS (Mental Component)	44.6 ± 13.2	43.1 ± 12.9	*
	Physical Function	40.0 ± 27.6	42.2 ± 27.6	*
	Role Physical	22.8 ± 35.4	26.8 ± 38.4	*
	Bodily Pain	46.5 ± 26.7	47.8 ± 28.1	
	General Health	38.0 ± 22.3	37.5 ± 21.0	
	Vitality	34.2 ± 23.1	41.0 ± 22.6	*
	Social Function	55.5 ± 30.5	54.5 ± 30.0	
	Role Emotional	51.0 ± 44.4	41.6 ± 43.5	*
	Mental Function	63.2 ± 24.4	61.4 ± 23.9	*
SOSQ	Humanistic	71.8 ± 24.5	66.0 ± 25.1	*
	Organizational	61.5 ± 23.9	58.6 ± 23.7	*

* = significant, p<0.05. Definitions: SD = standard deviation, SAQ = Seattle Angina Questionnaire, SOSQ = Seattle Outpatient Satisfaction Questionnaire, PCS = Physical Component Score, MCS = Mental Component Score

Table 3. Difference in Mean Scores between African Americans and

	Site A		Site B		Site C	
	Site	Site, SES Comorb	Site	Site, SES Comorb	Site	Site, SES Comorb
<i>Seattle Angina Questionnaire (n)</i>						
Stability (7,205)	3.4	5.7	-3.1	0.8	7.2	9.6
Disease Perception (7,320)	-2.7	-0.1	-6.7	-0.2	-0.2	3.2
Angina Frequency (7,628)	0.72	2.7	-2.3	1.2	2.7	4.3
Satisfaction (7,235)	-5.8	-3.7	-8.9	-4.4	-2.1	0.4
Physical Functioning (6,968)	4.4	6.3	-0.9	2.4	3.8	6.6
<i>SF-36 Summary Scores (n)</i>						
Physical (SF-PCS) (7,347)	2.6	2.8	1.9	2.6	2.4	3.6
Mental (SF-MCS) (7,346)	-1.3	0.3	-4.3	-1.9	1.4	1.9
<i>SF-36 Domains (n)</i>						
Physical Function (7,810)	5.5	6.4	3.0	5.5	3.0	5.8
Role Physical (7,655)	5.8	5.5	2.7	3.8	8.5	10.8
Bodily Pain (7,808)	0.9	2.7	-1.1	2.9	6.2	9.1
General Health (7,790)	0.5	3.7	-2.3	1.3	5.1	7.1
Vitality (7,828)	7.6	10.3	4.7	8.3	10.9	12.9
Social Function (7,899)	1.1	4.3	-5.0	-0.7	1.9	4.5
Role Emotional (7,550)	-8.3	-6.2	-14.5	-9.8	-2.0	-0.8
Mental Function (7,791)	-2.4	1.4	-6.4	-1.1	3.8	4.7
<i>Seattle Outpatient Satisfaction Questionnaire</i>						
Humanistic (7,759)	-1.1	0.7	-4.2	-1.9	-1.9	-0.1
Organizational (7,681)	-0.3	0.4	-0.7	-0.4	1.2	1.9

Based on ordinary linear regression on the respective domain with regression; a) site and ethnicity and site*ethnicity; b) completed the form, presence of depression, number of comorbid conditions, CABG or PTCA, and whether the patient score, MCS = Mental Component Score; **Bold** indicates P<0.05; † Since there was a significant interaction with ethnicity

tion specifically with angina treatment (SAQ satisfaction scale) was lower for African Americans at five of six sites with differences ranging from -4.37 points to -2.08 points, but results were only significant for three (sites A, B, and F) (Table 3).

DISCUSSION

Numerous published reports have documented ethnic differences in the receipt and outcomes of care between African-American and Caucasian patients in a variety of settings. Many of these studies have been based upon administrative data relating to hospitalization. This analysis represents one of the few attempts to investigate the existence of such differences in the primary care setting using data collected directly from patients. We found that African Americans with ischemic heart disease had higher levels of self-reported risk factors for ischemic heart disease, such as smoking, diabetes and hypertension but reported having received fewer cardiac procedures. Surprisingly, however, African Americans reported better physical function, vitality, and angina stability than Caucasians—a difference that persisted after adjustment for socioeco-

nomics covariates and stratification by site. We also observed lower scores on the mental health scales of the SF-36 among African Americans compared with Caucasians, but these differences did not persist consistently across sites after adjustment. Notably, African Americans reported significantly lower satisfaction with the care for their IHD compared to Caucasian patients, and these differences persisted at half of our sites after adjustment.

Although many studies have evaluated health-related quality of life in veteran patients,^{16,25-29} few studies have examined ethnic differences. In a longitudinal study conducted in the general veteran population, Kazis and colleagues found that, taken together, the covariates ethnicity, age, marital status, education, and income accounted for only 4% of the variability of the PCS and 10% of the variability of the MCS. The population studied, however, was 92% Caucasian.²⁷ In our study, African-American veterans represented 16% of the study sample. Of interest, mean and predicted values for both African Americans and Caucasians were substantially lower than those values reported from both a general VA population,²⁷ and a national sample of patients with a

Caucasians, Adjusted for Site, Socioeconomic Status, and Comorbid Conditions

Site D		Site E		Site F		All Sites†	
Site	Site, SES Comorb	Site	Site, SES Comorb	Site	Site, SES Comorb	SES Comorb	SES, Site Comorb
0.6	4.8	-4.5	-0.6	-7.3	-2.1	4.5	3.9
-11.0	-6.4	-7.2	-5.3	-10.3	-4.0	-0.8	-0.8
-4.7	-0.4	-2.1	1.8	-7.2	-2.0	2.2	1.8
-5.6	-2.1	-4.0	-3.1	-7.6	-3.8	-2.7	-2.6
-2.3	-1.0	-1.7	2.1	-8.3	-1.2	3.9	3.5
-2.8	-2.8	0.5	1.4	-1.7	0.2	2.4	2.0
-0.4	0.9	-2.5	-0.1	-5.3	-0.6	0.1	0.1
-6.2	-5.4	1.0	4.3	-7.7	-2.4	4.2	3.6
-5.0	-4.7	-1.8	1.1	-8.4	-1.1	5.4	4.4
-4.8	-4.5	-1.1	-0.1	-7.7	0.2	4.1	3.3
-9.1	-6.8	-5.2	-1.3	-8.3	-1.6	2.5	2.1
0.4	3.1	5.0	9.3	-3.2	3.6	9.6	9.0
-1.5	-1.3	-1.7	1.5	-10.1	-0.9	1.9	1.8
-8.1	-5.3	-15.5	-10.0	-21.8	-11.4	-6.5	-6.6
-2.0	0.5	-3.0	1.3	-9.1	-0.2	1.5	1.4
-9.7	-7.1	-6.3	-4.0	-7.2	-6.3	-4.2	-2.1
-8.5	-6.7	-3.5	-2.0	-3.4	-3.0	-2.2	-0.6

site, race, site*ethnicity, age, education, marital status, employment, income, access to care outside of the VA, who is a current smoker. Definitions: comorb = comorbid conditions, SES = socioeconomic status, PCS = physical component and site, the final results are those stratified by site. The data from all sites combined are presented for comparisons.

history of myocardial infarction studied as part of the Medical Outcomes Study,³⁰ which reflects the high level of chronic illness among patients who receive primary care from VA facilities.

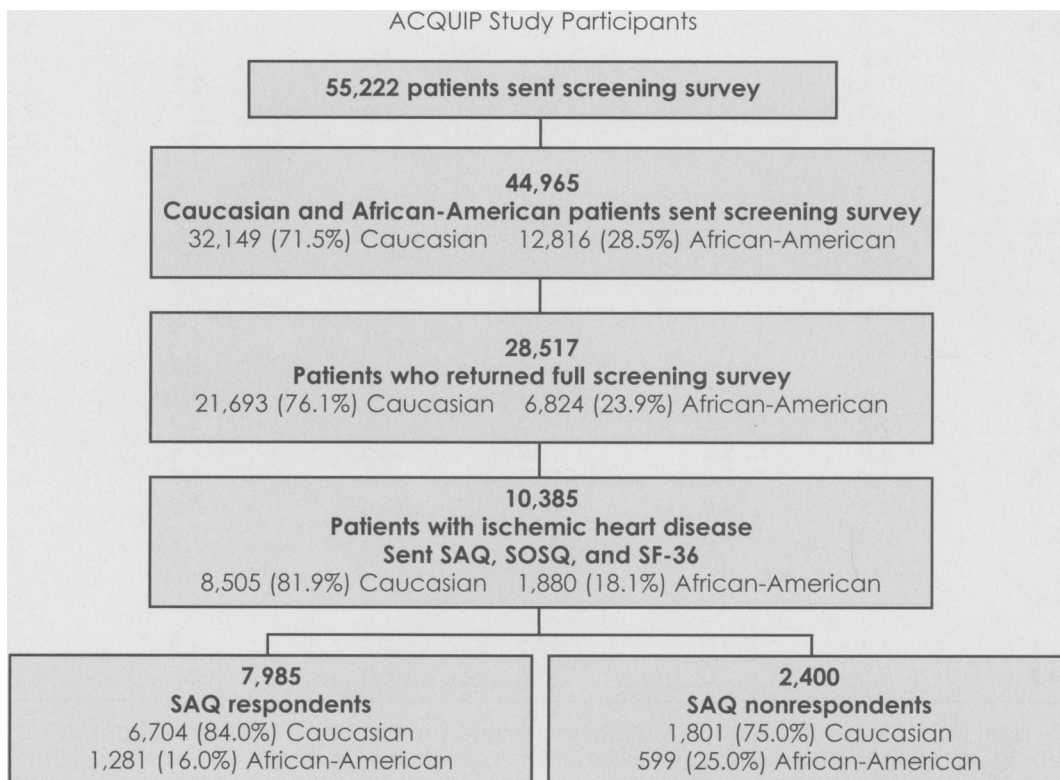
Consistent with results from other population-based studies, the current study also found significant regional variation in results. Lee and colleagues found medical care treatment for Medicare recipients varied significantly by ethnicity and by geographic location; African-American-Caucasian disparities were largest in southern states.³¹ In contrast, Weitzman and colleagues found lower rates of invasive procedures among African Americans, but there was no significant variation by geographic location.¹² In addition, using ACQUIP study data, Au and colleagues reported statistically significant though small regional variations in health status.¹⁶ In the present study, African-American-Caucasian disparities in quality of life appeared more consistently in eastern/southeastern states compared with northwestern and western states. This result may represent limited statistical power rather than an absence of true differences given that there were relatively fewer African-American patients at sites outside of the east/southeast.

Our results concerning condition-specific quality of life in patients with cardiovascular disease were at variance with those found in the literature. Bosworth

and colleagues³² evaluated quality of life in patients with documented ischemic heart disease and found that crude and adjusted scores for health-related quality of life among African Americans were significantly higher for general health, social function, mental health and vitality compared with Caucasians.³² Reporting on ethnic differences in health-related attitudes toward cardiovascular procedures in patients with IHD, Kressen and colleagues found no ethnic differences in perception of disease severity, patient satisfaction with the decision-making process or satisfaction with VA physicians or of care received.³³ We found that African-American patients had scores on the anginal frequency and stability scales of the SAQ that were comparable to those of Caucasian patients at most sites. They did have lower scores on the SAQ disease perception scale, but this disparity was no longer significant at four of six sites after adjustment for sociodemographic and other variables. However, because this is the first report of the use of the SAQ in a minority population, direct comparisons with other reports from minority populations are limited.

In unadjusted comparisons of the two SOSQ scales and the satisfaction scale of the SAQ, we found that African Americans demonstrated greater dissatisfaction with their healthcare when compared with Caucasians. However, after adjustment for

Figure 1. ACQUIP Study Design and Flow Chart



sociodemographic factors and comorbidity, these disparities were no longer consistently apparent across all sites. Although these results are at odds with those of some investigators who have found lower satisfaction among African-American patients compared with Caucasian patients,³⁴ the results are consistent with the findings in other studies. Among hospitalized veterans, Young et al. found that non-Caucasian veterans reported lower satisfaction for both inpatient and outpatient care than Caucasians.³⁵ In a study using the Medical Outcomes Study database, Meredith and Siu found that patient satisfaction was slightly lower among African Americans than among Caucasians.³⁶

In contrast to those findings, there are several other studies that, like ours, have demonstrated similar levels of satisfaction between African-American and Caucasian patients. For example, in a large health maintenance organization, Murray-Garcia reported that African Americans were similarly satisfied when compared with Caucasians³⁷. Taira and colleagues found that overall satisfaction, trust, interpersonal treatment, organizational access, longitudinal continuity, or comprehensive scope of care did not differ significantly between African Americans and Caucasians, in a university hospital primary care group practice.³⁸ In addition, Kressen and colleagues also showed that there was no variation in satisfaction between African Americans and Caucasians with IHD.³³ The fact that these more recent studies, along with our results, fail to demonstrate systematic differences in satisfaction between African-American and Caucasian patients may indicate that a number of other factors may modify any effect of ethnicity on satisfaction. Cooper-Patrick determined that race-concordance and a participatory style between patient and physician were associated with greater satisfaction for African Americans when compared with Caucasians.³⁹ Other studies have shown that in addition to ethnicity, age, marital status, socioeconomic status, health status, and type of health system where care is received all influence a patient's satisfaction with his or her healthcare.⁴⁰ Although limited cardiovascular disease data are available with which we can compare our data directly, our results do suggest that in a medical system where access to care is independent of ability to pay, ethnicity may not be an important determinant of satisfaction.

Our study had several strengths, one of which includes a large sample of ethnically diverse patients. The Department of Veterans Affairs is the largest integrated health system in the United States and serves a diverse patient population. Eligibility for care is largely based on factors other than ability to pay. In addition, we used two reliable, valid, and

responsive measures of health to evaluate quality of life and satisfaction in a population where quality of life has not been well-characterized.

This study, however, also had several potential limitations. First, there is the possibility of response bias. Although there were some statistically significant differences between patients who participated in the study and those who did not, most of these were relatively minor. A second limitation is that IHD and comorbid conditions were identified via a combination of self-report and information obtained from the electronic medical record. The frequency of inaccuracies based on patients' self-report was, however, apt to have been low given that our previous research has shown that our diagnostic criteria for IHD using self-report had a specificity of 93% of patients with angina²¹ and the criteria for COPD had a specificity of 98%.⁴¹ Third, our patient population was composed mainly of a sample of chronically ill, elderly men, and our findings cannot be generalized to other groups. Finally, ethnic concordance between a patient and his or her provider is significantly related to satisfaction, and we did not collect information on the ethnicity of providers.³⁹

In summary, among patients with ischemic heart disease followed in the GIM clinics of six VA medical centers, we observed ethnic differences in reported general health and quality of life. Ethnic differences in satisfaction with the provider and medical system, and disease-specific health as measured by angina perception, satisfaction with and treatment for cardiovascular disease were not sustained at all sites after adjustment and stratification by geographic site. In this large medical system where financial barriers to care are minimal, ethnic differences in satisfaction with patients' providers and their medical treatment were site-specific.

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REFERENCES

1. Schulman KA, Berlin JA, Harless W, et al. The effect of race and sex on physicians' recommendations for cardiac catheterization. *N Engl J Med.* 1999;340:618-626.
2. Peterson ED, Wright SM, Daley J, et al. Racial variation in cardiac procedure use and survival following acute myocardial infarction in the Department of Veterans Affairs. *JAMA.* 1994;271:1175-1180.
3. Peterson ED, Shaw LK, DeLong ER, et al. Racial variation in the use of coronary-revascularization procedures. Are the differences real? Do they matter? *N Engl J Med.* 1997;336:480-486.
4. Rathore SS, Berger AK, Weinfurt KP, et al. Race, sex, poverty, and the medical treatment of acute myocardial infarction in the elderly. *Circulation.* 2000;102:642-648.
5. Taylor Jr HA, Canto JG, Sanderson B, et al. Management and outcomes for black patients with acute myocardial infarction in the reperfusion era. National Registry of Myocardial Infarction 2 Investigators. *Am J Cardiol.* 1998;82:1019-1023.
6. Wilt TJ, Rubins HB, Collins D, et al. Correlates and consequences of diffuse atherosclerosis in men with coronary heart disease. Veterans Affairs High-Density Lipoprotein Intervention Trial Study Group. *Arch Intern Med.* 1996;156:1181-1188.
7. Higgins RS, Paone G, Borzak S, et al. Effect of payer status on outcomes of coronary artery bypass surgery in blacks. *Circulation.* 1998;98:44-49; discussion 49-50.
8. Diez-Roux AV, Nieto FJ, Tyroler HA, et al. Social inequalities and atherosclerosis. The atherosclerosis risk in communities study. *Am J Epidemiol.* 1995;141:960-972.
9. Schechter AD, Goldschmidt-Clermont PJ, McKee G, et al. Influence of gender, race, and education on patient preferences and receipt of cardiac catheterizations among coronary care unit patients. *Am J Cardiol.* 1996;78:996-1001.
10. Taylor AJ, Meyer GS, Morse RW, et al. Can characteristics of a health-care system mitigate ethnic bias in access to cardiovascular procedures? Experience from the Military Health Services System. *J Am Coll Cardiol.* 1997;30:901-907.
11. Blustein J, Weitzman BC. Access to hospitals with high-technology cardiac services: how is race important? *Am J Public Health.* 1995;85:345-351.
12. Weitzman S, Cooper L, Chambless L, et al. Gender, racial, and geographic differences in the performance of cardiac diagnostic and therapeutic procedures for hospitalized acute myocardial infarction in four states. *Am J Cardiol.* 1997;79:722-726.
13. Whittle J, Conigliaro J, Good CB, et al. Racial differences in the use of invasive cardiovascular procedures in the Department of Veterans Affairs medical system. *N Engl J Med.* 1993;329:621-627.
14. Mirvis DM, Graney MJ. Variations in the use of cardiac procedures in the Veterans Health Administration. *Am Heart J.* 1999;137:706-713.
15. Jha A, Shlipak M, Hosmer W, et al. Racial Differences in Mortality Among Men Hospitalized in the Veterans Affairs Health Care System. *JAMA.* 2001;285:297-303.
16. Au DH, McDonnell MB, Martin DC, et al. Regional variations in health status. *Med Care.* 2001;39:879-888.
17. Stewart AL, Hays RD, Ware JE. The MOS short-form general health survey. Reliability and validity in a patient population. *Med Care.* 1988;26:724-735.
18. Spertus JA, Winder JA, Dewhurst TA, et al. Development and evaluation of the Seattle Angina Questionnaire: a new functional status measure for coronary artery disease. *J Am Coll Cardiol.* 1995;25:333-341.
19. Ware J, Snow K, Kosinski M, et al. SF-36 Health Survey Manual and Interpretation Guide. Lincoln, RI: Quality Metric, Inc, 1993.
20. Ware J, Kosinski M. SF-36 Physical and Mental Health Summary Scales: A User's Manual. Boston, MA: Hwalth Assessment Lab, New England Medical Center, 1994.
21. Spertus JA, McDonnell M, Woodman CL, et al. Association between depression and worse disease-specific functional status in outpatients with coronary artery disease. *Am Heart J.* 2000;140:105-110.
22. Webster D. Final report on the patient satisfaction questionnaire project. Philadelphia, PA: American Board of Internal Medicine, 1989.
23. SPSS. SPSS 8.0. Chicago, IL, 1998.
24. Stata. Stata Release 6.0. College Station, TX, 1999.
25. Weinberger M, Samsa GP, Hanlon JT, et al. An evaluation of a brief health status measure in elderly veterans. *J Am Geriatr Soc.* 1991;39:691-694.
26. Weinberger M, Kirkman MS, Samsa GP, et al. The relationship between glycemic control and health-related quality of life in patients with noninsulin-dependent diabetes mellitus. *Med Care.* 1994;32:1173-1181.
27. Kazis LE, Miller DR, Clark J, et al. Health-related quality of life in patients served by the Department of Veterans Affairs: results from the Veterans Health Study. *Arch Intern Med.* 1998;158:626-632.
28. Ren XS, Kazis L, Lee A, et al. Comparing generic and disease-specific measures of physical and role functioning: results from the Veterans Health Study. *Med Care.* 1998;36:155-166.
29. Rumsfeld JS, MaWhinney S, McCarthy Jr M, et al. Health-related quality of life as a predictor of mortality following coronary artery bypass graft surgery. Participants of the Department of Veterans Affairs Cooperative Study Group on Processes, Structures, and Outcomes of Care in Cardiac Surgery. *JAMA.* 1999;281:1298-1303.
30. Stewart AL, Greenfield S, Hays RD, et al. Functional status and well-being of patients with chronic conditions. Results from the Medical Outcomes Study [published erratum appears in *JAMA.* 1989;262:2542]. *JAMA.* 1989;262:907-913.
31. Lee AJ, Gehlbach S, Hosmer, et al. Medicare treatment differences for blacks and whites. *Med Care.* 1997;35:1173-1189.
32. Bosworth HB, Siegler IC, Olsen MK, et al. Social support and quality of life in patients with coronary artery disease. *Qual Life Res.* 2000;9:829-839.
33. Kresen NR, Clark JA, Whittle J, et al. Racial Differences in Health-Related Beliefs, Attitudes, and Experiences of VA Cardiac Patients: Scale Development and Application. *Med Care.* 2002;40:72-85.
34. Hulka BS, Kupper LL, Daly MB, et al. Correlates of satisfaction and dissatisfaction with medical care: a community perspective. *Med Care.* 1975;13:648-658.
35. Young GJ, Meterko M, Desai KR. Patient satisfaction with hospital care: effects of demographic and institutional characteristics. *Med Care.* 2000;38:325-334.
36. Meredith LS, Siu AL. Variation and quality of self-report health data. Asians and Pacific Islanders compared with other ethnic groups. *Med Care.* 1995;33:1120-1131.
37. Murray-Garcia JL, Selby JV, Schmittiel J, et al. Racial and ethnic differences in a patient survey: patients' values, ratings, and reports regarding physician primary care performance in a large health maintenance organization. *Med Care.* 2000;38:300-310.
38. Taira DA, Safran DG, Seto TB, et al. Asian-American patient ratings of physician primary care performance. *J Gen Intern Med.* 1997;12:237-242.
39. Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA.* 1999;282:583-589.
40. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis [published erratum appears in *Soc Sci Med.* 1990;30(12):following 1368]. *Soc Sci Med.* 1990;30:811-818.
41. Tu SP, McDonnell MB, Spertus JA, et al. A new self-administered questionnaire to monitor health-related quality of life in patients with COPD. Ambulatory Care Quality Improvement Project (ACQUIP) Investigators. *Chest.* 1997;112:614-622. ■

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