UC Irvine

UC Irvine Previously Published Works

Title

Ethnic differences in quality of life in persons with heart failure.

Permalink

<https://escholarship.org/uc/item/5r69v4g1>

Journal

Journal of cardiac failure, 14(1)

ISSN

1071-9164

Authors

Riegel, Barbara
Moser, Debra K
Rayens, Mary Kay
et al.

Publication Date

2008-02-01

DOI

10.1016/j.cardfail.2007.09.008

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Ethnic Differences in Quality of Life in Persons With Heart Failure

BARBARA RIEGEL, DNSC, RN, FAAN,¹ DEBRA K. MOSER, DNSC, RN, FAAN,² MARY KAY RAYENS, PhD,³ BEVERLY CARLSON, MS, RN, CNS,⁴ SUSAN J. PRESSLER, DNS, RN, FAAN,⁵ MARTHA SHIVELY, PhD, RN,⁶ NANCY M. ALBERT, PhD, RN, CCNS, CCRN, CNA,⁷ ROCHELLE R. ARMOLA, MSN, RN,⁸ LORRAINE EVANGELISTA, PhD, RN,⁹ CHERYL WESTLAKE, RN, PhD, APRN-BC, PN,¹⁰ AND KRISTEN SETHARES, PhD, RN,¹¹ FOR THE HEART FAILURE TRIALISTS COLLABORATORS

Philadelphia, Pennsylvania; Lexington, Kentucky; San Diego, California; Ann Arbor, Michigan; Cleveland and Toledo, Ohio; Los Angeles and Azusa, California; Dartmouth, Massachusetts

ABSTRACT

Background: Chronic illness burdens some groups more than others. In studies of ethnic/racial groups with chronic illness, some investigators have found differences in health-related quality of life (HRQL), whereas others have not. Few such comparisons have been performed in persons with heart failure. The purpose of this study was to compare HRQL in non-Hispanic white, black, and Hispanic adults with heart failure.

Methods: Data for this longitudinal comparative study were obtained from eight sites in the Southwest, Southeast, Northwest, Northeast, and Midwest United States. Enrollment and 3- and 6-month data on 1212 patients were used in this analysis. Propensity scores were used to adjust for sociodemographic and clinical differences among the ethnic/racial groups. Health-related quality of life was measured using the Minnesota Living with Heart Failure Questionnaire.

Results: Significant ethnic/racial effects were demonstrated, with more favorable Minnesota Living with Heart Failure Questionnaire total scores post-baseline for Hispanic patients compared with both black and white patients, even after adjusting for baseline scores, age, gender, education, severity of illness, and care setting (acute vs. chronic), and estimating the treatment effect (intervention vs. usual care). The models based on the physical and emotional subscale scores were similar, with post hoc comparisons indicating more positive outcomes for Hispanic patients than non-Hispanic white patients.

Conclusion: Cultural differences in the interpretation of and response to chronic illness may explain why HRQL improves more over time in Hispanic patients with heart failure compared with white and black patients. (*J Cardiac Fail* 2008;14:41–47)

Key Words: Culture, ethnicity, heart failure, hispanic, propensity analysis, race, quality of life.

From the ¹University of Pennsylvania, School of Nursing, Philadelphia, Pennsylvania; ²University of Kentucky, College of Nursing, Lexington, Kentucky; ³University of Kentucky, Colleges of Nursing and Public Health, Lexington, Kentucky; ⁴Clinical Research Department, Sharp HealthCare, San Diego State University, San Diego, California; ⁵School of Nursing, University of Michigan, Ann Arbor, Michigan; ⁶Nursing Service for Research, VA San Diego Healthcare System, San Diego, California; ⁷Cleveland Clinic, Cleveland, Ohio; ⁸Coronary Intensive Care Unit, The Toledo Hospital, Toledo, Ohio; ⁹School of Nursing, University of California, Los Angeles, California; ¹⁰Department of Nursing, CSUF, Fullerton and Professor, School of Nursing, Azusa Pacific University, Azusa, California and ¹¹College of Nursing, University of Massachusetts Dartmouth, Dartmouth, Massachusetts.

Manuscript received June 4, 2007; revised manuscript received August 6, 2007; revised manuscript accepted September 27, 2007.

Reprint requests: Barbara Riegel, DNSC, RN, FAAN, University of Pennsylvania; School of Nursing, 420 Guardian Drive, Philadelphia, PA 19104-6096.

Funding for individual studies was obtained from the American Heart Association (0270025N Riegel), Pfizer, Inc. (Riegel), AHRQ (R03 HS09822, Pressler) the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development Service (NRI-95244 Shively), and National American Heart Association, Established Investigator Award; University of Kentucky Gill Endowment; American Association of Critical Care Nurses Philips Medical Research Award; University of Kentucky General Clinical Research Center (M01RR02602, Moser).

1071-9164/\$ - see front matter

© 2008 Elsevier Inc. All rights reserved.

doi:10.1016/j.cardfail.2007.09.008

Heart failure is common in the United States, regardless of ethnic or racial background. According to the National Health and Nutrition Examination Survey for the 1999 to 2002 period, heart failure was found in 2.5% (men) to 1.9% (women) of the non-Hispanic white population, 2.7% (men) to 1.6% (women) of the Hispanic population, and 3.1% (men) to 3.5% (women) of the non-Hispanic black population.¹ These rates increase significantly with age.

Eliminating health disparities among different ethnic/racial groups is a major goal of Healthy People 2010. Ethnicity and race refer to families, tribes, peoples, or nations belonging to the same common stock, or a class or kind of people unified by shared interests, habits, or characteristics.² The unequal burden of chronic illness has caused some ethnic/racial groups to have more symptoms, worse functional disability, and lower health-related quality of life (HRQL) than others. In studies of HRQL by ethnic/racial groups, some investigators found differences, but others did not.³⁻⁵ Because few comparisons of HRQL by ethnicity/race have been performed in persons with heart failure, the burden of heart failure experienced by various ethnic/racial group is unknown.

The purpose of this study was to compare HRQL in a sample of non-Hispanic white, non-Hispanic black, and Hispanic adults with heart failure. We hypothesized that differences in HRQL would exist among these groups on the basis of our earlier work.⁶ HRQL refers to the perception of how illness influences one's physical, emotional, and social well-being.⁷ Physical and emotional components of HRQL were compared to identify specific problematic areas or mechanisms for differences. Knowing how different ethnic/racial groups experience heart failure would help focus education and intervention content.

Materials and Methods

Data for this longitudinal comparative study were obtained from a registry of heart failure quality of life (The Heart Failure Quality of Life Trialists Collaborative) contributed to by investigators from eight sites representing the Southwest, Southeast, Northwest, Northeast, and Midwest sections of the United States. Some sites were in large urban areas, and others were in mid-sized cities. The settings where recruitment occurred represented the range of possibilities: community hospitals, tertiary care centers, a federal health care system, and outpatient clinics that were both specialty and general in focus. No one setting was overrepresented. Most participants had been enrolled during an acute hospitalization (56%), with the remaining respondents enrolled in a chronic care setting. The different recruiting sites introduced heterogeneity into the sample that was controlled by including the type of enrollment setting in the propensity score model.

Sample

Enrollment and 3- and 6-month data on 1212 patients were used in this analysis. The inclusion criteria were similar at all sites. Only patients with an established diagnosis of chronic heart failure documented in the medical record by a physician provider were

included. Patients were excluded if they had acute myocardial infarction, unstable angina, cognitive impairment, or severe psychiatric problems; were homeless; or were discharged to an extended care or skilled nursing facility. Three investigative teams formally tested cognitive function with the Mini-Mental State Examination or the Pfeiffer Short Portable Mental Status Questionnaire, and others used clinical criteria to exclude patients who were unable to complete questionnaires and participate in data collection. Subjects of Hispanic descent were enrolled primarily at the Southern California sites, 99% of whom were persons of Mexican ancestry. Ethnicity/race was self-reported in all studies. Self-identification of ethnicity and race is problematic, but it is the best method available at this time.⁸

Some studies in the registry were observational assessments of usual care. Others were studies of behavioral, nonpharmacologic interventions, such as education, counseling, and self-care monitoring. To adjust for the influence of having received an active intervention on HRQL, patients were categorized as receiving "treatment" or "usual care," and this variable was included as an adjusting factor in the longitudinal analysis.

To evaluate our logic of combining the interventions into a single "treatment" group, we assessed treatment group means and the variability in scores. As expected, the intervention subjects had greater improvement in HRQL compared with controls over the 6-month study period; the average change in HRQL between baseline and 6 months was 22.9 for the treatment group and 12.5 for controls. Although the treatment group was composed of subjects exposed to different behavioral interventions, the degree of variability in this group was not greater than within the cohort of controls. The test for equality of variances for baseline HRQL was not significant (the treatment standard deviation 24.8 compared with 24.5 for the control group). Tests of equality of variances at 3 and 6 months were also nonsignificant: the standard deviations at 3 and 6 months for the intervention and control groups were 25.3 and 25.6, and 24.0 and 25.7, respectively. These findings indicate that although treatment group respondents may have responded differently to the various interventions they received, as a group their response to study participation exhibited the same range of variability as found in the more homogenous group of control subjects.

Measurement

HRQL was measured using the Minnesota Living with Heart Failure Questionnaire (MLHFQ), a 21-item disease-specific measure of HRQL. The MLHFQ measures overall well-being and two HRQL domains: physical limitations and emotional responses. English and Spanish versions of the MLHFQ were used in this study. Participants were given the choice to complete the instrument by themselves or to have it read to them by fluently bilingual research staff. The Spanish version had been translated professionally and back-translated to English by fluent Spanish speakers residing in the region where the data were collected to ensure that the local idioms (i.e., phrases and terms used in Southern California) were appropriate. The MLHFQ has been shown repeatedly to be internally consistent (with alpha coefficients usually > 0.90 in clinical samples) and stable over a short period of time.⁹⁻¹¹ For the total scale score and both the physical limitations and emotional responses subscales, lower scores on the MLHFQ indicate better HRQL.

Severity of illness was measured using New York Heart Association (NYHA) class. Technically, NYHA class is a measure of

functional status,¹² but others have shown that higher NYHA class is associated with increased mortality and hospitalization rates in persons with heart failure.¹³

Procedure and Analysis

The primary investigator obtained institutional review board approval for this comparison in addition to the approval obtained at each individual site. De-identified data on HRQL, group assignment (treatment or usual care), setting where enrolled (acute or chronic), ethnic/racial group, age, education, and NYHA functional class were submitted to a central site where it was integrated, reviewed for accuracy, and analyzed. From the full data set of 1490 patients, subjects with baseline and at least one follow-up MLHFQ score were retained for this analysis.

Descriptive statistics were used to summarize the data. Group differences in the demographic and clinical characteristics, as well as baseline HRQL, were determined using one-way analysis of variance, two-sample *t* tests, or chi-square tests, as appropriate. Comparisons among ethnic/racial groups, between treatment groups, and between those retained or not retained for this analysis were made using these techniques.

In the comparison of the demographic and clinical characteristics of the 1212 subjects in the analysis and the 278 subjects in the registry who were not included in the analysis, subjects in this analysis were significantly younger ($M = 66.1$ vs. $M = 68.4$; $t = 2.4$, $P = .02$), more likely to have at least some postsecondary education ($\chi^2 = 10.7$, $P = .005$), and more likely to have received an active intervention rather than usual care ($\chi^2 = 99.6$, $P < .0001$). A larger proportion of those enrolled from a chronic care settings were included (93%), whereas only 74% of those enrolled from an acute care setting were included ($\chi^2 = 84.9$, $P < .0001$). There were no differences in gender, ethnic/racial group, or NYHA class between those included or not included in the study.

The black, white, and Hispanic groups differed in several characteristics. The three ethnic/racial groups differed in mean age ($F = 46.5$, $P < .0001$); black patients were significantly younger ($M = 58.4$) than either the white ($M = 68.0$) or Hispanic patients ($M = 67.6$). Significant ethnic/racial group differences were also found in gender, education, care setting (acute vs. chronic), and NYHA class (Table 1), but the percentage of treatment participants did not differ across the three ethnicities.

Propensity scores minimize bias that may occur when making comparisons among groups that are dissimilar on demographic or clinical characteristics.¹⁴ By using the variables that demonstrated significant ethnic/racial differences, propensity scores were determined with logistic regression, and these scores were used as a covariate in subsequent analyses. The methodology requires that ethnicity/race has only two levels, because probabilities can only be determined in logistic regression for binary outcomes. In this study, the propensity score is the probability, with a potential range of zero to one of being a member of a particular ethnic/racial group given the profile of demographic and clinical characteristics.

The Hosmer-Lemeshow goodness-of-fit test was used to determine how well each model fit the data; for this test, large *P* values are desired because these correspond to a nonsignificant lack of model fit. The area under the receiver operating characteristic curve was assessed as a measure of how well each logistic model discriminated between the ethnic/racial groups. The receiver operating characteristic curve is a plot of the sensitivity versus one specificity. The area under the curve can range from zero to

Table 1. Summary of Demographic and Clinical Characteristics by Ethnicity and Comparisons Among Ethnic Groups (N = 1212)

Characteristic	White (n = 767) n (%)	Black (n = 231) n (%)	Hispanic (n = 214) n (%)	Group comparison χ^2
Gender				
Female	448 (58)	100 (43)	107 (50)	18.1 [†]
Male	319 (42)	131 (57)	107 (50)	
Education				
< High school	207 (28)	86 (38)	133 (62)	107.9 [†]
High school graduate	249 (33)	93 (41)	44 (21)	
Some college	293 (39)	46 (21)	36 (17)	
Setting				
Acute	450 (59)	46 (20)	180 (84)	192.7 [†]
Chronic	317 (41)	185 (80)	34 (16)	
NYHA class				
II	241 (32)	102 (45)	34 (16)	64.0 [†]
III	331 (45)	98 (43)	94 (44)	
IV	169 (23)	28 (12)	84 (40)	
Group				
Control group	387 (50)	134 (58)	106 (50)	4.6
Intervention group	380 (50)	97 (42)	108 (50)	

NYHA, New York Heart Association.

[†] $P < .0001$.

one, with values closer to one indicating a higher degree of accuracy of the model in the ability to discern between the two ethnic/racial groups being compared, based on the values of the predictor variables.

Repeated-measures analysis of covariance was used to compare HRQL among the ethnic/racial groups over time, adjusting for the baseline MLHFQ score and propensity scores. Although not the focus of this analysis, treatment group (intervention vs. usual care) was included as a factor in these longitudinal models because the interventions were designed to influence HRQL. Because propensity scores are determined for two ethnic/racial groups at a time, three analysis of covariance models were developed, one for each pair of the three groups. Each model included time (3 and 6 months), ethnicity/race (two groups), treatment group (control and intervention), and the two- and three-way interactions of these factors. Post hoc analysis was based on Fisher's least significant difference procedure for pairwise comparisons.

Patients were retained in the study if they had the baseline MLHFQ score and at least one of the two follow-up scores. Some of these subjects were omitted from the longitudinal analysis because they were missing one or more of the demographic and clinical characteristics used to calculate the propensity scores (5% of the sample, $n = 56$). Because the propensity scores were used as a covariate in the repeated-measures models, any subject missing the propensity scores was omitted from the longitudinal analysis. There was no difference in the baseline MLHFQ score between those who were included in the longitudinal study and those who were not (because their propensity scores could not be determined). All of the remaining 1156 subjects were included in two of the three repeated-measures models (corresponding to their ethnic group), even though 42% were missing from one of the two follow-up assessments based on the original study design. The SAS procedure used for the repeated-measures analysis, PROC MIXED, is particularly appropriate for longitudinal studies in which dropouts are not uncommon,¹⁵ assuming the incomplete data are missing at random. Because there was no difference in

baseline MLHFQ scores between those who had complete data and those who were missing one of the two follow-up scores, this assumption is reasonable.

All analyses were done using SAS for Windows, version 9.1 (SAS Institute, Inc., Cary, NC). An alpha level of 0.01 was used throughout to control for the overall Type I error rate associated with multiple comparisons.

Results

Most of the 1212 participants were male (54%) and non-Hispanic white (63%); the non-white patients were split nearly equally between black (19%) and Hispanic (18%) patients. The mean age overall was 66.1 years (standard deviation = 14.0), with a range from 20 to 96 years. Slightly more than one third (36%) of the sample had less than a high school education, and the remaining subjects were split between high school graduates (32%) and those with some post-secondary education (32%). The most common level of physical functioning was NYHA class III (44%), with 32% in class II and 24% in class IV. The sample was split between the treatment (48%) and usual care (52%) conditions. There was no difference by ethnicity/race in the percentage of patients assigned to the treatment or usual care groups. There was no difference among the three ethnic/racial groups in baseline MLHFQ scores.

Each of the three propensity score models fit the data well, as evidenced by nonsignificant *P* values in each case (Table 2). The area under the curve was high for each of the models, suggesting that the propensity scores captured the differences between each ethnic/racial pair accurately and that the scores are based on models that fit the data adequately.

Repeated-measures Analysis of Covariance

Mean MLHFQ scores improved over time in all the ethnic/racial groups, but most dramatically among Hispanics (Fig. 1). Both models of the total MLHFQ score that included Hispanic participants demonstrated a significant

ethnic/racial effect (Table 3). The post hoc analysis demonstrated more favorable MLHFQ total scores post-baseline for Hispanic patients compared with white patients, even after adjusting for MLHFQ total score at baseline, treatment group, and differences in demographic and clinical characteristics between the ethnic/racial groups. The least squares mean, which is adjusted for covariates, differed significantly between Hispanic and white patients post-baseline (*t* = 7.6, *P* < .0001). When black and Hispanic patients were compared, adjusted total scores differed significantly as well (*t* = 2.9, *P* = .004).

The physical and emotional subscale score models demonstrated a significant ethnic/racial effect (Table 3). When Hispanics and whites were compared, the Hispanics had more positive outcomes. On post hoc analysis, the least squares mean indicated significant differences in physical (*t* = 6.4, *P* < .0001) and emotional (*t* = 6.4, *P* < .0001) subscale scores post-baseline between Hispanic and white participants.

When Hispanic and black patients were compared, only total MLHFQ scores differed between them post-baseline (Table 3), with black patients reporting poorer total HRQL compared with Hispanic patients (*t* = 2.9, *P* = .006). No black versus white patient difference was significant for any of the three MLHFQ outcomes.

Discussion

The major finding of this study was that HRQL improved more over time in Hispanics with heart failure than white or black samples after controlling for demographic, clinical, and treatment group differences among the three major ethnic/racial groups. The differential improvement in HRQL seen in the Hispanic sample is consistent with our prior comparison of Hispanic and non-Hispanic white patients with heart failure.⁶ In that study, we matched Hispanic and white patients on functional status and age and compared scores obtained using the same measure of HRQL during a 6-month period after hospital discharge. We found that Hispanic patients, some of the same patients used in this analysis, improved more over time than white patients. However, without a good explanation for the phenomenon, possible spuriousness of the results due to inadequate matching was considered.

In this comparison, propensity scores were used to statistically adjust for differences in multiple demographic and clinical characteristics that may have unduly influenced our prior findings. In addition, the treatment effect was accounted for in the analysis. Also, a third group of patients with heart failure—non-Hispanic blacks—was added to the comparison. By using these methods, we are confident that the significant differences demonstrated in this analysis can be attributed to true group differences in MLHFQ scores rather than an artifact of group differences.

Few previous investigators have compared HRQL in ethnic/racial groups. The results from a population survey conducted between 1993 and 2002, the HRQL surveillance

Table 2. Summary of Logistic Models Developed to Obtain Propensity Scores for Each Pair of Ethnic/Racial Group*

Pair of ethnic groups being compared	Hosmer-Lemeshow goodness-of-fit test χ^2 (<i>P</i> value)	Area under the ROC curve
White and black (n = 945)	5.4 (.7)	0.80
White and Hispanic (n = 934)	8.0 (.4)	0.76
Black and Hispanic (n = 433)	3.1 (.9)	0.88

ROC, receiver operating characteristic.

*The number of observations used for each model is given in parentheses after the label indicating which pair of ethnic/racial groups is being compared; respondents who were missing one or more of the predictor variables were not included in the analysis, so the number is smaller than the total of the two ethnic/racial groups.

Fig. 1. Average scores on the MLHFQ by time and ethnic/racial group (N = 1212). Total and subscale scores are compared on the basis of ethnic/racial group, regardless of assignment to treatment or usual care group. MLHFQ, Minnesota Living with Heart Failure Questionnaire. Lower scores reflect better HRQL.

project from the National Centers for Chronic Disease Prevention and Health Promotion, revealed few differences among Hispanic, non-Hispanic black, and non-Hispanic white persons in perceived health and mental or physical functioning.¹⁶ In medically ill samples, Jackson-Triche and colleagues⁴ found that physical functioning scores on the Short Form-36 were highest (best) in Hispanics, lowest in blacks, and in the middle in non-Hispanic whites, similar to our results.

One explanation for our finding that HRQL improved more over time in Hispanics than in non-Hispanic whites and blacks with heart failure is an inaccurate perception about the chronicity of the illness in Hispanics. When Becker and colleagues¹⁷ compared views about chronic illness in Hispanic, black, and Filipino persons, they found that many Hispanics believed that symptom remission was a cure and that each exacerbation of symptoms was a separate illness unrelated to prior episodes. Black persons in their study held mainstream cultural views about chronic illness. It may be that the black and white patients in the current study realized that heart failure was a chronic illness that can only be controlled, whereas the Hispanic patients believed that symptom remission indicated that they were cured. If true, disease-specific HRQL would be expected to improve over time in individuals who believed that the problem had resolved. Much has been written about the Hispanic paradox, which refers to the epidemiologic finding that Hispanics in the United States tend to paradoxically have significantly better health than the average population, despite what their aggregate socioeconomic indicators would predict.¹⁸ The specific cause of this phenomenon is poorly

understood, but a mistaken perception about the meaning of illness may be protective in some fashion. It should be noted, though, that misperceptions about chronic illness are not limited to the Hispanic population; the same phenomenon has been noted in other populations.^{19,20}

Another explanation for why HRQL is better in Hispanics could be inner strength. In one study, older Hispanic women described drawing strength from their past, focusing on possibilities, being supported by others, knowing their purpose, and nurturing the spirit as characteristics that contributed to their inner strength and ability to cope with illness.²¹ This optimism was reflected in another study of Mexican-American families with chronically ill children.²² Family members took spiritual and secular actions to ensure the best possible care for the ill child and sought to influence God's good will on behalf of the child and the family. Perhaps, over time, the Hispanic patients in this sample refocused themselves in this fashion and thereby improved their HRQL.

Another interpretation is related to language. Although the Hispanic sample completed the instrument in their native language, it is plausible that the meaning given to the responses was interpreted differently. Others have noted that the lexicon of illness terms used by Hispanics in the United States is affected by the practice of speaking both Spanish and English and by their experiences with different health systems.²³

It is also possible that social desirability of responses among Hispanics influenced the results. That is, it could be that the Hispanics in the sample felt inclined to present themselves in a manner that would be viewed favorably by

Table 3. Repeated-measures Analysis of Covariance Models, with Separate Models for Each Pair of Ethnic/Racial Groups*

Covariate or factor	Black and white (combined N = 945)		White and Hispanic (combined N = 934)		Black and Hispanic (combined N = 433)	
	F	P value	F	P value	F	P value
Outcome: total score						
MLHFQ at baseline	557.4	<.0001	394.3	<.0001	269.9	<.0001
Propensity score	24.9	<.0001	16.1	<.0001	33.9	<.0001
Time (T)	1.4	.2	10.2	.002	3.3	.07
Ethnic group (E)	.5	.5	57.5	<.0001	8.2	.004
T*E	<0.1	>.9	3.2	.08	1.7	.2
Treatment group (TG)	10.7	.001	6.5	.01	2.4	.1
T*TG	<0.1	.8	0.6	.4	0.3	.6
E*TG	1.1	.3	1.0	.3	0.8	.4
T*E*TG	<0.1	.9	0.9	.3	0.2	.7
Outcome: PH subscale						
MLHFQ—PH at baseline	354.3	<.0001	232.6	<.0001	186.9	<.0001
Propensity score	30.4	<.0001	14.4	.0002	34.0	<.0001
Time (T)	0.7	.4	3.5	.06	1.6	.2
Ethnic group (E)	2.7	.1	41.1	<.0001	3.7	.06
T*E	0.2	.7	1.8	.2	0.4	.5
Treatment group (TG)	13.3	.0003	4.8	.03	4.5	.04
T*TG	<0.1	.9	1.3	.3	0.2	.6
E*TG	3.4	.07	1.0	.3	3.1	.08
T*E*TG	0.3	.6	0.1	.7	0.2	.7
Outcome: EH subscale						
MLHFQ—EH at baseline	586.8	<.0001	477.1	<.0001	232.5	<.0001
Propensity score	8.9	.003	8.0	.005	20.7	<.0001
Time (T)	0.3	.6	10.7	.001	1.9	.2
Ethnic group (E)	<0.1	.9	41.3	<.0001	4.7	.03
T*E	0.3	.6	4.1	.04	4.0	.05
Treatment group (TG)	7.0	.009	5.8	.02	1.1	.3
T*TG	0.4	.6	0.1	.7	0.3	.6
E*TG	0.3	.6	0.4	.6	<.1	.9
T*E*TG	0.4	.6	1.6	.2	<.1	.9

MLHFQ, Minnesota Living with Heart Failure Questionnaire; PH, physical health; EH, emotional health.

*Ethnic group analyses are in bold type for emphasis.

others. However, if such an explanation is true, we have no explanation about why they responded in a fashion comparable to the other groups at baseline.

It was surprising that the physical component of HRQL was not significantly different for black patients compared with either of the other ethnic/racial groups, considering prior studies. Others have found that physical decline may be more pronounced in ill blacks than in ill whites. For example, Clarke and colleagues²⁴ found that the risk of experiencing significant functional decline was approximately doubled in non-white patients with systolic dysfunction at 1 year. In work by Ferraro and colleagues,^{25,26} more rapid functional decline was observed in black patients during a 15-year period than in whites and others, even when illness was taken into account. Others have suggested that socioeconomic status may explain differences in physical functioning among blacks compared with other ethnic/racial groups.²⁷ Because the propensity score method controlled for sociodemographic differences, use of this strategy in the present study may explain why the differences in physical HRQL between blacks and others were not significant.

The primary limitation of this study is that it was a secondary analysis of existing data. These results are not generalizable to all patients with chronic heart failure because the patients in this analysis were younger and more likely to

have some post-secondary education than those not included in the analysis. The Hispanic sample was primarily of Mexican origin, so these results may not apply to Hispanics from other countries. The instrument used here to measure HRQL has been shown to be less sensitive than other measures of HRQL, so the extent of differences may be underestimated.²⁸ Another limitation was that the samples received different treatments at the various sites. However, the treatments were all behavioral in nature and treatment was controlled both as a predictor in the propensity scores and as a factor in the longitudinal analyses. An additional limitation was that variables that could further explain these differences, such as illness perceptions, social support, and spirituality were not measured. It is also possible that a cultural bias exists in the data obtained from the MLHFQ, but this seems unlikely because there were no differences in baseline scores and it was evident only on repeated assessment.

Strengths of the study include the methodologic control introduced with the use of propensity scoring. Some authors have refuted the Hispanic paradox concept, arguing that the apparent advantage reflects selection bias and poor methodologic control of confounding variables.¹⁸ On the basis of the methodologic controls used, we conclude that a true difference in HRQL exists among the ethnic/racial groups studied.

Whether or not the difference seen is related to heart failure cannot be stated with certainty, but use of longitudinal data strengthens our confidence in the conclusion that the response to heart failure seems to differ over time among the ethnic/racial groups studied.

The question of whether Hispanics improve more in HRQL over time because of inaccurate perceptions about illness chronicity, some inherent cultural strength, or differences in language remains the charge of future investigators. If there is something unique about the Hispanic culture that promotes positive HRQL, a greater understanding of how Hispanic culture promotes positive HRQL could bolster intervention strategies for all patients with heart failure.

References

1. Thom T, Haase N, Rosamond W, et al. Heart disease and stroke statistics—2006 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2006;113:e85–151.
2. Winker MA. Measuring race and ethnicity: why and how? *JAMA* 2004;292:1612–4.
3. Utsey SO, Chae MH, Brown CF, et al. Effect of ethnic group membership on ethnic identity, race-related stress, and quality of life. *Cultur Divers Ethnic Minor Psychol* 2002;8:366–77.
4. Jackson-Triche ME, Greer Sullivan J, Wells KB, Rogers W, Camp P, Mazel R. Depression and health-related quality of life in ethnic minorities seeking care in general medical settings. *J Affect Disord* 2000;58:89–97.
5. Bosworth HB, Siegler IC, Olsen MK, et al. Social support and quality of life in patients with coronary artery disease. *Qual Life Res* 2000;9:829–39.
6. Riegel B, Carlson B, Glaser D, et al. Changes over 6-months in health-related quality of life in a matched sample of Hispanics and non-Hispanics with heart failure. *Qual Life Res* 2003;12:689–98.
7. Guyatt GH. Measurement of health-related quality of life in heart failure. *J Am Coll Cardiol* 1993;22(Suppl A):185A–91A.
8. Fonarow GC, Adams KF Jr, Abraham WT, et al. Risk stratification for in-hospital mortality in acutely decompensated heart failure: classification and regression tree analysis. *JAMA* 2005;293:572–80.
9. Rector T, Kubo S, Cohn J. Patient's self-assessment of their congestive heart failure. Part 2: Content, reliability and validity of a new measure, The Minnesota Living with Heart Failure Questionnaire. *Heart Fail* 1987;1:198–209.
10. Rector T, Cohn J. Assessment of patient outcome with the Minnesota Living with Heart Failure questionnaire: reliability and validity during a randomized, double-blinded, placebo-controlled trial of pimobendan. Pimobendan Multicenter Research Group. *Am Heart J* 1992;124:1017–25.
11. Rector T, Kubo S, Cohn J. Validity of the Minnesota Living with Heart Failure questionnaire as a measure of therapeutic response to enalapril or placebo. *Am J Cardiol* 1993;71:1106–7.
12. Bennett J, Riegel B, Bittner V, et al. Validity and reliability of the NYHA classes for measuring research outcomes in patients with cardiac disease. *Heart Lung* 2002;31:262–70.
13. Ahmed A. Quality and outcomes of heart failure care in older adults: role of multidisciplinary disease-management programs. *J Am Geriatr Soc* 2002;50:1590–3.
14. Rubin DB. Estimating causal effects from large data sets using propensity scores. *Ann Intern Med* 1997;127(Pt 2):757–63.
15. Littell RC, Milliken GA, Stroup WW, et al. SAS system for mixed models. Cary, NC: SAS Institute, Inc.; 1996.
16. Zahran HS, Kobau R, Moriarty DG, et al. Health-related quality of life surveillance—United States, 1993–2002. *MMWR Surveill Summ* 2005;54:1–35.
17. Becker G, Beyene Y, Newsom EM, et al. Knowledge and care of chronic illness in three ethnic minority groups. *Fam Med* 1998;30:173–8.
18. Palloni A, Morenoff JD. Interpreting the paradoxical in the Hispanic paradox: demographic and epidemiologic approaches. *Ann N Y Acad Sci* 2001;954:140–74.
19. Kimmel PL, Patel SS. Quality of life in patients with chronic kidney disease: focus on end-stage renal disease treated with hemodialysis. *Semin Nephrol* 2006;26:68–79.
20. Gooberman-Hill R, Ayis S, Ebrahim S. Understanding long-standing illness among older people. *Soc Sci Med* 2003;56:2555–64.
21. Dingley C, Roux G. Inner strength in older Hispanic women with chronic illness. *J Cult Divers* 2003;10:11–22.
22. Rehm RS. Religious faith in Mexican-American families dealing with chronic childhood illness. *Image J Nurs Sch* 1999;31:33–8.
23. Kay M. Lexemic change and semantic shift in disease names. *Cult Med Psychiatry* 1979;3:73–94.
24. Clarke SP, Frasure-Smith N, Lesperance F, et al. Psychosocial factors as predictors of functional status at 1 year in patients with left ventricular dysfunction. *Res Nurs Health* 2000;23:290–300.
25. Ferraro KF, Farmer MM. Double jeopardy, aging as leveler, or persistent health inequality? A longitudinal analysis of white and black Americans. *J Gerontol B Psychol Sci Soc Sci* 1996;51B:S319–28.
26. Ferraro KF, Farmer MM, Wybraniec JA. Health trajectories: long-term dynamics among black and white adults. *J Health Soc Behav* 1997;39:38–54.
27. Lillie-Blanton M, Parsons PE, Gayle H, et al. Racial differences in health: not just black and white, but shades of gray. *Annu Rev Public Health* 1996;17:411–48.
28. Riegel B, Moser D, Glaser D, et al. The Minnesota Living with Heart Failure Questionnaire: sensitivity and responsiveness to intervention intensity in a clinical population. *Nurs Res* 2002;51:209–18.