

Randomized Controlled Trial of Telephone Case Management in Hispanics of Mexican Origin With Heart Failure

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ABSTRACT

Background: Disease management is effective in the general population, but it has not been tested prospectively in a sample of solely Hispanics with heart failure (HF). We tested the effectiveness of telephone case management in decreasing hospitalizations and improving health-related quality of life (HRQL) and depression in Hispanics of Mexican origin with HF.

Methods and Results: Hospitalized Hispanics with chronic HF (n = 134) were enrolled and randomized to intervention (n = 69) or usual care (n = 65). The sample was elderly (72 ± 11 years), New York Heart Association class III/IV (81.3%), and poorly educated (78.4% less than high school education). Most (55%) were unacculturated into US society. Bilingual/bicultural Mexican-American registered nurses provided 6 months of standardized telephone case management. Data on hospitalizations were collected from automated systems at 1, 3, and 6 months after the index hospital discharge. Health-related quality of life and depression were measured by self-report at enrollment, 3, and 6 months. Intention to treat analysis was used. No significant group differences were found in HF hospitalizations, the primary outcome variable (usual care: 0.49 ± 0.81 [CI 0.25–0.73]; intervention: 0.55 ± 1.1 [CI 0.32–0.78] at 6 months). No significant group differences were found in HF readmission rate, HF days in the hospital, HF cost of care, all-cause hospitalizations or cost, mortality, HRQL, or depression.

Conclusion: These results have important implications because of the current widespread enthusiasm for disease management. Although disease management is effective in the mainstream HF patient population, in Hispanics this ill, elderly, and poorly educated, a different approach may be needed.

Key Words: Access to care, acculturation, disease management, health disparities, heart failure, hispanic, Mexican-Americans.

Heart failure (HF) is a complex syndrome associated with poor outcomes. Rehospitalization rates remain high, health-related quality of life (HRQL) is poor, and depression is common in this population.^{1–3} Disease management

refers to a system of coordinated health care interventions for populations with conditions requiring significant self-care. Although disease management has been demonstrated to be effective in the general multiracial population,^{4–6} it has rarely been tested prospectively in Hispanics with HF.

Hispanics constitute the fastest growing ethnic minority in the United States. Hispanics comprise 13.3% of the population, and 66.9% of these are of Mexican descent.⁷ Cardiovascular disease (CVD) is the primary cause of death in Hispanics. The segment of the Hispanic population with the highest risk for CVD, those 65 years of age and older, is estimated to increase 11-fold by the year 2050.⁸ The prevalence of HF is comparable in Mexican-American Hispanics (males 2.7%, females 1.6%) and non-Hispanic whites (males 2.6%, females 2.1%).⁹ Alexander et al¹⁰ found that the percentage of HF patients rehospitalized for HF or other causes, total hospital days, and total hospital charges were all significantly higher in California Hispanics

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(most of whom are of Mexican descent) than non-Hispanic whites; Hispanics were more likely to be rehospitalized multiple times. The reasons for the high hospitalization rates are unclear, but may be related to poor self-care, variability in medical management, and barriers to accessing health care.¹¹ Disease management has been shown to effectively address these issues in other multiracial populations in the US and other countries.¹²

Galbreath and colleagues demonstrated a lower mortality rate in HF patients receiving disease management, 23% of whom were Hispanic, but no subgroup analyses were reported based on ethnic/racial subgroups.¹³ In a prior study, we demonstrated effectiveness of telephone case management in a primarily non-Hispanic white population of patients with HF.¹⁴ A subset analysis of those data, using the 26% of the sample that was Hispanic and primarily of Mexican descent, illustrated a trend toward fewer HF days in the hospital, lower HF costs, fewer multiple (more than 1) admissions, and higher patient satisfaction in the Hispanic intervention group compared with the Hispanic usual care group.¹⁵ Those data suggested to us that the intervention, delivered in a culturally sensitive fashion by bilingual nurse case managers, might be effective in this population. Therefore, we conducted a randomized controlled clinical trial testing the effectiveness of telephone case management compared with usual care in Hispanics with HF.

Methods

Two bilingual/bicultural Mexican-American registered nurses with special training in HF provided the intervention. Telephone case management was hypothesized to decrease hospitalizations (acute care use) and improve HRQL and depression. Heart failure rehospitalization was the primary outcome variable. Other outcome variables were all-cause hospitalizations, days in the hospital (HF and all-cause), multiple readmissions (more than 1 in 3 or

6 months), acute care costs (HF and all-cause), and all-cause mortality.

The study was conducted in Southern California, where the population of Hispanics from Mexico exceeds that of most other states. Institutional Review Boards of the principal investigator's institution and the clinical agencies where the patients were enrolled approved the study and all patients gave informed consent.

Sample

With repeated measures, a sample size of 63 per group was estimated to provide at least 80% power at the 0.05 significance level to detect a small to medium effect of the intervention on HF rehospitalizations; a moderate effect could be detected with 55 per group.¹⁶ Self-identified Hispanics were identified at 2 participating community hospitals close to the US-Mexico border. Patients hospitalized with a primary or secondary diagnosis of HF, living in the community (ie, not institutionalized) and planning to return to the community after hospital discharge were eligible to participate. Because HF rehospitalization was the primary outcome, we enrolled patients with a secondary diagnosis of HF only if they were at high risk for a HF hospitalization because of age older than 80 years, a high level of comorbid illness, or not being on an angiotensin-converting enzyme inhibitor at admission.^{2,17} Patients were excluded if they had a history of cognitive impairment, severe renal insufficiency requiring dialysis, acute myocardial infarction within the preceding 30 days without an established history of chronic HF, a complicating serious or terminal condition such as psychosis or HIV-AIDS, a major and uncorrected hearing loss, lack of access to a telephone (eg, homeless), or failure to give informed consent.

During the 2-year enrollment period (mid-2002 to mid-2004), 425 patients were screened; 225 (52.9%) of these met eligibility criteria (Fig. 1). Most exclusions were because of cognitive impairment (n = 83) or hemodialysis

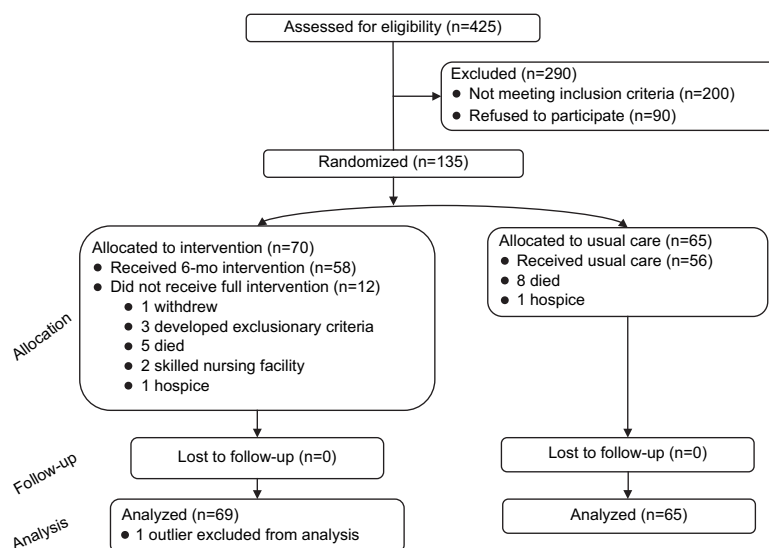


Fig. 1. Flow diagram of the progress through the phases of the trial.

($n = 69$). Of the 225 who were eligible, 135 (60%) agreed to participate, a rate comparable to that in our prior disease management trials.^{18,19} Those who refused were significantly older (76 versus 72 years, $P = .004$) than those who agreed to participate, their index length of hospital stay was a day longer (8.3 versus 7.1 days, $P > .05$), and their insurance status was similar. All participants spoke Spanish or English.

Intervention

Telephone case management was standardized using a decision-support software program—*At Home with Heart Failure*—used in our prior trial.¹⁹ The software program guides the nurse case manager to assess those factors previously shown to predict HF hospitalization (eg, poor adherence with medications and diet recommendations)²⁰ and teach patients important self-care skills (eg, monitoring signs and symptoms indicating worsening illness). Automated tools embedded in the software assist the nurse in setting priorities for the timing of the next telephone call, content of patient education, and documentation. Automated features can be overridden based on clinical judgment. The nurse case managers were affiliated with the hospital, not individual providers, so they did not titrate medications or coordinate follow-up care. The emphasis of the intervention was on education, monitoring, and guidance.

The intervention was refined to be culturally appropriate by the bilingual/bicultural collaborators (nurse case managers, physician coinvestigator, research assistant) who interacted directly with patients. Cultural values integrated into the intervention were an emphasis on *personalismo* or personalized caring, trust, inclusion of the family, and concrete solutions and problem solving in response to problems with self-care.^{11,21,22}

In this study, the intervention group was contacted by telephone, on average, within 5 days after hospital discharge and thereafter at a frequency guided by the software and nurse case manager judgment. Patients received an average of 13.5 (SD 5.9; median 13; interquartile range 11–16) telephone contacts and families received an additional 8.4 (SD 6.3; median 7; interquartile range 3–13)

telephone contacts over the 6-month intervention period, with most calls early after hospital discharge (Fig. 2). An additional 4.6 (SD 4.4; median 3; interquartile range 1.5–7) case management contacts involved consultation with other professionals (eg, physicians, dieticians, social workers) and community agencies. Printed educational material in the desired language was mailed to patients monthly and as needed when specific information was requested.

Nurse case managers telephoned physicians as needed and mailed reports on patient progress at regular intervals. Reports mailed to physicians noted when patients were not receiving medications advocated in clinical guidelines, to support evidence-based practice. The full 6-month intervention was received by 58 of the 70 patients randomized to the intervention group (Fig. 1).

Care for patients in the usual care control group was not standardized and no formal disease management program was in existence at these institutions. The standard of usual care was that patients were educated regarding HF management before hospital discharge, assuming that the nurse spoke the patient's language or someone bilingual was available to translate. In reality, only a small segment of the staff was bilingual, so much of the discharge instruction was provided in writing. Typical discharge instructions included a medication list and an institution-specific discharge instruction sheet with handwritten notes to follow a low-sodium diet and contact the physician if symptoms occur.

Measurement

Data on acute care use was gathered from automated financial records at 1, 3, and 6 months using Eclipsys (formerly Transition Systems, Inc, Atlanta, GA), the cost-accounting system used by both hospitals. Information on out-of-system inpatient resource use was obtained from patients by self-report at 3 and 6 months. When a patient reported visiting another hospital, he or she was queried carefully to discern what occurred before and during the visit, including the length of hospital stay and final diagnosis. Based on this information, the cause of hospitalization was coded by a single clinical expert as being due to HF or

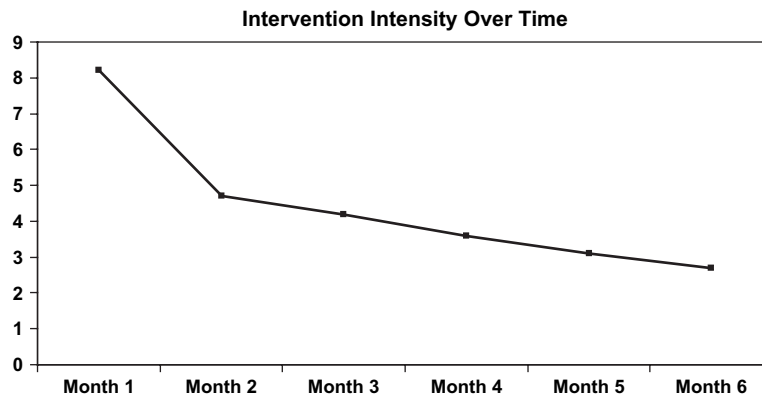


Fig. 2. Figure illustrating that the intervention was most intense in the first month.

another cause. All costs were measured as a combination of direct and indirect costs as specified by Gold et al.²³ Average costs from the primary institution were substituted for any out-of-system hospitalizations. Mortality and date of death were assessed at the end of the 6-month period through hospital records, provider reports, and discussions with family.

Self-reported HRQL was measured at enrollment, 3, and 6 months using the Minnesota Living with HF Questionnaire²⁴ and the EQ-5D,²⁵ a generic measure of HRQL. Total scores on the Minnesota Living with HF Questionnaire range from 0 to 105, with higher scores indicating lower HRQL. Scoring of the EQ-5D yields separate scores for mobility, self-care, activity, pain, and anxiety, which were aggregated according to the published method to generate an overall index score. In addition, the EQ-5D includes a single item visual analog scale on which patients rate their overall quality of life. Higher scores indicate higher HRQL.

Depression was measured at the same intervals using the Patient Health Questionnaire, a 9-item measure of depression severity.²⁶ Scores range from 0 to 27, with higher scores indicating higher depression. Scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depression, respectively.

Acculturation was defined as the extent to which one adapts to the dominant culture and measured using the 5-item Short Acculturation Scale for Hispanics.²⁷ Barriers to care were measured with an investigator-designed survey of 17 items measured on a 4-point scale.

All of the instruments had been used previously in a Hispanic population. Instruments unavailable in Spanish were translated and back-translated by bilingual staff and then reviewed by other bilingual health care providers to assure that the translation, grammar, and idioms were correct.

Demographic (eg, age, gender) and clinical data (eg, HF type) were collected from the medical record at the time of index hospitalization. The nurse enrolling the patient assessed functional status using the New York Heart Association classification system and functional performance before hospitalization with the Specific Activity Scale.²⁸ Data on comorbidity were gathered from the medical record and categorized using the Charlson Index.²⁹

Nurse case managers hired for the study enrolled patients during hospitalization to facilitate enrollment. The nurse introduced the study verbally and usually left the consent form so that the patient could discuss the study with the family and physician. The nurse case manager returned at a later date to meet with family members and obtain a signed consent. Baseline data were collected without family involvement. After the baseline data were collected, the nurse case manager opened a sealed envelope with the random assignment. These envelopes had been prepared by the project director and attached to the numbered data collection forms, to be opened in sequence. We were unable to strictly blind staff about which patients were in the intervention group, but a research assistant uninvolved with the clinical care collected all follow-up data.

Statistical Analysis

Before hypothesis testing, the intervention and control groups were compared on baseline demographic and clinical characteristics. A significant difference was found in one variable: the intervention group had significantly higher serum creatinine prior to hospital discharge (1.6 versus 1.3, $P = .01$) than the control group. Analyses were done with and without adjustment of this variable and it did not change the results, so the unadjusted analyses are shown.

Acute care outcomes were compared in the intervention and control groups at 1, 3, and 6 months after discharge from the index hospitalization. Hospitalization rates represent the mean number of hospitalizations per patient, calculated as the number of hospitalizations for the sample divided by the full sample size, regardless of whether a rehospitalization occurred. Readmissions were measured both as the number per patient and the readmission rate, which reflects the proportion of the sample admitted at least once during the study period. Readmission rates are calculated as the percentage of patients readmitted to the hospital after the index admission. Rate of multiple readmissions during the 6-month study period was calculated as the percentage of patients admitted more than once for any reason.

One outlier was removed from the dataset before analyses began because he spent 3 months in the hospital while his family debated taking him off life support. All analyses were done with the remaining sample of 134 patients on an intention to treat basis using SPSS version 12.0 (Chicago, IL). Repeated measures or mixed analysis of variance was used to assess the significance of differential change between the groups over time for all continuous variables (eg, hospital days, HRQL, depression). The likelihood of a difference between the groups in multiple readmissions and in mortality was tested using logistic regression analysis. A P value $< .05$ was predetermined as indicating a statistically significant difference between the groups.

Results

The sample was elderly (72 ± 11 years), 54% female, married (60%), and poorly educated (78.4% with less than a high school education). More than half (55%) of the patients were entirely unacculturated into US society (Tables 1 and 2). Eighteen (13.4%) patients had an event (eg, HF rehospitalization or death) in the first month. Two patients had an event (1 HF rehospitalization and 1 death) before the nurse case manager could contact them or their family.

No significant group differences were found in HF hospitalizations, HF readmission rate, HF days in the hospital, HF cost of care, all-cause acute care use or cost, mortality, HRQL, or depression. As shown in Tables 3 and 4, the intervention reduced acute care resource use initially, but the within-group variability was so great that the difference did not reach statistical significance. No beneficial effect was

Table 1. Demographic Profile of the Sample of Hispanics With Heart Failure

	All	Usual Care	Intervention
n	134	65	69
Age	72.1 ± 11	72.7 ± 11.2	71.6 ± 10.8
Female	72 (53.7%)	32 (49.2%)	40 (58.0%)
Married	80 (59.7%)	41 (63.1%)	39 (56.5%)
Education			
Grade school or less	105 (78.4)	50 (76.9%)	55 (79.7%)
High school	21 (15.7%)	8 (12.3%)	13 (18.8%)
More than high school	8 (6.0%)	7 (10.8%)	1 (1.4%)
Insurance			
Medicaid or other indigent care	14 (10.4%)	6 (9.2%)	8 (11.6%)
Medicare	80 (59.7%)	39 (60%)	41 (59.4%)
Health maintenance organization	32 (23.9%)	18 (27.7%)	14 (20.3%)
No insurance	8 (6.0%)	2 (3.1%)	6 (8.7%)
Heart failure is new (diagnosed ≤2 months ago)	40 (32.0%)	16 (26.2)	24 (37.5)
Work status:			
Working outside the home for pay	7 (5.2%)	3 (4.6%)	4 (5.8%)
Homemaker	36 (26.9%)	20 (30.8%)	16 (23.2%)
Retired or disabled	87 (64.9%)	38 (58.5%)	49 (71.0%)
Unemployed	4 (3.0%)	4 (6.2%)	0
Annual income <\$15,000 (n = 116)	88 (75.9%)	42 (71.2%)	46 (80.7%)
Primary language is Spanish	109 (81.3%)	55 (84.6%)	54 (78.3%)
Speak/read only Spanish	80 (63.0%)	41 (65.1%)	39 (60.9%)
Acculturation score (possible range 5–25; actual range 5–25; higher score = more acculturation)	7.3 ± 3.9	6.7 ± 2.8	7.9 ± 4.6
Barriers to care score (possible range 0–42; actual range 14–30; higher score = higher barriers)	19.0 ± 3.1	18.6 ± 3.0	19.4 ± 3.2

Data are given as mean ± SD or n (percentage). One outlier was eliminated from these descriptive analyses.

seen in the disease-specific or generic measures of HRQL or in depression (Table 5).

Discussion

Telephone case management provided by bilingual/bicultural registered nurses decreased acute care resource use in the intervention group, at least initially, but the difference did not reach statistical significance. These results differ from our prior study of this intervention.¹⁴ Both studies took place in the same community, with most patients enrolled from the same hospital. Both studies weaned patients from the intervention at about the same rate over the 6 months of the study. There were significantly more family contacts and a trend for significantly more patient contacts in this study. The nurses providing the intervention were different in the 2 studies, but all were mentored and closely supervised by the same cardiovascular clinical nurse specialist with 30 years of clinical experience.

Table 2. Summary of Clinical Characteristics at the Time of Enrollment

	All	Usual Care	Intervention
n	134	65	69
Admission systolic blood pressure in mm Hg	154 ± 32	152 ± 33	156 ± 30
Type of ventricular dysfunction (n = 120)			
Systolic (ejection fraction ≤40%)	63 (52.5%)	32 (53.3%)	31 (51.7%)
Diastolic (ejection fraction ≥50%)	51 (42.5%)	26 (43.3%)	25 (41.7%)
Midrange (ejection fraction = 41–49%)	6 (5.0%)	2 (3.3%)	4 (6.7%)
Ejection fraction (n = 105)	43.2 ± 18.1	44.1 ± 18.1	42.3 ± 18.3
Etiology of HF (n = 131)			
Ischemic	58 (44.3%)	26 (40%)	32 (48.5%)
Hypertensive	53 (40.5%)	26 (40%)	27 (40.9%)
Valve disease	9 (6.9%)	4 (6.2%)	5 (7.6%)
Other (alcoholic, idiopathic, etc.)	11 (8.4%)	9 (13.8%)	2 (3.0%)
Functional Status by NYHA			
NYHA class II	25 (18.7%)	13 (20.0%)	12 (17.4%)
NYHA class III	62 (46.3%)	31 (47.7%)	31 (44.9%)
NYHA class IV	47 (35.1%)	21 (32.3%)	26 (37.7%)
Comorbidity category by Charlson Index			
Low (1–2)	66 (49.3%)	26 (40.0%)	40 (58.0%)
Moderate (3–4)	44 (32.8%)	24 (36.9%)	20 (29.0%)
High (5 or more)	24 (17.9%)	15 (23.1%)	9 (13.0%)
Major comorbid illnesses			
Hypertension	106 (79.1%)	48 (73.8%)	58 (84.1%)
Chronic obstructive pulmonary disease	37 (27.6%)	22 (33.8%)	15 (21.7%)
History of myocardial infarction	37 (27.6%)	19 (29.2%)	18 (26.1%)
Diabetes	79 (59%)	41 (63.1%)	38 (55.1%)
Diabetes with end-organ damage	24 (17.9%)	12 (18.5%)	12 (17.4%)
Renal disease with creatinine >3 mg%	9 (6.7%)	3 (4.6%)	6 (8.7%)
Functional performance by specific activity scale			
Class I	1 (0.8%)	1 (1.5%)	0 (0%)
Class II	14 (10.5%)	5 (7.7%)	9 (13.2%)
Class III	88 (66.2%)	45 (69.2%)	43 (63.2%)
Class IV	30 (22.6%)	14 (21.5%)	16 (23.5%)
Hospital discharge medications (n = 126)			
Angiotensin-converting enzyme inhibitor	78 (61.9%)	33 (55.0%)	45 (68.2%)
Angiotensin receptor blocker	22 (17.5%)	12 (20.0%)	10 (15.2%)
β-Blocker	68 (54.0%)	34 (56.7%)	34 (51.5%)
Digoxin	50 (39.7%)	29 (48.3%)	21 (31.8%)
Diuretic	113 (89.0%)	51 (85.0%)	62 (92.5%)
Calcium channel blocker not approved for HF	6 (4.8%)	5 (8.3%)	1 (1.5%)
Antiarrhythmic	17 (13.5%)	10 (16.7%)	7 (10.6%)
Spironolactone	14 (11.1%)	10 (16.7%)	4 (6.1%)
Antidepressant	10 (7.9%)	5 (8.3%)	5 (7.6%)
Index length of hospital stay	7.1 ± 5.4	7.25 ± 6.4	6.97 ± 4.3
Serum creatinine at discharge* (n = 133)	1.3 ± .59	1.6 ± .76	1.5 ± .70
Atrial fibrillation at discharge	23 (17.4%)	11 (17.2%)	12 (17.6%)

Data are given as mean ± SD or n (percentage). One outlier was eliminated from these descriptive analyses.

HF, heart failure; NYHA, New York Heart Association.

**P* < .05.

There were important differences in the patients enrolled in these 2 studies. The patients in this study more ill than those in the first study.¹⁴ The Hispanics in this second study were less likely to be newly diagnosed with HF,

Table 3. Heart Failure Acute Care Resource Use in Hispanic Patients Receiving the Case-Management Intervention Compared With Those Receiving Usual Care

	Usual Care Group (n = 65)	Intervention Group (n = 69)
HF hospitalization rate		
at 1 month	0.15 ± 0.40 (CI 0.06–0.25)	0.10 ± 0.35 (CI 0.01–0.19)
at 3 months	0.32 ± 0.61 (CI 0.17–0.48)	0.29 ± 0.67 (CI 0.14–0.44)
at 6 months	0.49 ± 0.81 (CI 0.25–0.73)	0.55 ± 1.1 (CI 0.32–0.78)
HF readmission rate (proportion admitted for HF at least once)		
at 1 month (<i>P</i> = .42)	13.8%	8.7%
at 3 months (<i>P</i> = .69)	26.2%	21.7%
at 6 months (<i>P</i> = .85)	33.8%	31.9%
HF hospital days		
at 1 month	1.41 ± 5.5 (CI 0.4–2.4)	0.59 ± 2.3 (CI –0.4 to 1.6)
at 3 months	2.40 ± 6.2 (CI 0.98–3.8)	2.19 ± 5.4 (CI 0.8–3.6)
at 6 months	3.40 ± 7.1 (CI 1.6–5.2)	3.65 ± 7.8 (CI 1.9–5.4)
HF inpatient costs		
at 1 month	\$2830 ± \$13,896 (CI \$353–\$5308)	\$1012 ± \$4022 (CI –\$1392 to \$3416)
at 3 months	\$4130 ± \$14,468 (CI \$1304–\$6956)	\$3045 ± \$7784 (CI \$302–\$5788)
at 6 months	\$6151 ± \$16,650 (CI \$2485–\$9818)	\$5567 ± \$13,137 (CI \$2009–\$9126)

Data are given as mean ± SD or percentage.

their severity of illness and illness burden were higher, they reported more functional limitations, and had poorer HRQL at enrolment. β -blocker use, measured at index hospitalization, was significantly higher in this second study, and digoxin use was significantly lower, reflecting historical changes in practice patterns between 1999 and 2002.³⁰

These results differ from those of other HF disease management trials summarized in recent reviews of disease management in multiracial, multinational samples. Phillips and colleagues⁵ found significantly fewer rehospitalizations in the 6 studies classified as frequent telephone contact, with an overall relative risk (RR) reduction of .79 for rehospitalizations. McAlister et al⁴ separated hospitalizations by cause and found a significant benefit for HF hospitalizations (RR 0.75) but not all-cause hospitalizations (RR 0.98). Holland et al⁶ also separated hospitalization type and found

that telephone interventions reduced HF hospitalizations significantly (RR 0.70) but the effect on all-cause hospitalizations (RR 0.86) was of borderline statistical significance.

In this study, there was no significant benefit from the intervention in rehospitalizations for either HF or all-causes. At 1 month, it appeared that the intervention would be effective, especially in all-cause hospitalizations, but by 3 months, the effect was lost. Differences in the focus of the intervention, with more family contacts, could be responsible for the lack of benefit. The nurses did not preferentially interact with families more than patients, but they reported difficulty reaching patients at various times during the 6-month intervention because they were moving among different households or traveling back to Mexico.

Sample differences also could be responsible for the lack of an intervention effect. Perhaps these patients, who were more ill and further along in the progression of their

Table 4. All-cause Acute Care Resource Use in Hispanic Patients Receiving the Case-Management Intervention Compared With Those Receiving Usual Care

	Usual Care Group (n = 65)	Intervention Group (n = 69)
All-cause hospitalization rate		
at 1 month	0.23 ± 0.49 (CI 0.12–0.34)	0.17 ± 0.42 (CI 0.06–0.28)
at 3 months	0.65 ± 1.0 (CI 0.43–0.86)	0.48 ± 0.74 (CI 0.27–0.69)
at 6 months	1.08 ± 1.4 (CI 0.75–1.4)	1.06 ± 1.3 (CI 0.74–1.4)
All-cause readmission rate (proportion admitted at least once)		
at 1 month (<i>P</i> = .65)	20.0%	15.9%
at 3 months (<i>P</i> = .86)	40.0%	37.7%
at 6 months (<i>P</i> = 1.0)	56.9%	58.0%
All-cause hospital days		
at 1 month	1.75 ± 5.6 (CI 0.7–2.8)	0.84 ± 2.5 (CI –0.18 to 1.8)
at 3 months	4.54 ± 8.1 (CI 2.8–6.3)	3.11 ± 5.7 (CI 1.4–4.8)
at 6 months	7.41 ± 9.8 (CI 5.1–9.8)	6.33 ± 9.4 (CI 4.0–8.6)
All-cause inpatient costs		
at 1 month	\$3223 ± \$13,917 (CI \$706–\$739)	\$1615 ± \$4679 (CI –\$827 to \$4058)
at 3 months	\$8019 ± \$18,284 (CI \$4566–\$11,472)	\$4694 ± \$8356 (CI \$1342–\$8045)
at 6 months	\$13,967 ± \$22,923 (CI \$9132–\$18,802)	\$10,015 ± \$16,104 (CI \$5322–\$14,708)
Multiple (> 1) readmissions at 3-months (<i>P</i> = .26)	13.8%	7.2%
Multiple (> 1) readmissions at 6-months (<i>P</i> = .56)	24.6%	30.4%

Data are given as mean ± SD or percentage. One outlier was eliminated from these analyses.

Table 5. Health Related Quality of Life and Depression Over Time in Hispanic Patients Receiving The Case-Management Intervention Compared With Those Receiving Usual Care

	Usual Care Group (n = 65)	Intervention Group (n = 69)
MLHF emotional subscale		
at baseline	11.6 ± 6.8 (CI 9.6–13.7)	9.9 ± 7.2 (CI 7.9–11.8)
at 3 months	1.9 ± 3.8 (CI 0.92–2.9)	1.5 ± 2.8 (CI 0.60–2.4)
at 6 months	1.9 ± 3.3 (CI 1.0–2.8)	1.4 ± 3.0 (CI 0.53–2.3)
MLHF physical subscale		
at baseline	26.4 ± 8.8 (CI 23.8–29.1)	24.7 ± 9.3 (CI 22.2–27.2)
at 3 months	8.4 ± 7.4 (CI 6.3–10.4)	7.5 ± 6.6 (CI 5.5–9.4)
at 6 months	8.1 ± 6.7 (CI 6.0–10.1)	7.5 ± 7.1 (CI 5.6–9.4)
MLHF total		
at baseline	56.1 ± 16.7 (CI 50.7–61.4)	52.7 ± 19.6 (CI 47.7–57.8)
at 3 months	13.9 ± 13.9 (CI 10.1–17.6)	12.3 ± 11.8 (CI 8.7–15.8)
at 6 months	12.9 ± 10.9 (CI 9.5–16.3)	12.1 ± 12.3 (CI 8.9–15.3)
EQ-5D visual analog scale		
at baseline	57.1 ± 20.0 (CI 51.3–62.9)	60.4 ± 19.9 (CI 54.9–65.9)
at 3 months	64.0 ± 27.0 (CI 57.3–70.7)	70.1 ± 18.7 (CI 63.8–76.5)
at 6 months	73.7 ± 17.4 (CI 68.6–78.8)	73.4 ± 17.4 (CI 68.6–78.1)
EQ-5D Index		
at baseline	0.66 ± 0.25 (CI 0.60–0.73)	.69 ± .19 (CI 0.63–0.75)
at 3 months	0.77 ± 0.21 (CI 0.72–0.82)	.84 ± .14 (CI 0.79–0.89)
at 6 months	0.78 ± 0.20 (CI 0.72–0.84)	.82 ± .20 (CI 0.77–0.88)
Depression by PHQ-9		
at baseline	8.6 ± 5.4 (CI 6.8–10.4)	8.8 ± 5.8 (CI 7.2–10.4)
at 3 months	2.3 ± 2.3 (CI 1.6–3.0)	1.9 ± 2.1 (CI 1.3–2.5)
at 6 months	2.0 ± 2.1 (CI 1.3–2.6)	1.5 ± 2.0 (CI 0.92–2.1)

Data are given as mean ± SD or percentage.

MLHFQ = Minnesota Living with Heart Failure Questionnaire.

PHQ-9 = Patient Health Questionnaire 9 itemd.

disease, were less responsive to this type of intervention. They had had HF for some time, so maybe they were less open to suggestions from the nurse case managers about how to take care of themselves. The patients in this trial were also significantly more functionally limited and had poorer HRQL than those in the first trial, which may have decreased their enthusiasm for self-care.

All three systematic reviews found a benefit of telephone interventions on mortality that ranged from RR .70⁶ to RR .91,⁴ depending on the trials included in the subcategory. In this study, no intervention benefit was seen in mortality. Although mortality was 25% lower in the intervention group, mortality was low overall and the study was not powered to detect a difference in this outcome.

Of the 3 recent systematic reviews of HF disease management, only Phillips et al⁵ summarized the data on HRQL across trials. They found a significant intervention effect on HRQL from telephone interventions, with a 13.5% difference between groups at the end of 6 months. In this study, both generic and disease-specific HRQL improved in both groups over time but not significantly more so in either group. These results are consistent with our prior comparison of HRQL in a matched sample of Hispanics and non-Hispanics with HF.³¹ In that study, we found that HRQL, measured in the same manner, improved more over a 6-month period in Hispanics than in non-Hispanics. Depression also improved over time but not more so in the intervention group. These improvements over time in HRQL and depression, regardless of group assignment, may be explained by factors known to be strengths in the

Hispanic population such as spirituality,³² a culturally slower pace of living,³³ and family support.³⁴

Intervention intensity also may be an important factor explaining lack of intervention effectiveness. Although the software included a feature suggesting the timing of the next call, the nurses reported frequently overriding the software recommendations. The factors influencing the frequency of contact by the nurse case managers require further exploration. Perhaps if the intervention had continued at the intensity provided in the first month, the effect seen in that period could have been sustained. Level of acculturation into US society and barriers to care should be explored as factors that may influence intervention intensity. It may be that persons who have not adapted to the US culture and those who experience barriers to accessing health care may need a more intense intervention.

The results of this study suggest that telephone case management is not sufficient to improve outcomes in Hispanics with HF, even when the intervention is provided by bilingual/bicultural nurses. The intervention team was sensitive to cultural differences in views of illness, knowledge of diseases, symptom management, and chronic disease self-care practices.³⁵ Although culturally diverse patients have been shown to develop concepts of a disease that are quite similar to that of providers, their goals, strategies, and methods of evaluating progress in controlling their illness reflect their life-world views.³⁶ These views can be particularly challenging when they reflect beliefs that differ from that of the provider. Therefore, nurses from the same cultural group were hired so they were able to understand cultural

norms (eg, *fatalismo* or “God’s will”) and the choice of culturally accepted behaviors (eg, cooking with lard) over “healthy” ones. In spite of this, the intervention was not sufficient to improve outcomes in this elderly, ill, poorly educated sample. Future research should explore other approaches such as community-based, participatory approaches. Health and health risks are influenced by behavioral, social, and environmental factors, so perhaps approaches that integrate the wider community would be more effective.³⁷

The results of this study are limited by the small sample size and the highly select population of Hispanics. In spite of 2 years of study enrollment from 2 major hospitals close to the US-Mexico border, the sample size was not adequate to detect an effect of the intervention. With a larger sample size we may have been able to detect an effect of the intervention. Those enrolled were extremely ill, poorly educated, economically poor, and unacculturated into US society, so these results are not applicable to all Hispanics with HF. This intervention may be more effective in other Hispanic groups.

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