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Title: Anxiety, Depression, and Functional Status are the Best Predictors of Health Status for Patients with Heart Failure

Marla J. De Jong, MS, RN, Debra K. Moser, DNSc, RN, and Misook L. Chung, PhD, RN. College of Nursing, University of Kentucky, Lexington, KY, 40536.

Body: Background: Although mortality related to heart failure (HF) is high, the number of patients living with HF increases annually. Therefore, health status is an increasingly important concept in the management of HF. In fact, most symptomatic patients are more concerned about their everyday health status than the length of their life. Yet, most investigators conduct intervention studies that are designed to reduce mortality. As a result, health status is poorly understood for patients with HF. Thus, we conducted this study to identify predictors of health status. **Methods:** In this correlational study, we interviewed 87 patients (age 73 ±11 years; 48% female; ejection fraction [EF] 38 ±15%; New York Heart Association [NYHA] class III/IV 53%) immediately prior to discharge from a hospitalization for HF. Health status was conceptualized as health-related quality of life [HRQOL] (measured using the Minnesota Living with Heart Failure Questionnaire), actual physical activity level (measured over 24 hours using the Mini Mitter actigraph), and level of symptom burden (measured using the Dyspnea-Fatigue Index). Hierarchical multiple regression techniques were used to determine sociodemographic (sex, age, living alone), clinical (comorbidities, NYHA class, EF), health perception, and emotional (anxiety, depression, and hostility measured using the Brief Symptom Inventory) variables associated with health status. **Results:** The model for each indicator of health status accounted for 37%, 52%, and 17% of the variance in HRQOL, symptom burden, and physical activity level, respectively. Variables independently associated with each indicator of health status are shown in the table. Based on the standardized beta coefficients, the three strongest predictors of health status were anxiety, NYHA class, and depression. **Conclusions:** Although emotional variables are not routinely assessed clinically, clearly they have a major impact on health status. Data from this study demonstrate that most traditional demographic and clinical variables assessed by clinicians are not associated with health status. Interventions to improve health status should target not only physical, but also emotional, well-being.

Variables Associated With Health Status

Variable	HRQOL	Activity Level	Symptom Burden
Age	.08	.42	.19
Sex	.89	.32	.16
Living Alone	.38	.29	.67
NYHA	.05	.005	.001
EF	.11	.97	.57
Comorbidity	.29	.35	.07
Health Perception	.23	.51	.86
Anxiety	.03	.02	.45
Depression	.05	.11	.05
Hostility	.45	.41	.09

Numbers in cells are multivariate p values

Slide 1

Anxiety, Depression, and Functional Status are the Best Predictors of Health Status for Patients with Heart Failure

Marla J. De Jong, Debra K. Moser, Misook L. Chung
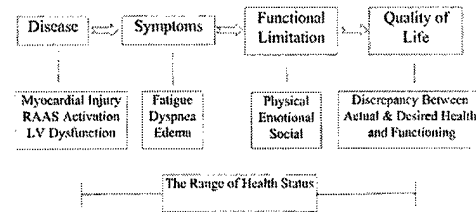
University of Kentucky

RICH
HEART PROGRAM

Slide 2

Slide 3

Health Status

- Heart failure has reached epidemic levels
- Health status important in management of HF
- Symptomatic patients more concerned about their everyday health status than the length of their life
  (Stanek et al., 2000; Rector et al., 1995; Lewis et al., 2001)
- Health status is a broad phenomenon (Spertus et al., 2002; Soto et al., 2004)
  - Health-related quality of life (HRQL)
  - Functional status
  - Symptom burden

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Range of Health Status

Disease	→	Symptoms	→	Functional Limitation	→	Quality of Life
Myocardial Injury RAAS Activation LV Dysfunction		Fatigue Dyspnea Edema		Physical Emotional Social		Discrepancy Between Actual & Desired Health and Functioning

The Range of Health Status

Spertus JA, et al. Expanding the outcomes in clinical trials of heart failure: the quality of life and economic components of EPHESUS (EPlerenone's neuroHormonal Efficacy and SUrvival Study). Am Heart J 2002;143:636-42.

Slide 5

Determinants of Health Status

- Clinicians focus on sociodemographic and physiologic determinants of health status
- Investigators often conduct intervention studies that are designed to reduce mortality
- Health status is poorly understood for patients with HF

Slide 6

Purpose

- To identify subjective predictors of health status, controlling for sociodemographic and clinical variables

Methods: Design

- Descriptive, correlational sub-study of a prospective, randomized clinical trial in which the dose of disease management needed to improve outcomes in patients with heart failure was determined

Methods: Sample Inclusion Criteria

- Hospitalized with heart failure
- NYHA classification II-IV
- At risk for heart failure rehospitalization

Methods: Sample Exclusion Criteria

- Discharged to an extended care facility
- Referred to hospice services or home care
- Referred to a specialty HF clinic
- Referred to cardiac rehabilitation
- Referred for outpatient infusion therapy
- Dementia, serious cognitive impairment, or serious psychiatric illness

Methods: Settings

- Inpatients with heart failure
  - Three urban and suburban community hospitals located in the Midwest

Methods: Data Collection

- IRB approval obtained at all sites
- Patients gave written informed consent
- Nurse research assistants collected data
- Data collected after patient's condition had stabilized

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Methods: Predictor Variables

- Sociodemographic variables
- Clinical variables
- Health perception
- Emotional variables

Methods: Measurement

- Predictor Variables
  - Sociodemographic variables
    - Age, gender, living arrangement
  - Clinical variables
    - NYHA class
    - Ejection fraction
    - History of CAD, AMI, PTCA, CABG

Methods: Instruments

- Predictor variable (cont.)
  - Health perception
    - Single-item question from the SF-36 about patients' perception of their current health

Methods: Instruments

- Predictor variables (cont.)
  - Emotions: Anxiety, Depression, Hostility
    - Subscales of Brief Symptom Inventory (BSI) Derogatis, 1983
      - Previous research supports reliability and validity for HF patients
      - Brief yet sensitive measures
      - No physical indicators of mood

Methods: Outcome Variables

- Health Status
  - Health-related quality of life
  - Actual physical activity level
  - Symptom burden

Methods: Instruments

- Health-related quality of life
  - Minnesota Living with Heart Failure Questionnaire Rector, 1987
    - Developed specifically to measure HRQL in HF patients
    - Addresses physical and emotional impairments
    - Used extensively in HF research
    - Previous research supports its reliability and validity

Methods: Measurement

- Physical activity level
  - Measured over 24 hours using Mini Mitter actigraph Mini Mitter Co., Inc., Bend, OR
    - Patient wears as he/she performs daily activities
    - Objective measure of functional status
    - Previous research supported reliability and validity
    - Advantages: compact, continuous monitoring capabilities within natural setting

Methods: Instruments

- Symptom burden
  - Dyspnea-Fatigue Index
    Feinstein, 1989
    - Designed to assess the degree to which the symptoms of dyspnea and fatigue have an impact on daily life
    - Previous research has supported reliability and validity for HF patients

Methods: Data Analysis

- Bivariate: Spearman's rho correlations
- Multivariate: Separate hierarchical multiple regression models for three indicators of health status
  - Step 1: Demographic variables: age, gender, living alone
  - Step 2: Clinical variables: NYHA class, EF, comorbidity
  - Step 3: Health perception: current health
  - Step 4: Emotional variables: anxiety, depression, hostility

Results: Sociodemographic Characteristics (N = 87)

Characteristic	Mean ± SD or %
Age (years)	72.5 ± 10.8
Education (years)	12.0 ± 2.6
Female Gender	42 (48.3%)
Married	39 (44.8%)
Lives Alone	39 (44.8%)
White Ethnicity	77 (88.5%)

Results: Clinical Characteristics (N = 87)

Characteristic	Mean ± SD or %
LVEF, %	38.2 ± 15.0
NYHA Classification	
II/III	41 (47.1%) / 41 (47.1%)
IV	5 (5.7%)
History CAD / AMI	61 (70.1%) / 33 (37.9%)
History PTCA	15 (17.2%)
History CABG	30 (34.5%)
History HTN	65 (74.7%)

Results: Health Perception and Emotional Variables (N = 87)

Characteristic	%
Poor or fair health perception	51.5%
Anxious	72.3%
Depressed	73.3%
Hostile	66.3%

Results: Outcome Variables (N = 87)

Characteristic	Mean ± SD
HRQOL	51.62 ± 22.58
Physical Activity Level	181,808.79 ± 88,034.75
Symptom Burden	5.04 ± 2.29

Results: Bivariate Correlations

Variable	HRQOL	Activity Level	Symptom Burden
Age	-.27*	-.22*	-.07
NYHA	.33*	-.32*	-.73*
EF	.11	.15	.09
Health Perception	.41*	.06	-.32*
Anxiety	.50*	-.03	-.43*
Depression	.51*	-.11	-.55*
Hostility	.43*	-.07	-.25*

Spearman's rho correlations; *$p < .05$

Health-Related Quality of Life

Step	Variable	P	Adj. R^2
1	Age	.08	
	Gender	.89	
	Living Alone	.38	.04
2	NYHA class	.05	
	EF	.11	
	Comorbidity	.29	.20
3	Current Health	.23	.25
4	Anxiety	.03	
	Depression	.05	
	Hostility	.45	.37

Physical Activity

Step	Variable	P	Adj. R^2
1	Age	.42	
	Gender	.32	
	Living Alone	.29	.06
2	NYHA class	.005	
	EF	.97	
	Comorbidity	.35	.10
3	Current Health	.51	.10
4	Anxiety	.02	
	Depression	.11	
	Hostility	.41	.17

Symptom Burden

Step	Variable	P	Adj. R^2
1	Age	.19	
	Gender	.16	
	Living Alone	.67	.04
2	NYHA class	.001	
	EF	.57	
	Comorbidity	.07	.45
3	Current Health	.86	.45
4	Anxiety	.45	
	Depression	.05	
	Hostility	.09	.52

Conclusions

- Three strongest predictors of health status were anxiety, NYHA class, and depression
- Although not routinely assessed clinically, emotional variables have major impact on health status
- Interventions designed to improve health status should target not only physical, but also emotional well-being