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Contributions of supportive relationships to heart failure self-care

By Margaret Sebern and Barbara Riegel

Supportive relationships are known to improve outcomes for persons with heart failure (HF). Supporters may do so by improving self-care, but little is known about the influence of supportive relationships on HF self-care.

The purpose of this study was to explore background characteristics associated with supportive relationships, and the contribution of supportive relationships to HF self-care. The construct of shared care was used to operationalize supportive relationships. Shared care refers to a system of interpersonal processes (communication, decision making, and reciprocity) used in close relationships to exchange support. A cross sectional design was employed recruiting 75 HF dyads.

Older patients who perceived their health as better reported better shared care communication. Spouse dyads perceived more reciprocity in their relationship than non-spouse dyads. The process of patient shared care decision making was related to HF self-care maintenance ($r = 0.65$) and self-care confidence ($r = 0.52$). Patient communication ($r = 0.24$) and reciprocity ($r = 0.41$) were related to self-care confidence. Caregiver decision making ($r = 0.29$) contributed to self-care maintenance; and caregiver decision making ($r = 0.37$) and reciprocity ($r = 0.35$) contributed to self-care confidence.

These findings suggest that augmenting the processes of shared care may be a valuable focus for future intervention research.

Heart failure (HF) is a major cause of disability and a significant contributor to escalating health care cost in the United States (U.S.) and globally [1]. The global prevalence of HF is at 15 million people and estimated to increase due to a worldwide increase in risk factors for atherosclerosis such as hypertension and obesity [1]. The direct and indirect cost of HF is estimated to be \$33.2 billion in 2007 in the U.S. [2]. The majority of HF expenditure is for hospital cost, which totaled \$17.8 billion from Medicare alone. However, more than 60% of the global burden of heart disease occurs in developing countries [3]. Researchers have linked the lack of formal and informal support to these costs [4].

An engaging idea behind social support is that support may contribute to health. In an integrative review examining the influence of social support on outcomes for patients with HF, lack of supportive relationships was related to hospital readmission and higher mortality in persons with HF [5]. Frasure-Smith and colleagues [6] investigated the impact of social support

on depression and mortality in patients following myocardial infarction (MI) and found a significant interaction between depression and perceived social support. Depression predicted 1 year mortality, but higher levels of social support predicted improvement in depressive symptoms for MI patients. In another study with HF patients, social isolation predicted a 36% increase in mortality [7]. Although evidence indicates social support is linked to health outcomes, less is known about the mechanism by which social support influences adaptation to chronic illness and outcomes [4,8,9].

Close relationships are a context for the exchange of social support and by its nature involves two persons. However not all close relationships are supportive. Negative aspects of close relationships include criticism, rejection, violation of privacy, lack of reciprocity, feeling angry about unpleasant events, and strain [10]. Shared care is conceptualized as a system of interpersonal processes (communication, decision making, reciprocity) used in relationships to exchange support. The relationships studied here were those between a HF patient and family caregiver. In this first study of shared care and HF self-care, we focused on the positive aspects of support.

Most of the nursing literature has focused on patient-centered care, where the providers of family care are often overlooked [11,12]. By focusing on only one or the other member of the care dyad we neglect important information about the relational influence of one person on the other. Several researchers identified that challenges in family care research are to develop methods and tools to study the dynamic characteristics of supportive relationships [9,13]. Understanding the influence of supportive relationships on HF patients is needed to guide the development of effective nursing interventions that improve HF patient outcomes. The purpose of this study was to explore background characteristics associated with supportive relationships, and the contribution of supportive relationships to HF self-care. The specific aims were; (a) to explore how age, gender, race, marital status, education, years of relationship, spousal relationship, and subjective perceptions of health, chronic illness, or being a giver and receiver of care are associated with shared care, and (b) to explore the contribution of shared care to HF self-care.

1. Background and conceptual framework

Shared care is a system of interpersonal processes used in dyadic relationships to exchange support. Shared care is a dyadic processes based on the premise that each participant affects and is affected by the other [14]. In previous work, shared care was used to describe the interpersonal process used by home care patients and family caregivers to manage

a chronic illness [15,16]. A family caregiver was defined as whomever a patient identified as providing them with assistance and support, such as a relative or a friend who is just like family. Family caregiving refers to unpaid assistance to a patient in their place of residence by relatives and friends [17].

Shared care interactions require cognitive ability to communicate, make decisions, and engage in reciprocal actions. Shared care is influenced by prior experiences; experiences providing and receiving assistance result in interpersonal patterns that are not easily changed [18]. Past relationships, either positive or negative, influence willingness to provide assistance in the present.

Although there are many components of family care interactions, three essential processes of shared care were studied—communication, decision making, and reciprocity—based on prior work with chronic illness [16]. Communication refers to the exchange of information about an illness experience that occurs between the caregiver and the patient about symptoms, feelings and advice, which shapes the meaning of the situation for the dyad. Decision making is defined as a patient's capacity to seek information and be involved in decisions about his/her care. The patient's evaluation of the situation may be the basis for action or the family member's understanding of the situation may be more important in making treatment decisions. Reciprocity refers to a partnership in managing an illness and is characterized by empathy and listening when providing and receiving assistance [16].

Other researchers have demonstrated the importance of communication, decision making, and reciprocity in family care. Both Lyons et al. [19] and Horowitz et al. [20] found that disagreement about care experiences increased strain and depressive symptoms for both members of the dyad. Others have reported that caregivers with high levels of agreement about problem behaviors experienced less burden and depression [21]. Quality of the relationship, such as ease of communication, has been shown to be associated with high levels of agreement about behaviors. Deimling and colleagues [22] found that decision making satisfaction influences caregiver depression and suggested that interventions that enhance communication and decision making skills may improve family function.

Reciprocity has been shown repeatedly to be an important component of family care [19,23–27]. Potential benefits of reciprocity in caregiving were decreased anxiety and depressive symptoms, and an increased sense of control [28,29]. Researchers studying the patient's perspective, reported that patients provide substantial support to caregivers and these acts of reciprocity are important to patient well being [26,30]. An inability to reciprocate and negative interactions with a caregiver, are major risk factors for poor patient outcomes.

Even though it is established that supportive relationships influence health and well being [31], the mechanism of the effect is still poorly understood [9,32,33]. A central question in the social support literature is how do social relationships influence adaptation to chronic illness? [34] The receipt of support probably improves adaptation by providing solutions, promoting adherence to health behaviors, and by tranquilizing the neuroendocrine system to be less reactive to stress [31,32]. Research is needed to understand the specific components of relationships that are helpful, neutral, or even harmful to well being [9].

In the current study, the theoretical constructs of shared care and HF self-care were combined in an attempt to understand the relationship between shared care and HF self-care. HF self-care was defined as a naturalistic decision making process involving the choice of behaviors that maintain physiologic stability (e.g., treatment adherence, symptom monitoring) and decision making in response to symptoms when they occur [35]. After exploring the relationship between patient and caregiver background variables and shared care dimensions, we described how the dimensions of patient and caregiver shared care relate to the dimensions of HF self-care.

2. Methods

2.1. Participants

Participants were obtained from an outpatient cardiology clinic affiliated with a Midwestern university. A power analysis was conducted to justify a sample size adequate to answer the study aims. Correlation coefficients and structure equation modeling require sample sizes large enough that correlations are reliably estimated [36]. To detect a 0.32 partial correlation between a background variable and components of shared care, and shared care and self-care, with alpha (two sided) = 0.05; β = 0.17; a sample size of 75 would be required [37]. To detect a 0.40 correlation coefficient between the shared care and SCHFI factors, with alpha (2-sided) = 0.05; and β = 0.20; a sample of 62 would be required. Therefore, a minimal sample size of 75 was sought for the final analysis. The investigation conforms to the principles outlined in the Declaration of Helsinki. Institutional Review Board approval was obtained and all participants gave informed consent.

Outpatient staff screened the HF patients for eligibility and if the patient met eligibility criteria, clinic staff explained the study and invited patients to participate. Clinic staff screened 190 patients and identified 173 (91%) who met eligibility criteria: diagnosed with chronic HF; over 21 years of age; cognitively intact; able to see, read and write English. Of the 173 patients eligible to participate, 146 (84%) accepted a survey package, and 101 (69%) returned the

package. Cases were included in the dyadic analysis if surveys were returned from both a patient and a matched caregiver. Out of the 101 returned surveys 75 cases included matched dyads, yielding a 51% response rate for matched patient and caregiver dyads.

Twenty-six surveys were returned with a survey from only one member of the dyad (20 patients and 6 caregivers). We compared background variables between the 75 patients with a matched caregiver and the 20 patients who did not have a matched partner, and did a similar comparison of the 75 caregivers with a matched patient and the 6 caregivers who did not have a matched partner. For HF patients, there were no significant differences for background variables between those with a matched caregiver, and those without a caregiver. In the comparison of the 75 matched caregivers with the 6 unmatched caregivers, there were no significant differences for background variables except for age and relationship. The caregivers in the unmatched group tended to be younger than the caregivers in the matched group ($p = 0.01$), and less likely to be the spouse (e.g., daughter) of the patient ($p = 0.03$).

2.2. Procedures

A cross sectional design was employed. Clinic staff offered survey packages to eligible HF patients. Patients who took a survey to complete were asked to give the caregiver survey to the person who provided them with the most assistance at home. Seventy-three percent of the patients gave the caregiver survey to a spouse or partner. Each survey package included the Self-Care in Heart Failure Index (SCHFI), a patient and caregiver version of the Shared Care Instrument-3 (SCI-3), a single item measure of perceived health, background questions, written instructions, and a self-addressed stamped return envelope. The background questions assessed gender, age, race, ethnicity, education, marital status, relationship type and duration, presence of a chronic illness, and whether the participant was a caregiver, care receiver, both, or neither. Information on NYHA classification and duration of HF was not collected.

2.3. Administration, description, and scoring of instruments

Shared care was measured using the 19 item SCI-3, which has two versions (patient and caregiver). The SCI-3 participants rate their agreement with items on a 6-point Likert type scale ranging from completely disagree (0) to completely agree (5). Factor analysis supported the underlying theoretical basis and factor structure of the SCI-3 [38,39], with three factors identified: communication, decision making, and reciprocity. Items on both versions are identical except for the decision making scale (6-items), which focuses on the patient's decision making capacity. So, in the caregiver version, the caregiver evaluates the patient's decision making capacity. An

example of a decision making item is, “When I am not feeling well, I decide when to call the doctor.” Five communication items are negatively worded and reverse coded. An example of a communication item is, “I have no one to talk to about how I am feeling.” There are 8 reciprocity items; an example of a reciprocity item is “We have a partnership”.

When Shared Care subscale scores are computed, higher scores reflect better communication, decision making, and reciprocity for each member of the dyad. No combined or total score is computed. In this sample, coefficient α for patient communication was 0.85, and 0.90 for caregiver communication. Coefficient α for patient decision making was 0.83, and 0.83 for caregiver decision making. And coefficient α for patient reciprocity was 0.69, and caregiver reciprocity was 0.79. The SCI-3 was written at a seventh grade reading level and requires 5–10 min to complete.

Self-care was measured using the Self-Care of Heart Failure Index (SCHFI) [35], which captures the following components of self-care (a) maintenance behaviors that prevent an acute exacerbation of HF (e.g., daily weighing); (b) the patient's ability to recognize symptoms when they occur; (c) independent and interdependent self-care treatments implemented by the patient (e.g., take an extra diuretic for shortness of breath); (d) ability to evaluate the effectiveness of the treatments implemented; and (e) confidence in the ability to perform self-care. The SCHFI contains 17 items measured on a 4-point Likert scale grouped to form three scales: maintenance (a above), management (b–d above), and confidence (e above). Items measuring self-care maintenance address treatment adherence and self-monitoring. Management focuses on decision making in response to symptoms. So, if patients have not experienced dyspnea or ankle edema in the past 3 months, then they are directed not to answer the management questions. Items measuring confidence address the perceived ability to engage in each phase of the self-care process (e.g., recognize symptoms). Higher scores reflect better self-care.

In this sample, coefficient α for maintenance was 0.71, for management 0.83, and for confidence 0.93. Construct validity of the SCHFI has been demonstrated through factor analysis [35]. The SCHFI has been shown to be sensitive to subtle behavioral changes in a variety of HF samples [40,41]. The SCHFI was written at a sixth grade reading level and takes approximately 5–10 min to complete.

Perceived health was measured with a single item question, In general how would you say your health is? This question is used widely to measure subjective health. The response options are poor, fair, good, very good, and excellent. This single item has been shown repeatedly to predict mortality after controlling for objective health status judged by a physician [42].

2.4. Approach to analysis of dyadic data

Data cleaning and accuracy checks were conducted on all returned surveys. In our model, we wished to incorporate all possible values from the dyad since our sample was fairly small, but noticed a moderate level of missing values. We conducted a missing data analysis to assess the potential for biases due to this missingness, and tried to eliminate these biases from our model. Based on Little and Rubin's [43] taxonomy of missingness, we were able to test and accept the assumption that the missingness was completely at random. Missing completely at random (MCAR) is the probability that our responses are intermittently missing completely independent of all covariates, all observed responses, and all missing responses. This was accomplished using the MCAR test [44], where $\chi^2 = 958.808$, $df = 893$, $p = 0.06$, allowing us to accept the assumption of MCAR.

To respond to this level of missingness and to be able to incorporate all possible information into our model, we used the structural equation modeling package Mplus Version 5, [45] which implements the full information maximum likelihood (FIML) algorithm developed by Little and Rubin [46]. The FIML algorithm has been shown to produce unbiased parameter estimates and standard errors under MAR and MCAR. FIML works by estimating a likelihood function for each individual based on the variables that are present so that all the available data are used. Rather than the traditional approach to calculating chi-square, FIML estimates two models, the H_0 (null hypothesis) model and the H_1 (research hypothesis) model. The H_0 model is the "unrestricted" model, meaning that all variables are correlated. The H_1 model is the specified model. The difference between the two log-likelihoods is used to derive the chi-square. This approach allows one to use all the information available in the variables.

MPlus was specifically designed to work with categorical data, and handles dependent dyadic data consistent with David Kenny's approach for analyzing dyadic data [47]. The dyad was the unit of analysis: each shared care and background variable was contained twice in the data set (i.e., once for each dyad member). However, the SCHFI variables were only represented once in the data set because only the patient completed this measure.

To assess the relationship between background variables and shared care dimensions we used Multiple Indicator Multiple Cause (MIMIC) models [45]. We first computed the correlation between patient and caregiver shared care and background variables (e.g. patient and caregiver communication; patient health with caregiver health). We regressed the SCI-3 variables on each of the background variables. Significant associations between background variables and communication, decision making, and reciprocity would suggest that the SCI

components vary with these variables. To analyze the association between components of patient and caregiver shared care and HF self-care we estimated the association between the scales using a correlated factor analysis model, where the correlations between the factors were estimated, controlling for dependency in patient and caregiver SCI-3 scores. Results were interpreted as suggested by Cohen [48], who defines 0.50 as a large correlation, 0.30 as medium, and 0.10 as small.

3. Results

The typical patient was a 71 year old Caucasian male with a high school education (Table 1). The typical caregiver was a 65 years old Caucasian female spouse or partner with a high school education. On average the patient and caregiver had known each other for 44 years (see Table 1). All the patients had a diagnosis of HF, although only 60% reported having a chronic illness. Forty-one percent of patients self rate their health as poor–fair, 50% good, 8% very good, and no patient rated his/her health as excellent (see Table 2). When patients were asked if they were a caregiver or a care receiver, 5% stated they were a care giver and 45% described themselves as both a caregiver and care receiver.

In the caregiver group, 48% described themselves as care givers, 31% described themselves as both a caregiver and care receiver. Thirty-nine percent of caregivers reported they had a chronic illness, and 20% self rate their health as poor– fair, 47% rated health as good, 21% very good, and 10% rated health as excellent (see Table 2).

3.1. Background variables related to components of shared care

Patient variables associated with one or more shared care dimensions were patient perceived health, chronic illness, age, and being a spouse/partner (Table 3). Specifically for the patient, shared care communication varied positively with higher age, better health, and perception of not having a chronic illness. Patient shared care reciprocity correlated with being a spouse/partner. Patient decision making was not significantly related to any background variables. It is interesting to note that all patient and caregiver background variables had moderate to strong correlations, suggesting that the dyads were more similar on these variables than different.

Caregivers who were a spouse/partner had higher levels of reciprocity. Caregiver perception of being both care giver and recipient was strongly associated with shared care communication and reciprocity (Table 4). Caregiver perceived health and education was positively associated with all 3 shared care components, suggesting that the caregiver's health

and education may be an important influence on the relationship.

As seen in Table 5, all but one patient shared care dimension correlated with the caregiver shared care dimensions. Patient communication, decision making, and reciprocity had moderate to large correlations with the similar caregiver dimension. Within dyad shared care correlations suggest a heightened similarity for these variables. However none of the shared care dimensions had correlations above 0.85 suggesting that patient and caregiver shared care are unique factors [47].

3.2. The contribution of shared care to HF self-care

About one third of the patients were asymptomatic and therefore unable to answer the SCHFI management questions, so this scale was not used in these analyses. When associations (correlations/covariances) between the SCI-3 scales and SCHFI maintenance and confidence scales were tested, patient and caregiver decision making were the only shared care components associated with patient self-care maintenance (Tables 6 and 7). All 3 of the patient shared care components had significant correlations with HF self-care confidence. For the caregiver, shared care decision making and reciprocity were significantly correlated with patient HF self-care confidence. The correlations between processes of patient and caregiver shared care and patient HF self-care ranged from small to strong. There were no negative correlations between shared care and HF self-care.

4. Discussion

To improve the care of both HF patients and family caregivers, information is needed about what are the characteristics of supportive relationships, how support influences outcomes, and what aspects of supportive relationships contribute to self-care. The aim of this study was to explore patient and caregiver background characteristics associated with shared care, and contributions of shared care to HF outpatients' self-care. The analysis of background variables suggests that older patients who perceived their health as relatively better reported better shared care communication. Spouse dyads perceived more reciprocity than non-spouse dyads. Older spouse caregivers providing and receiving care had better communication. More educated and healthy caregivers had higher scores for all 3 shared care components. These variables, especially health and being a spouse, warrant further study because of their potential influence on supportive relationship.

Related to the study's aim to understand the contribution of shared care to HF self-care, we found strong, positive relationships between patient and family caregiver shared care

decision making and HF self-care maintenance and confidence. Patient shared care communication and reciprocity were moderately related to self-care confidence but not maintenance. Caregiver reciprocity and decision making had a moderate association with HF self-care confidence. These findings corroborate social support propositions that interpersonal relationships influence adherence to health behaviors and enhance self confidence [49,50].

Prior researchers have suggested that specific processes in relationships may be linked to specific kinds of support [9]. The findings in this study suggest that shared care decision making may be a specific process used to support the patients' HF self-care maintenance behaviors and that shared care communication, decision making, and reciprocity may enhance HF self-care confidence. These findings support prior research indicating that collaborative relationships and constructive problem solving may be important relationship processes for couples managing HF [8,51].

Family and friends are important partners in providing long term care; however they cannot provide care alone and need guidance, support, and skills to manage care that is often complex. Coyne suggested that the health care system is ill equipped to facilitate the involvement of family in chronic illness care [8]. The findings from this study support the importance of involving both members of a care dyad in the care of persons with HF. Interventions designed to improve a dyad's communication, decision making, and reciprocity may improve HF self-care.

Nurses could use the findings from this study to re-conceptualize how they assess strengths in family relationships and to develop and test interventions targeting both members of the dyad. A nurse could use the shared care scales to assess the dyad's communication, decision making, and reciprocity, to identify difficulties, and to design interventions to assist in areas of difficulty. For example, if difficulty with patient decision making was identified, skill-based interventions might be implemented to strengthen patient and caregiver decision making. Coyne suggested that a reason for negative support may be inaccurate information held by the caregiver [8]. Providing accurate information about how to perform HF self-care maintenance and management to both members of the dyad could improve both dyad relationship quality and HF self-care.

Within the dyad shared care dimensions and background variables were significantly associated. These findings are consistent with other researchers who hold that dyads have more in common than unrelated participants [47]. For both patients and caregivers, being a spouse/partner had a significant positive association with reciprocity. Other researchers suggest that spouse may have higher reciprocity because of multiple opportunities to provide and receive

assistance, and if they value interdependence [51]. People with spouses are more likely to adhere to life style changes [32], and not having a partner is a significant predictor of poor outcomes for HF patients [52]. The findings in the current study and those by other researchers demonstrate the importance of assessing background characteristics of both members of the dyad.

Several limitations to the study were recognized. First, due to the small sample and cross sectional study design, the direction of these relationships and causality cannot be assumed. The study had adequate power for estimating factor correlations between shared care and HF self-care, and partial correlations greater than 0.32.

A second limitation was the majority of participants were non-Hispanic white, so the shared care models need further evaluation with other racial and ethnic groups. The participants were cognitively intact with no major psychiatric morbidity, thus the findings cannot be generalized to people with cognitive and mental disabilities without further testing. Finally, the internal consistency of the reciprocity scale was borderline (0.69 patient reciprocity and 0.79 caregiver reciprocity). Mc Dowell [42] recommends a 0.79 or greater internal consistency for attitude measures. However, Mc Dowell stated that lower reliability, from 0.50 to 0.70, was adequate for the purpose of testing correlations between groups.

Although the relationships between components of shared care and HF self-care are correlations, further testing of the direction of relationships between shared care, HF self-care, and outcomes for both patients and caregivers is warranted. The findings support efforts to assess modifiable factors in close relationships like shared care, and the testing of dyadic interventions to strengthen supportive exchanges between HF patients and caregivers in order to improve outcomes for both members of the care dyad.

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References

- [1] Young JB. The global epidemiology of heart failure. *Med Clin North Am* 2004;88(5):1135–43.
- [2] Rosamond W, Flegal K, Friday G, et al. Heart disease and stroke statistics— 2007 update: a report from the American Heart Association Statistics Committee and Stroke

- Statistics Subcommittee. *Circulation* 2007;115: e69–171.
- [3] Atlas of heart disease and stroke. World Health Organization; 2002 (Accessed June 22, 2007, at http://www.who.int/cardiovascular_diseases/resources/atlas/en/index.html).
- [4] Molloy G, Johnston D, Witham M. Family caregiving and congestive heart failure. Review and analysis. *Eur J Heart Fail* 2005;7:592–603.
- [5] Luttik ML, Jaarsma T, Moser D, Sanderman R, van Veldhuisen DJ. The importance and impact of social support on outcomes in patients with heart failure: an overview of the literature. *J Cardiovasc Nurs* 2005;20(3):162–9.
- [6] Frasure-Smith N, Lesperance F, Gravel G, et al. Social support, depression, and mortality during the first year after myocardial infarction. *Circulation* 2000;101(16):1919–24.
- [7] Murberg TA. Long-term effect of social relationships on mortality in patients with congestive heart failure. *Int J Psychiatry Med* 2004;34(3):207–17.
- [8] Coyne JC. Interventions in close relationships. In: Lyons RF, Sullivan MJ, Ritvo PG, editors. *Relationships in chronic illness and disability*. Thousand Oaks: Sage; 1995. p. 96–122.
- [9] Reis HT, Collins N. Measuring relationship properties and interactions relevant to social support. In: Cohen S, Underwood LG, Gottlieb BJ, editors. *Social support measurement and intervention*. New York: Oxford University Press; 2000. p. 136–92.
- [10] Krause N. Negative interaction and heart disease in late life: exploring variations by socioeconomic status. *J Aging Health* 2005;17(1):28–55.
- [11] Chapter 11 Family caring. National Institute of Health; 2004 (Accessed September 29, 2006, at <http://ninr.nih.gov/ninr/research/vol3/FamCare.html>).
- [12] Lauver DR, Ward S, Heidrich SM, et al. Patient-centered interventions. *Res Nurs Health* 2002;25:246–55.
- [13] Martire LM, Lustig AP, Schulz R, Miller GE, Helgeson VS. Is it beneficial to involve a family member? A meta-analysis of psychosocial interventions for chronic illness. *Health Psychol* 2004; 23(6):599–611.
- [14] Gayle BM, Preiss RW. Chap. 7 An overview of dyadic processes in interpersonal communication. In: Allen M, Preiss RW, Gayle BM, Burrell NA, editors. *Interpersonal communication research: advances through meta-analysis*. Mahwah, N.J.: Lawrence Erlbaum Associates; 2002. p. 111–24.
- [15] Sebern M. Explication of the construct of shared care and the prevention of pressure sores in home health care. *Res Nurs Health* 1996;19:183–92.

- [16] Sebern M. Shared Care, elder and family member skills used to manage burden. *J Adv Nurs* 2005;52(2):170–9.
- [17] Archbold PG. Family-based care for frail older persons: treatment implementation of PREP. Gerontological Society of America; 2004 October 2004. Washington, DC: *Gerontologist*; 2004. p. 171–2.
- [18] Gaugler JE, Kane RL, Kane RA. Family care for older adults with disabilities: toward more targeted and interpretable research. *Int J Aging Hum Dev* 2002;54(3):205–31.
- [19] Lyons KS, Zarit SH, Sayer AG, Whitlatch CJ. Caregiving as a dyadic process: perspectives from caregiver and receiver. *J Geront, Ser B Psychol Sci Soc Sci* 2002;57(3):P195–204.
- [20] Horowitz A, Goodman C, Reinhardt J. Congruence between disabled elders and their primary caregivers. *The Gerontologist* 2004;44(4):532–42.
- [21] Pruchno RA, Burant CJ, Peters ND. Understanding the well-being of care receivers. *Gerontologist* 1997;37(1):102–9.
- [22] Deimling GT, Smerglia VL, Schaefer ML. The impact of family environment and decision-making satisfaction on caregiver depression: a path analytic model. *J Aging Health* 2001;13(1):47–71.
- [23] Archbold PG, Stewart BJ, Greenlick MR, Harvath TA. The clinical assessment of mutuality and preparedness in family caregivers to frail older people. In: Funk SG, Tornquist EM, Champagne MT, Copp LA, editors. *Key aspects of elder care*. New York: Springer; 1992. p. 328–39.
- [24] Davey A, Eggebeen DJ. Patterns of intergenerational exchange and mental health. *J Geront, Ser B Psychol Sci Soc Sci* 1998;53(2):86–95.
- [25] Liang J, Krause NM, Bennett JM. Social exchange and well-being: is giving better than receiving? *Psychol Aging* 2001;16(3):511–23.
- [26] Newsom JT, Schulz R. Caregiving from the recipient's perspective: negative reactions to being helped. *Health Psychol* 1998;17(2):172–81.
- [27] Wolff JL, Agree EM. Depression among recipients of informal care: the effects of reciprocity, respect, and adequacy of support. *J Geront, Ser B Psychol Sci Soc Sci* 2004;59(3):S173–180.
- [28] Beach SR, Schulz R, Yee JL, Jackson S. Negative and positive health effects of caring for a disabled spouse: longitudinal findings from the caregiver health effects study. *Psychol Aging* 2000;15(2):259–71.
- [29] Kramer BJ. Gain in the caregiving experience: where are we? What next?

- Gerontologist 1997;37(2):218–32.
- [30] Reinhardt J. Effects of positive and negative support received and provided on adaptation to chronic visual impairment. *Appl Dev Sci* 2001;5(2):76–85.
- [31] Cohen S, Gottlieb B, Underwood L. Social Relationships and Health. In: Cohen S, Gottlieb B, Underwood L, editors. *Social support measurement and intervention*. New York: Oxford University Press; 2000. p. 3–25.
- [32] Pender N, Murdaugh C, Parsons M. Chapter 9: social support and health promotion. In: Pender N, Murdaugh C, Parsons M, editors. *Health promotion in nursing practice*. Fifth ed. Upper Saddle River Pearson Prentice Hall; 2006. p. 223–42.
- [33] Wills T. Supportive functions of interpersonal relationships. In: Syme SCaS, editor. *Social support and health*. New York: Academic Press; 1985. p. 61–82.
- [34] Lyons RF, Sullivan MJ, Ritvo PG. *Relationships in chronic illness and disability*. Thousand Oaks: Sage; 1995.
- [35] Riegel B, Carlson B, Moser DK, Sebern M, Hicks FD, Roland V. Psychometric testing of the self-care of heart failure index. *J Card Fail* 2004;10(4):350–60.
- [36] Boomsma A. On the robustness of LISERAL (maximum likelihood estimation) against small sample size and non-normality. University of Groningen; 1983. Grogungen.
- [37] Saris W, Satorra A. Power evaluations in structural equation models. In: Bollen KA, Long JS, editors. *Testing structural equation models*. Newbury Park: Sage; 1993. p. 181–204.
- [38] Sebern M. Psychometric evaluation of the shared care instrument in a sample of home health care family dyads. *J Nurs Meas* 2005;13(3):175–91.
- [39] Sebern M. Refinement of the shared care instrument-revised: a measure of a family care interaction. *Journal of Nursing Measurement* in press;16(1).
- [40] Riegel B, Carlson B. Is individual peer support a promising intervention for persons with heart failure? *J Cardiovasc Nurs* 2004;19(3):174–83.
- [41] Riegel B, Dickson VV, Hoke L, McMahon JP, Reis BF, Sayers S. A motivational counseling approach to improving heart failure self-care: mechanisms of effectiveness. *J Cardiovasc Nurs* 2006;21(3):232–41.
- [42] McDowell I. *Measuring health*. Third ed. New York: Oxford University Press; 2006.
- [43] Little RJ, Rubin DA. *Statistical analysis with missing data*. New York: John Wiley and Sons; 1987.
- [44] Little RJ. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc* 1988;83:1198–202.

- [45] Muthén LK, Muthén BO. *Mplus: statistical analysis with latent variables user's guide*. 5th Edition ed. Los Angeles, CA: Muthen and Muthen; 2007.
- [46] Little RJ, Rubin DA. *Statistical analysis with missing data*. New York: John Wiley and Sons; 2002.
- [47] Kenny D, Kashy D, Cook W. *Dyadic data analysis*. New York: Guilford Press; 2006.
- [48] Cohen J. A power primer. *Psychol Bull* 1992;112:155–9.
- [49] Cohen S. Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychol* 1988;7(3):269–97.
- [50] Coyne JC, Smith DA. Couples coping with a myocardial infarction: a contextual perspective on wives' distress. *J Pers Soc Psychol* 1991;61(3):404–12.
- [51] Benazon NR, Foster MD, Coyne JC. Expressed emotion, adaptation, and patient survival among couples coping with chronic heart failure. *J Fam Psychol* Vol 2006;20(2):328–34.
- [52] Burg MM, Barefoot J, Berkman L, et al. Low perceived social support and post-myocardial infarction prognosis in the enhancing recovery in coronary heart disease clinical trial: the effects of treatment. *Psychosom Med* 2005;67(6):879–88 Vol.

Appendix

Table 1: Background characteristics of 75 matched dyads.

	Patient	Caregiver
Age (mean)	71 sd 10	65 sd 12
Range	(46-87)	(23-84)
Gender: Female	27% (20)	78% (59)
Race		
White	96% (71)	97% (73)
Black	2.7% (2)	2.6% (2)
American Indian	1.3% (1)	
Ethnicity: Hispanic	0	1% (1)
Education (mean)	13 sd 2.6	12.8 sd 2.4
Relationship to each other		
Spouse or partner	73% (49)	71% (52)
Son, daughter, friend	7.5% (5)	23% (17)
Parent	9% (6)	1.3% (1)
Role: caregiver/receiver		
	CG 5.2% (3)	CG 48% (31)
	CR 24.5% (14)	CR 2.7% (2)
	Both 45.6% (26)	Both 31% (23)
	Neither 24.5% (14)	Neither 17% (13)
Year of relationship (mean)	45 sd 18	44 sd 18

Notes. CG = care giver. CR = care receiver.

Table 2: Self rating of chronic illness and health.

	Patient	Caregiver
Chronic illness	60% (42)	39% (29)
Self rating of health		
Poor/fair	41% (30)	20% (15)
Good	50% (37)	47% (35)
Very good	8% (6)	21% (16)
Excellent	0% (0)	10% (8)

Table 3: Patient partial correlation coefficients between shared care and background characteristics; within dyad correlations.

Patient characteristic	Communication	Decision making	Reciprocity	Within dyad correlation
Spouse	~~	~~	0.34 <i>p</i> =0.012	<i>r</i> =1.0*
Health	0.35 (<i>p</i> =0.000)	~~	~~	<i>r</i> =0.39 (<i>p</i> =0.000)
Age	0.34 (<i>p</i> =0.004)	~~	~~	<i>r</i> =0.64 (<i>p</i> =0.000)
Chronic illness	-0.26 (<i>p</i> =0.053)	~~	~~	<i>r</i> =0.54 (<i>p</i> =0.000)
Gender	~~	~~	~~	<i>r</i> =-0.26 (<i>p</i> =0.007)
Education	~~	~~	~~	<i>r</i> =0.32 (<i>p</i> =0.000)
Years together	~~	~~	~~	<i>r</i> =0.92 (<i>p</i> =0.000)
Both CG and CR	~~	~~	~~	<i>r</i> =0.48 (<i>p</i> =0.000)

Notes. ~~=not significant.

Table 4: Caregiver partial correlation coefficients between shared care and background characteristics.

Caregiver	Communication	Decision making	Reciprocity
Spouse	~~	~~	0.46 ($p=0.001$)
Health	0.23 ($p=0.02$)	0.36 ($p=0.003$)	0.23 ($p=0.004$)
Education	0.27 ($p=0.004$)	0.24 ($p=0.005$)	0.19 ($p=0.003$)
Both CG and CR	0.61 ($p=0.001$)	~~	0.53 ($p=0.008$)
Gender	~~	~~	~~
Age	0.22 ($p=0.048$)	~~	~~
Chronic illness	~~	~~	~~
Years together	~~	~~	~~

Notes. ~~=not significant.

Table 5: SCI-3 within dyad factor correlations for shared care dimensions.

	CG ^b communication	CG ^b decision making	CG ^b reciprocity
PT ^a communication	0.46 (<i>p</i> =0.000)	0.13	0.27 (<i>p</i> =0.02)
PT ^a decision making	0.27 (<i>p</i> =0.008)	0.50 (<i>p</i> =0.000)	0.30 (<i>p</i> =0.002)
PT ^a reciprocity	0.33 (<i>p</i> =0.001)	0.30 (<i>p</i> =0.008)	0.50 (<i>p</i> =0.000)

^aPT = patient, ^bCG = caregiver.

Table 6: Patient correlations between dimensions of shared care and SCHFI.

Patient	Communication	Decision making	Reciprocity
Patient self-care maintenance	~~	0.65 ($p=0.000$)	~~
Patient self-care confidence	0.24 ($p=0.023$)	0.52 ($p=0.000$)	0.41 ($p=0.000$)

Notes. ~~=not significant.

Table 7: Caregiver correlations between dimensions of shared care and patient SCHFI.

Caregiver	Communication	Decision making	Reciprocity
Patient self-care maintenance	~~	0.29 ($p=0.014$)	~~
Patient self-care confidence	~~	0.37 ($p=0.000$)	0.35 ($p=0.001$)

Notes. ~~=not significant.